UNIVERSIDADE FEDERAL DE SANTA CATARINA

A COMPARATIVE STUDY OF STUDENTS' ABILITY TO DISTINGUISH MAIN POINTS FROM DETAILS IN ENGLISH AND PORTUGUESE.

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RESUMO

Este estudo investigou a habilidade de alunos universitários em distinguir pontos principais de detalhes em textos em português e inglês. Quarenta e dois alunos da Universidade Federal de Santa Catarina foram aleatoriamente divididos em quatro grupos. Cada grupo leu e resumiu dois textos, um em português, outro em inglês. Os resultados mostram que os estudantes tiveram dificuldade em identificar os pontos principais em ambas as línguas. Os estudantes incluíram informações de nível secundário e terciário (de acordo com os juízes) tanto nos resumos dos textos em português como nos de inglês. Ademais, não houve relação entre o nível de conhecimento de inglês dos estudantes e sua performance em resumir os textos em inglês. Não houve correlação significativa entre as notas obtidas no teste de inglês e as notas das variáveis IDÉIAS PRINCIPAIS, IDÉIAS SECUNDÁRIAS, IDÉIAS TERCIÁRIAS, RESUMO e FORMA. Os resultados deste trabalho sugerem que a dificuldade dos estudantes em distinguir pontos principais de detalhes se deve a fatores cognitivos assim como lingüísticos. Contudo, são necessários outros estudos investigando o problema antes que qualquer generalização possa ser feita.

ABSTRACT

This study investigated students' ability to distinguish main ideas from details of texts in Portuguese and English. Fourty-two Federal University of Santa Catarina undergraduates were randomly divided into four groups. Each group read and summarized two texts, one in English the other in Portuguese. Results show that students had difficulty in identifying main points in both languages. Students included secondary and tertiary level information (according to a pannel of judges) both in their summaries of Portuguese and English texts. Also, students' knowledge of English was not related to their performance in summarizing English texts. There was no significant correlation between students' scores on the EFL test and scores on variables MAIN IDEAS, SECONDARY IDEAS, TERTIARY IDEAS, SUMMARY and FORM. The findings of this study suggest that subjects' difficulty to distinguish main points from details was due to cognitive factors as well as linguistic. Yet, more studies are needed to further investigate this problem before any generalizations can be made.

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CHAPTER I

INTRODUCTION

1.1. The Problem

Teachers involved in the programme of 'Inglês Instrumental' at the Federal University of Santa Catarina have noticed that a considerable number of students have difficulties in distinguishing main points from details in foreign language texts. Examples or secondary information are often indicated as main ideas of passages.

Very little is known about reading comprehension processes and even less about those processes concerning foreign language reading. Thus we are prevented from helping students to solve their problems. Although there has been a great deal of research on the kind of information which tends to appear in the comprehension and summarization of texts, a) studies until now have focused on native language materials so that we lack scientific studies using foreign language texts; b) these studies have only provided part of the solution to the theoretical problem: "What is a main point?"

The objective of the present study is to investigate the ability of Federal University of Santa Catarina Dentistry students to determine whether a given idea in a text in English or Portuguese is a "main point" or a subsidiary detail. In this way it may be possible a) to plan better reading comprehension materials and classes, and b) come nearer to answering the question: "what is a main point?"

The study thus considers certain factors such as the students' ability to distinguish main points from details in native and foreign language texts, the strategies used for identifying the main points in both languages, the types of students that have more or less difficulty in the task, and the relevance of the amount of knowledge of the foreign language.

These points are raised with the following questions in mind:

a) Is the problem of distinguishing main points from details linguistic or cognitive?[1]

b) Is there a correlation between the amount of knowledge of the language and the difficulty in distinguishing main points from details?

c) Are the strategies used to identify main points in native and foreign language texts different?

The relevance of this study is that it should be possible to supply a starting point from which teachers can help students to develop their ability to comprehend texts.

1.2. Significance of the Study

Academic education in Brazil requires of students the ability to obtain information from foreign language texts. In

[1]The word "cognitive" is used here to refer to the ability of reasoning.

almost all areas of study the obligatory or recommended bibliography includes books, reviews or articles in English because factors such as the recency of the publications limit the amount and quality of translations available.

Since most Brazilian university students' knowledge of English is restricted to that acquired in secondary school, these foreign language materials which could contribute largely to the improvement of their studies and to the development of better professionals are simply ignored.

In an effort to give these students the ability to cope with English texts, ESP courses have been developed throughout the country. Students learn about reading strategies which, with the help of the little knowledge of the language they have, enable them to find the information they need in foreign language texts. At the same time, students are trained to use appropriate strategies for each reading task. Texts are selected and exercises designed so as to provide a variety of materials where students practice reading. However, the preparation of materials that meet the students' needs demands first, identifying their weaknesses; second, finding the origin of these problems; and third, proposing possible solutions.

Accordingly, the relevance of this study lies in the possibility of it shedding light on the murky origins of the difficulties students engaged in the ESP project at our University have suffered from.

Moreover, the significance of the problem itself lies in the fact that the ability to identify key ideas of any piece of written prose seems to be essential for its understanding as well as for the writing of summaries or reports which are standard academic and professional tasks.

1.3. The Study

Fourty-two Federal University of Santa Catarina undergraduates participated in the experiment that consisted basically of summarizing two texts - one in Portuguese, the other in English.

These summaries were scored for main points, details and other subsidiary information according to a 'standard summary' produced by integrating 8 judges' summaries.

On a lateral work, subjects were also investigated on the use of reading strategies.

The data were codified and analyzed on a series of statistical tests and the results supported the answers for our questions, which are stated in the work in terms of 4 hypotheses.

CHAPTER II

A PROCESS VIEW OF READING

2.1. The Reading Process

2.1.1. Introduction

A great deal of the discussion about reading - what reading is, the roots of reading - in the pertinent literature refers to the problem of letter or word identification versus meaning construction.

On the one hand, word - centered approaches emphasize the role of letter and word identification in the process. Reading, from this point of view, is a precise bottom-up process which starts with graphic stimuli and letter identification and continues through word recognition and processing of sentences and larger language units. The reader's participation in the process is mainly mechanical: he simply pieces together visual features one at a time and in a left-to-right sequence (Cf. GOUGH, 1972)

However, reading theory has developed to incorporate psychological and sociological components. Attention is devoted to the study of mental processes involved in the reading act.

As a result, reading has come to be seen as an active process. The reader is not a mere decoder of graphic symbols. His role is that of an actual contributor who brings to the task expectations and background knowledge and arrives at meaning through the use of comprehension strategies which take into account higher level processes (contextual, semantic and syntactic analysis) as opposed to lower level graphic perception, (Cf., Kintsch and van Dijk, 1983; Rumelhart, 1977).

In the following pages we will attempt to describe the bottom-up/top-down theories of reading discussing the appropriateness of such a classification with respect to Gough's (1972), LaBerge and Samuels' (1974) and Goodman's ([1967] 1982) models.

Mainly based on Baltra's work (1982) this paper will argue that: a) bottom-up and top-down models of reading fail to account for the very complex nature of the reading process, b) the classification of models such as Goodman's ([1967] 1982) as purely top-down does not correspond to the reality displayed in his work, and c) reading should be envisioned as an act where higher and lower level comprehension processes interact.

2.1.2. A Bottom-up Approach

According to Baltra (1982) and Wildman and Kling (1979), the most significant example of this theory is presented by Gough in his article "One Second of Reading" (1972) on which he proposes to "describe the events that take place during one second of reading aloud" (Baltra, 1982:61).

In short, Gough's (1972) model, as explained by the authors mentioned, characterizes reading as exclusively a

mechanical process whose essence is the visual analysis of graphic symbols (letters and words). From letter-by-letter identification and recognition of every word through phonemic encoding the reader arrives at the comprehension of sentences which with the help of phonological rules, provides for oral performance.

This view can be criticized on at least three grounds. Firstly, on its striking emphasis on letter and word identification. In our culture written discourse is realized through letters that form words, that form sentences, and so on. When we read we do so because something has been expressed in the written code under certain established conventions. The reader of this chapter surely is not surprised by the fact that some letters are put together forming words which follow one another in a horizontal fashion. However, he reads without paying attention to that. He is aware of the letters and words as he is aware of the page or the type of print. But if he concentrates on such details he loses the sense of what he is reading (cf., Smith, 1978:118).

What one needs, according to Smith (1978), is to have knowledge about the "distinctive features", the traces that characterize different letters and words. About the recognition of these features he says: "We are not aware

> of what the distinctive features are that enable us to distinguish different things - this is *implicit* knowledge"; "... what constitutes a distinctive feature is relative to the distinctions we want to make" (p.110-11).

In other words, we are able to differentiate words in a glance but most of the time we cannot explain how we do so. We use some inherent capacity not unique to reading, but which permits us to

discriminate things in general. The relationship among things we want to differentiate establishes the parameters for the characterization of each individual unit.

As evidence of this distinctive features view Smith (1978) points out the fact that even when prevented from identifying a letter we generally have a good idea of what it is not (cf., p. 111). For those who have had optical examinations this fact can be clearly recognized. At a certain point the examinee is shown a card which he cannot see well to identify the letters, so he may confuse 't' with 'l' or 'u' with 'n' but he would not confuse 'm' with 'p'.

In this sense, reading is possible because we are able to identify significant differences between letters and words but this is not an objective in itself. Obviously, in the normal flow of reading, we look at words, but what we see is not each individual word lined up one after the other. As Smith (1978) observes, in reading our eyes "shift around in leaps and bounds" (SACCADES), resting in places named FIXATIONS, each fixation being a glance (cf., p.21). Scott (1981) explains that these "fixations are not adjacent words or letters but would usually be several words and a couple of lines apart at each time" (p.45).

The reason for that lies in the reading objective per se. We read contextualized language (in opposition to random strings of letters or words). And we read for meaning, for content. Comprehension of messages is our goal. Thus, the graphic display works as a conductor of messages which are expressed by writers and explored by readers.

A second criticism relates to the decoding - to - sound nature of Gough's (1972) model. Meaning, according to the bottom-

up model, is obtained through sound, i.e., the reader goes "from written language to meaning by way of speech" (Baltra, 1982:66). This view is criticized not only by Baltra (1982) and Wildman and Kling (1979), but Frank Smith (1971) and (1978) strongly objects to it devoting many pages of both these publications to the explanation of what he calls "the fallacy of phonics."

Smith (1978) argues that reading is not at all dependent on phonics. It is perfectly possible to read without producing or imagining sounds. He presents numerous factors as evidence, the most obvious being the fact that if information in reading were gained through sound, deaf people would never be able to read. Likewise, as he points out, how could people read languages like Chinese, in which written words stand for ideas, not for specific letters and words (cf., p.60)?

In fact, the possibility of divining meaning without dependence on phonological cues is admitted by other supporters of the bottom-up reading approach. Baltra (1982) cites the LaBerge & Samuels' (1974) model which accepts the idea of attaining meaning directly from the visual code. However, he observes, it is suggested that this direct association results from practice (cf., p.74). According to that, we may conclude that only experienced readers are expected to be able to understand written messages without recurring to sounding out letters or words.

The belief that comprehension results from phonological analysis of graphic materials has influenced reading instruction leading to the development of methods which teach reading by way of speech. Following these methods the beginning reader goes over the print very slowly, translating to sound every graphic signal.

Undoubtedly, in doing so the reader's attention is deviated from the task of getting information to the hard work of converting letters into nonsense sounds, according to the combinations which form words that are also sounded out one at a time in a linear fashion, and finally seen as a set of parts which form a whole - the sentence. As the reader progresses, the transference from written to oral code becomes more and more automatic until he reaches the stage where he no longer 'needs' the help of phonemic analysis to understand print.

LaBerge & Samuels' (1974) suggestion that it is possible to derive meaning directly from the written code seems to assign to their model a broader view of the reading process. However, their theory is built on the same naive premisse as Gough's (1972): that reading occurs in a very fixed linear sequence where higher level processes have no influence on lower ones.

Third, the bottom-up model can be criticized on establishing sentences as the largest units to be processed by the brain. Readers understand sentences and store sentences (not concepts) in memory. As Baltra (1982) remarks, it is difficult to see how sentences, instead of ideas can be stored in memory. Nevertheless, it must be observed that this view is concurrent with linguistic theory of the 1960s and 1970s which rarely looked beyond sentence boundaries.

2.1.3. "Top-Down" as a Label

The terminological dichotomy "bottom-up" versus "top-down" could be misleading in the sense that it may give the idea that a top-down reading theory would characterize the reading process by

the same precisely defined serial nature of the bottom-up approach, only from an opposite point of view.

According to this view, higher level processes influence lower ones, i.e., the perception of letters is affected by our knowledge about words which are recognized due to the influence of sentence context and so on. However, models of reading such as Goodman's ([1967] 1982) which do not support bottom-up analysis of print cannot be classified as exclusively top-down either (if we take the term in its raw meaning, in opposition to bottom-up). Indeed, Kintsch & Van Dijk (1983) hold that

> "pure top-down models have never really existed, strictly speaking, because pure top-down processing is phychologically absurd" (p.25).

In what way would pure top-down models be "phychologically absurd"?

Specifically, in their rigid sequential nature. As we said with respect to bottom-up approaches, reading cannot be considered as developing in a step-by-step fashion where the processing of a certain element is always preceded and followed by the processing of two other elements as, for example, the processing of words coming after the identification of letters and before the processing of sentences. Rather, we have a situation where bottom-up and top-down analysis of information interact or happen simultaneously. Factors inherent to the material or inherent to the reader (i.e., his expectations and previous knowledge) favor different types of processing.

According to the reader's purpose in the act, the analysis of the information of a text may take various forms. At a certain point of his reading the fluent reader may stop to analyse a particular word which attracted his attention for some

reason, as for example, to confirm a prediction, and then get back to a normal flow of reading, i.e., devoting his attention to the ideas of the text, to the text as a whole.

Quoting Gibson & Levin (1975:454) Baltra (1982) agrees that "there are as many reading processes as there are readers, things to be read, and goals to be served" (p.97). Such an assumption could, lead to simply accepting that reading is a complex issue which nobody understands and thus, which cannot be explained by any theory. Scientific research, though, has tried to explore the processing of the reading act, attempting to describe the mental operations which go on in the reader's mind. These investigations have provided the necessary insights for the construction of theoretical models which see reading from a more flexible standpoint.

2.1.4. A Modified Top-Down Approach

Accounting for the complexity and richness of the reading process, authors have proposed an integrative view of reading (e.g., Rumelhart, 1977; Kintsch & Van Dijk, 1978; Stanovich, 1980). This integrative view of the reading process would incorporate the different levels of comprehension processes considering the reader's ability to assimilate information found in different parts of the text in hand.

While the nomenclature bottom-up/top-down suggests strictly sequential information - processing models, the integrative theory advocates "interactive models" which recognize the extremely flexible nature of the reading process, where information flows "up *and* down in different degrees at various

stages of the process" (Baltra, 1982:57). In Kintsch & Van Dijk's (1983) words "a bottom-up, data-driven analysis process interacts with a top-down, knowledge - driven hypothesis - testing process" (p.23).

Thus, any model designed on these premises has to deal with a very broad range of alternatives which take into consideration this flexible processing and multiple - source information flow. In this sense, Rumelhart (1977) characterizes the skilled reader as the one who is able to make use of lexical, syntactic, semantic and ortographic information to attain his reading goals. According to Rumelhart, the reading process is illustrated by the figure:

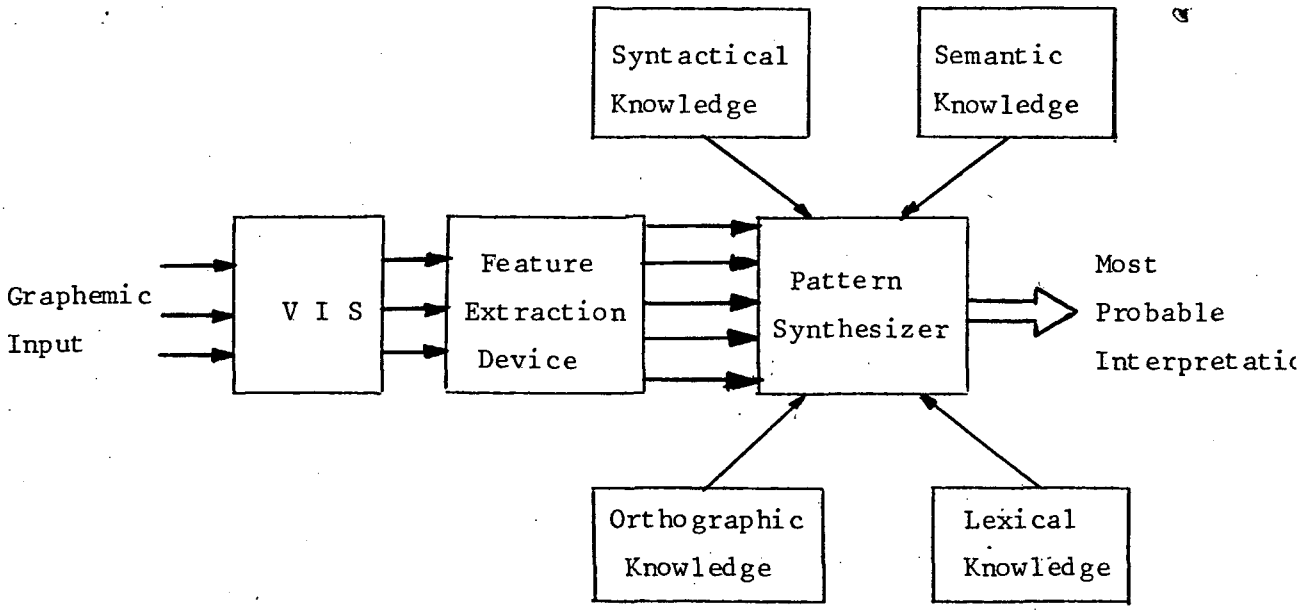


FIG. 1 - A stage representation of an interactive model of reading.

VIS = visual information store (1977:588)

Rumelhart's (1977) interactive model built on the belief that reading is both a perceptual and cognitive process attempts to explain how these different knowledge sources interact to

produce the reader's "most probable interpretation". The mechanism which performs the interaction of sources is called message center. A brief account of the model is offered in the following quotation:

> "The message center keeps a running list of hypotheses about the nature of the input string. Each knowledge source constantly scans the message center for the appearance of hypotheses relevant to its own sphere of knowledge. Whenever such a hypothesis enters the message center the knowledge source in question evaluates the hypothesis in light of its own specialized knowledge. As a result of its analysis, the hypothesis may be confirmed, disconfirmed, and removed from the message center, or a new hypothesis can be added to the message center. This process continues until some decision can be reached. At that point the most probable hypothesis is determined to be the correct one" (Rumelhart, 1977:589-90).

Another example presented as a modified top-down model is Goodman's ([1967] 1982) view of the reading process. It has been labeled as exclusively top-down by Stanovich (1980), however, Baltra (1982) disagrees with this position arguing that in doing so, the bottom-up flow, "crucial to Goodman's theory" is simply ignored (cf., p.58).

Goodman presented his model in 1967 in a paper entitled "READING: a Psycholinguistic Guessing Game". The psycholinguistic nature of reading is explained by the fact that "it involves an interaction between language and thought" (Goodman, 1982:34). Reading takes place in a graphic context, but the graphic code has no meaning in itself. The reader supplies the conceptual input necessary to reach meaning. Moreover, reading is a guessing-game because of its hypothesis-testing nature. The reader brings to the task his expectations about the text. He formulates hypotheses to be tested, playing a game where success leads to meaning.

Goodman's model ([1967] 1982) gives us a new dimension of the reading process. In Goodman's terms "reading is a selective process" in the sense that the reader actively makes decisions about the visual display in front of his eyes (cf., 1982:33). These decisions are not at all intuitive but they result from the sum of expectations the reader brings to the act. Implicit in this definition are three of Goodman's major claims about reading.

One idea which is apparent in his definition is Goodman's attitude toward the graphic information processing. The print marks on the page are considered references which are used as the starting point of the process. Thus, letters and words are recognized as the input which stimulates the reader visually (the bottom-up component).

Secondly, we have the assumption that the reading process is active. This implies that the reader participates in the process influencing it with personal contributions. The decisions about the development of the act are made in the reader's mind.

Third, the definition draws attention to the relevance of the element of prediction in the process. The reader forms expectations about what he is going to read and, according to Goodman (1982), these expectations are crucial because they influence the decisions made before and during the development of the process.

These points will be explored in more detail in the next pages.

a) The bottom-up/top-down interaction

We said elsewhere that Goodman's model cannot be considered as based exclusively on a top-down theory for it includes a

bottom-up constituent in its framework. The question is, then: how is this interaction achieved?

In a list of equivalent terms presented by Baltra (1982) - based on Stanovich's work (1980) - bottom-up models are also described as outside-in and consequently, top-down as inside-out. These terms can be helpful in clarifying the interactive quality of Goodman's model as they relate to the direction of the information flow in the reading process. The model proposes that from 'outside' (out of the reader's mind) to 'in' (the reader) comes information involving the graphic array of printed symbols. On the other hand, from 'inside' (in the reader's mind) to 'out' flows syntactic and semantic information which has been previously learned and stored. The reader makes use of both types of information processing in his search for meaning.

b) The active nature of the reading process

Reading is a mental activity. The reader is the agent in whose brain the process takes place. In this sense, the reading act is permeated with his contributions. The result is a process in which graphic information reaches the reader visually while other kinds of nonvisual information provide for effectiveness. It is this association of visual and nonvisual information which makes it possible to see and comprehend more.

As nonvisual information Smith (1978) cites: "an understanding of the relevant language, familiarity with the subject matter and some general ability in reading" (p.13). He emphasizes that there is a reciprocal relationship between the two kinds of information, i.e., the more nonvisual information one brings to reading, the less visual information is needed and vice-versa. Simple, frequent situations can illustrate that. For

example, knowing in advance about a book (familiarity with the subject matter) facilitates its reading in the sense that one can read it faster, in small print or with relatively poor light. On the other hand, total ignorance about a book, requires more time and better quality of print and light (cf., Smith, 1978:15). In the same way, efficient reading means depending very little on graphic details and a lot on background knowledge brought by the reader to the task.

Accordingly, Goodman's reading theory sees the reader as a processor of this integrative relation. In his search for information which he needs to solve his doubts or satisfy curiosity, he passes his eyes over the print while his brain continuously applies mental reactions to the ideas expressed. So, he actively agrees or disagrees, draws inferences and makes hypotheses to be tested.

In his article "The Reading Process" (1982) Goodman states that reading develops according to five processes employed by the brain: RECOGNITION-INITIATION, PREDICTION, CONFIRMATION, CORRECTION and TERMINATION. The brain starts recognizing the printed material in front of the eyes and reading is initiated (the bottom-up constituent). Immediately, the brain begins to antecipate what has not been seen, making guesses which will be confirmed or rejected. If rejected, the reader rethinks his predictions and correction takes place. Finaly, amongst other things, perceiving that ones' objectives have been met is a sufficient reason for stopping reading.

This model draws attention to the relevance of the element 'prediction' in the process.

c) The role of prediction

It is widely accepted nowadays that prediction is crucial to reading (Cf., Smith, 1978; Holmes, 1982). Indeed, the importance of prediction is not seen as restricted to reading but it is present in all our experience of life.

Smith (1971) holds that everyone, even the small child, is able to predict, to antecipate what is going to happen and it is owing to this capacity to project the future that we limit the possibilities of being overwhelmed. He goes further and says that "our lives would be impossible, we would be reluctant even to leave our beds in the morning if we had no expectations about what the day will bring" (1971:64). These expectations are built upon our knowledge of the world. Past experience moulds the predictions we make. Thus, no one expects to see a dog eating with knife and fork or a baby making math calculations, because our theory of how things work does not expect such possibilities. On the other hand, the fact that dogs bark, people speak of fruit grows on trees does not surprise us. These are predictable things which are part of our theory of the world.

With respect to reading, prediction, making guesses about what will come next, has, as we said before, a decisive character in the process. It is owing to our capacity to antecipate what has not been seen that we delimitate alternatives and thus reduce uncertainty. The reader brings to the task of reading expectations about what he is going to see.

Right or wrong, he is constantly making guesses. Accurate guesses favor comprehension, characterizing efficient reading, but wrong guesses should also be viewed from a positive standpoint in Baltra's (1982) opinion. He argues that "rejecting

a hypothesis could also be considered a degree of comprehension, i.e., discovering that X is not Y" (p.90).

It is interesting to note that James Coady (1979) claims that one quality of the good reader is his capacity to recover from a wrong guess. He says that one of the main differences between good and poor readers is that the former have the ability to recover quickly from wrong guesses whereas the latter "will instead fall into a vicious cycle of wrong previous information leading to wrong later predictions" (p.6).

This antecipatory behavior is studied in Goodman's analysis of oral miscues (1982:35,41). Miscues can be conceptualized as observed responses to a text which do not correspond to expected ones. For example, the substitution of one word for another, omissions or insertions of certain words, etc.

Goodman (1982) believes that the study of miscues produced in oral reading is a useful tool in the analysis of reading behavior. As such, these miscues, which are commonly considered errors, due to careless reading "are like windows on the reading process since we can infer what the reader is thinking as they occur" (p.72). In this sense, miscues give evidence of the active nature of reading, as in the case of being related to the antecipatory process carried out by the reader. Indeed, Cambourne (1977) points out that oral reading miscues are not" random, coincidental occurrences, but rather reflect the systematic, covert information-processing strategies by which the reader extracts meaning from print when reading silently as well" (p. 623).

Among other sources of miscue productions, prediction appears in an example Goodman cites of a substitution of 'the'

for 'your'. Rejecting the 'careless reading' theory, Goodman advocates that this substitution resulted from the reader's prediction that a noun marker should appear in that place (cf., 1982:35).

Prediction in reading, though, is not restricted to word-guessing. Much more than that it involves the formulation of hypotheses about the content of the text. Readers approach texts with different expectations drawn on the basis of individual characteristics: different background knowledge, different objectives in the task. Consequently, the whole development of his reading (from his reading behavior to the gains resultant from the act) is affected by his own predictions about the text.

Up to this point we have been concerned with the nature of the reading process, attempting to provide an overview of the different approaches with reference to the most significant terms which characterize each of them.

In the following section we will describe the reading comprehension notion as it is viewed particularly by Smith (1971) and (1978), Goodman (1982), and Scott (1981).

2.2. Reading Comprehension

In the previous section we related comprehension to prediction. This interrelation will be explored in the following pages accounting to Smith's (1978) basic premise that comprehension is having the questions we bring to the reading act answered (cf., p.85).

2.2.1. The Universals of Comprehension

Comprehension, in a broad sense, is what we all seek in our daily life through the contact we establish with people, with things and facts, with the environment. From birth on, the individual starts building up his own vision of the world guided by an inherent will to understand, to make sense of what he feels, sees, hears, touches, etc., forming a solid theory which will enable him to comprehend more and more.

This theory is what we know, what we have in our minds. It is a summary comprising generalizations about our past experience. Obviously, we do not remember every detail of our past, but, as Smith (1978) observes, "we remember specific events only when they are exceptions to our summary rules, or when they have some particularly dramatic or powerful or emotional significance" (p.80).

In this sense, comprehension is contrasted with bewilderment. Every time we are faced with some situation which does not correspond to the summary we have built up in our minds we are puzzled. In failing to establish the links with our previous experience we do not find the necessary basis for our predictions, and setting up inadequate questions will generally result in getting wrong answers, i.e., confusion, misunderstanding. However, the evidence that our summary is consistent and works well lies in the fact that bewilderment is a rare condition. Indeed, no one could live in constant mental confusion (cf., Smith, 1978:81).

The whole intricate universe of comprehension could be represented by a snowball growing as the individual assimilates more and more things in his brain: observation of the world ⟶

personal theory → prediction → comprehension → observation → ... Put this way, we can see that the comprehension of a determined situation results from our predictions elaborated on the basis of a personal view of the world which, in turn, has been enriched by the comprehension of antecedent facts or situations.

In this context, no activity entailing comprehension can be seen in isolation. Rather, we have to take to consideration the relationship existent among the factors mentioned above.

2.2.2. The Factors Involved in Reading Comprehension

Like listening to a radio program or to a lecture, seeing a film or even standing by the window observing pedestrians and cars, reading is a comprehension-seeking activity. The essence of reading, its final goal is comprehension, and reading without comprehension is a frustrating activity.

The factors involved in the comprehension of print do not differ from those influencing our understanding of the world in general. As we said elsewhere, our reading comprehension is affected by the predictions we bring to the act, which are basically formed on our background knowledge, our experience of the world. This experience is one of the personal features which differentiate people. Two people can have an identical view of some situation or fact at the same time, but they cannot have exactly the same view of everything always.

Unless our reading is conducted by a specific objective, such as looking for particular grammatical patterns or vocabulary items, one's aim is to comprehend the message encoded

in the graphic system. Meaning is the main concern. Goodman argues that the process of reading is reconstructive. The writer constructs meaning and exposes this meaning in the form of language. The reader tries to comprehend the writer's meaning. So, he reconstructs the message. In this reconstruction, Goodman (1982) says: "what message the reader produces is partly dependent on what the writer intended, but also very much dependent on what the reader brings to the particular text" (p.78). The reader-comprehender actively integrates information found in the text with his theory of the world. The load of his past life: his experience as a human being, his conceptual development, his knowledge about language, etc., remains latent and is brought to interact with the written message being processed. This reconstructive view of comprehension is widely accepted nowadays, being especially supported by models of reading such as Goodman's ([1967] 1982) which are based on the "predict-test-confirm" procedure.

The quality of the questions the reader makes to the text varies according to the 'baggage' he brings in his mind. He will elaborate effective questions, if his theory provides substantial data for that. On the other hand, his predictions will not be so good in terms of leading to comprehension if he fails to relate what he already knows with the informational content of the text. Concurring with the idea that comprehension depends on prediction, Holmes (1982) says:

> "there must be some element of predictability in our reading... total predictability means that the text can tell us nothing new; total unpredictability means we lack purpose in reading and can mean total lack of understanding" (p.4).

In other words, there must be some information gap between what

the reader already knows and the ideas expressed in the text. The reader is the miner who digs in order to find the kind of mineral he knows or supposes exists in the place. He does not dig for any mineral, his objective is very well established in his mind and according to it he elaborates predictions and conducts his work.

A very important pedagogical point is stressed by Holmes (1982) with respect to purpose in reading: he argues that the normal classroom situations where reading materials are selected and imposed by the teacher imparts comprehension. If the reader is not given the opportunity to choose his reading matters on the basis of his own predictions, his interest may not be raised. The task of reading, will then, seem arid resulting in loss of comprehension (cf., p.4-5).

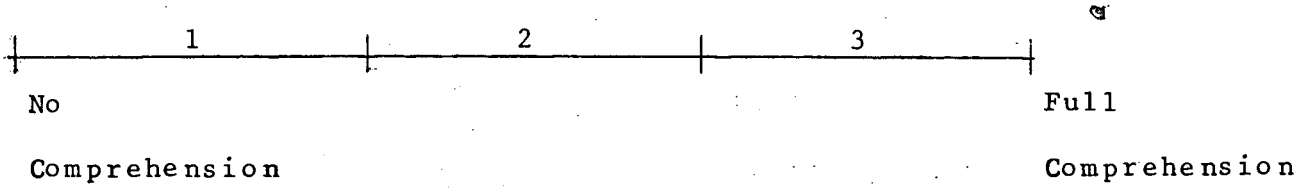
Another interesting point concerning how comprehension is and should be envisioned in reading instruction is brought up by Smith (1971). Many times when the teacher complains that his students did not understand something, Smith proposes, the reality is that the students did not make the kind of predictions they should have made, and so, they saw things from a different point of view from the teacher's. Asking pertinent well-elaborated questions in advance would help students in directing their reading towards the meaning the teacher wants them to get. The purpose of their reading will be defined in their minds as when we try to find a name or address in the telephone directory, for example (cf., 1971:87).

The exploration of texts may assume, in this way, different forms. It may vary according to factors such as purpose in reading (reading for entertainment, reading for specific

information, etc.) or it may also take different forms according to the load of information one wants or needs from the printed material. Scott (1981) argues that the comprehension of texts could be divided into three levels.

2.2.3. Three Levels of Comprehension

In Scott's (1981) view a scale of comprehension ranging from zero to 100% comprehension could be divided into three sections. These three sections would correspond to the depth of exploration of the ideational content of the text:



The first one third of the scale is that of identifying the topic of the text and having a brief idea of what the author says about it (GENERAL COMPREHENSION); the second, is knowing the topic and the key ideas about it (MAIN POINTS COMPREHENSION); and the last, exploring the text in detail (DETAILED COMPREHENSION). The level of comprehension desired may vary depending on the material being read, on the reader's objective, on his knowledge of the language code and/or about the topic, etc. (cf., 1981:41). In reading a newspaper we generally look through the titles stopping when some article calls our attention. It is, then, according to our interest and objectives that we decide whether to explore the text in more detail or not. However, in the case of newspaper articles, what we often want is to have a general idea about the topic, whereas when reading instructions for the

use of household appliances, for example, we need to understand the details. Reading different kinds of materials, with different purposes, demands using different techniques though. The word 'technique' is used in Scott's work with respect to the amount of information to be explored. He proposes three techniques:

1. Scanning

Used when we have the supposition that the information desired is in that text. "For example,

> when we know that a certain book gives a description of early 18th century Rio de Janeiro, we may search for it in the index or by flicking through the relevant chapter, looking for dates like 1720, or, the capital R and J of the city in question" (1981:42).

2. Skimming

Quickly looking over a text in order to get a general idea: looking at the title, the author, subtitles, graphs, pictures, etc.

3. Reading for main points or detailed comprehension

In both readings the whole text is examined. The difference is in terms of how deep the reader wants to go.

Like Smith (1971) and (1978), Scott (1981) criticizes some common beliefs and procedures in reading comprehension instruction. Scott's (1981) criticism is related to the emphasis given to detailed comprehension in EAP (English for Academic Purposes) courses. The present writer's experience as student and teacher, though, has shown that the situation described by

Scott (1981) is also valid for reading instruction in the native language.

The emphasis given to detailed comprehension in reading, probably based on the mistaken idea that we do not understand a text if we do not get into its less important particularities, has relegated general and main points comprehension to a secondary place. However, as Scott (1981) comments, in our native language-in our reading outside school - we generally want to have a general idea when, for example, skimming through papers or magazines. He adds: "for the purpose of study it is highly advisable to cultivate the ability to extract a basic idea (levels one and two) first, and then return to the text for a more detailed comprehension *"IF MERITED" (1981:42).

Based upon the ideas exposed in this section we may conclude that, as Smith (1971) states, "comprehension is relative" (p.86). Its relativity is to be taken in terms of the very personal characteristics involved in the process.

Such characteristics as one's store of knowledge and experience, one's purpose and consequent antecipatory work, together with the ability or not to use reading strategies appropriate for the specific kind of text and for the condition will be decisive for one's comprehension of the written message encountered on the printed or handwritten page.

In the research on reading, much of the discussion concerns the question of what good comprehension requires. Consensus has been attained, though, on the significance of using appropriate strategies, i.e., strategies consistent with the reading goals and material.

In the following section we describe the notion of reading

* our emphasis.

strategies and its implications upon the process of reading.

2.3. Reading Strategies

As said before, I have assumed that reading as a process of comprehending the universe of ideas expressed through the graphic code develops according to the process model proposed by Goodman ([1967] 1982): recognition-initiation, prediction, confirmation, correction and termination. However, this kind of framework can only be said to provide a very general view of things. As Baltra (1982) observes, it describes the reading process at a macro-level, not attempting to "stipulate explicitly the different sorts of strategies which are put to use when the reader, text, purpose variables are combined... capturing only the invariant aspects of the phenomenon"(p.106). At a micro-level, the reading process, or processes, may be realized differently. The general, global end-goal, comprehension, can be reached in distinct ways with the same degree of success or failure. The reader has available to him a number of different procedures, different paths to arrive at his objective.

In this sense, Kintsch and van Dijk (1983) relate the notion of strategy to the "action theory". They state that

> "a strategy involves human ACTION... there are often several courses of action or interactions that may lead to the same final result or goal" (p.63).

Regardless of the very extensive and complex discussion that the definition of the term strategy in relation to understanding language can bring about, as the authors above show, by strategy, specifically reading strategies, is meant the devices the reader uses to understand written messages.

In accordance with his guessing game view of the process Goodman (1982) advocates that efficient reading is not dependent on accuracy of identification of all language items, but on using effective strategies for selecting the most productive cues necessary to elaborate good hypothesis (cf. p.34). Smith (1978) corroborates this position as he proposes that the fluent reader does not process all visual information, but passes his eyes over the print selecting information that is most relevant to his purposes (cf. p.105). Language provides the cues and readers interpret these cues strategically. Thus, the printed symbols on the page are used as references for the elaboration of guesses, for their testing, confirmation or correction. Consequently, what proficient reading demands is the employment of effective strategies for selecting the most useful cues for that.

In recent years the interest in the investigation of reading comprehension strategies has increased (cf., Kintsch and van Dijk, 1983). Studies are undertaken with the objective of discovering what type of strategies good and poor readers employ in the course of their reading. It is assumed that the comparison of strategy usage by different types of readers can be helpful in providing basic insights for the understanding of what the nonsuccessful readers' deficiencies are. Moreover, these studies may make it possible to help poor readers to improve their reading performance.

Research has demonstrated that the major difficulty encountered in this kind of investigation resides in the definition of the procedure to assess strategy usage (cf., Olshavsky, 1977). Among the three techniques commonly cited (introspection-where the subject is asked questions while he reads; retrospection-mainly characterized by questionnaires applied after the reading; and

protocol analysis - which requires the subject to "think aloud" as he reads) the latter seems to have gained preference since it implies less interference of the researcher in the process (cf., Olshavsky, 1977:661).

Most of the time, the reader's difficulty in verbalizing his utilization of strategies is due to his own lack of awareness. The protocol analysis procedure facilitates identification of reading strategies since from the point of view of the reader he has no commitment to this or that kind of previously established reading behavior (which may be indicated by the researcher's questions). His task is simply to try to report his reading behavior, as subjectively as possible, leaving the researcher to analyse the data for evidence of strategies.

Equally apparent in the literature is the fact that the relationship between reading comprehension and strategy usage involves more factors than the question of the kind or amount of strategies used by poor and good readers. Investigatory studies such as Gambrell & Heathington's (1981) propose that sensitivity to strategy dimensions in reading may be a determinant factor for comprehension. Adult poor readers showed they were unware of the value of strategy variables for performance. The conclusion is that "it seems reasonable that instruction with adult disabled readers should focus upon both awareness and use of a repertoire of strategies" (p.220-1).

That being so, the implication for reading instruction is that it is not enough to identify good readers' strategies and teach them to poor readers. Primarily, students must be aware of their own reading behavior and must be conscious of the influence of strategies in reading comprehension. As Myers & Paris (1978) state "a proficient reader may utilize such strategies as

underlining, note taking or selective rereading. Incorporation of such skills into the reader's knowledge base and awareness of the value of those skills must preceed their deliberate employment" (p.689).

In an attempt to offer an overview of the strategies used in comprehension, Kintsch and van Dijk (1983) list eight different types of strategies. Three types - sociocultural, communicative and knowledge use strategies - relate to particular variables inherent to the readers: one's social, cultural or communicative purpose in reading, his interest and motivation, his background knowledge which is used in the individual steps of the other strategies.

The other five types pertain to the development of the reading act as such. They are concerned with the strategic way of approaching and dealing with the text as the reading progresses. In this group we have:

a) General reading strategies - a number of overall strategies employed before actually reading the text. For example: reading the title to identify the topic.

b) Local comprehension strategies - used in establishing the meaning of the first words of the first clause, the subsequent clauses, and so on.

c) Local coherence strategies - those used for establishing relations between clauses and sentences.

d) Macrostrategies - used in establishing the topic, the main points of the text.

e) Schematic strategies - establishing the overall organization of the text, or at a more local level, establishing

the rethorical functions of the different paragraphs (cf., p.99-106).

This list is suggested with relation to a sample text ("Guatemala: no Choices" from NEWSWEEK), chosen for its natural, everyday discourse. The analysis is taken by Kintsch and van Dijk (1983) as giving a partial, very general outlook of comprehension strategies. Each type of strategies mentioned, however, includes a number of more specific ones. In the case of local comprehension strategies, for example, strategies for identifying grammatical categories and/or semantic functions of expressions may be activated (cf., p.101).

The activation of different types of strategies and, at a more detailed level, of the various strategies that are included in one of these types may occur depending on reader, material, task, situation, etc., variables. From the part of the reader strategy usage may be determined by factors such as one's purpose in the task, proficiency in reading and interest, for example.

A study conducted by Olshavsky (1976 - 1977) investigated the relationship between the last two factors with strategy utilization. Concerning the 'interest variable' the results showed that readers with high interest in the material applied strategies more frequently than those with low interest, as expected. However, the hypothesis raised that proficient readers use different strategies than poor readers was not confirmed, but difference in strategy usage was also realized in terms of frequency: good readers used strategies more often. Another factor investigated by the study refers to the material. Olshavsky studied the relationship between the use of strategies and

writing style - concrete or abstract - and found that readers used more strategies with abstract style material.

With respect to the kind of material it seems reasonable to expect that the use of reading strategies also varies according to factors running from language complexity to text layout.

A third element which can be responsible for variations in strategy employment relates to the amount of comprehension desired from the text in question. Taking Scott's (1981) level of comprehension scale as a standard measure, strategy usage may be influenced by the amount of information which the reader wants from the text. It is expected that if the reader's intention is to get general comprehension from a passage, then he reads it differently than if his goal is detailed comprehension. In order to increase our chances of comprehending a particular passage at the main points level, for example, we may devote special attention to certain elements of the text which we select as carrying information more consistent with our reading goal.

In this sense, knowing what or how many strategies to employ to attain the level of comprehension desired in one's reading seems to be a basic requirement for the efficient processing of a written discourse. It must be stressed, though, that research on reading strategies is in its infancy and much of what is said in this section lies in the field of intuition or common sense. The evidence reviewed cannot be presented as strongly proving the hypothetical feelings the authors have about the existence and use of reading strategies. Further research is obviously needed in order to examine, support and extend the

investigations undertaken up to the present.

This review of the literature concerning theoretical models of the reading process, the reading comprehension notion and reading strategies usage aimed at briefly presenting the current state of knowledge, emphasizing the aspects which seem relevant for constructring the basis for our major concern in this dissertation - the discussion and investigation of main points comprehension in reading.

CHAPTER III

MAIN POINTS

3.1. What are Main Points?

3.1.1. Introduction

The identification of main ideas has been considered as fundamental among processes involved in the comprehension of written and oral materials (cf., Brown and Smiley, 1977; Brown and Day, 1983). In this sense, studies investigating the universe of main points comprehension have multiplied in the last years. Among other facts, these studies have attempted to analyse aspects related either to the nature of the material (prose passages, stories, etc.), to the condition (reading or listening) or to the subject's background (age, level of instruction, qualification as a reader, etc.). The underlying objective has, generally been to assess subjects' awareness of the important features of texts and their capacity to identify these features differentiating them from information that is peripheral.

The results of such experiments seem to have started to

shed light on the matter, providing well-founded data which enable better comprehension of the issues involved in the "main point" concept and also to develop more practical methods and materials on reading instruction.

However, the question of what should be considered relevant - and what should not - in texts is still under discussion since the current state of knowledge does not harmonize with the traditional way of conceptualizing and explaining terms in the domain of reading. In this sense, what could seem a simple and even naive question assumes a complex character deserving a deeper analysis of the aspects involved.

This is the subject of the next section.

3.1.2. Textual and Contextual Integration

TEACHER: "How many of you have ever taken a reading class?"

CLASS : Five hands.

TEACHER: "Good. Who can define a main point?"

CLASS : Zero hands.

The situation presented by Martha Thompson Arnold in her article "Teaching theme, thesis, topic sentences and clinchers as related concepts" (1981:373) is an accurate description of what happens when the concept of main idea is brought to discussion. Different reactions such as "it is a central idea", or "it is an essential point", etc. can happen but the question remains unanswered. Still, the problem is - what is essential, central in a text, which ideas should be considered important?

At this point, a polemic question brings to discussion the consecrated relationship writer - text - reader: central,

essential ideas for whom? Should the writer be a reference for an objective selection or each reader decide on the basis of subjective judgements?

On the one hand, the writer, as the prime owner of the text, has a theme in his head that he develops throughout his writing. In this development he makes some points, stresses or questions ideas representing the essence of what he wishes to communicate. This set of ideas covers the author's thought as a whole, expressing the core of the text.

On the other hand, each reader, is a text co-author in the reconstructive process of reading. The references, relations the reader makes are fruit of a very personal view of the text which is influenced by the load of his past experience both as a reader and as a human being. Thus, the results of the "re-creation act", what the reader gets from the written page are very specific to him. The activation of the engine which will help understanding the text is provoked by an interaction between what one brings to the reading act-not only in terms of background knowledge but also with respect to the reader's interest, purpose, in the task - and the printed material itself.

Concerning the judgement of importance of elements in a text the purpose impelling the reading act works as a theme and the reader seeks for relations between this theme and the text. So, readers with different linguistic and/or life experience, or readers with different purposes will certainly arrive at different conclusions in the selection of a text's main ideas.

The task of explaining the concept of main ideas must begin by establishing a definite criterion which takes into account the relationship writer-reader and its object, the text.

This criterion is provided by van Dijk (1979). According to Winograd (1984), van Dijk proposes that elements may be textually or contextually relevant, respectivelly in the point of view of the author and of the reader. And adequate judgement makes use of both textual and contextual criteria "so that importance is assigned to elements that are personally relevant and to elements the author intended to be relevant" (p.406).

It is the author's responsibility to ensure that the ideas he considers important and which he wants the reader to focus his attention on are really emphasized. A well - written text, will present a conventional organization characteristic of its category (e.g., short - story, novel, research report).

This conventional structure on which the text is built will allow for a more accurate interpretation of its elements, working as an orienting device for the reader.

The efficacy of following the organization of a passage as a means of increasing retention has been investigated by Meyer, Brand and Bluth (1980) in an experiment with ninth - grade students. Among other findings the experiment showed that although less than 50% of the students used this strategy consistently, most good readers used it in their recall protocols while poor readers did not. Results also showed that students who used the organization of the text as a strategy recalled much more information.

If following the organization of a passage is a characteristic of skilled reading (cf., Meyer, 1975 (a) and (b)) the importance of clearly organizing texts providing efficient interpretation cues for the reader by means of signaling aspects related to this structure must be stressed. Likewise, in terms

of main points identification, the fluent writer may facilitate the reader's task by making use of linguistic devices such as text organization and signaling.

For the reader, there is a problem of descriminating the different conventionalized discourse types which is expected to be a facilitating element for comprehension. If the reader is able to evoke the structure of the text he will certainly arrive at good results (provided the text is well - organized).

Meyer, Brandt and Bluth (1980) suggest that the ability to use the structure strategy may develop with age and schooling and other studies (e.g., Freedle and Hale, 1979) have pointed out that "competence with story structure precedes competence with expository structure" (Meyer, Brand and Bluth, 1980:98).

As expected, mastery will be directly related to one's experience as a hearer or reader. Young children are familiar with stories that they hear in the early ages and start reading as soon as they are able to. Their experience with stories precedes the first contacts with any other kind of discourse so that when this happens they have already internalized features specific of stories.

Modern theories of discourse have been concerned with the idea of textual organization patterns and its effects on reading comprehension. The notion of schema has been subject of discussion and a number of scientific studies have investigated problems of comprehension related to it (e.g., McGee, 1982; Kintsch, Mandel and Kozminsky, 1977).

This is the topic of our next section.

3.1.3. The Notion of Schema

By schema, in terms of textual organization, is meant the conventional framework which characterizes different discourse types. Kintsch and van Dijk (1983) call these conventional schematic structures, superstructures (cf., p.16). For example, the superstructure of stories in occidental culture is known to be exposition - complication-resolution. A story may consist of one or more episodes, but these episodes will always be assigned to one of the three narrative categories (cf., Kintsch and Kozminsky, 1977; Kintsch, Mandel and Kozminsky, 1977).

Another discourse type largely used in experiments, the psychological research report is supposed to be built on the following schema: introduction, method, results and discussion (cf., Kintsch and van Dijk, 1978).

The term schema, in the broad sense, refers to any kind of formal representation or plan which defines the organizational frame of an act or thing. According to Anderson and Pearson (1984), Bartlett (1932) is known to be the first psychologist to explore the notion of schema in discourse comprehension, however, "historical precedence must surely be given to Gestalt Psychologists" (p.256).

The work of Wulf (1922/1938), a Gestalt psychologist, with studies on visual perception, is an example of how the idea of a prehexisting schema was proved to influence subjects' perception. Subjects were shown a design rapidly and were asked to reproduce it on different occasions. It was noted that subjects' reproductions varied according to their interpretations of the designs, i.e., they stressed points which made the drawings more similar to the idea they had got from the visual input. Wulf

explains: "In addition to, or even instead of, purely visual data there were also general types of schemata in terms of which the subject construed his responses" (cf., Anderson and Pearson, 1984:257).

In discourse comprehension the existence of a pre-established schema will equally influence one's understanding to the extent of making a text assume meanings according to different schemata set up by readers. In this way, in addition to the schema determined by textual factors (the conventional text structure) which will influence the writer's work establishing a common point of reference between writers and readers, there is the "personal schema" which is dependent on contextual factors related to the subject (reader): his/her background knowledge and purpose in the reading act. That being so, readers who bring to bear different schemata will give distinct interpretations to what they read.

In Bartlett's (1932) terms schema refers to "an active organization of past reactions, or past experience" (cf., Anderson and Pearson, 1984:257). It is noteworthy that there is a strong relationship between this assumption and the current theories and works on models for representing human knowledge. The reader's background knowledge, his cultural and social experience provide material for establishing the reading schema and equally his reading goal may define this schema.

A growing body of scientific studies have provided considerable evidence to support the relationship reading goal - schema eliciting. From Bartlett's work on recall of the American Indian folktale, "The War of the Ghosts" (1932) to more recent studies there has been a general consensus among researchers to advocate the existence of such a relationship.

Studies by Pichert and Anderson (1977 and 1978) have shown that relative importance in prose is a function of adult readers perspective. The assignment of different perspectives in reading a story led to different results in terms of rating the importance of story elements. In their first study independent groups of adult subjects read two stories containing details and events of interest from at least two different points of view. One story, about two boys skipping school to go to one boy's house while his mother is out was read from one of the three different points of view: that of a burglar, a prospective homebuyer, or no direct perspective. The results of the experiment supported the hypothesis that there was a correlation between the schema set up to read the story and the rating of importance of its elements.

In the second study, subjects were directed to shift perspectives (they read the story from one point of view, then from another). Remarkably, subjects' recalling was proved to be profoundly affected by perspective since they recalled information consistent with the different points of view of each reading act.

Extending these studies to a population of children in grades 3,5 and 7, Pichert (1979) found that, in general, children as young as third grade rate the relative importance of a text's idea units in a similar way to adults when assigned perspectives. Also their recall is highly affected by the assignment of perspectives.

Interestingly, a developmental trend was noted in that children's ratings are better predictors of their recall than adults' ratings so that, unlike Brown and Smiley (1977), Pichert

(1979) argues that children's ratings are not to be considered idiosyncratic. Pichert (1979) states that: "explanations of why children remember and forget what they do may be made more complete with a better understanding of the child's perspective" (p.45).

In these experiments the activation of different schemata was directed by factors outside the reader. In normal everyday reading, however, it is the reader who decides which schema he/she will use to get the information he/she wants or needs from the printed page.

The reader's decision may be taken on a number of grounds. One important factor for comprehension is the reader's capacity to invoke an appropriate schema when approaching a text.

The adequacy of the schema should be viewed in terms of features specific to the text and to factors such as reading purpose. Anderson and Pearson (1984) suggest that maybe one important factor involved in this decision-making process is inferencing (p.269).

The role of inferences in the process of reading and in the process of comprehension in general has been emphasized in the works of Frank Smith (1971 and 1978), Goodman (1982) and other reading theorists of the last decades. The effect of inferences upon schemata activation seems to be of primary concern in relation to the problem of main points comprehension. Again, the process may be compared to a snowball rolling and growing as one factor leads to another (cf., Chapter II). The reader's background knowledge will influence his view of the specific moment of reading and of the text that will modify his previous theory of the world enlarging his field of knowledge

ellucidating or even creating doubts which will probably be solved in future readings.

In the same way, or by the same "chain process" the reader's background knowledge may determine his reading purpose which will provide the constraints for inference making and that will activate a certain schema. In this sense, inferencing seems to have its role well-established in the relationship reading goal-schema eliciting.

A study by Anderson, Reynolds, Schallert and Goetz (1977) illustrates this point. A group of college students was presented two texts of ambiguous contents. One text could be interpreted as a description of a prisoner planning his escape from cell or as a wrestler trying to get out of his opponent's hold. The other text permitted interpretation of four people getting together to play cards or that of a quartet preparing to begin their weekly practice of music. Interestingly, students tended to interpret the texts according to their personal experience: physical education students assigned the wrestling schema to the first text and the cards schema to the second one, while music students interpreted the first text as a description of an escape plan and the second as a music practice preparation.

As stated before, the reader's goal acts as a theme that he/she imposes on the text. This theme is the theoretical basis of the schema that is set up to read the text and is equally the reader's references in the selection of a text's main points. Probably, by assigning the wrestling schema to the first text, physical education students paid attention to elements of the text which were important from this point of view while music students giving another interpretation, devoted special

attention to other parts of the same text.

Studies such as the one by Pichert and Anderson (1977) and Anderson et al. (1977) among others, seem to have established clear starting points for answering the question of which ideas should be considered important in a text.

What is necessary to have in mind is that: (a) the writer gives his view of things through the written work. There are certain features that he imposes on his writing that will guide comprehension. The writer's ability to guide the reader to the key points of his writing may be a determinant of his success; (b) texts do not bring definite truths; and (c) readers may give different interpretations to a text as the result of subjective characteristics. Readers may assign different values (on a scale of importance) to the ideas in a text according to factors such as personal knowledge and reading goal.

In the words of Kintsch and van Dijk (1978):

> "It is assumed that text comprehension is always controlled by a specific schema. However, in some situations the controlling schema may not be detailed nor predictable. If a reader's goals are vague and the text that he or she reads lacks a conventional structure, different schemata might be set up by different readers essentially in an unpredictable manner" (p.373).

The results of that will be that readers will lack concrete elements on which to base their judgement of importance of the ideas in a text.

The work of Kintsch and his colleagues from the development of his model of text comprehension on (Kintsch and van Dijk, 1978), has been concerned with the problem of main points identification.

In the following section Kintsch's (1978) model of reading is described.

3.2. The Kintsch Model

Basically, the assumption that delineates and supports the model is that comprehension is a complex process which can be decomposed into multiple components. These componentes, or subprocesses can operate either sequentially of in parallel (cf., Kintsch and van Dijk, 1978).

Three types of mental operations are specified in the model. The first set of operations organizes the meaning elements of the text into a coherent whole. The elements are subjected to multiple processing which results in differential retention. The second reduces the full meaning of the text into its gist (main points). The third is responsible for generating new texts based on the one read - the so-called second order discourses.

The theoretical formulations for the model were proposed in Kintsch (1974). The surface structure of a discourse is interpreted as a set of propositions - basic units of meaning. The elements of a proposition are word concepts that may be used either as arguments or a predicators. A proposition contains a predicator and one or more arguments and it is conventionally represented as:

Mary works. (WORK, MARY)

Mary has sisters. (HAVE, MARY, SISTERS)

The set of propositions representing the surface structure of the text is ordered by semantic relations among themselves. And is named text base.

The realization of mental processes involved in the derivation of the input discourse into text bases has been studied in Kintsch and van Dijk (1978) and has originated a number of studies since then. The idea is that discourse structures are characterized at two levels. At the microlevel, the microstructure refers to the structure of the individual propositions and the relations among them. At the macrolevel, the macrostructure characterizes the discourse as a whole. The two levels are related by semantic mapping rules, the macrorules. These macrorules reduce the more detailed information of the microstructure of the text organizing it into macrostructural information. The basic principle underlying the application of these rules is that "no proposition may be deleted that is an interpretation condition of a following proposition of the text" (Kintsch and van Dijk, 1978:366).

The authors cite three basic macrorules:

a) Deletion - Each proposition that is not an interpretation condition for another proposition may be deleted.
Example:

John had a small car - John had a car.

b) Generalization - A sequence of propositions may be substituted by a general proposition that is entailed by each of them.
Example:

The girl picked roses, daisies, orchids and tulips - The girld picked flowers.

c) Construction - A sequence of propositions may be replaced by a proposition which denotes a global fact about

them.

Example:

Mary cooked potatoes

Mary mashed the potatoes

Mary made a purée

These macrorules operate recursively on sequences of macropropositions originating a hierarchy, which consists of several levels. The formal structure of a text base in terms of these different levels is represented by the figure:

Macrostructures and Discourse Understanding

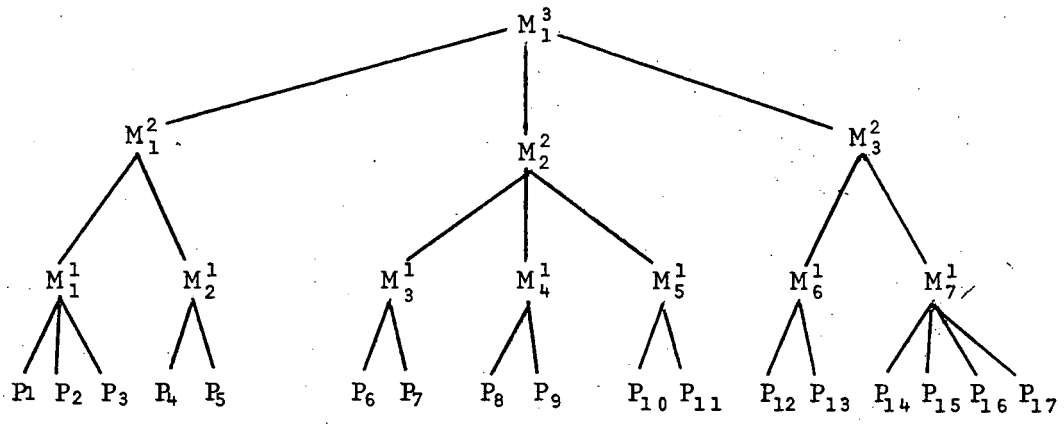


FIG. 2 - The formal structure of a textbase.

(Kintsch and van Dijk, 1983: 191)

P = propositions forming the microstructure

M = propositions forming the macrostructure

The graph illustrates how the cyclical application of macrorules may reduce the number of macropropositions in the lower levels of the macrostructure to a single proposition representing the text as a unit.

As mentioned before the notion of a controlling schema is also present in the model. Kintsch and van Dijk (1978) argue that a cycling schema constrains the application of the macrorules "so that macrostructures do not become virtually meaningless abstractions or generelizations" (p.366). The schema determines which parts of the discourse should be considered relevant. It provides the criteria of relevance applied to the different cycles of processing restricting the number of macropropositions retained. In this sense, micropropositions that are considered irrelevant never become macropropositions while macropropositions selected as relevant in the various levels of the hierarchy are probably the ones which are brought to be reproduced.

The production component of the model has been studied in summaries and recall protocols mainly. Important data accounting for the problem of gist identification has been gathered in experiments using one and/or the other instrument.

Kintsch and van Dijk (1978) observe that the texts generated by readers on the basis of their comprehension of the piece of discourse previously read are not simple replicas. Rather, they are "texts in their own right" resulting from very particular viewpoints which determine the transformations applied to the original piece read and create different texts (cf., p.374).

Up to this point we have tried to describe some theoretical notions essential for the understanding of gist acquisition. In the following pages gist comprehension assessment measures are discussed.

3.3. Main Points Comprehension Assessment

If comprehending written discourse is not a simple task, measuring one's comprehension can be said to be a much harder one.

The exploration of what goes on in the reader's mind while his eyes focus on the printed page has gained great impetus becoming one of the most fascinating areas of psychological research on reading.

The very fact that a variety of mental processes identified in reading comprehension experiments are proposed not to be specific to the task, but processes involved in comprehension in general, determines the importance of such investigations to help human beings in understanding each other best.

The multiple - processing view of reading advocated by scientists as Kintsch and van Dijk (1978) among others not only allows for studying the operation of comprehension as it is concurrent with the multi-ability description of reading.

A survey of educational and psychological literature provided Burkart's (1945) study on the importance of different abilities with a list of 214 reading abilities.

Indeed, it seems reasonable to affirm that a deeper analysis could bring to light a still greater number of abilities involved in reading.

Pedagogically speaking, the decomposition of the generic reading skill into more specific abilities might make it possible assessing problems and so designing developmental and/or remedial procedures in order to increase comprehension.

In this sense, the abstract notion of comprehension becomes more tangible since it can be measured in terms of presence or absence of different abilities. The basic problem then, is to choose or design instruments and procedures adequate to assess different reading skills.

In the specific area of gist identification, most of the experiments have relied on recalling and summarization.

These measuring instruments and their efficacy in assessing readers' ability to distinguish main points from details of written material are discussed in the next pages.

3.3.1. Protocol Recalls

The protocol recall has proved to be an efficient measure of the reader/listener ability to retain important features of texts at the expense of details. Studies have shown, first, that both children and adults favor key points of texts in recalling. Studies with child groups of different ages have investigated the relationship recalling - gist identification (e.g., Christie and Schumacher, 1975; Brown and Smiley, 1977; Smiley et al., 1977). These studies have shown, in general terms, that even the youngest children (5 year-old Kindegarten in Christie and Schumacher's experiment) recall more information relevant to the theme of the stories heard or read than irrelevant information. Adult readers have confirmed this tendency in a number of experiments run with college students (e.g., Kintsch and Keenan, 1973; Kintsch et al., 1975; Johnson, 1970/1973).

Secondly, studies investigating the effect of different

retention intervals upon recalling have presented interesting results. The hypothesis is that the longer the interval, the highest the probability of remembering more points representing the essential core of the text than subsidiary information. Johnson (1970) had various samples of undergraduate students to reproduce the famous "The War of the Ghosts" folktale (cf., Bartlett, 1932) after intervals of 15 min., 7 days, 21 days or 63 days; Kintsch and van Dijk (1978) tested the recall of the psychological research report "Bumperstickers and the Cops" also varying the retention interval: 1 group was tested immediately after reading it, another group after 1 month and a third group after 3 months of reading; Meyer, Brandt and Bluth (1980) investigated the effect of the use of the author's organizational structure upon a group of ninth - graders' recall on two different occasions-immediately and one week after reading.

Generally, recall of the various samples obeyed the same pattern (shown in graphs and tables provided in the respective reports): no matter the retention interval, subjects recall more important points of texts than unimportant ones. In fact, as time intervals lengthen the amount of both trivial and essential information recalled diminishes but later recalls seem to concentrate much more on gist than on details, i.e., as the interval between the reading act and the recalling increases the difference between the amount of details and main points recalled also grows, which confirms the hypothesis above.

Finally, some effort has been devoted to study the nature of the information recalled. Although the issue is in need of a deeper analysis some studies have tentatively presented data in this sense. Frederiksen (1975b) has proposed that recalls

typically contain different types of conceptual and relational information including paraphrases, overgeneralizations, inferences made from the input text and from the subject's background knowledge and elaborations not inferrable from the text. Conclusions from experimental data on undergraduates recall led Frederiksen (1975b) to state that if the same results of his investigations are replicated across a wide range of text types one implication would be that a major part of the semantic structure generated in recall protocols is derived from the text source but not diretly expressed in it. Moreover, the fact that this derived semantic structure persists with repeated exposures to the text reveals that "the derived information becomes an integral part of the subject's understanding of the text" (Frederiksen, 1975b:168).

These findings are clearly in accordance with Kintsch and van Dijk's (1978) remarking that protocols (either summaries or recall) are not simply replicas of memory representations of the original discourse, but, "on the contrary, the subject will try to produce a new text that satisfies the pragmatic conditions of a particular task context in an experiment or requeriments of effective communication in a more natural context" (p.374). Three types of transformational processes that may underlie production of protocols (both recall and summaries) are identified by Kintsch and van Dijk (1978) as:

(1) Reproduction. The simplest operation in second-order discourse production. It involves the retrieval of memory contents.

(2) Reconstruction. Three types of operations may be applied when information cannot be directly retrieved: (a) addition of plausible details and normal properties, (b) particularization, and (c) specification of normal conditions, components, or

consequences of events; and

(3) Metastatements. Comments, opinions about the target text structure, content or schema.

Studying the effect of delay on the occurrence of these types of transformations Kintsch and van Dijk (1978) report that after 3 months the proportion of reproductive propositions declined from 72% to 48%, while the number of reconstructions almost doubled and metastatements quadrupled. This "decreasing" effect of delay on the frequency of reproductions is shown in a previous experiment (Kintsch et al., 1975) where recall was tested in immediate and 24 hours conditions. In the same line of happenings of Kintsch and van Dijk's (1978) earlier experiment, while the number of reproductions declined, intrusions (information introduced by the subject on the basis of his own knowledge about the content of the text) became more frequent.

A second type of measuring instrument widely used in experimental research related to main ideas identification is the written summary.

3.3.2. Summarization

The relationship between summary content and assignement of importance of ideas in a text is studied by Winograd (1984). The study shows that while 8th grade poor readers seemed to use totally unrelated strategies to select the most important sentences in the text and to decide what material was to be included in the summaries, good readers and adults used "their sensitivity to importance to guide them in both the inclusion and selection tasks" (p.414).

Other studies (e.g., Thorndike (in Bower, 1976); Kintsch

and van Dijk, 1978) have found that propositions higher in structural hierarchies of the kind set up by story grammars (Rumelhart, 1975) are rated as more important to the gist of the story and also more frequently included in summaries.

Nevertheless, review of the literature has shown that there is a lack of systematization in the use of the summary instrument which may be suspected to impart comparison of results. For example, studies make use of summaries obtained immediately after reading with access to the text (e.g., Kintsch and Kozminsky, 1977; Winograd, 1984) or without access to the text (e.g., Kintsch, Mandel and Kozminsky, 1977), and summaries written after a recalling task (e.g., Thorndike, 1975 (in Bower, 1976); Kintsch and van Dijk, 1978).

Undoubtedly, in terms of procedure, summaries written without access to the text source are similar to recall protocols since some memory encoding and retrieval is involved in both.

On the other hand partial results of a recent study by Kleiman and Terzi (1984) have gone in the direction of proposing that summaries written without access to the material read are better structured, representing the global meaning of the text while with the possibility of referring to the text summaries are less coherent because they are limited to a mechanical selection of sentences. Based on these data the authors question Kintsch and van Dijk's (1978) assertion that the capacity to summarize is a manifestation of the subject's comprehension. They propose that the lack of correlation between 8^{th} graders ability to summarize and their performance in tests where comprehension of the material previously summarized is assessed is explained by the fact that with access to the text, students do not need to

understand its content to write the summaries.

However, while the data gathered in Kleiman and Terzi's (1984) experiment clearly show a qualitative distinction between summaries obtained in the two conditions, it seems that the problem does not lie in the procedure but rather, in the students unwareness of task demands. In other words, the problem seems to be that students lacked knowledge about the summarization task. They did not know what a summary is, what type of information must be included in it, and so, they could not summarize appropriately.

The difference in the quality of the summaries may also be explained by the fact that when not permitted to refer to the passage students have to rely completely on memory and it has been shown that mainly the significant points of texts are stored and come to surface when necessary (cf., Christie and Schumacher, 1975; Johnson, 1970/73).

Nevertheless, studies with college students have shown that, in general, differences in access to text while writing summaries matter remarkably little for those subjects. Kintsch and Kosminsky's (1977) findings indicate that summaries after reading (with access to the text) and listening (without access) are very similar, provided that other studies have proved the reliability of comparing results of the two modalities, i.e., reading and listening (e.g., King, 1968; Kintsch et al., 1975).

The possible problem raised by Kleiman and Terzi (1984) which would invalidate using the summary-with-text instrument as a means of assessing readers' ability to identify main points of texts apparently does not find support in the literature. It seems then that when using the summary instrument, mainly with

the intention of obtaining information to be compared to those from other free measures as recall protocol, we must keep in mind that the written summary is a conventionalized discourse expression and as such has definite characteristics that should be respected in its production. Lack of proficiency in writing summaries per se may be responsible for bad quality rather than access problems.

Studies by Brown and Day (1983) and Winograd (1984) and others clearly establish a developmental trend in the ability to write summaries. In a series of experiments Brown and Day (1983) investigated different age groups on their use of macrorules (Kintsch and van Dijk's (1978) process of deletion, generalization and construction) for summarizing texts. For the purposes of the study these three basic rules were decomposed into a system of six in that deletion was viewed in terms of deleting trivial or redundant information; generalization was considered in Kintsch and van Dijk's terms and in its reverse (labeled substitution); and construction seen in the subject's invention of a topic sentence when this was not offered in the text and selection when the sentence was present.

The developmental trend was identified in terms of acquisition of these summarization rules. It appeared in those studies that the rule of deletion is earlier acquired than the others, and that the invention rule is the the most complex one. It was rarely used by fifth graders and even college students used it only in half of the occasions when it would be appropriate to do so.

Only the graduate students in the experiment made efficient use of this rule inventing topic sentences and writing

summaries around and in support of them (cf. Brown and Day, 1983:13-18).

Using a different system Winograd (1984) scored summary protocols for the use of reproductions (paraphrase or word for word copying), combinations (of two or more sentences) run - on combinations (badly - formed combinations, included in the analysis to be distinguished from well-formed ones), and inventions (individual sentences conveying the meaning of a paragraph, several paragraphs or the whole text). Again, the results showed developmental tendencies in the use of summarization rules in that "increased reading skill (growing with age)* led to fewer reproductions and run - on combinations and more combinations and inventions" (p.415).

One implication of this evidenced maturation factor and the popular nature of summarizing as an academic task is the necessity of teaching it from early ages. Moreover, in the use of summarization in experimental research two points seem to deserve attention. First, the analysis and comparison of results with the use of summaries has to take into account this maturation factor and be restricted to information pertinent to specific research goals. For example, comparison of summaries and recall protocols of young subjects in order to assess gist comprehension has to be directed to the type of information included in both and factors such as cohesion in their writings, should not affect the analysis.

Second, there is the necessity of explicitly instructing subjects on what they are expected to perform. In gist identification assessment, simply asking subjects to write

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*our parenthesis

summaries is not enough. Since the task of summarizing as a means of conveying texts into chief points only is not well - known, more detailed instructions telling subjects that they should express only the key points of passages seems to be a valuable device.

3.4. Concluding Remarks

Experts' judgement of importance of reading abilities (Burkart, 1945) has ranked attention first, comprehension second, and reproduction third. While the question of rating importance of different abilities to the process of reading comprehension would surely deserve careful examination accounting for factors such as reading goals, the ability to report on information previously gained is undoubtedly an indispensable requirement for communication.

Academic life demands intense reproductive activity in the form of analysis, critiques, comments or reports. Essential for establishing effective communication through these is one's ability to read selectively, and consequently, transmit the gist of what he has read.

The notion of transmission is explained by Petroff (1975) as the transformation of a text source T into a second one t, in that T and t are equivalent for their addressee (cf., p.41). This equivalence should be seen not in terms of quantity but from the point of view of the type of information shared. Determinant for establishing this equivalence is one's capacity to perceive importance of different parts of the text in order to produce second order discourse material that retains the

core of its original.

Adapting Jenkin's (1979, cited in Spiro and Myers, 1984: 498) tetrahedral taxonomy the different variables involved in the universe of main ideas identification can be summarized as: (a) characteristics of readers; (b) the material to be read; (c) the mental processes, realized in the act of identifying central parts of texts; and (d) the criterial tasks used to assess ability to do so.

First, on the part of the reader there is his capacity to make judgements based on textual and contextual criteria, i.e., accounting for the author's thought revealed in the written page and for personal objectives in the act of reading.

Second, characteristics inherent to the material being explored as organizational structure, level of explicitness of the ideas or of the purpose underlying its production must be taken into consideration.

Third, there are factors as the judgement operation at the mental level, the psychological processes involved in selective reading and in the transformation of texts T into texts t as Kintsch and van Dijk's (1978) macroprocessual model proposes.

Fourth, experimental research has made effective use of summarization and recall protocols, however, special attention is necessary so as to avoid task difficulties interference in the assessment of gist comprehension ability.

Proficiency in reading has been seen from a number of grounds in that the fluent reader is expected to perform a variety of subtasks through sequential and/or parallel mental

operations. In terms of central ideas identification, the proficient reader is the one who is capable of reading selectively, devoting attention to aspects that are significant from the author's point of view and for his own moment and intentions.

CHAPTER IV

THE EXPERIMENT

4.1. Introduction

The current study was designed with the objective of identifying the source of students' difficulty in defining important points of texts. As mentioned before, this difficulty is commonly observed with students of "Inglês Instrumental" at the Federal University of Santa Catarina, both in their writing of summaries and in the less complex task of underlining the main points of texts.

Assuming that the problem is not originated by language - students with less knowledge of English would present more difficulty and vice-versa - this experiment aimed at testing the following hypotheses:

Hypothesis A: The ability to distinguish main points from details is unrelated to the fact that the material is in Portuguese or English;

Hypothesis B: The amount of knowledge of English does not affect the ability to distinguish main points from

details.

Additionally, strategy usage was investigated in an attempt to test the hypotheses:

Hypothesis C: Students use the same strategies to distinguish main points from details in Portuguese and English;

Hypothesis D: The ability to distinguish main points from details is unrelated to the type of strategies used.

4.2. Method

4.2.1. Subjects

The subjects were forty-two Federal University of Santa Catarina undergraduates - 19 men and 23 women - enrolled in two classes of the "Inglês Instrumental" course in the second semester of 1983. The great majority of these students came from the first semester of the Dentistry course, but there were also some students from other areas: 2 Architecture students, 1 Mechanical Engineering student, and 1 Physical Education student.

The sample was considered appropriate for the investigation in the sense that these students formed a representative group of students at the University. In the College Entrance Exam Dentistry students ranked around the upper 90 and lower 70 percentile of the whole group of applicants.

4.2.2. Materials

a) Foreign Language Test

In a preliminary stage of the study a foreign language test was applied to the subjects in order to measure students' knowledge of the English grammar and vocabulary.

The International House-Hastings English Language Assessment Test was adapted for the purpose of the investigation. The reading and writing, and the listening comprehension parts were taken out and the number of advanced level questions was reduced from 24 to 12. The test in its adapted condition consisted of three parts according to the level of difficulty: ELEMENTARY, INTERMEDIATE, and ADVANCED, with 12, 24 and 12 multiple choice questions, respectively (cf., Appendix: A). The greater number of intermediate level questions is due to the fact that, in general, undergraduates have some knowledge of English acquired in high school or in foreign language courses.

The International House-Hastings English Language Assessment Test was chosen for being a standardized test which has already been applied for years with success. Moreover, an item analysis made for the study supported the reliability of the test.

b) Texts

The texts for the experiment one in Portuguese, and other in English, were selected by a pannel of 7 judges (English teachers at the Federal University of Santa Catarina). Each judge received a booklet containing 5 texts previously selected by the experimenter. Two texts were in Portuguese and 3 in English. They also received

a list of the items to be analysed and a chart to mark their answers. The number of paragraphs and words of each text was already indicated in the chart (cf., Appendix: B).

The judges were asked to select two texts - one in Portuguese and one in English - which had more items in common, i.e., which were more similar in terms of the characteristics analysed.

According to this analysis the two texts "Dominant Males Have More Testosterone - and Heart Disease" from NEW SCIENTIST, 30 July 1981, and "Orientação Magnética", from CIÊNCIA HOJE, Ano 1, nº 1, Julho/Agosto - 1982, were selected and the respective Portuguese and English versions were made. The text "Dominant Males Have More Testosterone - and Heart Disease" had seven paragraphs and 364 words in its original and 352 words in the Portuguese version. The second text, "Orientação Magnética" contained 647 words in six paragraphs while its English version had 611 words.

The texts were typed in a similar fashion and format and reduced xerox copies were made in order to obtain a standard layout (cf., Appendix: C).

c) Questionnaire

The questionnaire was applied by the researcher in order to assess students' reading strategies (Hypotheses C and D).

It consisted of ten indirect questions (cf., Tuckman, 1972:198) of the type:

- "Ao iniciar a leitura do texto, o que você olhou primeiro?"
- "Quantas vezes você leu o texto ao todo?"

- "Você releu o texto enquanto fazia o resumo?" (cf., Appendix: D).

4.2.3. Procedure

a) English Language Test Application

The test was applied to both class groups during their regular English classes. Each English teacher introduced the experimenter to the students, explained that the results of the test would be used exclusively by the researcher as experimental data, not counting for the evaluation of their course performance and so, asked them to answer the questions honestly, not guessing.

The experimenter explained the objective of the test, i.e., to obtain a fair picture of students' knowledge of the English language, but no further explanation was given about the following steps of the experiment in order to preserve its validity.

The tests were handed out and the instructions on the front cover were read aloud by the experimenter.

No more interruptions were made and the students left the room as they finished aswering the test.

b) Measuring Instrument

After having determined the basic material to be used in the experiment and applied the language test, we were faced with the methodological problem of how to test students ability to distinguish main points from details.

The measuring instrument had to have certain qualities as: familiarity - it could not be some task that the students were not accostumed to; reliability - it should assess students' capacity consistently; and it had to be practical in the sense of fitting the experiment conditions.

A review of the pertinent literature showed that three different procedures have been used in experiments of the type: underlining, protocol recall, and written summaries.

Underlining was used by Paes de Barros (1983) in an experiment which had the objective of testing the hypothesis that students have difficulty in establishing the macrostructure of expository texts because they lack knowledge about macro-rules such as generalization, deletion and construction. According to Kintsch and van Dijk (1978) these are some of the rules which govern text comprehension.

In Paes de Barros' (1983) experiment students were asked to underline the sentences that expressed the key ideas of the text. The underlining procedure, however, is not always appropriate for determining main ideas of texts, as it was in the Paes de Barros experiment. Most of the times the idea content is not organized in an exact manner. There is not a one-to-one correspondence between ideas and sentences. Two or more sentences can express one idea, for example, or a single sentence can contain more than one idea. Axelrod (1975) referring to stories says: "many times the main idea is not mentioned explicitly in the story and can only be grasped by reading between the lines or by assessing the meaning of the passage as a whole (p.384). Moreover, the more complex the text, the less often underlining will work because the relation idea-sentence

does not happen.

A second type of procedure largely used to assess ability to identify the gist of written material is recalling. Both written and oral recall have been used in experiments (cf., Chapter III).

The adequacy of a recall measure is supported by studies such as Johnson's (1970), Meyer and McConkie (1973) and Smiley et al. (1977), among many others. These studies have shown that the central ideas of texts or stories are most often recalled.

Finally, as well as protocol recalls the written summary, has shown to be a reliable instrument. Scientific studies using it sucessfully can be found in the literature (e.g., Kintsch and Kozminsky, 1977; Kintsch, Mandel and Kozminsky, 1977; Kintsch and van Dijk, 1978; and for a more detailed discussion see Chapter III).

In the present experiment, this third modality of measuring instrument - the written summary - was used. The choice was mainly influenced by the fact that the students had a considerable experience in writing summaries both in the "Inglês Instrumental" course and in other subjects.

Defined the measuring instrument, English teachers at the Federal University of Santa Catarina, some who had already cooperated in the selection of texts, were asked to summarize the two experimental texts. For this step, teachers received a booklet containing: a) a text and its summary (written by the experimenter), which was to serve as an example in order to clarify possible doubts in terms of summary content and length, mainly; and b) the two texts, in English, and blank sheets for the summaries. The instructions on the front page asked for

summaries, in Portuguese, of a maximum of 35 words for "Dominant Males Have More Testosterone - and Heart Disease" and 40 words for "Magnetic Direction Finding". It was stressed that the summaries should contain only the main ideas of the texts (cf., Appendix: E).

The limitation of words was based on summaries of these two texts, written by the experimenter, which were considered good in terms of expressing the main points by an experienced reading teacher and two Portuguese teachers. The booklets were distributed by the experimenter and collected within a week.

These summaries had an important role in the experiment since they served as the basis for formulating the grading criteria on which students' performance was scored.

A superficial analysis of the judges' summaries confirmed that it was possible to restrict them to the number of words asked and showed that the measuring instrument was adequate.

The following step, then, was the pilot-testing of the research materials. This test should indicate whether material, timing and procedure were satisfactory.

In this pilot-test the research material was administered to a group of 9 third semester language students in the same way it would be presented to the sample selected. This material consisted of a booklet containing a) instructions (on the front sheet), b) the text, and c) the 'answer sheet' on which the student had to fill in his/her name, register number and course, and write the summary in Portuguese in the dotted lines. The instructions told not to exceed these lines. The purpose of choosing dotted lines to restrict summary length instead of determining the number of words was that the second method would

deviate students attention to the mechanical task of counting and recounting words with the risk of affecting summary quality. Summary length needed to be restricted, otherwise summaries could differ so much in length that a comparison between them would be almost impossible.

For the pilot-test group the 'answer sheet' contained 9 dotted lines for "Dominant Males Have More Testosterone - and Heart Disease" and 10 lines for "Magnetic Direction Finding".

The results of this testing encouraged limiting even more the space, i.e., taking 2 lines for the summaries. No other problem was detected.

This pilot test completed the preliminary activities of the experiment and the positive results led to the immediate administration of the material to the sample.

As in the language test application, the study was conducted during the regular English class period, but this time, the respective teachers were not present. The researcher explained that she was there to apply the second part of the material of the experiment and asked the students to cooperate. Then, the subjects were given the booklets similar to those used in the pilot-test condition, (Cf., Appendix: F). The order of presentation of the four texts - the two experimental texts in Portuguese and English - was counterbalanced over subjects so that subjects were randomly assigned to the four conditions. The design for the study can be illustrated by the following matrix:

	P	E
T_1	A	B
T_2	C	D

A = Machos Dominadores...

B = Dominant Males...

C = Orientação Magnética

D = Magnetic Direction Finding

Four experimental groups were formed according to the condition determined by the order of presentation of the texts.

Subject Group	Order of presentation of the texts
Group I	A, D
Group II	D, A
Group III	C, B
Group IV	D, C

After the texts had been distributed, the experimenter read the instructions on the front sheet. The instructions were:

> "Resuma o texto a seguir, em português, usando o mínimo de palavras possível. Atente para que o resumo expresse somente os pontos principais do texto.
> NOTA: Use a folha anexa, escrevendo seu resumo na parte pontilhada."

Students were also told that they would see 2 texts, one in Portuguese, the other in English or vice-versa and that they had 40 minutes for each reading - summary writing task. As the subject finished the first text, he/she should come to the experimenter and take the second one. Time was controlled by

the experimenter by means of a chart on which the beginning and finishing time for each subject and text were recorded. When the subject finished the second text he/she was asked to leave the room.

The procedure was the same for the 2 class groups and, in general, the students were very receptive, but most of them complained about their difficulty in writing summaries.

c) Questionnaire Application

The questionnaire investigating strategy usage was applied in the form of an oral interview.

Taking a superficial look at the summaries, the experimenter selected 5 subjects to be interviewed on the use of reading strategies: three subjects who had written relatively good summaries of the two texts; 1 subject, who had written a bad summary of the Portuguese text and a good summary of the English one; and also 1 who had written a bad summary of the English text and a good summary of the Portuguese one.

The criterion of selection was to have represented in this small sample subjects who had written good and bad summaries in terms of citing only the main ideas of the texts.

The students were interviewed individually on the following day and their answers noted down by the experimenter. They were given a copy of each text which had been summarized on the previous day. Using the texts as reference, each of these subjects was asked the set of ten questions with respect to the first text and then the same questions were repeated for the second text.

4.3. Data Analysis

4.3.1. Grading Criteria

a) Foreign Language Test

The International House - Hastings English Language Assessment Test is a multiple choice test consisting (in its version adapted for the study) of 48 questions.

The 'correction for guessing' formula was applied in grading the English as a foreign Language Test (EFL TEST). The use of such a criterian owes to the fact that subjects had been instructed not to guess, answering only the questions they knew.

b) Summaries

Undoubtedly, one of the main difficulties we were faced with in this investigation was related to the development of the criteria for analysing and scoring the summaries.

Despite the wealth of literature that has more recently been generated with respect to experiments involving summary writing and protocol recalls (e.g., Kintsch and van Dijk, 1978) there is clearly a lack of systematization concerning measurement methods for scoring prose.

Significant has been the contribution of Johnson (1970) and Kintsch (1974/1978) in the sense of developing measurement models which enable researchers to score prose in terms of its ideational content.

Basically, the work of Ronald E. Johnson (1970) proposes the division of narrative prose into smaller units, called idea units. These idea units are obtained through the division of a text "pause acceptability" units which are, in Johnson's terms,

pause "to catch a breath, to give emphasis to the story or to enhance meaning" (1970:13).

The method was tested in experiments reported by Johnson (1970) and has also been used by other scientists in investigations of the type (e.g., Brown and Smiley, 1977; Pichert, 1979).

The use of such a measurement method, however, would involve a much larger group of raters than it would be possible to find at the Federal University of Santa Catarina. In this method one group of raters is responsible for dividing the text in idea units, but other independent groups are needed to judge the importance of these units according to the content of the text.

A second method was developed by Walter Kintsch (1974). The procedure divised by Kintsch, and which has been used in a number of experiments (e.g., Kintsch et al., 1975; Kintsch and van Dijk, 1978), consists of the propositional analysis of the texts (see Chapter III for a more detailed description).

A text is represented by means of a structured list of propositions which are composed by word concepts, i.e., lexical items. A proposition includes a predicate and one or more arguments. A very simplified example would be:

Anne writes a letter (WRITE, ANNE, LETTER).

The list of propositions that represents the surface structure of a text is called TEXT BASE.

This TEXT BASE is the core of Kintsch's model since it completely expresses the ideas of the text in question (c.f., Kintsch, 1978:376-7). However, the derivation of texts into

propositions and the consequent construction of the text base, is not so simple as in the example above. In the case of more complex texts it involves a number of rules accounting for the syntactic and mainly, semantic level of the discourse. In fact, Kintsch (1974) refers to the works of Fillmore (1968), Winograd (1972) and Simmons (1973) for the study of such rules, but the literature still lacks a systematic, detailed description of the employment of derivation rules, for the construction of propositions and text bases.

The lack of concrete elements on which to base a scoring procedure of the type proposed in Kintsch's model (1974) made it impossible applying it in this investigation.

By suggestion of Michael Scott, a scoring method was used on which both the judges' and the students' summaries were analysed. First, each judge's summary was itemized into a list of concepts (cf., Appendix: G). The term "concepts" refers to words that fulfill a unique semantic role related to the specific texts used here. For example, the concept PESQUISADORES was considered when subjects wrote 'cientistas' or 'professores' in their summaries of 'Magnetic Direction Finding'. Based on these individual lists a single list was made on which all concepts cited by the judges were present and a table was designed making it possible to visualize which were the most and the least frequently cited concepts. Through this mapping the concepts were classified as IDEAS 'A', 'B', and 'C'; respectively: main points, details and even less important information (cf., Appendix: H).

The classification obeyed the following criteria: from a total of 8 judges, concepts cited by 6 or more judges (IDEAS 'A'),

concepts cited by 3 to 5 judges (IDEAS 'B'), the remaining concepts (IDEAS 'C').

Second, each subject's summary was checked against the set of concepts labeled IDEAS 'A', 'B' and 'C'. Through this checking it was possible to see how many concepts the subject had cited in his/her summary, and also which were these concepts. The concepts cited by the subjects were checked against the judges' list of IDEAS 'A'. The sum of these concepts was considered his/her score for IDEAS 'A' (cf., Appendix: I).

Following the same scoring method lists were made of all other concepts mentioned by the subjects of the sample. These lists were checked against the judges' list of IDEAS 'B', providing for the IDEAS 'B' score. Accordingly, the remaining concepts cited by the subjects were classified as IDEAS 'C' (cf., Appendix: I).

Third, the reading of the summaries indicated the necessity of accounting for other types of information. In this sense, in the same listing procedure, the mistaken ideas (ERRORS), were arranged on charts and the summaries scored by the same criteria used for the previous items, i.e., the subject received 1 point each time he/she cited a mistaken idea.

Fourth, the striking bad quality of the summaries in general, in terms of language expression, led to an additional type of analysis which provided the seventh score. This grade was given by an independent rater, a Portuguese high school teacher, who, without reading the texts, graded the summaries for their formal correctness (FORM) on a scale from 0 to 10.

Fifth, in an attempt to 'test' the validity of the criteria used to score the summaries in terms of main points/ details expression, a subjective analysis of the summaries was carried out by another high school Portuguese teacher who had no involvement with the ideas underlying the investigation. The teacher read the two texts and graded the summaries, from 0 to 10, as she would grade her own students'.

This subjective grading was labeled SUMMARY for the statistical analysis effects.

c) Questionnaire

The five subjects who answered the questionnaire on reading strategies (STRAT) received scores from 1 to 3 according to a subjective judgement carried out by the experimenter.

The judgement was based on the notion of reading strategies presented in the literature of more recent years and having as a reference the "Processing Strategies" list provided by Scott (1981).

From the 10 questions made, subjects who answered a minimum of 8 questions according to the list, received a score 1 (good strategy); subjects who answered from 5 to 7 questions received a score 2 (not very appropriate strategy); and the subjects who answered less than 5 questions received a score 3 (bad strategy).

In addition to the variables scored either by the experimenter or by the two independent raters, four other variables were included in the statistical analysis: the time taken for each reading/summarizing task (TIME), the number of words of the summaries (WORDS), the subjects' sex (SEX),

and the effect of order of presentation of the texts (ORDER).

4.3.2. Statistical Analysis

The data gathered were analyzed by means of a series of statistical tests performed with the help of the University computer.

An Item Analysis was conducted to check the reliability of the language test (EFL test) and a battery of T tests of significance was used in order to compare variables according to the hypotheses underlying this work.

For additional statistical information the medians, modes, means and standard deviations were calculated for all variables and the Pearson product - moment method determined the coefficients of correlation.

4.4. Results

As described earlier, the major question under analysis in this study refers to the nature of students' difficulty to distinguish main points from details of prose passages. It was hypothesized that students would present problems in judging importance of ideas in a text both in Portuguese and in English, and that the amount of knowledge of the foreign language would have no influence upon the problem.

Moreover, in a complementary work, reading strategies usage was assessed in order to test the hypotheses that students use the same type of strategies in Portuguese and English and

that their ability to identify main points of texts is unrelated to the type of strategies employed.

These hypotheses were tested through students' performance in summarizing two texts previously selected, as explained in section 4.2.2.b. In order to assure approximately equal levels of difficulty of these experimental texts in both languages - Portuguese and English - a pilot-test was conducted. The data from this pilot-test are shown in Table 01.

Table 01

Comparison of Texts Concerning Main Ideas

Texts	Means	SD_d	df	t-value	significance
MI_{T1}	8.14	0.4085	41	0.661	N.S.
MI_{T2}	8.41				

MI_{T1} = MAIN IDEAS, TEXT 1

MI_{T2} = MAIN IDEAS, TEX 2

A t-test was conducted on the mean differences between Portuguese and English texts concerning subjects' difficulty to identify main ideas. No differences were found at the 0.05 level of significance. It appears that the two texts had the same level of difficulty.

Concerning the investigation of the origin of the problem, our first hypothesis - the ability to distinguish main points from details is unrelated to the fact that the material is in Portuguese or English - the analysis of the summaries in terms of concepts was mainly directed to three basic variables: MAIN IDEAS (ideas 'A'), SECONDARY IDEAS (ideas 'B'), and TERTIARY IDEAS (ideas 'C').

Variables TIME (time spent to read and summarize each text), FORM (written expression scores given by an independent judge), SUMMARY (scores on the summaries given by another independent judge), WORDS (number of words of each summary), and ERRORS (mistaken ideas presented in the summaries) were also investigated in order to establish possible relations with the ability to distinguish main points from details in texts in Portuguese and English.

The analyses of differences between Portuguese and English texts are presented in Table 02.

Table 02

Analyses of Differences Between Portuguese and English Texts

VARIABLE	MEANS		SD_d	DF	t-values	SIGN.
	PORTUGUESE	ENGLISH				
MAIN IDEAS(A)	8.798	7.781	0.394	41	2.581	at 0.05
SECONDARY IDEAS (B)	3.595	2.595	0.334	41	2.994	at 0.05
TERTIARY IDEAS (B)	7.167	6.857	1.156	41	0.268	N.S.
WORDS	58.024	47.143	5.276	41	2.062	at 0.05
TIME	18.857	18.095	1.737	41	0.439	N.S.
FORM	5.833	5.448	0.314	41	1.226	N.S.
SUMMARY	6.833	6.048	0.431	41	1.821	N.S.
ERRORS	0.095	0.690	0.279	41	-2.133	at 0.05

The hypothesized non-linguistic origin of the problem of distinguishing main points from details - Hypothesis A - was supported by the data in Table 02. Significant differences were

found between Portuguese and English texts summarizing concerning MAIN and SECONDARY IDEAS. There were also significant differences between WORDS and ERRORS. No significant differences were found between Portuguese and English concerning TERTIARY IDEAS, TIME, FORM, and SUMMARY.

Another way of testing the first hypothesis was to see if there were differences between the two languages with regard to the differences between DETAILS and MAIN IDEAS, by adding up SECONDARY and TERTIARY IDEAS in each language and subtracting the MAIN IDEAS. The results of this analysis of the data are presented in Table 03.

Table 03

Comparison Between Portuguese and English Texts Concerning Differences on Levels of Ideas.

LANGUAGE	MEANS*	SD_d	df	t-value	SIGN.
PORTUGUESE	1.890	1.253	41	0.178	N.S.
ENGLISH	1.667				

* Means * (B + C) - A

The difference between students' performance in Portuguese and English was not significant concerning the variables of details.

An analysis of the relations among variables MAIN IDEAS, SECONDARY IDEAS, TERTIARY IDEAS, WORDS, FORM, SUMMARY, ERROR and TIME in the two languages can be seen in Tables 04 and 05.

Table 04

Pearson Correlation Matrix

Correlations Between Variables - Portuguese

VARIABLES	MAIN IDEAS (A)	SECOND IDEAS (B)	TERTIARY IDEAS (C)	FORM	SUM	ERROR	WORDS	TIME
MAIN IDEAS (A)	-							
SECOND IDEAS (B)	0.043	-						
TERTIARY IDEAS (C)	-0.079	0.094	-					
FORM	0.146	0.183	-0.017	-				
SUM	0.797 <0.001	0.272	-0.227	0.188	-			
ERROR	-0.037	-0.008	-0.069	-0.213	0.085	-		
WORDS	0.152	0.101	0.735 <0.001	0.082	0.133	-	-	
TIME	0.027	0.076	0.222	-	-	-	0.076	-

Table 05

Pearson Correlation Matrix

Correlations Between Variables - English

VARIABLES	MAIN IDEAS (A)	SECOND IDEAS (B)	TERTIARY IDEAS (C)	FORM	SUM	ERROR	WORDS	TIME	EFL
MAIN IDEAS (A)	-								
SECOND IDEAS (B)	0.349 <0.05	-							
TERTIARY IDEAS (C)	-0.075	0.022	-						
FORM	0.567 <0.001	0.186	0.162	-					
SUM	0.673 <0.001	0.256	-0.026	0.496 <0.001	-				
ERROR	-0.185	-0.194	0.116	-0.067	-0.359 <0.02	-			
WORDS	0.050	0.120	0.098	0.042	0.191	-	-		
TIME	-0.025	-0.132	0.274	-	-	-	0.233	-	
EFL	0.254	0.125	0.058	0.286	0.278	0.051	-	-0.129	-

The only significant correlation found between variables involved in testing the hypothesis that students present difficulty in distinguishing main points from details in English and Portuguese was the correlation between MAIN IDEAS and SECONDARY IDEAS in English ($r = 0.0349$, $p < 0.05$). No other significant correlation was found in English texts. In Portuguese there was no significant correlation between variables MAIN IDEAS and details of SECONDARY and TERTIARY levels. However, the coefficients of correlation between variables MAIN IDEAS and TERTIARY IDEAS both in Portuguese and English were negative ($r = 0.079$ and $r = -0.075$).

The second hypothesis states that - the amount of knowledge of English does not affect the ability to distinguish main points from details.

In testing this hypothesis, first, and Item Analysis was carried out, which supported the reliability of the foreign language test used to assess students' knowledge of English - the International House - Hastings English Language Assessment Test. The data related to the test is shown in Table 06.

Table 06

Statistical Characteristics of the EFL Test - The International House - Hastings English Language Assessment Test.

No. of S_S	MEAN	SD	DI*	IDI**	REABILITY
42	11.226	7.908	0.233	0.334	0.9

* Difficulty Index

**Item Discrimination Index

The coefficients of the Difficulty Index and Item Discrimination Index show that the foreign language test was difficult but it discriminated appropriately being highly reliable (0.9).

As seen in Table 05, the correlations between variables EFL test and MAIN IDEAS, EFL and SECONDARY IDEAS, and EFL and TERTIARY IDEAS in English were not significant. This supports the hypothesis that the amount of knowledge of the foreign language did not affect students' performance in distinguishing main points from details in texts in English. Also, there was no significant correlation between variables EFL and FORM, and EFL and SUMMARY.

After establishing the inter-variable relations set up to test the two main hypothesis, additional data were provided by correlation tests between variables SUMMARY and MAIN IDEAS, and SUMMARY and TERTIARY IDEAS. Variable SUMMARY correlated highly with variable MAIN IDEAS both in Portuguese ($r = 0.797$, $p < 0.001$) and English ($r = 0.673$, $p < 0.001$) while it correlated negatively (although not significantly) with variable TERTIARY IDEAS in Portuguese ($r = 0.227$) and English ($r = -0.026$).

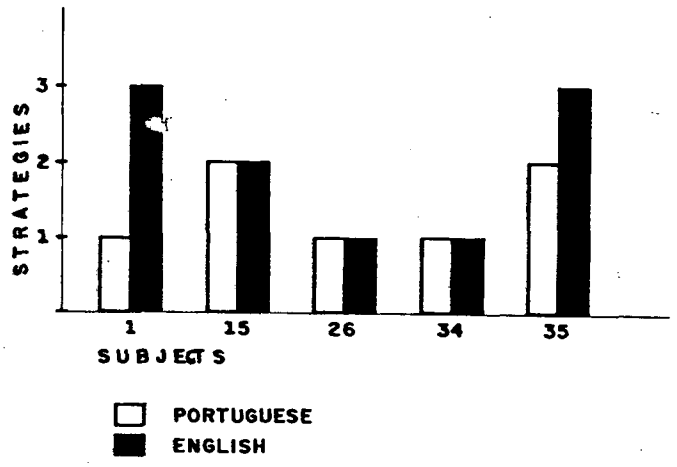
The objective of including a second measurement criteria to judge the quality of the summaries - variable SUMMARY - in the study was to have an element of comparison which could 'test' the criteria chosen for the experiment (listing concepts).

The two lateral hypotheses concerned with the investigation of reading strategies usage, were tested through a questionnaire applied to 5 students. The criteria used to select these students is explained in section 4.2.3. C. Owing to the reduced number of subjects involved in testing this variable - STRAT - the data are

analysed in terms of a case study. Students received scores on their answers to the questionnaire with relation to their work in the two languages, independently. The scores were: 1 (good strategy), 2 (not very appropriate strategy), and 3 (bad strategy).

Hypothesis C stated that students use the same strategies to distinguish main points from details in Portuguese and English. Graph 01 shows students' use of strategies in the two languages.

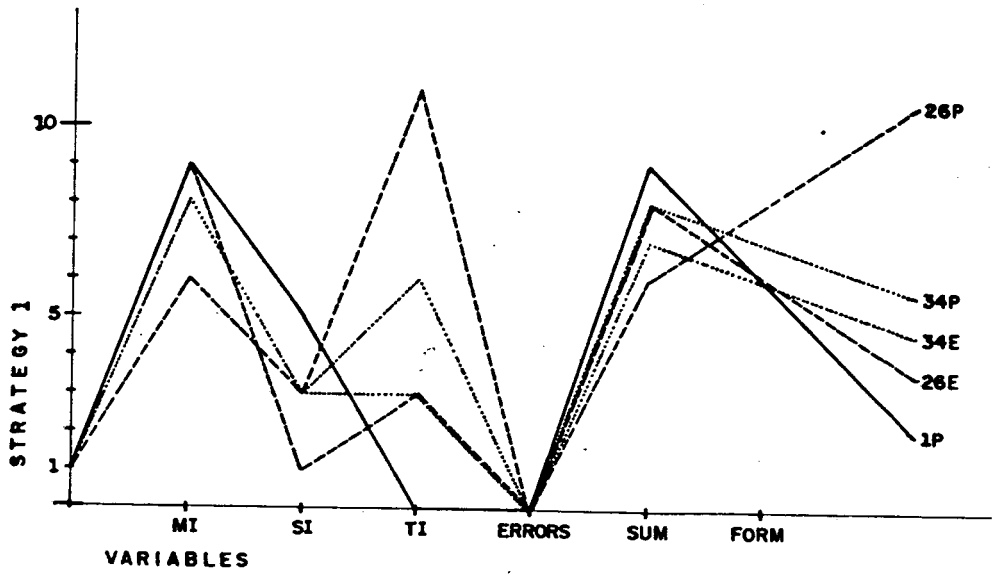
GRAPH 01



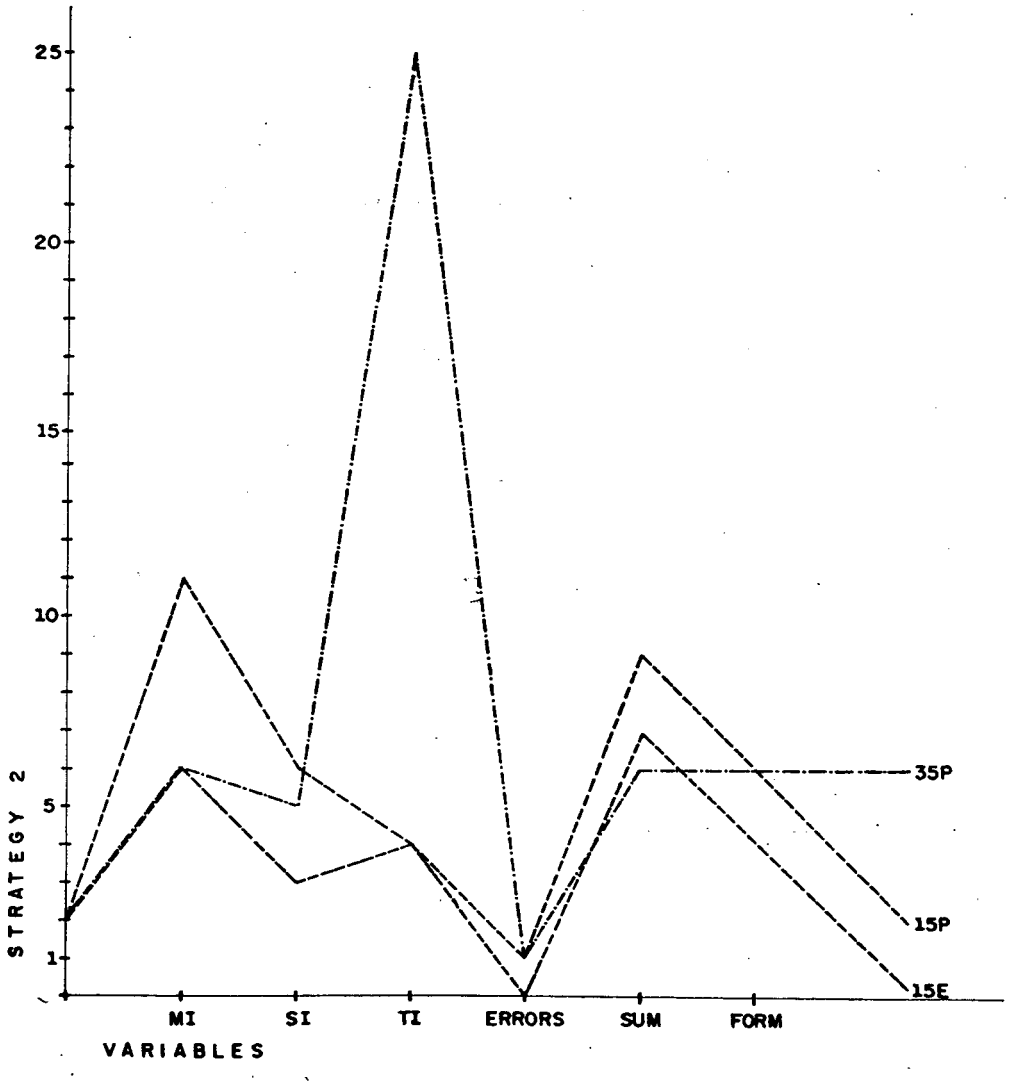
As Graph 01 shows, three students used the same type of strategies in reading Portuguese and English texts while two students used different ones.

The second hypothesis related to strategies says that the ability to distinguish main points from details is unrelated to the type of strategies used. Graphs 02, 03 and 04 show students use of strategies and their scores on variables MAIN IDEAS, SECONDARY IDEAS, TERTIARY IDEAS, ERRORS, SUMMARY and FORM.

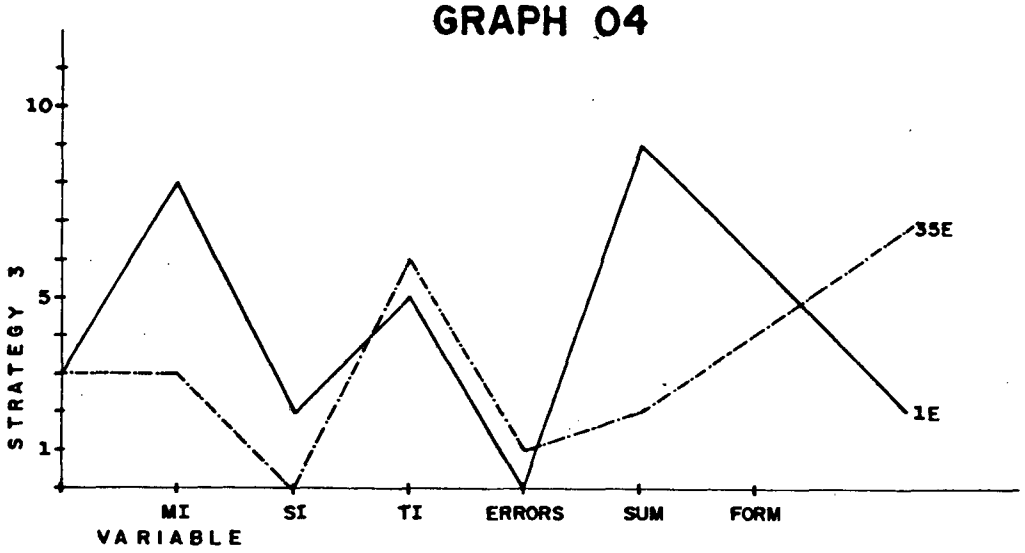
GRAPH 02



GRAPH 03



GRAPH 04



The use of different strategies does not seem to have affected students performance in summarizing the two texts. In general the five students presented the same type of procedure working in Portuguese and English and using good, not very appropriate, or bad reading strategies.

However, the data are insufficient to draw any final conclusions with regard to hypotheses C and D. Strategy usage is of primary importance for reading, therefore more work should be done to investigate foreign language readers' use of strategies, yet with a larger number of subjects.

The following data are related to variables SEX and ORDER. The objective of testing these was to investigate if there was any sex difference in the ability to distinguish main points from details and if there was any order effect in the results. The data on SEX are shown in Table 07.

Table 07

Means and t-values of Variables Concerning SEX.

VARIABLES	MEANS		SD_d	DF	t-value	SIGN
	MALE	FEMALE				
EFL	8.39	13.57	2.35	41	2.2062	at 0.05
MAIN IDEAS TEXT 1	7.63	8.57	0.68	41	1.3815	N.S.
MAIN IDEAS TEXT 2	8.61	8.25	0.45	41	0.7943	N.S.
SECONDARY IDEAS TEXT 1	3.32	3.04	0.48	41	0.5822	N.S.
SECONDARY IDEAS TEXT 2	3.00	2.39	0.43	41	1.4293	N.S.
TERTIARY IDEAS TEXT 1	5.16	5.74	1.34	41	0.4398	N.S.
TERTIARY IDEAS TEXT 2	7.21	9.65	1.76	41	1.3845	N.S.

The data suggest that girls did significantly better in the EFL test but no significant difference was presented on variables MAIN IDEAS, SECONDARY and TERTIARY IDEAS with relation to sex.

The data on variable ORDER is presented in Table 08.

Table 08

Means and t-values of Variables Concerning Order Effect

ORDER VARIABLE	MEANS FIRST	MEANS SECOND	SD_d	DF	t-value	SIGN
MAIN IDEAS TEXT 1	8.48	7.81	0.68	20	0.978	N.S.
MAIN IDEAS TEXT 2	8.18	8.64	0.42	20	1.016	N.S.
SECONDARY IDEAS TEXT 1	3.19	3.14	0.49	20	0.102	N.S.
SECONDARY IDEAS TEXT 2	2.95	2.38	0.42	20	1.344	N.S.
TERTIARY IDEAS TEXT 1	7.43	3.52	1.17	20	3.351	0.05
TERTIARY IDEAS TEXT 2	7.24	9.86	1.75	20	1.498	N.S.
TIME TEXT 1	17.62	18.76	2.46	20	0.464	N.S.
TIME TEXT 2	16.71	20.71	2.39	20	1.673	N.S.
WORDS TEXT 1	53.42	42.29	5.23	20	2.130	0.05
WORDS TEXT 2	52.29	53.76	6.64	20	0.222	N.S.

Significant differences with relation to ORDER effect were found on variables TERTIARY IDEAS and WORDS when Text 1 (Dominant Males...) was read first. However, rather than an ORDER effect these significances seem to reflect a general tendency of the subjects in the group which worked first with Text 1 to write more. An inter-group comparison shows that this group cited also more MAIN IDEAS (Texts 1 and 2), more SECONDARY

IDEAS (Text 1), more TERTIARY IDEAS (Text 2), and used more WORDS (Text 2), although these differences were not statistically significant.

In summary, the relevant data which were taken into account in testing the two main hypotheses were:

1. The t-values of variables MAIN IDEAS$_{(P)}$ and MAIN IDEAS$_{(E)}$; SECONDARY IDEAS$_{(P)}$ and TERTIARY IDEAS$_{(E)}$. This showed that students cited most main ideas of the texts but equally included a large number of secondary and tertiary level information in their summaries both of Portuguese and English texts;
2. The significant (0.05) difference found in variable WORDS between the two languages, which showed that summaries of Portuguese texts were much longer;
3. The non-significant difference between means on variables FORM and SUMMARY in the two languages which indicate that language familiarity did not contribute to the writing of better summaries;
4. The non-significant difference between means in Portuguese and English on variable TIME which indicates that language familiarity was not a facilitating factor in terms of time;
5. The lack of significant correlations between variable EFL and variables MAIN IDEAS, SECONDARY IDEAS, TERTIARY IDEAS in English, which suggest that foreign language knowledge had no influence on the task of distinguishing main points from details.

These results and their interpretation will be discussed in the next section.

4.5. Discussion

The present study has attempted to make experimental inferences concerning Brazilian ESP college students' ability to distinguish main ideas from details by examining students' summaries of texts in Portuguese and English. The expectation was that students would present the same type of difficulty whether the material summarized was in their native language or in a foreign language. Also, it was expected that the amount of knowledge of the foreign language would not affect the results.

Concerning the first hypothesis, as it can be seen in Table 02, working in Portuguese students included significantly more MAIN IDEAS, but, on the other hand, they also included significantly more SECONDARY IDEAS and a very large number of TERTIARY IDEAS (the difference between languages was not significant in TERTIARY IDEAS), which made the summaries of Portuguese texts become significantly longer than those of English. This could be due to students' lack of knowledge about the summarization task demands, to their unawareness of the requisites for good summaries. Subjects had been given clear instructions (both orally and written) to restrict the summaries to the main ideas of the texts. Thus, it seems that the main reason for the inclusion of such a large number of details in summaries of Portuguese texts was basically subjects' lack of sensitivity to importance of ideas in the texts, their inability to make selective judgements about the information, and in a broader sense, to read properly. The significant difference in terms of length in summaries of Portuguese and English texts indicates that subjects might have had problems in the summarization task per se. The students' assumption seems to

be that it is better to be prolix than neglectful when summarizing texts. Native language texts were better understood, so their summaries were longer, 'covering' the text more completely.

In terms of correlations, the only significant correlations found in Portuguese were between MAIN IDEAS and SUMMARY ($p < 0.001$) and WORDS and TERTIARY IDEAS ($p < 0.001$). The first correlation lends support to the reliability of the measurement criteria adopted in the experiment - listing concepts. This point is stressed by the significance of the correlation between MAIN IDEAS and SUMMARY in English. The correlation between WORDS and TERTIARY IDEAS in Portuguese indicates that the amount of tertiary level information included in the summaries of Portuguese texts was one of the factors responsible for their length.

Students performance in summarizing English texts was very similar to their performance in summarizing texts in Portuguese (Tables 02 and 03). Although there were significant differences (the Portuguese means were higher than the means in English) in variables MAIN IDEAS, SECONDARY IDEAS, and WORDS, the number of second and third level ideas included in summaries of English texts and their length went far beyond the quantity expected in the summaries. Also, as in Portuguese, the summaries of English texts received low scores on the written expression as well as on the summarization tests.

The inclusion of a large number of details in English, making the summaries longer than expected, suggests that the same line of thought was behind the construction of summaries in Portuguese and English. Again, as in Portuguese, it indicates that students did not distinguish properly different levels of information in texts and that they lack knowledge about the

summarization task.

One significant difference between means on variables with respect to Portuguese and English seems to be related to language effect: the significant difference between variable ERROR in the two languages. Summaries of English texts contained significantly more mistaken ideas than summaries of Portuguese texts. The nature of most mistakes in English seems to explain the reason for that. Most of the mistakes students made when summarizing English texts might be attributed to vocabulary difficulty. Thus, in addition to errors which seem to be due to misinterpretation of ideas and/or misuse of summarization rules, mistakes common in both languages, it is possible that, in English, vocabulary mistakes made the difference significant.

As said before, a significant correlation was found between variables MAIN IDEAS and SUMMARY in English ($p < 0.001$). However, unlike in Portuguese, significant correlations were found between $\text{MAIN IDEAS}_{(E)}$ and $\text{SECONDARY IDEAS}_{(E)}$ ($p < 0.05$); $\text{MAIN IDEAS}_{(E)}$ and $\text{FORM}_{(E)}$ ($p < 0.001$); $\text{FORM}_{(E)}$ and $\text{SUMMARY}_{(E)}$ ($p < 0.001$); and $\text{SUMMARY}_{(E)}$ and $\text{ERROR}_{(E)}$ ($p < 0.02$, negative).

The significant correlation between MAIN IDEAS and SECONDARY IDEAS in English may reflect students' difficulty to differentiate the two levels of information in texts in English. Among all statistical tests it seems that this correlation and the mean difference on variable ERROR were the main significant factors that could be linked to language difficulty. The correlations between variable $\text{FORM}_{(E)}$ and $\text{MAIN IDEAS}_{(E)}$, and $\text{FORM}_{(E)}$ and $\text{SUMMARY}_{(E)}$ suggest that the subjects' written expression in Portuguese when summarizing English texts was a good measure of their performance in summarizing these texts.

These correlations were not significant when subjects worked with texts in Portuguese. One possible reason for this could be that, when working in Portuguese, subjects referred more frequently to the texts, in this way, reproducing sentences or parts of sentences without paying attention to the 'form' of their writings. On the other hand, when summarizing texts in English, the impossibility of copying diminished linguistic dependence and the subjects' checking in order to see whether the ideas in the text were satisfactorily 'translated' contributed to the writing of more cohesive pieces of writing. These findings are consistent with Kleiman and Terzi's (1984) line of thought. The structural dependence originated by the possibility of referring to the text could be responsible for non-cohesive and incoherent summaries. However, as argued before, the fact that when having access to the text (or reading native language texts as in this experiment) subjects limit their work to a sequential selection of sentences is a clear evidence that they lack knowledge and adequate practice on the task of summarizing, which, by extension, may be a consequence of poor reading/writing instruction.

As Widdowson (1978) proposes, reading and writing abilities are intrinsically related. Thus, reading deficiencies could be responsible for many of the problems generally attributed exclusively to poor writing. Moreover, the development of remedial instruction on one of the abilities may be strongly dependent on aspects inherent to the other.

During this experiment, the experimenter observed a fact that could be related to this idea. A negative reaction to reading was apparent when students were asked to read and summarize the texts. Students complained that they did not like

to read or that they did not know how to write summaries. This feeling of anxiety seems to reflect students' awareness of their incapacity to perform these tasks adequately. It also suggests that these students perhaps did not have strongly developed skills of finding main ideas and of summarizing in their native language. Thus, language knowledge was probably not the only factor influencing poor performance on summarizing texts since their summaries of native language texts were not significantly better than the summaries of English texts. One could suppose that lack of reading ability also influenced the results of this study. If students had read the texts efficiently, their summaries, even the ones badly written would probably have concentrated on main ideas.

The significant correlation found between variables SUMMARY and ERROR in English seems to support the reliability of the judges' scoring of summaries of English texts. This is also indicated by the significant correlations between SUMMARY and FORM; and SUMMARY and MAIN IDEAS in English (Table 05).

The data pertinent to testing Hypothesis A indicate that the task of distinguishing main point from details was not performed with more efficiency when the texts were in the students' native language. In both languages students' summaries left a lot to be desired in the sense that a large number of details was included in them. The fact that working in Portuguese students wrote significantly longer summaries lends support to the premise that the problem is not only linguistic. It shows that these summaries were not restricted to the central points of the texts, indicating lack of sensitivity to importance in judging the ideas in the text, and unawareness of summarization as a task of reducing the communication to its

essentials.

The second hypothesis proposed that students' knowledge of English would not affect their ability of distinguishing main points from details. The objective was, as in the first hypothesis, to investigate whether the problem was originated by language or it should have another connotation.

The relationships between students' performance on the English as a foreign language test and on their performance in selecting MAIN IDEAS, SECONDARY IDEAS and TERTIARY IDEAS in English were investigated. The mean on the EFL test ($\bar{X}$ = 11.226) indicates that students had little knowledge of English. However, no significant correlations were found between variables EFL and MAIN $IDEAS_{(E)}$; EFL and SECONDARY $IDEAS_{(E)}$; and EFL and TERTIARY $IDEAS_{(E)}$. Also, variable EFL did not correlate significantly with variables FORM and SUMMARY in English.

This suggests that for these subjects the amount of knowledge of the foreign language had no significant effect on their ability to distinguish main points from details and that it had no significant relation with the performance in the summarizing task. However, these findings contrast with Alderson et. al's (1977) who found a strong relationship between foreign language proficiency and reading ability in that language. The influence of language knowledge on the ability to identify main points and on the reading ability in general surely deserves further investigation. It seems reasonable to assert that there must be some effect of relationship between foreign language proficiency level and the ability to read and summarize. There must be a minimum level of language knowledge required to read any language. This level, in English, seems to have been reached by

the students in the experiment since they obtained a very low mean in terms of ERRORS on their summaries of the texts in the foreign language.

Summarizing this chapter, the findings in this experiment suggest, on one hand, that knowledge of language, or language proficiency had no influence on these students' ability to differentiate main ideas from details when reading texts. The results show that: 1) Students included a large number of SECONDARY and TERTIARY DETAILS in their summaries of Portuguese and English texts; no significant differences were found in the two languages concerning variables SUMMARY, FORM, and TIME; a significant difference was found between language on variable WORDS - students wrote significantly longer summaries in Portuguese; 2) no significant correlation was found between EFL test and MAIN IDEAS, EFL test and SECONDARY IDEAS, EFL test and TERTIARY IDEAS, EFL test and SUMMARY, and EFL test and FORM with regard to texts in English.

CHAPTER IV

CONCLUSIONS

5.1. Conclusions

Before presenting the conclusions of this study, two limitations must be noted. One limitation concerns the measurement criteria employed (listing concepts) which surely needs supportive exploration of its adequacy and effectiveness. The other one relates to the sample studied both in terms of size and of the concentration on the Dentistry area, which may not be representative of all undergraduates at the University.

Recognizing these shortcomings, the major conclusions arrived at through the analysis of the data may be listed as follows:

1. The problem of distinguishing main points from details for the students in this study seems to be linguistic and cognitive:
   a. students present difficulty to select the main ideas of texts both in the foreign language and in their native language; and

b. the amount of knowledge of the foreign language does not seem to affect ability to judge relevance of information in a text.

2. The cognitive origin of the problem appears to be highly related to the folowing aspects:
   a. students lack knowledge about the reading activity per se. They do not know how to read properly;
   b. students lack knowledge about reading strategies to search for information wanted; and
   c. they are unaware of the summarization task demands.

Although the problem of distinguishing main points from details is only one of a wide variety of reading difficulties which seem to be experienced by university students, the implications of a lack of sensitivity to importance of information in a text are undoubtedly compromising. The mass of information which circulates in our days requires from students (and readers in general) the ability to extract from the printed page the essence of the communication.

In academic education most of what one must learn is gained via written discourse. Thus, lack of the ability may be, among other things, responsible for transforming any reading in a time consuming activity which prevents students from diversification and as such causes formation of weak students and professionals.

The findings of this study have shown that a group of students, who can be considered to be well - qualified by their classification in the "vestibular" exam, cannot make distinctions between different levels of information in a text even in their native language. Very few students seemed to have captured the theme and purpose of the texts and even though, in general, the

ideas transferred to the summaries did not present a consistent reference to the "main theme". It seems that, while subjects read, different sub-themes are established and the ideas are selected in accordance to these sub-themes. The summary becomes so, a badly-structured, disordered piece of writing. This was apparent in most of the summaries which were characterized by poor writing in terms of structure and coherence. An analysis of the mechanical aspects of writing revealed a large number of spelling and punctuation mistakes in the summaries.

It is tempting to speculate that the poor performance of students in this study reflects, in a broad sense, the lack of adequate reading instruction since the earlier stages of academic education. In Brazil, reading is commonly taken as decoding and the teaching of reading in school reflects this misconception. From the beginning of academic education reading consists of exercises in deciphering graphic symbols and elocutionary exercises, and the primary purpose of these exercises is the study of vocabulary and grammatical features.

The poor performance of students on reading comprehension, the problems presented by students when they reach the stage of "proficient reading" - reading for comprehension - seems to indicate that there must be something wrong with that type of approach. In the specific case of comprehension of main points, the difficulty students show in identifying the gist of a written communication might be due to total lack of pertinent instruction or to the use of inappropriate pedagogical procedures.

In the next section some pedagogical recommendations will be made on the basis of the results obtained in this experiment.

5.2. Pedagogical Implications

The findings of the present study, in their broad lines, suggest that there is a need of developing efficient reading instruction in the sense of providing students with the tools that can help them to construct meaning when reading. It was shown that students' reading performance in Portuguese and English, as measured by their capacity to differentiate levels of importance of information in texts, is very weak.

There is some consensus among reading experts to qualify the ability to identify main ideas as one of the essential tools in reading (cf., Axelrod, 1975; Brown and Smiley, 1977). Moreover, the development of instructional techniques to help students in identifying main points has gained great impetus (cf., Axelrod, 1975; Alexander, 1976; Moore and Readence, 1980). What these authors emphasize is that more than teaching a "gimmick" (giving special attention to the first sentence of each paragraph) instructions should be developed with the objective of teaching the concept of main ideas (cf., Axelrod, 1975).

The strategy to go directly to the first or last sentence of paragraphs, however, is largely used in ESP courses and for the objectives of these courses it seems to be valid. Reading instruction is not the primary concern of these courses. The objective is to provide students with the necessary training to be capable of coping with the complex and dense foreign language material that they are required to read for university courses. Thus, it is always assumed that students have already reached a certain level of mastery on the reading task, acquired through instruction and practice in their native language. From this basic level, more specific goal-oriented strategies may be

taught.

In the case of the students involved in this experiment, though, it seems that what could be considered the basic skills for efficient reading have not been acquired. Therefore, it seems reasonable to speculate that more than learning a trick, they need to receive clear, objective instructions on the concept of main ideas.

Another important point against only teaching students to pay attention to the first or last sentences of paragraphs is that this trick does not always work. Texts are rarely so directly organized that each paragraph presents the same pattern of organization and

> "many times the main idea is not mentioned explicity... and can only be grasped by reading between the lines or by assessing the meaning of the passage as a whole" (Axelrod, 1975:284).

In fact, about paragraph organization Trimble (1977) proposes that there are two types of paragraphs: the physical paragraph, referring to the arrangement of sentences on the page-indentation; and the conceptual paragraph, which is characterized by a group of sentences developing a given generalization (p.2-3).

That being so, instructions on main points identification should focus on teaching students to read between the lines inducing general ideas among details, through the combination of information presented in two or more paragraphs. A study by Brown and Day (1983) suggested that "the ability to invent topic sentences to state the implicit main idea of paragraphs is difficult, and develops with age" (p.13). Early pertinent training seems to be needed in order to enable students to develop their capacity of judgement in selecting main ideas.

Attempts to devise progressive training on that have been made by Axelrod (1975); Alexander (1976); Moore and Readence (1980); Arnold (1981); and Moore and Moore (1982), among others. The findings of this study, especially with respect to native language reading performance, seem to reflect the approach given to reading instruction since elementary school in Brazil:

- reading is only a means of learning/practicing grammar and vocabulary, and sometimes acquiring fluency; and
- students have no involvement with the subjects dealt in the texts.

In such an arid environment students have no opportunity to enjoy reading and it naturally becomes a painful experience.

What our students seem to need is meaningful reading. They should be able to establish contact with texts that are appropriate to their age or intelectual development, texts dealing with attractive issues which can make reading an enjoyable activity.

They seem to be claiming for substantial reading instruction, reading instruction that allows them to interact with the meaning in the text, that enables them to make clever guesses and min the game.

BIBLIOGRAPHY

ALDERSON, C.; BASTIEN, S. & MADRAZO, A.M. "A Comparison of Reading Comprehension in English and Spanish". Universidad Nacional Autonoma de Mexico, 1977.

ALEXANDER, C.F. "Strategies for Finding the Main Idea". Journal of Reading, 19, 4, 299-301, 1976.

ANDERSON, R.C. & PEARSON, P.D. "A Schema-Theoretic View of Basic Processes in Reading Comprehension". In P.D. Pearson (Ed.) Handbook of Reading Research, Longman, New York, 255-291, 1984.

ANDERSON, R.C.; REYNOLDS, R.E.; SCHALLERT, D.L. & GOETZ, E.T. "Frameworks for Comprehending Discourse". American Educational Research Journal, 14, 367-382, 1977.

ARNOLD, M.T. "Teaching Theme, Thesis, Topic Sentences and Clinchers as Related Concepts". Journal of Reading, 24, 373-76, 1981.

AXELROD, J. "Getting the Main Idea Is Still the Main Idea". Journal of Reading, 18, N. 5, 383-7, 1975.

BARTLETT, F.C. Remembering. Cambridge. Cambridge University Press, 1932.

BOWER, G.H. "Experiments on Story Understanding and Recall." Quarterly Journal of Experimental Psychology, 28, 511-34, 1976.

BROWN, A.L. & DAY J.D. "Macrorules for Summarizing Texts: The Development of Expertise". Technical Report Nº 270. Urbana: Center for the Study of Reading, Illionois University, 1983.

BROWN, A.L. & SMILEY, S.A. "Rating the Importance of Structural Units of Prose Passages: A Problem of Metacognitive Development". Child Development, 48, 1-8, 1977.

BURKART, K.H. "An Analysis of Reading Abilities". Journal of Educational Research, 36, 6, 430-39, 1945.

CAMBOURNE, B. "Getting to Goodman: an Analysis of the Goodman Model of Reading With some Suggestions for Evaluation". Reading Research Quarterly, 12, 4, 605-636, 1976-77.

COADY, James. "A Psycholinguistic Model of the ESL Reader". In Mackay, R.; Barkman, Bruce and R.R. Jordan (eds.), Reading in a Second Language. Hypotheses, Organization and Practice. Newbury House Publishers, Inc., Rowley. Massachussets, 1979.

CHRISTIE, D.J. & SCHUMACHER, G.M. "Developmental Trends in the Abstraction and Recall of Relevant versus Irrelevant Thematic Information from Connected Verbal Materials". Child Development 46, 598-602, 1975.

FILLMORE, C.J. "The Case for Case". In E. Bach & R.T. Harms (eds.). Universals in Linguistic Theory. New York: Holt, Rinehart & Winston, 1968.

FREDERIKSEN, C.H. "Acquisition of Semantic Information from Discourse: Effects of Repeated Exposures". Journal of Verbal Learning and Verbal Behavior, 14, 158-69, 1975(b).

FREEDLE, R.D. & HALE, G. "Acquisition of New Comprehension Schemata for Expository Prose by Transfer of a Narrative Schema". In R.O. Freedle (Ed.), New Directions in Discourse Processing. Norwood, N.J.: Ablex Publishing Corporation,1979.

GAMBRELL, L.B. & HEATHINGTON, B.S. "Adult Disabled Readers' Metacognitive Awareness About Reading Tasks and Strategies". Journal of Reading Behavior, 13, 3, 215-22, 1981.

GIBSON, E.J. & LEVIN, H. The Psychology of Reading. Cambridge. Massachusetts, MIT Press, 1975.

GOODMAN, K.S. "The Reading Process". In F.V. Gollash (Ed.), Language & Literacy: The Selected Writings of Kenneth S. Goodman. Boston: Routledge & Kegan Paul, 5-18, 1982.

GOODMAN, K.S. "Reading: A Psycholinguistic Guessing Game". In F.V. Gollash (ed.) Language & Literacy: the Selected Writings of Kenneth S. Goodman. Boston: Routledge & Kegan Paul, 33-44, 1982.

GOODMAN, K.S. "What Is Universal About the Reading Process". In F.V. Gollash (Ed.), Language & Literacy: The Selected Writings of Kenneth S. Goodman. Boston: Routhledge & Kegan Paul, 63-76, 1982.

GOODMAN, K.S. "What We Know About Reading". In F.V. Gollash (Ed.), Language Literacy: The Selected Writings of Kennet S. Goodman. Boston: Routledge & Kegan Paul, 77-88, 1982.

GOUGH, P.B. "One Second in Reading". In Kavanagh & Mattingly (eds.). 331-358, 1972. Reprinted in Singer & Ruddell (eds.) 509-35, 1976.

HOLMES, J. "The Importance of Prediction". Working Papers No. 5. PUC, São Paulo, April 1982.

JOHNSON, R.E. "Recall of Prose as a Function of the Structural Importance of the Linguistic Units". Journal of Verbal Learning and Verbal Behavior, 9, 12-20, 1970.

JOHNSON, R.E. "Meaningfulness and the Recall of Textual Prose." American Educational Research Journal, 10, 1, 49-58, 1973.

KING, D.J. "Retention of Connected Meaningful Material as a Function of Modes of Presentation and Recall". Journal of Experimental Psychology, 77, 676-83, 1968.

KINTSCH, W. & KEENAN, J. "Reading Rate and Retention as a Function of the Number of Propositions in the Base Structure of Sentences. Cognitive Psychology, 5, 257-274, 1973.

KINTSCH, W. & KOZMINSKY, E. "Summarizing Stories After Reading and Listening". Journal of Educational Psychology, 69, 491-99, 1977.

KINTSCH, W. The Representation of Meaning in Memory. Hillsdale, NJ:Erlbaum, 1974.

KINTSCH, W.; KOZMINSKY, E.; STREBY, W.S.; McKOON, G. & KEENAN, J.M. "Comprehension and Recall of Text as Function of Content

Variables". Journal of Verbal Learning and Verbal Behavior, 14, 196-214, 1975.

KINTSCH, W.; MANDEL, T.S. & KOZMINSKY, E. "Summarizing Scrambled Stories". Memory & Cognition, 5, 547-52, 1977.

KINTSCH, W. & van DIJK, T.A. "Cognitive Psychology and Discourse: Recalling and Summarizing Stories. In W.H. Dressler (Ed.), Trends in Text - Linguistics. New York: De Gruyter, 1977.

KINTSCH, W. & van DIJK, T.A. "Toward a Model of Text Comprehension and Production". Psychological Review, 85, 5, 363-94, 1978.

KINTSCH, W. & van DIJK, T.A. Strategies of Discourse Comprehension Academic Press. New York, 1983.

KLEIMAN, A.B. & TERZI, S.B. Fatores Determinantes na Elaboração de Resumos: Maturação ou Condições da Tarefa? IEL, UNICAMP, 1984.

LABERGE, D. & SAMUELS, S.J. "Toward a Theory of Automatic Information Processing in Reading". Cognitive Psychology, 6, 293-323, 1974.

McGEE, L.M. "Awareness of Text Structure: Effects on Children's Recall of Expository Text". Reading Research Quarterly, 17, 4, 581-90, 1982.

MEYER, B.J.F. The Organization of prose and Its Effects on Memory. Amsterdam: North-Holland Publishing Co., 1975(a).

MEYER, B.J.F. "Identification of the Structure of Prose and Its Implications for the Study of Reading and Memory". Journal of Reading Behavior, 7, 7-47, 1975(b).

MEYER, B.J.F.; BRANDT, D.M. & BLUTH, G.J. "Use of Top-Level Structure in Text: Key for Reading Comprehension of Ninth-Grade Students". Reading Research Quarterly, 16, 1, 72-101, 1980.

MEYER, B.J.F. McCONKIE, G.W. "What is Recalled After Hearing A Passage?" Journal of Educational Psychology, 65, 1, 109-17, 1973.

MONTANER, A.H.B. Reading for Academic Purposes. An Exploration of Reading Theories and Pratical Classroom Applications. Unpublished doctoral dissertation. PUC, São Paulo, 1982.

MOORE, D.W. and MOORE, S.A. "An Exploration of Readers' Ideas of Main Ideas". Twenty-Sixth Annual Conference. College Reading Association. Philadelphia, Pennsylvania. October 28, 1982.

MOORE, D.W. and READENCE, J.E. "Processing. Main Ideas Through Parallel Sesson Transfer". Journal of Reading, 23, 7, 589-93, 1980.

MYERS, M. & PARIS, S.G. "Children's Metacognitive Knowledge About Reading, Journal of Educational Psychology, 70, 680-90, 1978.

OLSHAVSKY, J.E. "Reading as Problem Solving: An Investigation of Strategies". Reading Research Quarterly, 12, 4, 654-74, 1976-77.

PAES DE BARROS, A.R.M. "O Papel da Super-Estrutura na Compreensão e no Resumo de Textos Dissertativo - Argumentativos", 1st Colloguium on Reading, PUC, São Paulo, 10 pp. (unpublished).

PICHERT, J.W. "Sensitivity to What is Important in Prose". Technical Report Nº 149, Urbana: Center for the Study of Reading, Illinois University, 1979.

PICHERT, J.W. & ANDERSON, R.C. "Taking Different Perspectives on a Story". Journal of Educational Psychology, 69, 309-15, 1977.

PICHERT, J.W. & ANDERSON, R.C. "Recall of Previously Unrecallable Information Following a Shift in Perspective". Journal of Verbal Learning and Verbal Behaviour, 17, 1-12, 1978.

RUMELHART, D.E. "Notes on a Schema for Stories". In Bobrow, D. G. and Collins, A. (Eds.) Representation an Understanding. New York, Academic Press, 1975.

RUMELHART, D.E. "Towards an Interactive Model of Reading". In S. Dornic (Ed.) Attention and Performance VI. Hillsdale, N. J.: Erlbaum, 1977.

* SCOTT, M.R. "Reading Comprehension in English for Academic Purposes" (EAP). The Especialist, 3, 41-51, 1981.

* SCOTT, M.R. "Report on the Workshops on Exercise-Types for EAP Reading Comprehension". The Especialist, 7, 17-44, 1983.

SIMMONS, R.F. Semantic Networks: Their Computation and use for Understanding English Sentences. In R.C. Schank & K.M. Colby (eds.), Computer Models of Thought and Language. San Francisco 1973. Freeman.

SMILEY, S.S.; DAKLEY, D.D.; WORTHEN, D.; CAMPIONE, J.C. & BROWN, A.L. "Recall of Thematically Relevant Material by Adolescent Good and Poor Readers as a Function of Written Versus Oral

Presentation". Technical Report Nº 23, Urbana: Center for the Study of Reading, Illionois University, 1977.

SMITH, F. Understanding Reading. A Psycholinguistic Analysis of Reading and Learning to Read. Holt, Rinehart & Winston. New York, 1971.

SMITH, F. Reading. Cambridge, University Press, 1978.

SPIRO, R.J. & MYERS, A. "Individual Differences and Underlying Cognitive Processes". In P.D. Pearson (Ed.) Handbook of Reading Research, Longman, New York, 471-504, 1984.

STANOVICH, K.E. Toward an Interactive - Compensatory Model of Individual Differences in the Development of Reading Fluency. Reading Research Quarterly, 16, 32-71, 1980.

TRIMBLE, Louis. "An Approach to Reading Scientific and Technical English". LENGUAS. Para Objetivos Específicos. Cuaderno 4, 1977.

van DIJK, T.A. "Relevance Assignment in Discourse Comprehension". Discourse Processes, 2, 113-126, 1979.

WILDMAN, D.M. & KLING, M. "Semantic, Syntactic and Spatial Antecipation in Reading". Reading Research Quarterly, 14, 2, 128-164, 1978-79.

WINOGRAD, P. "Understanding Natural Language". Cognitive Psychology, 3, 1-191, 1972.

WINOGRAD, P. "Strategic Difficulties in Summarizing Texts". Reading Research Quarterly, 19, 4, 404-25, 1984.

APPENDICES

APPENDIX A

CHECAGEM DE CONHECIMENTO

Isto não é um teste, mas um instrumento de pesquisa que se destina a medir seu conhecimento de inglês.
Ele está dividido em três partes: elementar, intermediária e avançada, com 12, 24 e 12 questões de múltipla escolha, respectivamente.
Para cada questão há somente 1(uma) alternativa correta que você deve assinalar na grade anexa.

ATENÇÃO: *Responda somente as questões que tiver certeza, deixando em branco aquelas que você tem dúvida ou que não sabe.*

NÃO CHUTE, *por favor.*

PARTE I

ELEMENTAR

1
A. *What is you doing?*
B. *What are you doing?*
C. *What you doing?*

2
A. *Where you are coming from?*
B. *Where you come from?*
C. *Where do you come from?*

3
A. *Peter and Mary are working.*
B. *Peter and Mary do working.*
C. *Peter and Mary they working.*

4
A. *Tom plays tennis every Saturday.*
B. *Tom playing tennis every Saturday.*
C. *Tom he play tennis every Saturday.*

5
A. This book is my.
B. This book is mine.
C. This book is to me.

6
A. Who is that? It's Peter.
B. Who is that? Is Peter.
C. Who is that? Peter's that.

7
A. Where is my book? It there.
B. Where is my book? There's it.
C. Where is my book? There it is.

8
A. Are you married John? No, I'm not.
B. Are you married John? No,I aren't.
C. Are you married John? No, I not.

9
A. Do you like dancing? Yes, I like.
B. Do you like dancing? Yes, I do like.
C. Do you like dancing? Yes, I do.

10
A. What you are doing tonight?
B. What you will do tonight?
C. What are you doing tonight?

11
A. Peter wants to go swimming.
B. Peter wants go swimming.
C. Peter wants going swimming.

12
A. Mary can playing the piano.
B. Mary can play the piano.
C. Mary can to play the piano.

.....

Se você conseguiu resolver mais do que 8(oito) questões desta parte, vá adiante.

PARTE II

INTERMEDIÁRIA

1

A. He often visits London.
B. He often is visiting London.
C. He visits often London.

2

A. Last Saturday we are going on an excursion.
B. Last Saturday we went on an excursion.
C. Last Saturday we have been on an excursion.

3

A. I did not visit Paris yet.
B. I had not visited Paris yet.
C. I have not visited Paris yet.

4

A. I will be waiting for you at the station tomorrow.
B. I am waiting for you at the station tomorrow.
C. I wait for you at the station tomorrow.

5

A. He does not want to go with us.
B. He wants to not go with us.
C. He is not wanting to go with us.

6

A. What is this word meaning?
B. What means this word?
C. What does this word mean?

7

A. When lost you your book?
B. When did you lose your book?
C. When were you losing your book?

8

A. I hope the cinema opens soon. I waited for an hour already.
B. I hope the cinema opens soon. I am waiting an hour already.
C. I hope the cinema opens soon. I've been waiting an hour already.

9

A. He is born in 1939.
B. He has been born in 1939.
C. He was born in 1939.

10

A. Peter was already been told the news when you saw him.
B. Peter has already been told the news when you saw him.
C. Peter had already been told the news when you saw him.

11

A. This work must do tonight.
B. This work must be doing tonight.
C. This work must be done tonight.

12

A. He plays football better than I do.
B. He plays football more good than I do.
C. He plays football more well than I do.

13

A. My hair is long but hers is more longer.
B. My hair is long but her is longer.
C. My hair is long but hers is longer.

14

A. It is such a small village that it only has one hotel.
B. It is so a small village that it only has one hotel.
C. It is a such small village that it only has one hotel.

15

A. I had not any sugar so I bought one.
B. I had not any sugar so I bought some.
C. I had not some sugar so I bought one.

16

A. I can not make an omelette without I break some eggs.
B. I can not make an omelette without to break some eggs.
C. I can not make an omelette without breaking some eggs.

17

A. I enjoy playing the piano.
B. I enjoy to play the piano.
C. I enjoy that I play the piano.

18

A. He arrived on Monday.
B. He arrived in Monday.
C. He arrived at Monday.

19

A. He prefers to travel on his own.
B. He prefers to travel by his own.
C. He prefers to travel with himself.

20

A. He comes to school in his car.
B. He comes to school by his car.
C. He comes to school on his car.

21

A. Do not help them. Let them do it by themself.
B. Do not help them. Let them do it by theirselves.
C. Do not help them. Let them do it by themselves.

22

A. He's never read this book, has he?
B. He's never read this book, is he?
C. He's never read this book, does he?

23

A. They should have stayed there, didn't they?
B. They should have stayed there, haven't they?
C. They should have stayed there, shouldn't they?

24

A. I never drink beer and she does not.
B. I never drink beer and she does neither.
C. I never drink beer and nor does she.

.....

Se você assinalou mais de 12 questões desta parte, siga adiante.

PARTE III

AVANÇADA

1
A. By Christmas I will have been married for ten years.
B. By Christmas I will be married for ten years.
C. By Christmas I am married for ten years.

2
A. You must work faster. You should be finishing hours ago.
B. You must work faster. You should have finished hours ago.
C. you must work faster. You should finish hours ago.

3
A. I wish I will go to the party tomorrow.
B. I wish I went to the party tomorrow.
C. I wish I were going to the party tomorrow.

4
A. If I hadn't lost the key, he had started the car.
B. If I hadn't lost the key, we were able to start the car.
C. If I hadn't lost the key, we might have started the car.

5
A. The moment he is informed of the meeting he went.
B. The moment he was informed of the meeting he went.
C. The moment he has been informed of the meeting he went.

6
A. The bill used to be paid in cash.
B. The bill was used to being paid in cash.
C. The bill was used to pay in cash.

7
A. He is interested to learn to swim.
B. He is interested to learn swimming.
C. He is interested in learning to swim.

8
A. She is looking forward to see me next week.
B. She is looking forward to seeing me next week.
C. She is looking forward to my seeing next week.

9
A. The bus pulled through in front of the school.
B. The bus pulled up in front of the school.
C. The bus pulled to in front of the school.

10

A. We must put the meeting off until next week.
B. We must put the meeting down until next week.
C. We must put the meeting away until next week.

11

A. The morning was wet but the afternoon turned up fine.
B. The morning was wet but the afternoon turned into fine.
C. The morning was wet but the afternoon turned out fine.

12

A. She hopes to take out nursing as a career.
B. She hopes to take up nursing as a career.
C. She hopes to take in nursing as a career.

Adapted from International House-Hastings. English Language Assessment Test.

APPENDIX B

SELECTION OF TEXTS

You are receiving a number of texts to be analysed in terms of the items listed below.
This analysis will provide data for you to measure the similarity between the texts in order to choose 1 text in English and 1 in Portuguese.
These two texts have to be similar in terms of:

1. Length - a. number of paragraphs
   b. number of words

2. Layout -
   2.1. Title - a. presence/absence
   b. vocabulary - easy/difficult
   c. raise curiosity/not
   2.2. Subtitle - a. presence/absence
   b. vocabulary - easy/difficult
   2.3. Typographical Clues - a. presence/absence
   2.4. Illustration - a. presence/absence
   b. helps comprehension/not

3. Subject - a. raise interest/not
   b. up-to-date/not
   c. information gap/not

4. Language - a. some challenging/no
   b. technical words - many/few

5. Rhetorical Function - a. 1 macro-function/≠ functions
   b. the macro-function - clearly signalled/not
   c. (specify the macro-function)

6. MP comprehension - a. easy/difficult to take notes on
   b. vocabulary - problems at this level/no

ANALYSIS:

Items	Texts in Portuguese		Texts in English		
	V. Solar	O. Magnética	Stomach	A. Islands	D. Males
1. a.	7	6	6	6	7
b.	461	647	465	485	364
2.1. a.					
b.					
c.					
2.2. a.					
b.					
2.3. a.					
2.4. a.					
b.					
3. a.					
b.					
c.					
4. a.					
b.					
5. a.					
b.					
c.					
6. a.					
b.					

The two texts are:

Portuguese-.....

English-.....

Imagina-se que o espaço interplanetário e o espaço interestelar são um imenso vazio, ocasionalmente riscado por meteoritos e cometas. No entanto, sabe-se hoje que muitas estrelas, inclusive o Sol, emitem um fluxo constante de partículas que varre essas extensões, transmitindo matéria e energia.

VENTO SOLAR E VENTOS ESTELARES

J.A. de Freitas Pacheco*

A coroa solar é constituída de um gás extremamente quente, com temperaturas da ordem de um milhão de graus. Devido a essa elevada temperatura, a atração gravitacional do Sol não consegue mantê-la confinada em sua vizinhança, e a coroa se expande através do espaço interplanetário, dando origem a um fluxo de gás poeticamente chamado de vento solar.

A existência do vento solar foi inferida inicialmente em 1951 por um astrofísico alemão, Biermann, através do estudo das caudas iônicas dos cometas. Esses astros podem possuir dois tipos de caudas. A primeira é constituída de grãos de poeira ("gelo sujo") com dimensões de centenas a milhares de Ångströms, que dispersam a luz solar; sua direção é determinada pela orientação do cometa em relação ao Sol e pela direção de seu próprio movimento orbital. O outro tipo de cauda, a chamada cauda iônica, é constituída de átomos e moléculas ionizados e se apresenta sempre na direção cometa-Sol, o que se deve à ação do vento solar, responsável pelo transporte dessas partículas.

Com a emissão de partículas que constituem o seu vento, o Sol sofre uma perda de massa, que no seu caso entretanto é ínfima: apenas 2×10^{-4} massas solares por ano. Assim, se esse processo se mantiver durante toda a vida estimada do Sol (cerca de 10 bilhões de anos), ele perderá apenas cerca de dois décimos de milésimo de sua massa total.

Quadro 1 - Propriedades do Vento Solar na Vizinhança da Terra

Velocidade de Expansão	300 km/s
Densidade	9 átomos/cm³
Temperatura dos Elétrons	150.000°K
Temperatura dos Prótons	40.000°K

E as outras estrelas? Possuirão elas também um análogo do vento solar, que represente uma perda de massa importante durante suas vidas?

Já no final da década de 60, com um pequeno instrumento a bordo de foguetes, o astrofísico norte-americano Morton mostrou que as estrelas supergigantes localizadas na constelação de Orion apresentavam ventos estelares.

Inúmeras observações realizadas nos permitem afirmar que os ventos estelares, longe de serem uma exceção, constituem-se em regra quase que geral. O fenômeno se encontra presente em maior ou menor intensidade, conforme a *luminosidade* da estrela em questão.

As propriedades até hoje observadas dos ventos estelares apontam para a existência de uma forte relação entre a taxa de perda de massa e a luminosidade do objeto, o que sugere que a *força de radiação* representa o mecanismo responsável pela aceleração do vento. Isto pode ainda ser verificado ao constatarmos que cerca de 2 a 50% da quantidade de movimento dos fótons são transmitidos ao gás, ao contrário do caso do Sol, onde *não existe* nenhuma força impelindo o vento, que se desloca unicamente devido à sua alta temperatura.

Propriedades dos Ventos Estelares

Tipo de estrela	Luminosidade em relação ao Sol	Perda de massa (massas solares/ano)	Velocidade de expansão
Of e Supergigantes OB	3×10^5	$10^{-6} - 10^{-5}$	3.000 km/s
B, Be	10^4	$10^{-9} - 10^{-8}$	1.500 – 2.000 km/s
Núcleos de Planetárias	10^3	10^{-10}	2.000 km/s

ORIENTAÇÃO MAGNÉTICA

Henrique G. P. Lins de Barros
Darci Motta S. Esquivel*

Uma hipótese levantada há mais de vinte anos é a de que o campo magnético da Terra pode fornecer informações importantes para a orientação e navegação de animais, e tem sido sistematicamente considerado no caso dos pombos. Os resultados dessas pesquisas, realizadas inicialmente por C. Walcott e R.P. Green, da Universidade de Cornell, em Nova York, mostraram que em certas condições o pombo é afetado pelo campo magnético, indicando a possibilidade de que o campo geomagnético seja usado como base e referência. Colocaram-se ímãs na região da cabeça de pombos em dias de pouca visibilidade e eles tiveram seu senso de orientação perturbado.

Supõe-se que o mecanismo que atua sobre o pombo não é o mesmo de uma bússula, sendo constituído por material magnético que interage como o campo geomagnético mas transmite as informações diretamente para o sistema nervoso da ave. De fato, em fins de 1980, foi encontrada magnetita, um óxido magnético do ferro (Fe_3O_4), na região da cabeça do pombo, o que parece indicar a existência de sensores magnéticos nesta ave.

Trabalhos realizados por diversos grupos do mundo inteiro se têm voltado para a procura e a compreensão destes sensores magnéticos, sem que no entanto se tenha ainda chegado a resultados conclusivos. A procura de material magnético em animais, realizada nos últimos anos, tem trazido surpresas aos pesquisadores que se dedicam ao estudo da biomineralização. Embora se conheça relativamente bem os processos de mineralização de carbonatos, fosfatos etc. em seres vivos, até poucos anos atrás não se conhecia nenhum exemplo de organismo vivo que produzisse a magnetita através desses processos. Só a partir de estudos em um molusco do gênero Chiton realizados há vinte anos por H.A. Lowenstam, do Instituto de Tecnologia da Califórnia (CALTECH), é que se teve a primeira evidência da biomineralização da magnetita em animais. O processo por que o ferro passa até ser cristalizado na forma de magnetita ainda não é compreendido, e constitui um dos campos atuais do trabalho de vários biólogos, bioquímicos e biofísicos. Após os trabalhos de Lowenstam, encontrou-se magnetita biomineralizada em vários outros seres vivos, mostrando que esse processo é bastante

A magnetita é extremamente densa e possui magnetização permanente, o que pode ser uma indicação da existência de sensores magnéticos, e já foi encontrada em tartarugas, morcegos, pombos, atuns, abelhas, algas, bactérias etc. A influência do campo magnético da Terra sobre o comportamento de seres vivos foi apontada nos pombos; nas abelhas, que o utilizam como elementos de orientação do vôo e como referência durante a dança que realizam quando à procura do néctar; em algas verdes, e em bactérias. É apenas nestes dois últimos organismos, porém, que o mecanismo de atuação do campo pareca estar estabelecido.

Para o estudo da percepção magnética em seres vivos, teve grande importância a descoberta, feita em 1974 por R.P. Blakemore, da Universidade de New Hampshire, de bactérias que apresentam um tipo de tactismo até então desconhecido, que recebeu o nome de *magnetotatismo* ou *magnetotaxia*. Essas bactérias encontradas em regiões logo acima do fundo lodoso do lago de Woods Hole, em Massachusetts, são influenciadas pelo campo geo magnético.

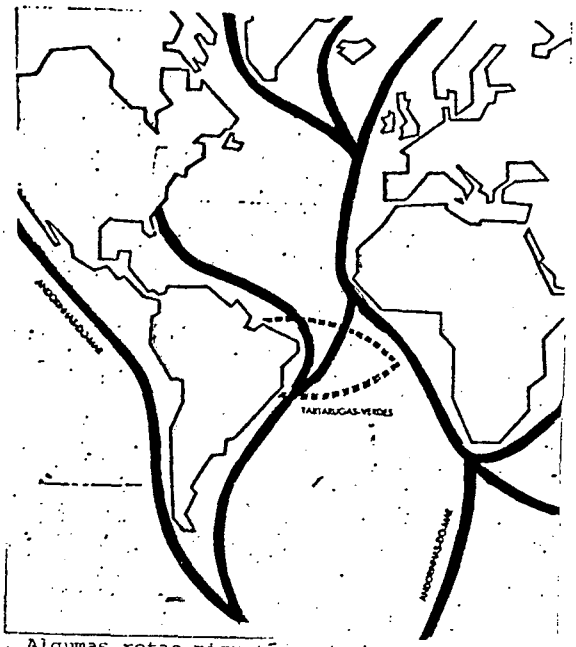


Figura 1. Algumas rotas migratórias das andorinhas-do-mar e das tartarugas-verdes. As andorinhas-do-mar são provavelmente as aves que fazem o maior vôo de migração do planeta. Elas desovam na costa nordeste da Europa, na Ásia e na América do Norte durante o período de junho a setembro. Durante o verão do hemisfério Sul elas migram para as regiões antárticas. As tartarugas-verdes empreendem uma viagem de cerca da 2.000 km. para desovarem na ilha de Ascensão no meio do oceano Atlântico.

Assim como as bactérias e algas magnetotácticas, assim como os pombos que retornam ao lar nos dias e noites nublados, as andorinhas, as tartarugas, as abelhas, o cágado e talvez o homem utilizam o campo geomagnético como importante elemento para sua orientação. Esta percepção do campo magnético terrestre mostra, mais uma vez, que os organismos vivos estão intimamente ligados ao planeta, formando um todo integrado, conhecendo o seu meio através de uma experiência herdada de seus ancestrais. O ser vivo é a memória viva da Terra, memória desta aventura que se iniciou há uns 3,5 bilhões de anos, quando surgiram as primeiras células.

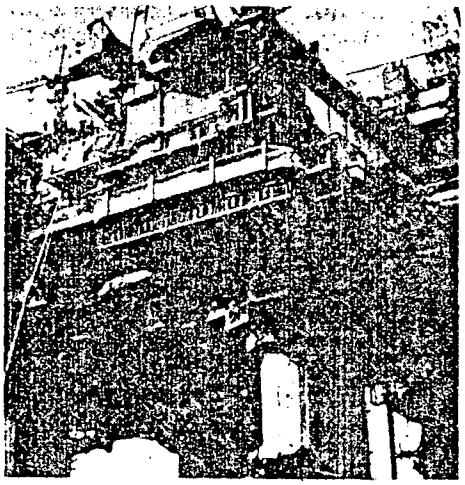
Artificial islands could help Third World

FLOATING islands could help developing countries to enter the industrial age, according to a consortium of companies in Monaco. The group, called Eurocean, says that factories built out at sea do not use valuable land, cause people less trouble with pollution and may be cheaper than their counterparts on shore. Even more important, with floating platforms, firms can tow their plants to places where demand for their goods is high or where raw materials are easily available.

Eurocean says that several types of industrial operation can take place at sea—chemical and paper processing, electricity generation, desalination and fish canning. According to Don Lennard, the company's British representative, industrial platforms offer Third World nations several benefits. The platforms would be built in a modern shipyard abroad and towed into position. The developing nation would not have to clear space for industry in coastal zones that may be congested with other types of buildings. And if the country suffers from earthquakes, damage is reduced when buildings are constructed in the sea.

But Lennard, who was talking last week to a conference on artificial islands at the Institution of Mechanical Engineers in London, warned that not all developing nations would welcome floating islands produced abroad. Some might think the technology was not in their best interests. "It [the floating island concept] takes away from developing countries all possibility of participating in the construction of their own factories, of following the progress of work and finally of employing their own labour."

Turning to prospects in the industrialised world, Lennard said that floating platforms would be attractive for industrialists who wish to expand in areas that are already crowded or where planning permission is difficult to obtain. Nations in the West already have experience in building similar platforms for oil and gas exploration. The cost of a platform that is towed into position can be 15 per cent less than that of a conventional factory.



Derivatives of oil platforms could spell a watery future for industry

The platforms themselves could be built in several different ways. Jack-up platforms are temporarily installed with three or more legs on the sea bottom and can be easily moved to other sites. Semi-submersibles have concrete or steel hulls that support factories on an upper deck; they have to be moored to the sea bed with cables. Another alternative is to build a barge in a shipyard, tow it near to the place where the factory is located and here build on top of it the plant that is required, for instance a power station or a chemical works.

The floating barge concept, could, according to Eurocean, be the most attractive to developing countries as they would have a chance to build a large part of the factories themselves. But the company warns that "operational costs, and especially maintenance costs, are very uncertain due to lack of experience and may therefore be much higher than foreseen". □

New Scientist 26 November 1981

Stomach bug provides food for thought

THE REAL problem with pains in the bowels is in the mind, say researchers at the London Hospital. And they aim to prove their point by bugging their patients' digestive tracts. David Wingate and Roland Valori have developed a steel capsule, to be swallowed by patients. This transmits information about the effects of mental stress on the bowel. The "pills" are for people who suffer from what doctors call irritable bowel syndrome.

The syndrome is one of the commonest, but least understood, of complaints. Doctors used to think that its symptoms—pain, and either diarrhoea or constipation—were the result of an abnormality in the large bowel. There is evidence that people who suffer from irritable bowels experience abnormal contractions in that region between meals. But doctors find it difficult to detect abnormalities in bowel behaviour during a person's everyday life.

Wingate and Valori's pill is a stainless steel, bullet-shaped cylinder about 32 mm long and 8·6 mm in diameter. One end holds a pressure sensor and the other contains a radio transmitter. Transmitting in brief but regular pulses, the pills broadcast information about pressure changes caused by contractions in the gut. The pills operate for up to eight days before their batteries run down. A patient swallows two pills to record the speed at which the contractions move through the bowel. Set a few centimetres apart just above the small bowel, the pills are anchored to the patient's teeth by fine string. Three aerials, in the form of belts and bandoliers slung around the patient's body, pick up transmissions from the pills and pass them to a miniature tape recorder on a belt.

As long as the patient can tolerate the string, the pills monitor the small bowel, night and day. Few people who suffer from irritable bowels object to an inconvenience that promises to help to explain their mysterious condition. But two or three days is about the longest period that most can stand, say Wingate and Valori, who have developed the pill with a small Scottish electronics company, Gaeltech of Dunvegan in Skye. Gaeltech plans to sell the pill early next year.

The researchers will ask their patients to induce stress, for instance by driving in London traffic or listening to irritating noises. Such experiments could well pinpoint causes of abnormal bowel behaviour. In a healthy person, the small bowel contracts irregularly during digestion, stops contracting after digestion, and contracts first irregularly and then regularly the longer the stomach goes without food. Recordings from bugged patients should reveal evidence of an increase in the frequency of foodless contractions in irritable bowels. If this evidence arises from a first batch of 15 people during the next few months, then Wingate and Valori will experiment with animals to discover abnormalities of the gut or nervous system that might be responsible for the condition.

Lines of communication between the brain and the bowels have been researched ever since doctors discovered identical, locally-acting hormones in both organs. Research with radio pills in animals as well as human subjects could help to reveal just how mental events and bowel behaviour are related. □

New Scientist 22 October 1981

Dominant males have more testosterone—and heart disease

DYNAMIC, aggressive, extrovert individuals are more susceptible to high blood pressure and heart disease than others. For some time it has been suspected that there is some underlying physiological basis to this correlation. At the University of Akron in Ohio, Dan Ely's studies of mice are beginning to put some of the pieces to the complex behavioural-hormonal jigsaw underlying this correlation (*Physiology and Behaviour*, vol 26, p 655).

Researchers in Akron have been investigating blood pressure disturbances in populations of mice. Mice were held in seven cages that each contained five males and 12 females. The males rapidly established a hierarchy of one dominant male and four subordinates. Dominant males had larger territories, closer association with females and were in better physical condition than subordinates. Subordinates had smaller territories and bore scars from flights with the dominant male. Ely monitored the blood pressure of male mice weekly for four months.

After four months he examined tissues for evidence of hardening of heart tissue (fibrosis) hardening of arteries (arteriosclerosis) and thickening of kidney tissues. Damage in any of these three will lead to high blood pressure. In order to eliminate any bias he coded microscopic slides of the tissues and asked a colleague to score the tissue damage on a scale from 1 (no damage) to 5 (severe damage).

The researchers found that within the first month dominant males developed significantly higher blood pressure. This high blood pressure was maintained throughout the study. They also found significantly higher levels of testosterone, the male sex hormone, synthesised in the testes, whose presence in abnormal quantities has been linked with aggressive tendencies.

The dominant males also showed more arteriosclerosis than other males. Heart and kidney tissues were undamaged.

In a second experiment, Ely removed the dominant male from half of the cages. Within a week the dominant males' blood pressure returned to normal. While the dominant male was gone the next-ranking male took over his position and in turn developed high blood pressure.

Finally, Ely established the importance of testosterone by castrating males. Castrated males failed to establish a dominance hierarchy, had low testosterone levels and no hypertension. □

New Scientist 30 July 1981

APPENDIX C

Dominant males have more testosterone–and heart disease

DYNAMIC, aggressive, extrovert individuals are more suscetible to high blood pressure and heart disease than others. For some time it has been suspected that there is some underlying psychological basis to this correlation. At the University of Akron in Ohio, Dan Ely's studies of mice are beginning to put some of the pieces to the complex behavioral-hormonal jigsaw underlying this correlation (*Physiology and Behavior*, vol 26, p 555).

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New Scientist 30 July 1981

Machos dominadores têm mais testosterona–e doenças coronárias

INDIVÍDUOS dinâmicos, agressivos e extrovertidos são mais suscetíveis à pressão sanguínea alta e doenças coronárias. Há algum tempo se tem suspeitado haver fundamentação fisiológica para esta correlação. Os estudos de Dan Ely na Universidade de Akron em Ohio, começam a juntar algumas peças do complexo enigma comportamental-hormonal em que se baseia esta correlação (*Physiology and Behavior*, vol 26, p 655).

Pesquisadores em Akron têm investigado distúrbios na pressão sanguínea em populações de ratos. Ratos foram dispostos em sete gaiolas contendo cinco machos e 12 fêmeas cada. Rapidamente, os machos estabeleceram uma hierarquia de um dominador e 4 subordinados. Os machos dominadores tinham territórios maiores, melhor relacionamento com as fêmeas e estavam em melhor condição física que os subordinados. Estes tinham territórios menores e apresentavam cicatrizes provenientes de lutas com o macho dominador. Ely mediu a pressão sanguínea dos machos semanalmente durante quatro meses.

Após quatro meses ele examinou os tecidos no sentido de encontrar evidência de endurecimento do tecido do coração (fibrose), endurecimento das artérias (arteriosclerose) e espessamento dos tecidos renais. Danos em quaisquer destes causa pressão alta. Para evitar parcialidade Ely codificou os *slides* microscópicos dos tecidos e pediu a um colega que avaliasse os danos nos tecidos numa escala de 1(nenhum dano) a 5 (danos severos).

Os pesquisadores constataram que no primeiro mês a pressão sanguínea dos machos dominadores aumentou consideravelmente. Esta pressão alta foi mantida durante todo o estudo. Além disso, os pesquisadores encontraram altos níveis de testosterona, o hormônio sexual masculino, sintetizados nos testículos, presença esta que em quantidades anormais tem sido ligada à tendências agressivas.

Os machos dominadores portavam também mais arteriosclerose que os outros. Os tecidos do coração e rins estavam intactos.

Num segundo experimento, Ely removeu o macho dominador de metade das gaiolas. Dentro de uma semana a pressão sanguínea dos mesmos retornou ao normal. A saída do macho dominador fez com que o hierarquicamente seguinte assumisse sua posição e como consequência passasse a desenvolver pressão sanguínea alta.

Por fim, Ely estabeleceu a importância da testosterona através da castração dos machos. Os machos castrados não conseguiram estabelecer domínio, apresentaram baixo nível de testosterona e nenhuma hipertensão.

New Scientist 30 July 1981

MAGNETIC DIRECTION FINDING

Henrique G. P. Lins de Barros
Darci Motta S. Esquivel*

More than twenty years ago the hypothesis was raised that the earth's magnetic field could supply important information for the direction and navigation of animals, and this hypothesis has been systematically considered in the case of pigeons. The results of research carried out initially by C. Walcott and R.P. Green of Cornell University in New York have shown that, under certain conditions, the pigeon is affected by the magnetic field, indicating the possibility of the geomagnetic field being used as a point of reference. Magnets were placed on the heads of pigeons on days of poor visibility, and their sense of direction became confused.

It is assumed that the mechanism which acts in the pigeon is not the same as in a compass; being made up of magnetic material which interacts with the geomagnetic field, but transmits information directly to the bird's nervous system. In fact, toward the end of 1980, magnetite, a magnetic oxide of iron (Fe_3O_4), was found in the head of a pigeon, which seems to indicate the existence of magnetic sensors in this bird.

Studies carried out by various groups around the world have aimed at the discovery and understanding of these magnetic sensors, without yet reaching any conclusive results. The search for magnetic material in animals carried out in recent years has brought surprises to researchers dedicated to biomineralization. Although the mineralization processes of carbonates, phosphates, etc. in living beings are relatively well-known, until a few years ago there was no known example of a living organism which produced magnetite by these processes. It was only twenty years ago that the studies of a mollusc of the Chiton genre, carried out by H.A. Lowenstam of the California Institute of Technology (CALTECH), produced the first evidence of biomineralization of magnetite in animals. The process through which iron is cristalized in the form of magnetite is not yet understood, and constitutes one of the recent fields of study of numerous biologists, biochemists, and biophysicists. Since Lowenstam's studies, biomineralized magnetite has been found in other living beings, showing that this process is relatively common.

Magnetite, which is extremely dense and has permanent magnetization, has been found in turtles, bats, pigeons, tuna, bees, algae, bacteria, etc., a possible indication of the existence of magnetic sensors. The influence of the earth's magnetic field on the behaviour of living beings has been shown in pigeons; in bees, which use it as an element of flight direction and as a reference point during the dance when looking for nectar; in green algae; and in bacteria. It is only in the last two organisms, however, that the field's acting mechanism seems to have been established.

Of great importance for the study of magnetic perception in living beings was the discovery by R.P. Blakemore of the University of New Hampshire, in 1974, of bacteria which exhibit a type of tactism until then unknown, which has received the name *magnetotactism* or *magnetotaxia*. These bacteria, found in regions just above the muddy bottom of Woods Hole in Massachusetts, are influenced by the geomagnetic field.

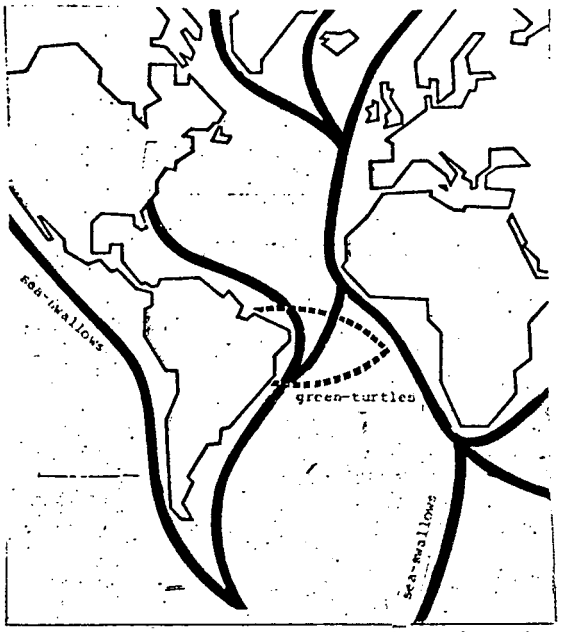

Figure 1. Some migratory routes of the sea swallows and green turtles. The sea swallows are probably the birds which make the longest migratory flight on the planet. They lay their eggs on the northeast coast of Europe, in Asia, and in North America during the period from June to September. During the summer on the Southern hemisphere, they migrate to Antarctic regions. The green turtles travel about 2,000 km. to lay their eggs on Ascension Island, in the middle of the Atlantic ocean.

Like the magnetotactic bacteria and algae, like the pigeons which return home on cloudy days and nights, swallows, turtles, bees, and maybe even man use the geomagnetic field as an important element for their direction finding. This perception of the earth's magnetic field shows again that living organisms are intimately linked to the planet, forming an integrated whole, learning about their surroundings from an experience inherited from their ancestors. The living being is the living memory of the earth, the memory of this adventure which began some 3.5 billion years ago, when the first cells were born.

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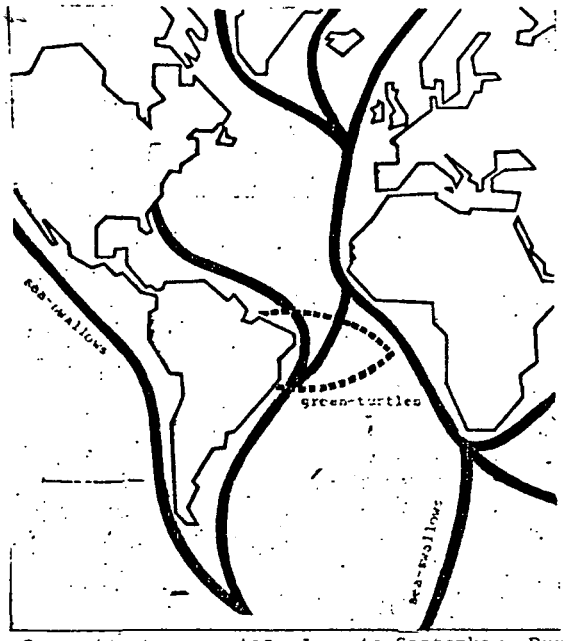

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APPENDIX D

QUESTIONNAIRE

1. Ao iniciar a leitura do texto, o que você olhou primeiro?
2. Como você fez a primeira leitura do texto?
3. Quantas vezes você leu o texto antes de começar a fazer o resumo?
4. Quantas vezes você leu o texto ao todo?
5. Você releu o texto enquanto fazia o resumo? Por quê?
6. Como você procedeu para fazer o resumo, para identificar as idéias principais? Usou algum método - técnica (fez rascunho)?
7. Você achou o texto fácil ou difícil de entender?
8. Você achou o exercício fácil ou difícil?
9. O que o (a) levou a decidir que aquelas idéias que colocou no resumo eram as principais do texto?
10. Você leu o resumo depois de pronto? (Modificou alguma coisa)?

APPENDIX E

JUDGES' BOOKLET FOR SUMMARIZATION

Por favor, resuma os textos *DOMINANT MALES HAVE MORE TESTOSTERONE - AND HEART DISEASE* e *MAGNETIC DIRECTION FINDING* em no máximo 35 e 40 palavras, respectivamente, em português. Atente para que os resumos expressem somente as idéias principais dos textos

NOTA: Na página seguinte você encontrará o texto *CONVERSA VEGETAL* e seu resumo que lhe servirá de amostra daquilo que pretendemos obter.

Ciência

Conversa vegetal

Plantas se comunicam por sinais químicos

Os biólogos sabem há muito tempo que algumas espécies de salgueiros vitimadas por pragas conseguem modificar seu metabolismo e aumentar os índices de compostos tóxicos em suas folhas, tornando-as, assim, indigestas aos insetos que as devoram. Agora, de acordo com dois pesquisadores da Universidade de Washington, nos Estados Unidos, pode-se chegar a outra conclusão, ainda mais intrigante: as árvores não só se defendem como são capazes de avisar as outras de que estão sendo atacadas. E assim as plantas vizinhas podem deflagrar seus mecanismos tóxicos de defesa antes mesmo de visitadas pelos insetos.

Na verdade, as conclusões de Gordon Orians e David Rhoades — os dois cientistas de Washington — indicam, nada menos, que as árvores falam. Os pesquisadores chegaram a suas conclusões depois de estudar durante dois anos uma reserva de salgueiros submetida a uma

invasão de lagartas famintas. "As árvores pareciam comunicar-se entre si", diz Orians. "Não com palavras, é claro, mas com sinais químicos, claros e eficientes como qualquer vocabulário."

Orians e Rhoades notaram, primeiro, que árvores distantes até 60 metros das plantas com lagartas nas folhas exibiam altos níveis de tóxicos. Ou seja, elas se valiam inexplicavelmente da mesma defesa natural utilizada pelas plantas afetadas. Depois de constatar que as raízes dessas árvores não mantinham vínculos subterrâneos, os pesquisadores concluíram que as árvores devem enviar suas mensagens de alerta pelo ar. "Lançadas ao vento, nuvens de substâncias químicas conseguiriam realizar essa tarefa", afirma Rhoades.

Os cientistas não conseguiram, ainda, identificar qual a substância química que levaria a mensagem de uma árvore a outra. Já existe, porém, um candidato a correio do bosque. "O gás etileno se desprende naturalmente em grandes quantidades tanto de árvores afetadas por pragas como de plantas sadias", informa Orians. "Há possibilidade de que seja ele o vetor da mensagem química." Há uma utilidade prática a se tirar da descoberta: se os cientistas conseguirem isolar a substância que protege as plantas, será possível fabricar com ela um poderoso pesticida natural. "Será um produto capaz de proteger florestas inteiras sem prejuízo ecológico", diz Orians. ●

VEJA, 22 DE JUNHO, 1983

R E S U M O

Pesquisas indicam que algumas espécies de salgueiros, além de se defenderem de pragas produzindo compostos tóxicos, alertam os outros.

Os cientistas pretendem, identificando, isolar a substância química alertadora para fabricar poderoso pesticida natural.

Dominant males have more testosterone—and heart disease

DYNAMIC, aggressive, extrovert individuals are more suscetible to high blood pressure and heart disease than others. For some time it has been suspected that there is some underlying physiological basis to this correlation. At the University of Akron in Ohio, Dan Ely's studies of mice are beginning to put some of the pieces to the complex behavioral-hormonal jigsaw underlying this correlation (*Physiology and Behavior*, vol 26, p 655).

Researchers in Akron have been investigating blood pressure disturbances in populations of mice. Mice were held in seven cages that each contained five males and 12 females. The males rapidly established a hierarchy of one dominant male and four subordinates. Dominant males had larger territories, closer association with females and were in better physical condition than subordinates. Subordinates had smaller territories and bore scars from fights with the dominant male. Ely monitored the blood pressure of male mice weekly for four months.

After four months he examined tissues for evidence of hardening of heart tissue (fibrosis) hardening of arteries (arteriosclerosis) and thickening of kidney tissues. Damage in any of these three will lead to high blood pressure. In order to eliminate any bias he coded microscopic slides of the tissues and asked a colleague to score the tissue damage on a scale from 1 (no damage) to 5 (severe damage).

The researchers found that within the first month dominant males developed significantly higher blood pressure. This high blood pressure was maintained throughout the study. They also found significantly higher levels of testosterone, the male sex hormone, synthesised in the testes, whose presence in abnormal quantities has been linked with aggressive tendencies.

The dominant males also showed more arteriosclerosis than other males. Heart and kidney tissues were undamaged.

In a second experiment, Ely removed the dominant male from half of the cages. Within a week the dominant male was gone the next-ranking male took over his position and in turn developed high blood pressure.

Finally, Ely established the importance of testosterone by castrating males. Castrated males failed to establish a dominance hierarchy, had low testosterone levels and no hypertension.

New Scientist 30 July 1981

MAGNETIC DIRECTION FINDING

Henrique G. P. Lins de Barros
Darci Motta S. Esquivel*

More than twenty years ago the hypothesis was raised that the earth's magnetic field could supply important information for the direction and navigation of animals, and this hypothesis has been systematically considered in the case of pigeons. The results of research carried out initially by C. Walcott and R.P. Green of Cornell University in New York have shown that, under certain conditions, the pigeon is affected by the magnetic field, indicating the possibility of the geomagnetic field being used as a point of reference. Magnets were placed on the heads of pigeons on days of poor visibility, and their sense of direction became confused.

It is assumed that the mechanism which acts in the pigeon is not the same as in a compass; being made up of magnetic material which interacts with the geomagnetic field, but transmits information directly to the bird's nervous system. In fact, toward the end of 1980, magnetite, a magnetic oxide of iron (Fe_3O_4), was found in the head of a pigeon, which seems to indicate the existence of magnetic sensors in this bird.

Studies carried out by various groups around the world have aimed at the discovery and understanding of these magnetic sensors, without yet reaching any conclusive results. The search for magnetic material in animals carried out in recent years has brought surprises to researchers dedicated to biomineralization. Although the mineralization processes of carbonates, phosphates, etc. in living beings are relatively well-known, until a few years ago there was no known example of a living organism which produced magnetite by these processes. It was only twenty years ago that the studies of a mollusc of the Chiton genre, carried out by H.A. Lowenstam of the California Institute of Technology (CALTECH), produced the first evidence of biomineralization of magnetite in animals. The process through which iron is cristalized in the form of magnetite is not yet understood, and constitutes one of the recent fields of study of numerous biologists, biochemists, and biophysicists. Since Lowenstam's studies, biomineralized magnetite has been found in other living beings, showing that this process is relatively common.

Magnetite, which is extremely dense and has permanent magnetization, has been found in turtles, bats, pigeons, tuna, bees, algae, bacteria, etc., a possible indication of the existence of magnetic sensors. The influence of the earth's magnetic field on the behaviour of living beings has been shown in pigeons; in bees, which use it as an element of flight direction and as a reference point during the dance when looking for nectar; in green algae; and in bacteria. It is only in the last two organisms, however, that the field's acting mechanism seems to have been established.

Of great importance for the study of magnetic perception in living beings was the discovery by R.P. Blakemore of the University of New Hampshire, in 1974, of bacteria which exhibit a type of tactism until then unknown, which has received the name *magnetotactism* or *magnetotaxia*. These bacteria, found in regions just above the muddy bottom of Woods Hole in Massachusetts, are influenced by the geomagnetic field.

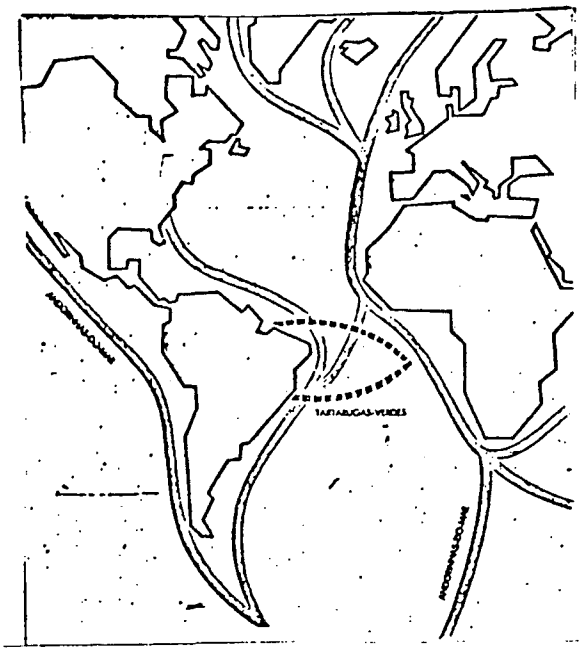

Figure 1. Some migratory routes of the sea swallows and green turtles. The sea swallows are probably the bird which robs the longest migratory flight on the planet. They lay their eggs on : the britanic coast of Europe, in Asia, and in North America during the period from

Like the magnetotactic bacteria and algae, like the pigeons which return home on cloudy days and nights, swallows, turtles, bees, and maybe even man use the geomagnetic field as an important element for their direction finding. This perception of the earth's magnetic field shows again that living organisms are intimately linked to the planet, forming an integrated whole, learning about their surroundings from an experience inherited from their ancestors. The living being is the living memory of the earth, the memory of this adventure which began some 3.5 billion years ago, when the first cells were born.

APPENDIX F

SUBJECTS' BOOKLETS FOR SUMMARIZATION OF TEXTS

Resuma o texto a seguir, em português, usando o mínimo de palavras possível.
Atente para que o resumo expresse somente os pontos principais do texto.

NOTA: Use a folha anexa, escrevendo seu resumo na parte pontilhada.

Nome: _____

Nº de matrícula: _____

Curso: _____

TEXTO: DOMINANT MALES HAVE MORE TESTOSTERONE-AND HEART DISEASE

R E S U M O

Nome: _____

Nº de matrícula: _____

Curso: _____

TEXTO: MACHOS DOMINADORES TÊM MAIS TESTOSTERONA-E DOENÇAS CORONÁRIAS

R E S U M O

Nome: _____

Nº de matrícula: _____

Curso: _____

TEXTO: MAGNETIC DIRECTION FINDING

R E S U M O

_____

_____

_____

_____

_____

_____

_____

_____

_____

Nome: _____

Nº de matrícula: _____

Curso: _____

TEXTO: ORIENTAÇÃO MAGNÉTICA

R E S U M O

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX G

JUDGES' SUMMARIES (ITEMIZED INTO LISTS OF CONCEPTS)

DOMINANT MALES HAVE MORE TESTOSTERONE - AND HEART DISEASE

JUDGE 3

pesquisas
com
ratos
mostram ——— INDICAM
haver
uma
relação ——— CORRELAÇÃO
entre
a
incidência ——— NÍVEL + MAIS ALTOS
de
pressão
arterial
alta
é
arteriosclerose
em
machos ——— INDIVÍDUOS + MASCULINOS
de
caráter
dominante ——— DOMINADORES
com
seus
índices ——— NÍVEL

elevados ——— MAIS ALTOS
de
testosterona

MAGNETIC DIRECTION FINDING

JUDGE 4

pesquisas
atestam ——— DEMONSTRAR
que
ø
campo
geomagnético ——— MAGNÉTICO + TERRA
exerce
grande CORRELAÇÃO
influência
nos
animais
provavelmente
incluindo
ø
homem
orientando-lhes ——— ORIENTAÇÃO
a
direção
os
pesquisadores
ainda
estudam ——— PESQUISAR
ø
processo

de

biomineralização

da

magnetita

elemento

encontrado —— HAVER

em

animais

como

possível

indicador

da

sua

percepção

magnética

APPENDIX G_1

CONCEPTUAL SUBSTITUTIONS

DOMINANTE MALES HAVE MORE TESTOSTERONE - AND HEART DISEASE

CONCEPTS APPEARING IN THE SUMMARIES	SUBSTITUTIONS
- tem, adquirirem, produziram, são	APRESENTAR
- não-dominantes	SUBORDINADOS
- maior, elevados	MAIS ALTOS
- índice	NÍVEL
- fizeram experiências, procura-se, investigações, experiências	PESQUISAS
- dinâmico e agressivo, comportamento agressivo, dinâmico, extrovertido, comportamento dominante, caráter dominante	DOMINADORES
- confirmam, comprovando, mostram, demonstram, revelam, resultados obtidos	INDICAR
- tem relação	CORRELAÇÃO
- distúrbios comportamentais, comportamento agressivo, tendências agressivas	AGRESSIVIDADE
- machos	RATOS + MASCULINOS ou INDIVÍDUOS + MASCULINOS
- hipertensão	NÍVEL + PRESSÃO + ~~ARTERIAL + MAIS ALTO~~
- excesso, aumento, ser mais propenso, ser mais suscetível	MAIS ALTO + NÍVEL
- animais (caso específico)	RATOS

- pessoas	INDIVÍDUOS
- do coração	CARDÍACAS
- alta	MAIS ALTO
- verificar a suspeita de que há uma base fisiológica	FUNDAMENTAR + FISIOLOGICAMENTE
- sanguínea	ARTERIAL
- problemas, ataques	DOENÇAS
- incidência	NÍVEL

MAGNETIC DIRECTION FINDING

CONCEPTS APPEARING IN THE SUMMARIES	SUBSTITUTIONS
- cientistas, professores	PESQUISADORES
- estão a caminho da comprovação, pesquisa-se, estudos, estudam, fizeram experiências	PESQUISAS
- senso de direção, comportamento, navegação, direção, orientando-lhes	ORIENTAÇÃO
- foi demonstrada, provaram, atestam, confirmaram, prova, apoiam, revelaram, indicaram, possíveis indicações	DEMONSTRAR
- terrestre, planeta	TERRA
- geomagnética	MAGNÉTICO+ TERRA
- encontrado, presença, existência	HAVER
- significativas	IMPORTANTES
- ser humano	HOMEM
- alguns, certos	DETERMINADOS
- agiria	FUNCIONAR
- elemento	INFORMAÇÃO
- une... entre si com o..., exerce grande influência, estreito relacionamento, ajuda, influenciaria, são afetados, fornecer informação(s) importante(s), influência	CORRELAÇÃO
- magnetismo	CAMPO + MAGNÉTICO

APPENDIX H

CLASSIFICATION OF CONCEPTS

DOMINANTE MALES HAVE MORE TESTOSTERONE - AND HEART DISEASE

LEVEL A (6 TO 8)

CONCEPT	Nº OF JUDGES
1. PESQUISAS	8
2. RATOS	8
3. INDICAR	8
4. PRESSÃO	8
5. TESTOSTERONA	8
6. MAIS ALTOS	8
7. DOMINADORES	7
8. INDIVÍDUOS	7
9. NÍVEL	7
10. MASCULINOS	6
11. ARTERIAL	6

LEVEL B (3 TO 5)

CONCEPT	Nº OF JUDGES
1. DOENÇA	5
2. CARDÍACA	5
3. APRESENTAR	5
4. ARTERIOSCLEROSE	5
5. CORRELAÇÃO	4
6. FUNDAMENTAR	3
7. FISIOLOGICAMENTE	3
8. AGRESSIVIDADE	3

MAGNETIC DIRECTION FINDING

LEVEL A (6 TO 8)		LEVEL B (3 TO 5)	
CONCEPTS	Nº OF JUDGES	CONCEPTS	Nº OF JUDGES
1. PESQUISAS	8	1. SERES	5
2. CAMPO	8	2. VIVOS	5
3. MAGNÉTICO	8	3. POMBOS	5
4. ORIENTAÇÃO	8	4. MAGNETITA	5
5. CORRELAÇÃO	8	5. HAVER	5
6. TERRA	8	6. PESQUISADORES	4
7. ANIMAIS	7	7. HOMEM	4
8. DEMONSTRAM	7	8. HIPÓTESE	4
		9. BIOMINERALIZAÇÃO	3

	GROUP I											GROUP II											GROUP III											GROUP IV										
SEX	M	F	M	F	F	M	F	M	M	F	F	F	F	F	M	M	F	M	F	F	M	F	F	F	F	F	M	M	F	M	M	M	F	F	F	F	F	M	M	M	M	M	F
CODE NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
EFL TEST	1.5	9	12.5	11.5	13.5	5.5	6	12	6	14.5	7.5	12.5	3	18	6	4.5	6.5	3.5	3	19	3	16	27	6.5	15.5	32.5	4	12	28	6.5	11	11.5	9.5	7.5	11.5	25	6	6	21.5	22	4.5	1	
(11) IDEAS A	5	11	11	11	9	8	8	6	5	10	9	10	8	8	11	8	7	6	10	10	9	10	11	4	7	9	3	10	7	5	7	4	7	8	3	11	8	10	8	9	8	10	
(8) IDEAS B	3	5	5	2	3	4	3	4	1	5	1	4	4	3	6	3	6	3	3	2	3	4	5	2	1	1	2	1	5	3	3	2	3	3	0	4	3	4	2	4	5	1	
IDEAS C	0	10	6	11	12	3	6	17	10	14	1	8	5	4	4	4	3	3	4	5	0	4	7	4	5	3	2	2	3	3	0	1	6	6	6	1	4	3	9	10	17	4	
ERRORS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	0	1	0	0	0	1	0	1	0	1	0	0	0	1	0	0	1	
(10) FORM	6	6	7	5	6	8	7	7	6	8	7	4	6	6	6	5	6	4	5	6	4	8	6	3	5	6	4	8	4	5	4	3	7	6	4	8	9	6	7	7	5	4	
(10) SUMMARY	9	10	10	8	8	7	8	5	4	9	8	8	7	7	9	7	6	5	8	9	8	9	9	3	5	8	1	8	7	5	6	4	6	7	2	9	7	8	7	8	7	9	
(40) TIME	30	20	10	30	20	5	25	20	15	15	20	20	27	20	10	10	10	10	15	25	35	20	10	20	27	5	15	15	25	15	20	25	10	20	40	5	5	15	15	15	25	20	
STRATEGY	1	/	/	/	/	/	/	/	/	/	/	/	2	/	/	/	/	/	/	/	/	/	/	/	/	1	/	/	/	/	/	/	/	1	3	/	/	/	/	/	/	/	
WORDS	39	63	77	57	74	63	59	65	36	83	29	52	39	55	72	51	56	31	52	46	30	44	58	33	43	36	15	41	49	23	21	41	45	38	21	32	27	45	56	80	86	47	
(8) IDEAS A	5	5	7	6	7	5	7	5	6	6	5	5	5	6	5	8	4	6	5	7	5	6	8	7	6	6	6	5	6	7	7	5	6	8	6	6	6	6	6	8	8	1	
(9) IDEAS B	2	2	1	3	3	2	1	4	3	2	1	1	2	1	3	3	2	3	5	1	3	2	5	1	5	3	3	3	3	6	4	4	5	3	5	0	1	2	3	2	4	1	
IDEAS C	5	5	1	7	23	13	10	11	7	18	10	6	6	13	4	7	14	4	3	8	12	5	3	9	9	11	1	5	13	1	13	5	8	3	25	0	1	9	13	7	18	13	
ERRORS	0	0	0	0	1	0	0	2	1	0	0	0	0	1	0	0	1	1	0	3	0	1	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	1	
(10) FORM	6	5	6	5	7	4	6	7	3	7	4	2	5	7	4	7	4	5	6	6	6	7	7	6	4	8	7	5	6	5	3	4	8	7	6	5	5	6	5	6	5	4	
(10) SUMMARY	9	5	9	6	6	4	6	4	5	6	4	6	6	7	6	10	3	5	5	6	5	5	8	8	7	6	6	4	6	7	7	6	4	8	6	7	7	5	7	9	7	2	
(40) TIME	35	15	20	15	35	25	10	20	25	35	20	15	13	15	25	10	10	20	20	10	10	10	25	20	28	25	10	15	10	15	20	25	10	25	40	15	15	10	15	15	15	21	
STRATEGY	3	/	/	/	/	/	/	/	/	/	/	/	/	/	2	/	/	/	/	/	/	/	/	/	/	1	/	/	/	/	/	/	/	1	2	/	/	/	/	/	/	/	
WORDS	26	36	40	27	93	62	49	67	37	87	39	25	42	75	62	40	59	56	26	70	49	54	45	48	74	50	35	42	70	46	72	58	60	42	89	15	20	52	66	52	19	47	