

INTERNAL TEXT ORGANIZATION AS AN OVERALL SCHEMATA
FOR READING RESEARCH ARTICLES IN PSYCHOLOGY

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English, as the language of science, is the medium through which scientists from all over the world present their research results, in the form of published papers. Therefore, the reading of Englishwritten journals is an essential need for those non-native speakers of English who need to be up to date with research findings for either educational or professional purposes. However, it has been evidenced that non-native speakers of English, although understanding all the words of a sentence, still have problems understanding the total meaning of discourse (Selinker et al 1976). In order to facilitate the reading process for these non-native speakers, a number of analyses on the discourse structure of the English for Science and Technology (EST) have been done (Jordan 1980; Selinker et al 1976, 1978; Woods 1981). These analyses have been mostly directed to the analysis of University Introductory Textbooks, and consequently, have left the analysis of the discourse structure of journal articles barely touched. The literature which describes the analysis of journal articles focuses on the description of their organizational structure (Ewer 1976, Hatch et al 1982).

For a meaningful understanding of sentences and their further interpretation, the reader needs information on how the linguistic unit, i. e., the purely structural aspect of language, relates to the extra-linguistic world. Therefore, the analysis of the discourse, which will account for the organization of

research articles and provide readers with background information of their internal structure (Schemata), is essential for diminishing the gap between the writer and the reader.

Providing the reader with this background knowledge (schemata) will facilitate the reading process for non-native speakers of English since the knowledge of the research article organization will develop their reading strategies, and therefore, will facilitate their task of predicting what is coming next in the text.

It was both the difficulty which non-native speakers experience in understanding the total meaning of written discourse and the lack of a more detailed analysis of the internal text organization of research articles which motivated the study which will be presented henceforth. Journal articles reporting experiments in Psychology were selected for such analysis. The choice of Psychology journal articles resided on the availability of an informant with whom to check the results of the analysis as suggested by Cohen et al (1979).

The purpose of our investigation was twofold: (1) to determine what the reader is expected to find in the main sections of research articles, and (2) to determine how the reader can recognize the statement of problems.

Corpus of Data

Six articles were randomly selected from the journal Psychology Reports. Such choice was based on the opinion of our informant which considered it a significant journal in the field. Psychology Reports is considered a general psychology journal which publishes all types of experiment reports regardless of their nature (i. e., behavioral, transpersonal or

psychosynthesis). Therefore, it is considered a journal which is read by most psychologists.

The six articles selected were taken from Psychology Reports, January 1983 issue. No previous criteria had been established before selection except that the articles should report experiments.

Procedures

Each article was analyzed in order to answer the following question: What is the reader expected to find in each of the main sections of a research article, i. e., Introduction, Method, Results and Discussion Sections? The findings of each article were later compared to the others, and from such comparison conclusions were drawn. The same procedure above was followed for determining how the reader can recognize statements of problems.

DATA ANALYSIS

1 - Text Organization

The data analysis showed that the reader can identify a series of important information within each of the sections analyzed.

Introduction Section

The analysis of the Introduction Section which is not explicitly labelled, showed that there are at least five main

kinds of information that the reader can find when reading it. They are: Reason for Study, Past Research, Statement of Problem, Purpose of Study and Hypotheses.

Table I: Information found in Introduction Section

| ARTICLE 1 | ARTICLE 2 | ARTICLE 3 | ARTICLE 4 | ARTICLE 5 | ARTICLE 6 |
|----------------------|----------------------|----------------------|-------------------------|----------------------|----------------------|
| Reason for Study | Reason for Study | Reason for Study | Reason for Study | Reason for Study | Reason for Study |
| Past Research | Past Research | Past Research | Past Research | Past Research | Statement of Problem |
| Statement of Problem | Statement of Problem | Statement of Problem | Statement of Problem | Statement of Problem | Past Research |
| Statement of Purpose | Statement of Purpose | Statement of Purpose | Statement of Purpose | Statement of Purpose | Statement of Purpose |
| | Past Research | Hypotheses | Statement of Method | | |
| | Statement of Problem | | Information on Subjects | | |
| | Statement of Purpose | | | | |

In the first information which is given to the reader, i.e., Reasons for Study, the author states why such study is important by making a general statement about the object of Study. For instance, "A relationship between violence and alcohol intoxication has been recognized for centuries. Researches have established that over 50% of murderers have been drinking alcohol at the time of the crime" (Holcomb et al 1983: 159); "there have been

a substantial number of studies examining the effects of fear arousing communications on attitudes and behavior, and the evidence for changes in self-reported anxiety following a fear appeal is well documented" (Watson et al 1983: 139) or, "take two prototypical humorous situations: hat blowing off in the wind and person falling down in the street. Eysenck did just that in 1949, but his twelve examples 'did not reveal a single instance of laughter among the total of more than 100 passersby'" (Sheppard 1983: 299). Such statements are followed by the presentations of Past Research where the reader can find related experiments in the field, a brief description of their results, and furthermore, how they relate to the present study. The following excerpts serve to illustrate the Past Research subsection: "Overall and Eiland (1982) subsequently developed a general psychopathology screening scale (PSY) for the MMPI-168 and Overall, Rhoades and Lloyd (In press) have provided K-scale corrections and percentile norms for the five factor scores and the PSY screening scale with reference to a normal college population" (Lloyd et al 1983: 47), "previous studies (Bach et al 1970, Felzen et al 1970 & Freund et al 1972) showed that younger children the acoustic information and orthographic attributes were dominant while for older children the semantic and the verbal-associative attributes were dominant" (Toyota 1983: 243).

From the review of the literature, the author presents questions that were left unanswered, such questions form the next subsection: Statement of Problems. Here the author states that past research has left unanswered questions which are retaken by the author. E. g. "the assumptions underlying this approach are that individuals reporting indecision either lack knowledge about their personal preferences or lack information about opportunities or both. Although this model works well

for some students, ..., such indecision is a complex multidimensional problem which requires distinctively more diverse approaches than the normal model implies" (Hartman 1983: 95).

Finally, the introduction section is closed by the presentation of the Statement of Purpose. Generally, it follows the Statement of Problems. This provides the reader with the information of what the author attempted to answer or solve. Therefore, the Statement of Purpose tells the reader what motivated the project or what was done. E. g. "In this study we examined the predictive validity of the Career Decision Scale (Osipow et al 1976) adapted with permission of the scale's authors, for high school students to differentiate between career-decided individuals and individuals who suffer from long-term indecision" (Hartman et al 1983: 95).

The four types of information above were found across the six articles analyzed. However, in article #3, we found that after the author presented the statement of purpose, he also included a section where he described which were his hypotheses prior to the experiment (see Table 1). As this was not a pattern found across the six articles analyzed, it was not included as part of the information the reader would be likely to find in the introduction section. However, this can be a consequence of the sample selected, so the statement of hypotheses might occur in the introduction section. Furthermore, by looking at Table 1 we observe that in article 2, the information on Past Research, Statement of Problem and Statement of Purpose are recurrent. This may be found in articles in which the authors study a second issue within the same subject, therefore, they have to present information on Past Research, etc, again.

The next article which calls attention in Table 1 is

article #4. The authors of such article present information in the introduction which would usually be found in the next section, i. e., a brief statement of the method for analysis and a quite thorough description of the subjects' population.

Method Section

In this section we identified the following information as the most likely for the reader to find; information on Subjects, Procedures and Materials (see Table 2). These are usually subheadings to guide the reader.

Table 2 - Information found in Method Section

| ARTICLE 1 | ARTICLE 2 | ARTICLE 3 | ARTICLE 4 | ARTICLE 5 | ARTICLE 6 |
|--------------|--------------|--------------|---|--------------|--------------|
| Subjects | Subjects | Subjects | Previous Research | Subjects | Subjects |
| Procedures | Procedures | Materials | (Procedures)* | (Materials)* | Measure |
| | | Procedures | Informa- tion on Control Group | Procedures | Procedures |

* Indicates that these were not subheadings but that the author presented information on them.

In the Subjects subheading, the reader will find information on who participated in the research project. Such information will report: the total number of subjects, the number of subjects per sex, the place where subjects were found and, if

necessary, the author may include other information relevant for the study, such as, average IQ scores, average of instruction, or even information on the criteria for separating the subjects into groups, etc.

In the Materials subheading the author will identify which instruments were used during the research project, he will also describe them. E. g. "heart rate was measured using Red Dot ECG electrodes with a bi-polar placement on the upper chest. Trace output was recorded simultaneously onto Kodak direct print linagraph paper, using an EMI IIV oscilloscope" (Watson et al 1983: 140).

In the final subheading, Procedures, the author will describe which steps were taken for collecting the data. "The subjects were tested individually... Each slide was presented successively for three seconds with one sec. interstimulus intervals..." (Toyota 1983: 244).

Table 2 indicates that the information above was found in 3 out of the 6 articles. However, we observe that there was inconsistency for the presentation of that information. For instance, in article #4 the author presented the information on subjects and materials, as we have seen before, in the Introduction Section. In the Methods Section the author started by presenting information on previous research which had used the MMPI (object of the study). Such information was followed by a description of the procedures. It is worthwhile to point out that the authors did not make use of subheadings. Finally, the authors presented information on a control group and on a different test that were going to be included in the study to compare results. Such information should have been placed in the subjects or materials subheadings.

The other article which calls attention is article #6 whose author called the material used for analysis (Career

decision Scale) a measure, therefore, becoming a subheading.

Results Section

The results section was among all the sections analyzed, the one which presented more regularity as far as the information it is supposed to provide the reader with. In this section the reader will find a Description of the Results, generally in statistical form, and a brief Evaluation of their significance. All articles analyzed revealed the same content in this section, except for article #6 in which prior to presenting the results, the author introduced a statement of the hypotheses that had been expected before the experiment.

Discussion Section

In this section the following information was common to the articles analyzed: Interpretation of Results (IR), Contrast with Past Research (CPR), Statement of Limitation (SL), Statement of Application (SA) and Statement of Further Research (SFR), although, some of these types of information were not found in all the articles analyzed (see Table 3).

When the author presents the Interpretation of Results, the reader will find information on the meaning of those results. The presence of reference to Past Research in this section aims at telling the reader how such results fit what other researchers have done before. The author will contrast his results to those of past research by pointing out similarities or differences, so that the reader can have an idea of what is new, in relation to what is being studied or not. "Wolfgang (1958) argued that alcohol at the scene of the crime enhanced

the viciousness of the killing. These results support his conclusions and, in addition, suggest that multiple drug abuse has the same effect but even to a greater degree" (Holcomb 1983:163).

After presenting the results and comparing them to past research, the other type of information is the Statement of Limitation. Here, the author mentions limitations either in the method used for analysis which might have not revealed some of the answers that were expected, e. g. "it is a limitation of this study that no follow up data were obtained on subsequent smoking behavior and attitudes" (Watson 1983: 144). The author may also mention a limitation in the interpretation of results, that is, the author might have reached a conclusion but because he lacks more data to support his interpretation, he may alert the reader to this fact, e. g. "nevertheless, some caution is advised, since the effects were not found in both stimulus series. It may be that particular images within each set were responsible for this differences" (Sheppard 1983: 304).

Statements of limitation also function as a point of departure to suggest further research. It is in the Further Research Statement that the author will mention the areas which still remained unanswered at the end of the analysis. "Future research needs to focus on comparing alcohol and drug use in violent groups with matched control groups before causal inferences can be made" (Holcomb et al 1983:164). In some cases such statement is used to reduce the strengths of the claims made, e. g. "based on our findings we are encouraged about the potential use of this scale in high school settings. More information is necessary before fully evaluating the instrument ..., but the initial indications are promising" (Hartman et al 1983:99).

Another type of information that the reader will find in

the discussion section is a Statement of Application. Such information will discuss the practical implications of the findings, or if the article focuses on a more theoretical issue, will discuss the way such results fit into a broader picture. E. g. "These results suggest that factor-score profile patterns may represent major diagnostic distinctions in simpler form than the traditional clinical-score-profiles" (Lloyd et al 1983:53).

Table 3 shows that all the information presented above may be recurrent throughout the entire Discussion section. This is due to the presentation of interpretation of results in parts. Therefore, for each interpretation of results the author reports past research, states limitations, etc if necessary. However, we observe that authors have a tendency to restate what was previously presented in the discussion section. There are Restatement of Results (article #3), or of Method (article #4) or even of Purpose (article #4 and 5).

Table 3: Information found in the Discussion Section

| ARTICLE 1 | ARTICLE 2 | ARTICLE 3 | ARTICLE 4 | ARTICLE 5 | ARTICLE 6 |
|-------------------------------|------------------|------------------------|-----------------------|------------------------|--------------|
| Restatement of Group Division | IR | Restatement of Results | Restatement of Method | Restatement of Purpose | IR |
| | SL | CPR | CPR | IR | SA |
| CPR | CPR | Rstmt of Variables | Rstmt of Purpose | IR | SA |
| IR | SL | Rstmt of Results | IR | CPR | FR |
| CPR | IR | Rstmt of Hypotheses | CPR | SA | SL |
| SL | CPR | CPR | SL | | FR |
| SA | Rstmt of Results | SL | SA | | |
| FR | SL | Rstmt of Results | | | |
| | SA | FR | | | |
| | | SA | | | |

II - Lower Level Organization

Statement of Problem

The statement of problem is expressed by the usage of clauses of concession which express that the author accepts what has been done before but that he sees a problem that is still unresolved. Sometimes the problem is presented by way of an implicit contrast between two sentences. The author may also present the problem by interpreting the meaning of previous results, and from them present the problem through conditional clauses which aim at making the reader realize that there are still issues that need to be analyzed.

By looking at some of the ways statements of problems are expressed by different authors, one can have a good idea of what these sentences look like in the text. In the first article, for instance, the author expresses the problem by starting a paragraph with the following concessive clause: "In spite of the high correlation between murder and consumption of alcohol a single cause-and-effect relationship cannot be substantiated with our current data". The author then continues by presenting another sentence which will put the problem in a more distinguishable form: "Although many serious crimes are committed by men who are drinking, most men who drink do not commit serious crimes and specially not homicide" (Holcomb et al 1983:159).

The second article contains three different statements of problems in the introduction section. The first one is put in a very straightforward way: "What is not clear is the extent to which fear appeals manipulate levels of psychological response." The second problem is also easily identified because is preceded by the phrase 'a second issue'. "A second issue concerns

whether the extent of arousal bears any relationship to self-reports of emotional state", and the third is "These issues are complicated further by evidence that individual differences in reporting emotional states appears to influence or are influenced by the level of arousal, although the mechanism is unclear". (Watson et al 1983:139-140).

In article #3 the author presents the statement of problems by making inferences from the results of previous research which are stated as conditional clauses, these make the reader realize that more data is needed to come to conclusions. "From these explanations of humor's functions, it would follow that artificial and fantasy productions should reduce one's ability to feel superior and, as a result, would affect the degree of humorous enjoyment" (Sheppard 1983:52).

Finally, the last form which was used by an author to state a problem was to contrast the past research results to what happens in real life. From these two sentences the reader can identify that there is a problem which is being implicitly stated through such contrast. "In all studies mentioned above the to-be-remembered words were presented singly but this situation can be regarded dissimilar to that in school learning. In real life situations children have to process the semantic attributes of words in sentences" (Toyota 1983:243).

Discussion

Our analysis provided information which would be extremely valuable to teach reading skills to a very restricted but important population, i. e., non-native speakers of English who are in academic environments, or who needed to read journal articles for professional purposes.

Although we did find some identifiable patterns in the textual or formal organization of these articles, the number of differences across articles was also surprising. Such differences are surprising not because they exist per se, but because they exist in articles which were taken from the same journal. If the same number of articles had been taken from six different journals, these differences would have been explained. However, as such articles were taken from the same journal, one should expect to find an editorial pattern among them.

The identification of subsections within the main sections of a research article can help the learner to form a picture of what a research article contains in terms of valuable information which, in turn, will contribute for a total comprehension of the issue being reported. In this case the access to such information will be essential for the reader to evaluate critically the results reported by the author.

However, not only the learner, but also the teacher must be aware that the identification of patterns and their further categorization will not automatically mean that everything will fit into what the pattern had predetermined. Widdowson (1975) when discussing about communicative acts points out that "description of use in terms of precise rules may give an inaccurate picture of how people use language, ... because exactness is not a feature of normal communication" (:12). Although in written text, one does intend to find more organization than in oral language, it seems worthwhile to remember that there is not regularity in language and in language use.

As it has been pointed out the process of comprehending a text is interactive, that is, when the author writes, he assumes that the reader shares the same knowledge about the

structure of what is being written. Therefore, the value of providing students with the overall structure of the text is that such knowledge will diminish the gap between writer and non-native reader.

Implications for Teaching

Reading as an active process requires the reader to use a number of special skills for successful results. Such skills have to conform to the process of reading in which the reader forms a preliminary expectation about the material, then selects the fewest, most productive cues necessary to confirm or reject that expectation. This is a sampling process in which the reader takes advantages of his knowledge of vocabulary, syntax, discourse and the real world. Providing students with practice in these skills and helping them with consistent strategies to meet such skills should be the focus of a reading program.

Now that we have approximated the reader to the writer by filling the gap between them as far as 'conceptually preparing the readers to the world of the writer', we have to consider what the other areas that need to be 'attacked' are.

Since the population that will read research articles is a very specific one, assuming that what they need is to improve their reading skills in reading research articles, the classroom activities should be as closely as possible to the real world. Therefore, the best materials to use should be research articles. The skills that should be developed are: (1) scanning, (2) skimming, (3) reading for thorough comprehension, and (4) critical reading.

The four main sections of a research article can be approached differently, at first, for the development of

reading skills. For skimming purposes, the best part of the article to work with is the Introduction Section. It is there that the reader will find information on "what is this article about?" and/or on "Is the author for or against X's past research?" etc. The Results Section is ideal for scanning purposes because it contains a number of facts (significant vs non-significant results) and figures. The Method and Discussion Section can be used for developing 'thorough comprehension skills' through questions like "How was the experiment conducted?" or "What were the findings of this study?". The Discussion Section suits itself for the developing of critical reading, since it is there that the reader will find claims, conclusions and the author's point of view.

Furthermore, asking the reader to try to identify Statements of Problem, Limitations, Applications etc, will help them to quickly identify important areas in the article with minimum use of a detailed reading to obtain maximum information.

Conclusion

The presentation of background information on the organization of a text prior to requiring the learner to perform tasks is, therefore, of extreme importance. The knowledge of a textual or formal organization of text (Schemata) will help the reader find the information he needs. If, on the other hand, no background information is provided in advance, the reading tasks may become frustrating, and consequently, it may demotivate the learners. As stated before the gap between the writer and the reader has to be filled before the reading task begins. This will ensure that the reading process will be meaningful, in the sense that the

reader will be sharing the same background information (Schemata) which the writer assumes the reader has.

Finally, by developing reading skills through activities which have to do with the learner's real world, and which are structured in a way to make their learning more productive, the only expected and natural result is, obviously, to have better readers.

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