Paragraph Structure in Social Sciences: A Cross-Disciplinary Study

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Abstract

The present study compares paragraph structure from two disciplines in social sciences in order to find similarities and differences between them with regards to their applications of rhetorical elements based on Trimble's rhetorical approach (1985). To achieve this purpose, two textbooks from management and psychology were selected and around 5oo paragraphs were meticulously analyzed in terms of the frequency of rhetorical functions, rhetorical techniques, place of core statement and correspondence. The results of the study revealed that there is significant difference between management and psychology in terms of the frequency of the position of core statement and rhetorical functions. However, the difference between the two disciplines was not significant with regards to rhetorical techniques and correspondence.

Key words: paragraph structure**,** rhetorical functions, rhetorical techniques, position of core statement, correspondence.

1-Introduction

For students entering higher education English is vital. It is the basic language of science and it is the language which is used most in knowledge communication among researchers and materials writers around the world. Almost all scientific research and conferences need English, and knowing English gives access to the best databases available. Students are required to read books and journals. They are required to summarize, paraphrase, send e-mails, and even write their own articles. They need to participate in international conferences so they need to be able to take notes, listen or speak in English. However, most students are weak at using English for specific subject, especially those students who are learning it as a foreign language. Learning English for academic purposes (EAP) demands not only the knowledge of English lexicon and grammar in general, but also the knowledge of subject specific content and the linguistic conventions of the specific field of study (Kuroda, 2003). As academic texts are concerned with the presentation of facts, theories, hypothesis, and similar types of information, their syntax, lexis, and the organization of information are different from other types of texts. In terms of syntax, academic texts contain a high percentage of some structures as such the passive voice, present and past simple, modal verbs, conjunctions, -ing forms, relative clauses, etc. As far as lexis is concerned, four vocabulary types can be distinguished in technical discourse: functional words, general, technical and semi-technical vocabulary. In terms of the organization of information, academic texts are also different from other types of texts.

Trimble (1985) investigated into the organization of science and technology discourse and stated that with regards to organization of information, some rhetorical structures are more observable in these types of texts. He identified these structures as "core statement, " correspondence", "cohesive ties or rhetorical techniques", and "rhetorical functions," each "capable of being isolated and studied separately" (1985:69). He believed that explicit teaching of these elements as he called them to non-native students in science or technical fields is useful in promoting students' reading and secondarily writing. Carroll (1987) also maintains that teaching the top-level rhetorical organization of texts, using appropriate plan to accomplish specific communication goals, and teaching how to recognize text's organization through appropriate linguistic devices should all function to make reading comprehension more effective.

In some relatively recent studies the effect of knowledge of the rhetorical functions on students' reading comprehension has been investigated. These studies quite agree with Trimble that rhetoric of invention that pertains to science must be directly taught to students (Alavi, 1991; Mazloom, 1993; Kimbal 1996; Haji, 2005, porcaro, 2007). Kimbal (1996) investigated Japanese students' composing problems in English. He found out that one of the problems for Japanese students is their unfamiliarity with the dominant function of rhetorical norms in English-language paragraphs. He compared Japanese and English language rhetorical conventions and noted that difficulties for Japanese college students result from the difference between the two languages in terms of rhetorical conventions. Another cross-linguistic study regarding rhetorical functions was conducted by Moshirzade (1995) to determine whether or not these features are the same in Persian and English. The result indicated that there is a significant difference between Persian and English in applying

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rhetorical functions which can result in Iranian students' reading and writing difficulties.

Inspired by the importance of familiarity with the conventions of academic discourse, the present researcher examined the rhetorical organization of paragraphs in subject specific texts drawing on Trimble's rhetorical approach. While Trimble focused mainly on Science and Technology (EST), the present study focuses on Social Sciences (ESS). In this study the researcher tried to find out which rhetorical elements are more frequently applied in the paragraph structure of psychology and management and whether the two disciplines differ in terms of the frequency of these rhetorical elements. In particular, this study addresses the following research questions:

Q1: What is the frequency of rhetorical functions, rhetorical techniques, type of core statement, and type of correspondence in psychology?

Q2: What is the frequency of rhetorical functions, rhetorical techniques, type of core statement, and type of correspondence in management?

Q3: Is there any significant difference between computer psychology and management with regards to the frequency of these elements?

The findings of the study will be useful for materials production and textbook writers in that they give materials writers' insights into what is exactly involved in each field and provide them with detailed description of the frequency of different types of rhetorical functions, techniques, or types of paragraphs and the extent to which these elements need to be used in developing reading or writing materials

2- Trimble' Rhetorical Approach

This section just reviews rhetorical elements in Trimble's approach (1985) to build the necessary ground for this study. As mentioned before, Trimble (1985) stated that certain rhetorical characteristics are observable in scientific English discourse that makes it different from other forms of written English discourse. He tried to identify those characteristics and used the results of the study to develop classroom materials and taught those materials to non-native students in science or technical fields. This approach which aimed at teaching reading (and secondarily writing) to science students was called rhetorical approach. The rhetorical approach is built around three main rhetorical concepts:

1. The nature of EST paragraph
2. The rhetorical function most commonly used in written EST discourse
3. The rhetorical techniques most commonly used in written EST discourse.

The key element in Trimble's approach to research and teaching of EST discourse is the notion of paragraph. He chose paragraph as the basic discourse unit for the analysis of EST discourse, because he believed that it carries appropriate piece of information and shows how various piece of information are related. He defined EST paragraph as " a unit of written English discourse that presents the reader with a selected amount of information on a given area of a subject. This information is so organized by the writer that the rhetorical concepts chosen and the relationships between these concepts are the most functional for both the rhetorical purpose of the paragraph and for the level reader; that is, the reader position in respect to the subject matter under discussion-beginner, expert,

etc." (P.15). Trimble made a distinction between two types of paragraphs: physical and conceptual paragraphs. Conceptual paragraph "consists of all the information chosen by the writer to develop a generalization, whether this is stated or implied ". The physical paragraph, in his opinion, refers to "that amount of information relating to the generalization which is set off from other parts of the discourse by spacing or indentation" (P.15)

He further stated that the distinction between physical and conceptual paragraphs necessitates the ideas of "correspondence" and "core generalization". When a conceptual paragraph is developed by only one physical paragraph, we have one-to-one- correspondence and when it is developed by two physical paragraphs, we have one-to- more- than –one-correspondence. In terms of the place of the core statement, there are four types of paragraphs: those which have their core statement at the beginning (deductive), those which have their core statement in the middle (hybrid), those which have their core statement at the end (inductive), and finally those which have implied core statements. The findings of this study will also have some pedagogical implications especially in regard to reading and writing.

Rhetorical functions, in fact, constitute the basis of the rhetorical approach are defined as '' a name for what a given unit of discourse is trying to do'' (p. 12). He presented description, definition, classification, instruction, and visual-verbal relationship as the most frequent rhetorical functions in written EST discourse. And finally rhetorical techniques are those elements that bind together the information in a piece of discourse. He presented two types of rhetorical techniques: natural order and logical order. Natural orders are those techniques that are imposed by the nature of the material and include space order, time order, and cause/ effect. Logical orders are those techniques that are imposed by the writer's choice and include order of importance, comparison/contrast, exemplification, analogy. In addition to these rhetorical techniques, rhetorical functions sometimes act as rhetorical techniques and serve to develop the main rhetorical function. For example, the rhetorical function of description may be used as a rhetorical technique to develop the rhetorical function of definition.

3-The Data

The corpus used in the present study consisted of two textbooks for Master of Art students. To obtain a random sampling of the textbooks, the researcher consulted with professors in the respective disciplines. After consultation, several textbooks were introduced among which one textbook for each discipline were randomly selected: for management *(Management of Organizational Behavior, Heresy and Blanchard, 1988)*, and for psychology *(Abnormal Psychology, Dacison and Neal, 2001)*. The topics dealt with in these books were not general; rather they were all concerned with specific concepts within the respected disciplines. The researcher felt that 100 pages of each textbook has an acceptable, yet manageable number of paragraphs required to obtain an accurate sampling. On the whole, about 500 paragraphs were analyzed carefully in the four textbooks. Moreover, the very first paragraph of each chapter was not analyzed,   postulating that it had an introductory nature and most of the time was a description of previous chapter and consequently it would not yield the most representative sample.

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In order to increase validity of the study, training sessions were held for a week during which a postgraduate researcher taught the researcher how to analyze paragraphs in terms of these rhetorical elements. After getting familiar with the analysis procedures, the researcher began to analyze the selected textbooks. The analyses of textbooks were reviewed and examined several times during frequent discussions with the postgraduate researcher in order to achieve almost complete agreement about the identified elements. After the data collection, the data were stored in computer. The frequency of these variables was recorded. To determine whether there is a significant disciplinary variation Chi-square method was applied. The acceptance of level for the hypothesis was set at 0.01.

3.1. Sample Analysis

The first sample paragraph was selected from management textbook.

> **1. Satisfying** factors **that involve feeling of achievement, professional growth, and recognition that one can experience in a job that offers challenge and scope are referred to as** motivators**.** Hertzberg **used this term** because **these factors seem capable of having a positive effect on job satisfaction, often resulting in an increase in ones total output capacity".** **[Source: Heresy and Blanchard, 1988:15]**

1. This paragraph has one physical and one conceptual paragraph, that is, we have one-to-one correspondence.

1. The core statement is in fact the definition of *motivation* which is located at the beginning of the paragraph. So the paragraph is deductive.

2. The rhetorical function is "formal definition" because it provides all three types of information of formal definitions: the term (motivation), the class (factors), and the difference (that involve feeling of achievement, professional growth, and recognition that one can experience in a job that offers challenge and scope).

3. The main rhetorical technique of this paragraph is "appeal to authority" (Hertzberg) and the second one is "cause/effect" (because these factors seem capable of having a positive effect on job satisfaction).

The following paragraph has been selected from psychology textbook

1. The symptoms for PTSD are grouped into three major categories. The diagnosis requires that symptoms in each category last longer than one month.

2. Re-experiencing the traumatic event. The individual frequency recalls the event and experiences nightmares. Intense emotional upset is produced by a stimulus that symbolizes the event (e.g., thunder, reminding a veteran of the battlefield) or on anniversaries of some specific experiences (e.g., the day a woman was assaulted). In a laboratory confirmation of this symptom, the Stroop test was administered to Vietnam veterans with and without PTSD (McNally et al, 1990). In this test the participant sees a set of words indifferent colors and must name the color of each word as rapidly as possible and not simply say the word. Inference, measured as a slowing of response time, occurs because of the content of some words. Words from several different categories-neutral (e.g. "input"), positive (e.g., "love"), obsessive-compulsive disorder (e.g., "germs"), and PTSD (e.g., "body"-bags") were used in this study. Veterans with PTSD were slower than veterans without PTSD only on the PTSD words. The same effect has been has been documented for rape victims (Foa et al, 1991). Similarly, patients with PTSD show better recall for words related to their trauma (Vrana, &Beckhan, 1995).

3. Avoidance of stimuli associated with the event or numbing of responsiveness. The person tries to avoid thinking about trauma or encountering stimuli that will bring it to mind; there may be amnesia for the event. Numbing refers to decreased interest in others, a sense of estrangement, and an inability to feel positive emotions. These symptoms seem almost contradictory to those in item 1. In PTSD there is in fact fluctuation; the person goes back and forth between re-experiencing and numbing.

4. Symptoms of increased arousal. These symptoms include difficulties falling or staying asleep, difficulty concentrating, hyper vigilance, and an exaggerated startle response. Laboratory studies have confirmed these clinical symptoms by documenting the heightened physiological reactivity of PTSD patients to combat imagery (e.g., Orr et al, 1995) and their high-magnitude startle responses (Shalev et al, 2001). (Dacison and Neal, 2001:164).

4. Results

First, the results regarding the rhetorical functions in management and psychology are presented in table 1.

Table 1. Chi-square tests for rhetorical functions in management and psychology

Function	Discipline						Total		
	Management			Psychology					
	Count		Expect.	Count		Expect.	Count		Expect.
	F	Per.		F	Per.		F	Per	
Description	63	31.5	51.5	40	20.0	51.5	103	51.5	103
Definition	26	13.0	28.0	30	15.0	28	56	28.0	56
Classification	6	3.0	17.5	29	14.5	17.5	35	17.5	35
Instruction	5	2.5	3.0	1	0.5	3.0	6	3.0	6.0
Total	100	50.0%	100.0	100	50.0%	100.0	200	100.0%	200.0

X^2=23.20   df =3   P<0.0001

The chi-square test, as shown in table 1, indicates that although the most frequent rhetorical function in management and psychology is description, there is a *significant difference* between management and psychology textbooks *in terms of rhetorical functions* (x2=23.20, df = 3,p< 0.0001).

The results concerning the differences between the disciplines in terms of the rhetorical techniques are presented in table 2.

Table 2. Chi-square test result for the rhetorical techniques in management and psychology

Technique	Discipline						Total		
	Management			Psychology					
	Count		Expect.	Count		Expect.	Count		Expect.
	F	Per.		F	Per.		F	Per.	
Time order	7	3.5	6.5	6	3.0	6.5	13	6.5	13.0
Cause/effect	30	15.0	33.0	36	18	33.0	66	33.0	66.0
Order of importance	1	0.5	.5	0	.0	.5	1	0.5	1.0
Comparison/contrast	6	3.0	6.5	7	3.5	6.5	13	6.5	13.0
Exemplification	20	10.0	16.5	13	6.5	16.5	33	16.5	33.0

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Appeal to authority	16	8.0	16.5	17	8.5	16.5	33	16.5	33.0
Visual information	8	4.0	5.5	3	1.5	5.5	11	5.5	11.0
Description	2	1.0	6.0	10	5.0	6.0	12	6.0	12.0
Definition	7	3.5	6.0	5	2.5	6.0	12	6.0	12.0
Classification	3	1.5	2.0	1	0.5	2.0	4	2.0	4.0
Instruction	0	.0	1.0	2	1.0	1.0	2	1.0	2.0
Total	100	50.0	100.0	100	50.0	100.0	200	100.0	200.0

$X^2=14.15$ $df=11$ $p>0.16$

In terms of the *rhetorical techniques*, also management was not *significantly different* from psychology ($X^2=14.15$, $df =11$, $p>0.16$). In fact, the most frequent technique was cause/effect in management and psychology.

And finally, the results regarding to the correspondence and the position of the core statement are presented in table 3 and 4.

Table 3. Chi-square tests for the frequency of the position of core statement

Paragraph	Discipline						Total		
	Management			Psychology					
	Count		Expect.	Count		Expect.	Count		Expect.
	F	Per.		F	Per.		F	Per.	
Deductive	88	44.0	88.0	88	44.0	88.0	176	88.0	176.0
Inductive	3	1.5	6.0	9	4.5	6.0	12	6.0	12.0
Hybrid	9	4.5	5.5	2	1.0	5.5	11	5.5	11.0
Implied	0	.0	.5	1	.5	.5	1	.5	1.0
Total	100	50.0%	100.0	100	50.0%	100.0	200	100.0%	200.0

$X^2=8.45$ $df=3$ $p<0.04$

As you can see from the table above, the most frequent type of core statement in management and psychology discourse is deductive, that is, most paragraphs in management and psychology have their topic at the beginning. Chi-square test results in table 3 also indicate that there is a significant difference between the two disciplines in terms of the frequency of the type of topic($x^2 =8.45$, $df = 3$, $p < 0.04$).

Table 4.Chi-square test for the frequency of correspondence

Paragraph	Discipline						Total		
	Management			Psychology					
	Count		Expect.	Count		Expect.	Count		Expect.
	F	Per.		F	Per.		F	Per.	
One-to-one correspondence	56	28.0	60.0	64	32.0	60.0	120	60.0	120.0
One-to-more-than- one	44	40.0	40.0	36	18.0	40.0	80	40.0	80.0
Total	100	50.0%	100.0	100	50.0%	100.0	200	100.0%	200.0

$X^2 = 1.33$ $df = 1$ $P < 0.25$

As you can see from the table 4 one-to-one-correspondence is more frequent in management and psychology. However as shown in table 4 above, the chi-square test result was *not significant* for the difference between computer and chemical engineering in terms of type of paragraph ($x^2 = 1.33$ df = 4, p < 0.25).

5- Conclusions and Implications

In view of the results reported above, at least in the present data there are some differences in the frequency of different types of rhetorical elements in the selected textbooks and it can be suggested that different disciplinary contexts influence textual representations of rhetorical elements. The results show that each discipline has a paragraph order unique to itself and the general nature of each discipline influences on the incidence and variety of rhetorical functions and rhetorical techniques.

Holmes (1988, as quoted in Varttala, 2001) believes that information obtained through the analysis of authentic data is of great significance in educational contexts as it gives educational programmers and materials writers "some awareness of the relative frequency of different contexts so that they can accurately gauge the stylistic effect of using one form rather than one another"(p.23). As evidence indicates the existing materials do not satisfy the current demanding requirements of Iranian classroom realities (Esfahani, 2004) and the existing materials have been based on no clear principle of discourse or genre analysis (Soleimani, 2005). So the results of this study will provide Iranian materials developers with practical and useful information regarding the textual characteristics of each field and they can build materials which have a sound rhetorical basis. These findings show that instead of perceiving textbooks from different fields of study as rhetorically similar, more attention should be paid to the variations between these fields. From the viewpoint of materials designs, more emphasis should be placed on these potential variations and in producing contextually appropriate textbooks, textbook writers need to be aware of rhetorical characteristics of the particular discipline and rules governing organizations of information. Materials writers in different disciplines will need to write in different ways, following what is conventional in their discourse community.

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The findings are also of great importance to language teachers in that it provides teachers with systematic knowledge of the ways of describing texts, and they can make their students aware of features of specific discourse. The knowledge of arrangement and variety of rhetorical functions and techniques and paragraph types influences students' understanding, as well as the speed of perception (Yorkey, 1970; Wright, 1987). Sensitizing students to the linguistic characteristics of their academic texts and to the existing differences across different disciplines make them pay more attention to the range of language forms that can be used to express the basic rhetoric of the academic papers they write. Imparting the knowledge of rhetorical structure results in increasing awareness of the conventions of writing, and teaching students to produce well-formed and suitable texts.

Although the present study has found some differences between the two disciplines, but a larger corpus is needed to determine the generalisability of the findings. Further research focusing on variation among other disciplines and analyzing more textbooks or even other types of academic discourse such as research articles might yield new insights into the phenomenon of interdisciplinary variation not only in the structural organization of textbooks but other types of academic texts.

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