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## Reference Items in Agricultural Articles

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Vijaya Lekshmi Viswanathan  
Sek. Men. Keb. Datuk Mansor  
Bahau, Negeri Sembilan

### Introduction and Background

The structure of connected discourse is considered a topic of primary importance in current linguistic theory and is closely linked with semantic structure and its relation to syntax. However, it was only in 1973 that there was a more positive change in attitude towards discourse structure studies when Charles Ruhl considered the rhetorical notion of coherence, mentioning the Prague School linguists and Halliday in his article '*Language Sciences 25, Prerequisites for a Linguistic Description of Coherence*'. And in 1976, Michael Halliday and Ruqaiya Hasan further delved into this area in their '*Cohesion in English*', using systemic functional grammar and focusing on text rather than the clause.

Halliday's (and Hasan's) contribution to systemic functional grammar is vast. His '*Introduction to Functional Grammar*' [1985a] outlines the grammar of English, which realises the discourse semantics developed in J. R. Martin's '*English Text*' [1992]. While some linguists find Halliday's English grammar excessive, Martin points out that his '*English Text*' is actually a complement of

Halliday's non-parsimonious grammar. It is also an extension of '*Cohesion in English*', though the latter is organised as the opposition between grammar and cohesion, whereas '*English Text*' is organised **stratally** as an opposition between grammar and semantics. And because such a grammar focuses on text-size rather than clause-size, he calls it **discourse semantics**.

This study uses Halliday's theoretical model, together with Hasan's and Martin's modes of text analysis to investigate the contribution of reference items in Agricultural articles. Halliday's model is characterised broadly as:

### **Language as a Resource:**

- i. Language is a network of relationships.
- ii. Description shows how these relations and relationships are interrelated.
- iii. Explanation reveals the connections between these relations and the use to which language is put.

Thus, functional linguistics conceptualises language as a resource for meaning; it is user-friendly and concerned with choice. As this approach deals with **system** or relationships between linguistic units of various kinds, we call it systemic functional linguistics.

Other than Halliday and Hassan (1976), Hassan (1984) and Martin (1992), Hoey (1991) also ventured into the coherence and cohesive harmony in political and newspaper items, while G. Parsons (1991), Drury (1991), Ventola (1991), Mauranen (1991), Hashim (1996) and Srinivass (1996), among others, investigated the **cohesion-coherence** of scientific texts. But it was Ventola and Mauranen (1991) who delved into some Finnish writers' use of connectors and thematic patterns, and touched on text participants and reference. Reference to text participants or parts of text create **cohesive chains**, which help readers to keep track of referents in the texts. Thus, they compared native and non-native writing skills in this manner.

Meanwhile, **genre / register analysis** was gaining popularity. Consequently, Martin used the education content and investigated texts of different genres in Science and Humanities, used by Australian junior secondary school students. Hunston and Gunnarson (1993) also explored scientific texts (**factual genre**) and arrived at some interesting conclusions –

that there was no sharp distinction between 'fact' and 'evaluation', and that there were clearer genre boundaries for scientific texts.

### **Purpose of the Study**

There is now a great need to obtain information on the English Language, and the ways it is used, because of its present status as an international language. This has given rise to immense research in various fields of linguistics. With the use of the systemic theory to evaluate text in the process of becoming, systemic and functional linguists have contributed vastly to linguistics. Thus, to add on to Martin's (1992), Ventola's (1991), and Couture's work on genre and systemic linguistics, I have analysed several Agricultural texts of the factual genre, a scientific area which has so far been unexplored. Furthermore, studies on the factual genre are still relatively low, compared with those done on the narrative and the descriptive genres, hence my interest in this area.

Reference items were examined in two types of factual articles – reports and explanations. Halliday's and Hasan's models for analysing them for cohesion was first used. These were then supported by Martin's reference chains to determine if they help readers to keep track of referents in the texts, to understand text participant roles in the texts, and to treat texts as coherent units. Therefore, the research questions were as follows:

- i. Does a text-type of the factual genre favour a particular reference type?
- ii. Does the density of reference items remain constant for each genre type, or vary?
- iii. To what extent do reference chains inter-relate participants in the identification system to make whole messages in each text-type?

### **WHAT IS COHESION?**

**Cohesion** is expressed through the **stratal** organisation of language, which is actually "a multiple coding system comprising three levels of coding or 'strata' the semantic [meanings], the **lexicogrammatical** [forms] and the **phonological** and **orthographical** [expressions]. Meanings are realised [coded] as **forms**, and forms are realised in turn [re-coded] as **expressions**" [Halliday-Hasan, 1976:5], whereby **meaning** is put into **wording** or wording



into **sound** or **writing**. Thus, cohesion is an essential feature of text and is expressed through the grammar and the vocabulary of the lexicogrammatical system.

In a text, there are several cohesive chains or reference chains pointing **backward** or **forward**, or to **text**, to show the interaction of participants. They enable a text to function as a meaningful unit, resulting in cohesion through reference items. Cohesion, therefore, in its simplest form is the **presupposition** of something that has gone before, and, when pointing backward to a previous item, is called **anaphora**, as in:

Where is Mridula?  
She is in the garden.

Another form of reference is **cataphora** or forward reference, as in:

This is how you should do it.  
Put some tea in a pot and pour some boiling water into it.

Here, *this* refers to the whole procedure following it.

A third kind of reference is **exophoric**, which takes us outside the text altogether,

Did you water those plants?

Here, *those* may refer back to the preceding text or context of situation.

There are three types of reference items: **personal**, **demonstrative** and **comparative**, and Halliday's and Hasan's models focus on analysing these. However, Martin [*English Text*] organises text-forming resources in English into a stratified content plane, which accounts for most of the difference in categorisation – **Negotiation**, **Continuity**, **Identification** and **Ideation** systems. He uses the Identification system to deal with role relations. Hence, in the Identification system, every time a participant is mentioned, the identity of that participant is explicitly **recoverable** from the context (or not), from the nominal group structure, as in:

A boy lived by the river. The boy went to the zoo. He saw a gorilla there.

Here, *the boy*, *he* and *there* are recoverable from the context – they presume *a boy*, *the boy* and *the zoo* respectively. Such recoverable items are termed **phoric** items.

### Methodology

Six articles [3 reports and 3 explanations] from *The Planter*, a monthly magazine of the *Incorporated Society of Planters*, were analysed as follows:

1. First, the reference items and their cohesive nature were identified and classified as Personal, Demonstrative or Comparative using Halliday's Notation [1985].
2. Only the cohesive items were next analysed, using Halliday-Hasan's Coding Scheme [1979]. Here, the presupposed item or text was identified, and the percentage occurrence of each reference type determined manually and tabulated, with reference to (1) for the total number of reference items.
3. By referring to Halliday-Hasan's Coding Scheme and the presupposed items, reference chains and the overall effect of them in the identification system were determined. Only **phoric** terms were considered. This is because only phoric items ensure that the identity of the participant referred to, be recovered. If the identity of any participant is non-recoverable, then participant identification breaks down, thus affecting the cohesion of text.

### Findings and Discussion

- 1 The analysis of the articles, using Halliday's and Hasan's models showed the following percentage values for each reference item:

Table 1: Comparison of Reports and Explanations [I]

Genre:	Percentages						
	R:P		R:D		R:C		CR/R
	TR/R	C/TR	TR/R	C/TR	TR/R	C/TR	
<b>REPORT</b>							
Text 1	9.3	100.0	79.1	58.8	13.9	50.0	62.8
Text 2	16.4	90.9	71.6	50.0	11.9	75.0	59.7
Text 3	5.8	100.0	76.9	55.0	17.3	44.4	55.3
<b>Average</b>	10.5	97.0	75.9	54.6	14.4	56.5	59.3
<b>EXPLANATION</b>							
Text 1	20.0	100.0	71.7	51.2	8.3	80.0	63.3
Text 2	29.2	100.0	64.6	48.4	6.3	66.7	64.6
Text 3	40.7	91.7	54.2	46.9	5.1	33.3	64.4
<b>Average</b>	30.0	97.2	63.5	48.8	6.6	60.0	64.1

Table 2: Comparison of Reports and Explanations (II)

Genre :	Percentages						
	R:P		R:D		R:C		R
	C/CR	C/R	C/CR	C/R	C/CR	C/R	CR/R
<b>REPORT</b>							
Text 1	14.8	9.3	74.1	46.5	11.1	7.0	62.8
Text 2	25.0	14.9	60.0	35.8	15.0	9.0	59.7
Text 3	10.3	5.8	75.9	42.3	13.8	7.7	55.8
<b>Average</b>	16.7	10.0	70.0	41.4	13.3	7.9	59.3
<b>EXPLANATION</b>							
Text 1	31.6	20.0	57.9	36.7	10.5	6.7	63.3
Text 2	45.2	29.2	48.4	31.3	6.5	4.2	64.6
Text 3	57.9	37.0	39.5	25.4	2.6	1.7	64.4
<b>Average</b>	44.9	28.7	48.6	31.1	6.5	4.2	64.1

## Key:

- R:P - Reference: Pronominal                      R:D - Reference: Demonstrative  
 R:C - Reference: Comparative  
 C - Number of cohesive reference type [R:P/R:D/R:C]  
 CR - Total number of cohesive reference items in text [cohesive R:P+R:D+R:C]  
 R - Total number of reference items in text [cohesive + non-cohesive  
       R:P+R:D+R:C]  
 TR - Total number of a particular reference type.



The analysis of the articles therefore revealed the following:

- 1.1 The **higher** the C/TR, C/CR, C/R and CR/R value, the **more cohesive** is the reference type, thereby indicating a **more cohesive text**.
- 1.2 In these factual articles, the average CR/R value [percentage value of cohesive items in relation to ALL reference items in the text] is 59.3 % for **reports** and 64.1 % for **explanations**. This indicates that the overall contribution of reference items to the cohesion of text in reports and explanations is about the same. The latter is higher by only 4.8%, possibly because of the high number of **pronominals** [being letters to the Editor]. The relatively high percentage of non-cohesive reference items [40.7 and 35.9 respectively] can be explained by the **scientific** nature of these texts and the presence of **generic chains**, resulting in more **cataphoric** and **homophoric** items.
- 1.3 The **pronominals** are significantly lower [three times] in the reports than in the explanations. But Report Text 2 shows the presence of more pronominals than the other two. This may be due to the presence of **fewer generic chains**, resulting in a clearer linking of referents, using the Third Person pronoun. However, most pronominals are **cohesive** [up to 100% even].
- 1.4 The **demonstratives** form the bulk of the reference items, though they are lower in Explanations. It is seen that the more **impersonal** and **factual** a text, the higher is the number of demonstratives, as in Explanation Text 1, which is the most impersonal of all the letters. **Again**, not ALL demonstratives are cohesive – 54.6 % in Reports and 48.8 % in Explanations.
- 1.5 Comparatives form the least number of reference items in all texts. They do not seem to favour any particular genre-type.
- 1.6 Of the 59.4 % cohesive items in reports and 61.4 % in explanations, it is noted that **demonstratives** form the majority in both genre-types, but almost half of them are non-cohesive [45.4 and 51.2 respectively]. In contrast, **pronominals**, while being lesser, are more cohesive. The density of cohesive pronominals is, however, about **three times** higher in **explanations** than in reports, whereas cohesive **comparatives** appear to

be almost **twice** as high in reports. Thus, cohesiveness of scientific texts is **not** influenced by the presence of demonstratives alone, even though most of the non-cohesive items are demonstratives; **pronominals** and **comparatives** are just as essential. But the nature and tone of the genre-type may favour a particular reference-type, as stated in (4) above. Similarly, if the text had contained more comparisons, as in Factual Text 2, the number of comparatives would have been higher.

- 17 Lastly, it must be noted that, had Halliday-Hasan considered **esphora** or forward reference **WITHIN** the sentence, there would have been a **higher** percentage occurrence of each reference item in the texts.

## 2. Reference Chains – Martin’s Model

Sentences are first broken into ranking clauses, where **phoric** and **non-phoric** items are identified, before plotting the **semantic dependency structure**. However, only **recoverable** groups are shown in the structure. All participants realising a particular **first-mention item**, e.g. *'agricultural employment ratios'* are aligned in a row with their clause number written on the left margin. Dependency arrows (→) link these participants **anaphorically**, **cataphorically** or **esphorically**. A sample of the analysis is given below:

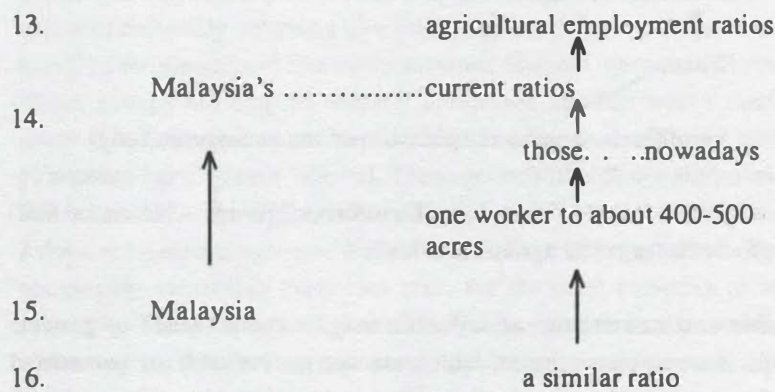
Text 2: Food Neglect: Implications on Political and Social Stability of Nations

13. As a result, agricultural employment ratios have dropped from something similar to Malaysia's current ratios in the estate sector.
14. to those nowadays of one worker to about 400-500 acres.
15. The challenge in Malaysia is whether the oil palm sector will be able to mechanise sufficiently to reduce its demand for labour
16. to a similar ratio over the next few decades.



The semantic dependency structure of the above text is as given below

Fig. 1

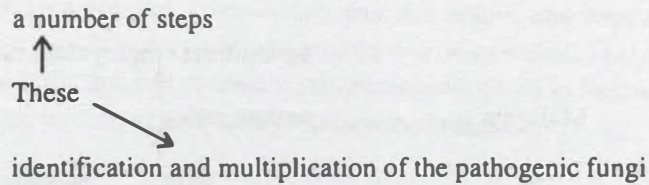


The findings from this analysis is summarised as follows:

2.1 If **generic chains** were taken as a criterion contributing to overall **cohesion**, then we would have Report Text 1 as being the **least** cohesive among the reports due to the presence of many non-retrievable items. Similarly, Explanation Texts 1 and 3 would be rendered less cohesive because of the presence of generic group items which are not recovered ('*harvesting. ....harvesting*', '*barn owls.....owls*'). These would then correspond to the findings in Halliday-Hasan's models. Yet, under the findings in Tables 1 and 2, Report Text 1 is considered the most **cohesive** of the reports, and this text contains the **most** number of generic chains and several non-recoverable items under '*bioherbicides*' and '*fungus pathogens*'. **Therefore, the number and length of generic or specific chains should not be the basis to consider cohesiveness.**

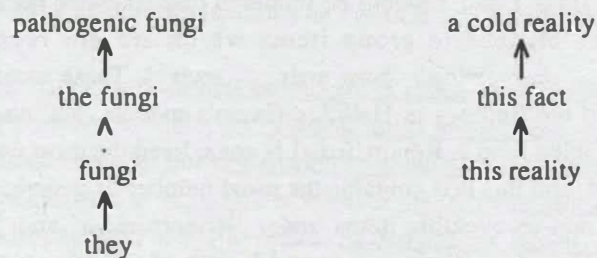
2.2 On the whole, scientific texts [agricultural texts here] contain **phoric** items that are not simple nouns or pronouns but are **whole groups** or **clauses**, sometimes even **whole texts**. They are retained as whole groups and not broken into individual words to preserve their meaning and effectiveness in playing their role in participation identification, as in: '*identification and multiplication of the pathogenic fungi*'. The meaning is not as

effective if each word is taken separately, for it is the whole item which is presumed by 'These', which in turn presumes 'a number of steps', as in:



Hence, phoric items of **very long structures** (groups, clauses or text) seem to be the norm in agricultural texts.

- 2.3 Another common feature of scientific texts is the presence of **generic groups**. As non-phoric items, which are **not recoverable or presumed** by other items in the text, do not enter into semantic dependencies with other articles, they are **excluded** from the reference structure. Only **non-phoric participants**, which are **presumed** by other participants and are recoverable are retained in the reference structure. They may be realised several times by **demonstratives, pronominals or comparatives**. These are the generic participants which may be introduced either **definitely or indefinitely**, as shown below [dotted arrows denote generic chains]:



In **generic reference**, definiteness does not matter. As long as the **experiential content** of a generic nominal group is understood, it is clear which **participant** is being identified. They do not depend on their context in the way **specific groups** do. In fact, unless they are realised through reference items [*they, these, etc.*], their context is actually simply that of knowledge of the language being used. However, generic groups may **neutralise number**, e.g., '*surveys of pathogenic fungi*' may be replaced by '*the survey of pathogenic fungi*' without changing the meaning.

These **neutralisations** affect the nature of cohesive patterns in texts oriented to generic participants. While pronouns and demonstratives are commonly used to presume generic participants, *'the'* is **not phoric in generic contexts** (unless from knowledge of the language and context we know that it is definitely referring to a particular participant). Thus, neutralisations break up the participant line into a **number of short generic reference chains**. These groups are aligned directly under one another with dotted arrows to show that the same participant is being realised, though not **continuously presumed** [as in *'fungi'* above]. These generic chains are abundant in **Report Texts 1 and 3**, and in **Explanation Texts 1 and 3**. However, **Explanation Text 2** does not have a single one while **Report Text 2** has just a few. This does **not** necessarily mean that these two texts are the **most cohesive** of all the texts reviewed. **The presence of generic reference chains is a prominent feature of factual texts, whether report or explanation**, but this cannot be used as a basis to judge the cohesiveness of text. Reference chains are, in fact, used to track **the identity of participants** and to trace the **sequential unfolding of text** with succeeding items listed below preceding ones. Thus, a **coding scheme** alone for reference items (as was used by Halliday-Hasan) is not sufficient to determine the contribution of reference items to cohesion.

- 2.4 In **generic chains**, most non-phoric, plural items are redeemed through **reminding phoricity (pronominals, 'the' and other demonstratives)**. But some items are also retrieved through **relevance phoricity** [though this is less commonly found in generic groups than in specific groups], e.g.: *'a similar fate'* and *'any further baiting'*, using **comparatives**.
- 2.5 Several participants in these texts exhibit **partial reference**. Where **specific reference** is co-selected with presenting, the question of **how many members of a class are involved** is relevant, e.g., *'a wide variety of crops'*, *'any nation'*, *'certain crops'*, *'many plantations'*, as opposed to total reference portrayed by *'15 H&C estates'* and *'each of the selected estates'*
- 2.6 **Initial mentions** are often **mass and plural nouns** and this is especially significant in **factual** texts. Thus, **all** the texts indicate this quality, e.g., *'economic benefits'*, *'developing nations'*, *'plantation companies'*, *'locals'*, etc. It must be noted that mass and plural nouns **lacking an indefinite article** (as in the examples above) provided **referents** for other



nominal groups more than when an indefinite article is present, as in '*several fungal pathogens*'.

- 2.7 Often, and especially in scientific texts, knowledge of the context of **culture** and context of **situation** is important to recover participants from the identification system. Halliday and Hasan considered **redundancy** phoricity as primarily **textual**, being mainly **anaphoric**, sometimes **cataphoric**, and seldom **exophoric**. But Martin distinguishes **homophora** from **exophora/endophora**, and states that **generic reference** is **NOT** a kind of homophora, as stated by Halliday and Hasan. Generic reference depends on knowledge of the language and culture as a **whole** and **not** knowledge of the relevant cultural context. Some such examples are '*the tropics*' and '*the plantation industry*', which are **homophoric**, while '*us*' and '*we*' are taken as **generic** if they do not specifically point to anyone. **Generic reference does not presume the identity of the participants the way homophoric reference does.**
- 2.8 While Halliday-Hasan does not accept reference **WITHIN** a sentence as cohesive, Martin considers **reference presuming information in the same sentence as cohesive**, i.e., an item can presume information from the preceding co-text [anaphora] or from the following co-text [cataphora or esphora]. In the reference chains analysed here, it is observed that if the presumed information follows an item, it usually appears **immediately** in the structure of the **same nominal group** or in the **same or adjacent clause complex**, otherwise participant identification would **break down**. For example, '*The next step is the production of fungi*' and '*an article on Prang Besar, its origin and growth*' show a kind of forward reference termed **esphora**, which is a common way of introducing participants into a text.
- While Halliday and Hasan regard such **forward reference** as **NOT** cohesive, the **reference chains** indicate the necessity of such structures and how **participant identification** is maintained for overall cohesiveness. **As long as there is enough information to identify a participant, esphora contributes significantly to the overall cohesion of texts.**
- 2.9 Forward reference between groups or **cataphora** is also common in **scientific** texts. What is prominent here is that **cataphoric reference almost always presumes text**, rather than participants, as in the examples:

'such work' referring to 'the introduction of the rust fungi', while 'This' and 'two parts' presume the projection 'Gough's Bible - Part I, Gough's Bible - Part II'. But more often **cataphoric** reference is found during **classification** [see (2.12) below].

- 2.10 **Bridging** is seen where **implicational relations** between parts and wholes, and among parts, are usual. Knowledge of the **language** and **context** is relied upon for this. Thus, the identity of 'the plantation industry' is established through 'the plantation companies' It goes without saying that an industry [e.g., textiles, electronics, etc.] consists of 'companies' There are numerous other cases of **bridging** in these texts but there is nothing to indicate that there is more **indirect** reference in reports than in explanations.
- 2.11 **Addition** items, or those participants which are **phoric** but **non-recoverable** either directly or through implication, abound in these texts. There are more of these items in the factual **explanations** [especially Texts 2 & 3] than in the factual **reports**. This may be due to the nature of the **subject matter** - the first focuses on a vast area covering the topic under discussion, whilst the second concentrates on specific areas of the topic being discussed. Hence, the reports have more **plural** and **mass nouns** which are **non-phoric** and **non-recoverable** (e.g., *bioherbicides, crops, planters, labour*, etc.) when compared to the explanations.
- 2.12 A distinct feature of the factual genre is its tendency to **taxonomise** or **classify**. In ALL the texts examined in this study, report as well as explanation, we see a taxonomy of **technical terms** through **anaphora, cataphora** or **esphora**. 3 types of classification are noticed:
- 2.12.1 through the **provision of examples**, e.g., 'unwanted plants' are classified as 'NJV, Strangleweed, Sicklepod', etc. in Report Text 1, while the 2 parts of the 'precis' on Prang Besar in Explanation Text 5 is given as 'Gough's Bible Part I' and 'Gough's Bible Part II'.
- 2.12.2 through **knowledge of the context and experience**, e.g., 'the tropics', 'any nation', 'developing nations', the different types of 'labour', the 2 types of machines involved in the 'mechanical

*process*', and *'predators'* in the various texts are classified through our own experience and knowledge.

- 2.12.3 through the elaboration of procedures, where a distillation of facts or technical terms. For example, in Report Text 1, the R & D work is given as involving *'surveys .....identification.....multiplication....transfer to parent weed. ...infection / re-infection'*. And in Report Text 2, the *'gene pool'* is classified through *'it'* into *'genetic manipulation'* and *'gene transfer'* whereby *'desirable characteristics'* are transferred. In Report Text 3, *'harvesting at a much earlier date'* is due to *'no ablation'* and therefore is a bad agronomic practice. In Explanation Text 4, the *'new ripeness standard'* should be *'bunches with colour change'* which will give *'the best comparative yield/unit of land.. 15 days'* Explanation Text 5 states that *'the purview'* is concerned with the *'production . .testing .proving ..recommending'* the *'high-yielding material'*. Whilst in Explanation Text 6, *'the introduction of barn owls'* would lead to the discontinuation of *'rodenticides'* and the only *'reason'* that some *'boxes'* are not occupied is because of other *'predators'*.

In all these and various others, a distinct pattern is noticed - the factual reports tend to elaborate and distil *technical terms* through experience and sometimes through definition. We do not see many instances of definition as these texts are not reports of processes. Nevertheless, this is observed in Text 2, where *'gene transfer'* and *'gene manipulation'* are actually the transfer of *'desirable characteristics between species'* The second instance is the definition of the term *'phytotoxicity'* in Text 3.

In the factual explanations, however, the pattern is different in the sense that there is a distillation of facts with an explanatory or reasoning quality, e.g., *'the new ripeness standard'* should be *'bunches with colour change'* and *'if we can increase the ratio to 30% .. we theoretically could increase the land-harvester ratio by 100%'*, etc.



- 2.13 **Extended reference** or reference to **text as act** is not seen in these texts. Being scientific texts, which are **factual** in nature and not descriptive, we do not see any act being referred to.
- 2.14 **Redundancy phoricity** does not contribute to the reference structure as **reminding** and **relevance phoricity**. This is because it is not concerned with presuming the identity of participants but with realising some aspect of their **experiential** meaning. **Substitution** and **ellipsis** at group rank is more an aspect of **lexical** cohesion, therefore redundancy phoricity is not discussed here in this study.
- 2.15 On the whole, through participant identification and the backward as well as forward tracking of participants, the **sequential** unfolding of each text is exhibited. The presence of **generic** chains do not interfere with the **unfolding** of text, rather it reveals an important fact about factual texts - that a particular participant is realised by **other participants** in different ways, showing that a particular fact can be sub-divided into several sub-classes realising it. Hence, texts which are considered **non-cohesive** by Halliday-Hasan's standards should be reviewed.
- 2.16 Consequently, the analysis provided the following answers to the research questions:
- i. Based on the analysis following Halliday-Hasan's method, we can conclude that factual **reports** favour more **demonstratives** [75.9%, of which 54.6% are cohesive] than the factual **explanations** [63.5%, of which 48.8% are cohesive] while the latter had a higher number of **pronominals** [three times more than the reports]. The number of cohesive items would have been **higher** if esphora had been considered. Both genre-types have a **low** density of **comparatives** but it is obvious that the reports have more than twice the number of them than the explanations, possibly because some comparisons are made here.
  - ii. the density of reference items and types for each genre-type does not remain constant but **varies** from text to text.
  - iii. in both genre-types, the presence of reference chains are **equally** important to track participants in order to make whole messages, and for the sequential unfolding of text to ensure the threads of continuity and

cohesion. Reference chains, in fact, help us to see what is missing in Halliday-Hasan's method - **participant identification**.

## IMPLICATIONS AND RECOMMENDATIONS

1. The findings of this study have implications on the **English Language syllabus** as well as **teaching programmes for English Language teachers** in our country and in countries where the first language is NOT English. To use spoken and written English properly, it is important that teachers and students understand the need to maintain **coherence** as well as **cohesive relations** in their text. **Cohesion** is a **semantic relation** between two or more elements in the text, and the **interpretation** of a text would be based on how **cohesive** those elements are. As the use of **articles** [*a, an, the*] and **demonstratives** [*this, that, here, there, etc.*] is one major **weakness** of our students nowadays, it is hoped that this study would provide an insight into the teaching of these items through the **retrieval of participants from the identification system**.
2. In the field of **research in Applied Linguistics**, this analysis would add to the collection of studies on **COHESION**, especially on **scientific texts**, and provide researchers and students of systemic linguistics with a better idea of this area.
3. The purpose of this study was to examine the contribution of **reference items** to the overall **cohesiveness** of the text and to trace the **sequential unfolding of text** through **participant identification**. There are so many other fields which have not been examined so far under the **factual genre** itself, thus it would be interesting to track participants in these fields, e.g., political and religious speeches [expositions, debates, etc.], lawyers' reports / articles / speeches, etc., engineering and architectural articles, etc. Research students can delve into the other **systems** constituting the **discourse semantic stratum** and how these systems interact systematically with **lexicogrammatical** structures. Since research into the **factual genre** is still low compared to **narratives** and **descriptions**, it is hoped that more research would be conducted on the various systems of this genre.

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