Elaboration Paradigms in PhD Theses Introductions

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Contents

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Abstract

This paper presents an analysis of introductory sections of PhD thesis dissertations in the fields of Linguistics and Computer Science. The aim of this study is to investigate whether definitional and reformulating patterns in PhD introductions are consistent or deviant across disciplines. Results show that there is consistency in the use of elaboration strategies among the soft and the hard disciplines with significant discrepancy in the functional aspect of particular rhetorical techniques (explanations, naming, alternating and specifying). Consistency stresses the importance of elaboration paradigms in academic post-graduate writings and their valuable role in guiding the reader towards a better understanding of writers' claims and arguments. On the other hand, discrepancy could be related to the specificities of the discipline (soft v.s hard sciences) and most importantly to the conventions of PhD Introductions as a genre. Thus, elaboration is not merely a matter of embellishment as some would argue; it is rather functionally purposeful and rhetorically required.

Keywords: *academic writing, textual metadiscourse, elaboration, definition, exemplification*

0. Introduction

In order to guarantee a clear text and a successful argumentation, postgraduate students use textual metadiscourse, more specifically code glosses. These rhetorical techniques have the ultimate purpose of rendering a piece of discourse more reader-friendly and help writers in fine tuning their ideas and arguments in a way that would leave no room for misunderstanding or misinterpretation on the part of the reader (Hyland and Tse 2004; Hyland 2007). Code glosses, on the other hand, have often been studied in research genres without being the focus of the study itself. While investigating metadiscourse, linguists have often classified them as either having interpersonal or textual functions (Vande Kopple 1985; Mauranen 1993; Halliday 1994; Bunton 1999). Code glosses would fall within the category of textual metadiscourse as they

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serve textual ends. Their function is not to add any propositional content to the ongoing discourse, but rather to clarify, restate, define or exemplify when authors think it is needed to do so (Halliday 1994: 225).

The present paper argues, following Hyland and Tse (2004) and Hyland (2007), that elaboration paradigms is a purposeful strategy used by post graduate doctoral students to boost and support arguments and claims that might be fuzzy to the reader. The elaboration segments are not cases of language embellishment or superfluous items within texts. Their function goes beyond coherence and cohesion to reach the threshold of 'almost propositional'. It is through defining, rewording and exemplifying that students guarantee not only reader understanding but also reader acceptance, approval and appreciation of their claims and logic. In fact, one might ask what would happen if elaboration segments are discarded from a text and only their antecedent items remained. The question might sound awkward but a speculative answer could be simple: there will be no text as there will be no meaning that could be extracted from it.

Therefore, the main objectives of the present research are 1) To establish a new model for Code Glossing/elaboration that deviates from the one advocated by Hyland (2007). 2) To investigate whether and how definitional and reformulating patterns in PhD introductions deviate across soft and hard disciplines.

1. Background

1.1. Meta-text and elaboration

Mauranen (1993: 7) narrows down the meaning of metatext to be "text about text itself". It thus ``comprises those elements in text which at least in their primary function go beyond the propositional content''. Identifying propositional from non propositional discourse, however, is not a straightforward task. To make the distinction, Vande Kopple (1985), Hyland and Tse (2004), Ifantidou (2005) and many other scholars use the truth condition test. For textual metadiscourse, for instance, elaboration markers like: 'in other words', 'that is', and 'for example' introduce segments of discourse that cannot undergo a truth-condition test (Ifantidou 2005). This test, though not a fundamental one, helps mainly when cases of ambiguity are encountered. The question that needs to be asked at this level relates to what Halliday (2006: 243) calls

Grammatical Metaphor. That is to say, is rewording simply saying the same things in different ways? or is it also 're-meaning', i.e. saying something different from the congruent form?

In Research Articles, for example, Hyland (2007: 266) claims that the basic function of code glosses is to "help to contribute to the creation of coherent, reader-friendly prose while conveying the writer's audience-sensitivity and relationship to the message." Hyland's work is among the few publications that have focused on code glosses and provided a classification and a model for its different sub-elements. He classifies code glosses as either reformulations or exemplifications. The reformulation category, however, does not account for definitional cases and they are restricted to the subcategory of explanations within expansions. This paper shall provide a new model for code glossing, setting **definitions**, **elaborations** and **exemplifications** as the starting points for a new classification.

Phd dissertations are written by post graduate students in order to guarantee themselves a place in the research world within a specific discipline community. The introduction section within dissertations has a fundamental role of providing the reader (in particular jury members) with the necessary general background of what the thesis is about, mainly its motivations, objectives, main claims, and thesis structure etc. known in the literature as 'moves'. Thus, thesis introductions could be classified as a genre in its own rights as they are both: formal and functional units.

On the other hand, PhD introductions are also part of academic writing and as Hyland (2005: 191) argues, the focus in academic discourse nowadays seems to have shifted to knowledge creation and 'solidarity' with the readers. In fact, writers "do not act in a social vacuum, and knowledge is not constructed outside particular communities of practice". Bearing this in mind, writers use a variety of rhetorical strategies in order to boost their claims and arguments and most importantly, to make those claims as clear as possible, lest misinterpretation or ambiguity should belittle the value of their works. For this reason, postgraduate students manipulate such skills in order to guarantee a clear text and a successful argumentation.

1.2. Hyland's 2007 model for code glosses

Hyland's model is based on a research done on Research Articles out of which he classifies Code Glosses into Reformulations and Exemplifications. These communication strategies are used in order to facilitate reader understanding. Hyland (2007: 269) defines reformulation as "a discourse function whereby the second unit is a restatement or an elaboration of the first in different words, to present it from a different point of view and to reinforce the message." Reformulations include cases of meaning expansion and meaning reduction. The expansion category includes explanations and implications. Definitions are included under this category. The reduction category includes paraphrases and Specifications. The following figure further explains the basis of Hyland's model:

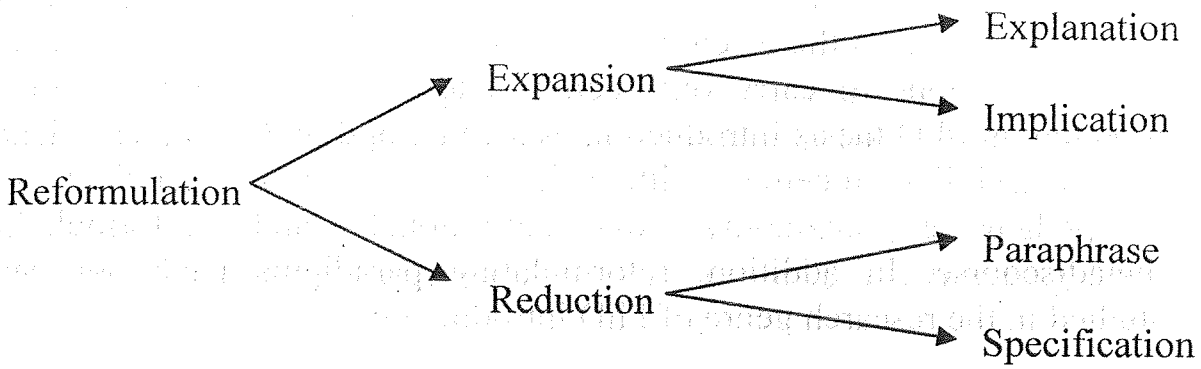

Figure 1: discourse functions of reformulations (Hyland 2007: 274)

Concerning exemplifications, Hyland states that they serve three basic functions. The first is to offer an instance of general category, the second is to provide a parallel or similar case, and the third is to provide a precept or a rule.

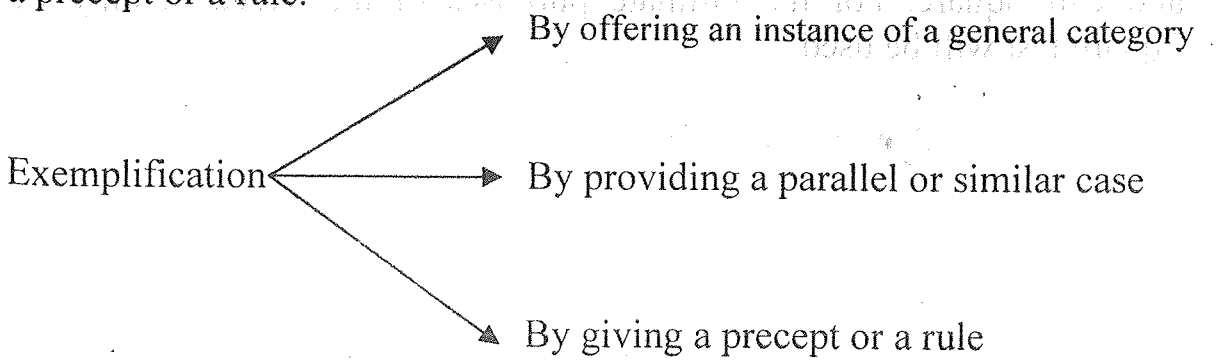

Figure 2: Exemplification (based on Hyland's 2007 model)

Hyland puts forth the impact of exemplification in academic writing as they "carry considerable empirical authority which helps to contribute to the apparently 'strong' claims of the sciences." (ibid: 281)
The problem with this model is that it neglects definitions and restricts them to a secondary position within explanations. Most importantly, this model does not cover specific lexical and semantic relations that could exist between terms or ideas and their elaborating chunks, hence the need for a more elaborate taxonomy.

2. Methodology

2.1. Corpus and procedure

The present research is carried on a corpus of PhD dissertation introductions (five in each discipline) amounting to more than 48 000 words belonging to the disciplines of Linguistics and Computer Science. The motivations to carry out such a study derive from a dearth of research on PhD thesis introduction as a genre and on Computer Science as a discipline together with a need for a more efficient and comprehensive taxonomy of definitional and reformulating metadiscourse. In addition, reformulating paradigms have not been studied in the research genre of PhD introductions.

For the analysis of the corpus, UAM CorpusTool (version 2.7.1. O'Donnell 2007[1]) was used to generate a system for elaboration paradigms. The system consists of macro and micro description of the corpus and the reformulation segments. CorpusTool automatically generates statistical elements backed with two significance tests: T Stat and Chi Square. For the ultimate purposes of this research only Chi Square test will be used.

2.2. A new model for elaboration

As previously mentioned, this research departs from a Systemic Functional Approach. It takes into consideration the functional aspect of texts. CorpusTool, specifically designed for systemic functional purposes, outperforms other tagging software in that it sets texts as the

[1] Downloadable for free from: http://www.wagsoft.com/CorpusTool/

starting point for analysis. It helps in creating one's personal scheme or *system* that matches their desired focus. In the present study the focus is on elaboration strategies. This system considers macro levels of the corpus as a whole, that is, genre and disciplines, and also the specific characteristics of micro levels, namely, elaboration paradigms. It takes into account the syntactic, semantic and functional aspects of those techniques.

Basically, the investigation of the corpus has made it possible to come up with a taxonomy for elaboration paradigms that serves three broad functions: defining, rewording and exemplifying. Each function could be achieved through other minor functions. The framed section in the system is the basis of the model. The other entries will be used for the analysis of a wider research that shall cover whole PhD dissertations on the one hand, and Research Articles on the other hand.

One fundamental aspect of a system network is the notion of choice. For elaboration, as an example, the writer **either** chooses *definition*, *rewording* or *exemplification* to elaborate on a specific idea, concept or claim. Choosing one strategy entails a second phase of choice that would involve the selection of a sub-function or a sub-strategy, and so on.

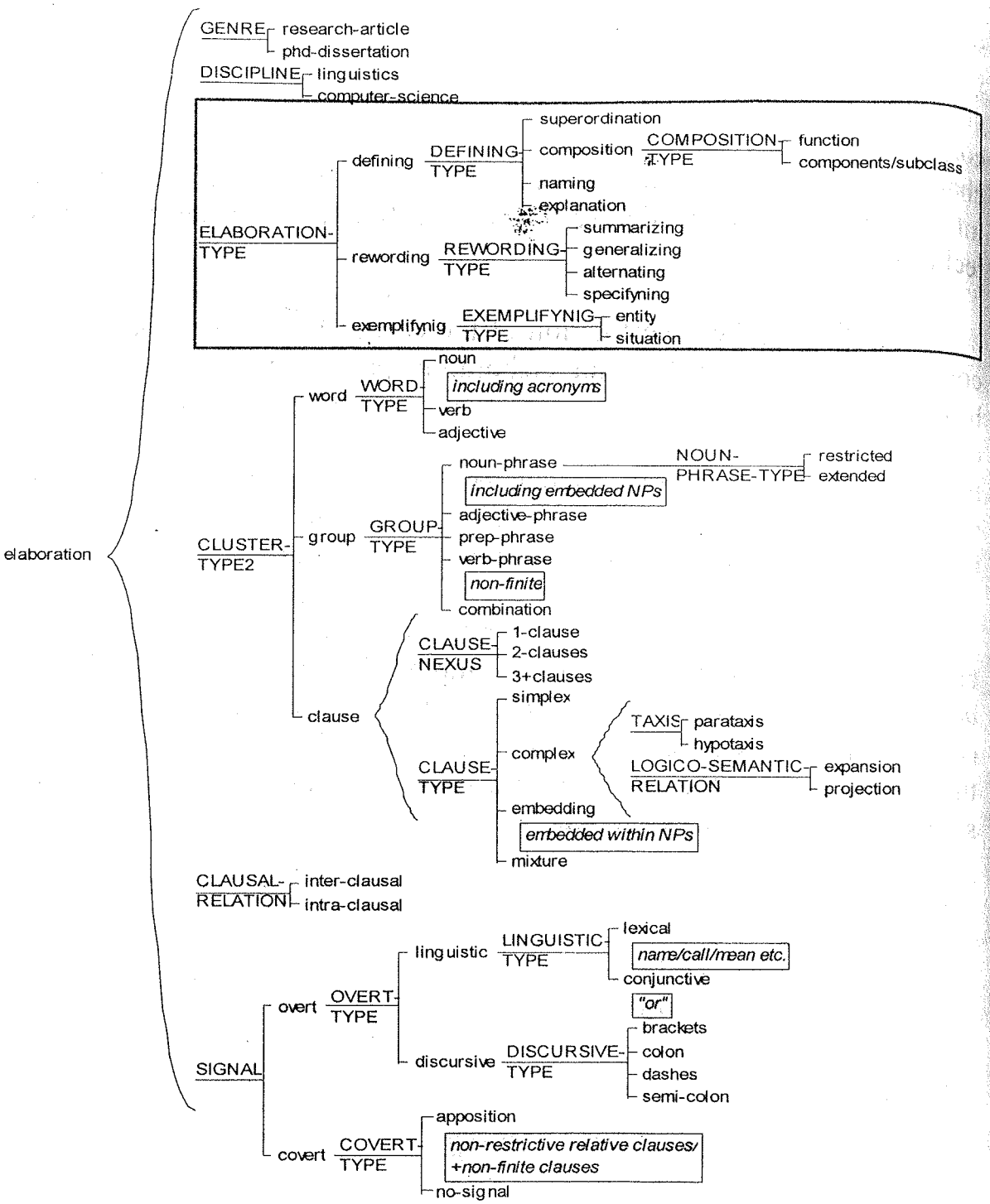

Figure 3: System Network for Elaboration Paradigms

3. Findings and Discussion

The results of the annotation procedure are automatically derived from CorpusTools's results and statistics interfaces. This section shall

focus on the most important features that mediate students' choice of one elaboration strategy and not the other.

3.1. General Findings

Analysis of the PhD introductions shows that providing definitions, rewording and examples is an important feature of academic discourse. It represents 13.56% of all number of words in computer science and 22.4% in linguistics, with the linguistics segments featuring longer stretches. Table1 shows that writers in the two disciples exploited all forms of elaboration with varying degrees.

	LINGUISTICS	COMPUTER SCIENCE	
% nbr of words	22,4%	13,56%	
Definitions	57,49%	42,51%	**100%**
Rewordings	57,25%	42,75%	**100%**
Exemplifications	45,45%	54,55%	**100%**

Table 1: Elaboration in PhD Introductions (Ling v.s. CompSc)

Linguistics researchers deploy more definitions and elaborations than exemplifications which is the opposite case for Computer Science counterparts. Overall, as Hyland (2007) states, the so called hard and soft knowledge fields contained a similar density of glosses. On the other hand, the presence of definitions in PhD Introductions is so important to the point that they cannot be under-categorized within a larger group. They do constitute an elaboration class by themselves and they deserve to be treated as a category distinct from Reformulations or any other elaboration taxonomy. In this respect, Wilkins (1986: 53) states that "definitions are obviously a feature of scientific and other academic forms of writing". Moving to details, however, striking variations appear which are revealing of conventional, generic and functional discrepancies between the two distinct disciplines.

The semantic relationship that links elaboration paradigms with their antecedent is guaranteed overtly (78,5%) through the use of '**elaboration markers**' like: 'i.e', 'in other words', 'for example', 'that is', 'this means', brackets, colon etc. Or it can also be understood covertly, that is with no use of elaboration markers. In this respect Mann & Thompson (1987: 19) argue that "The applicability of a relation definition never depends directly on the form of the text being analyzed; the definitions do not cite conjunctions, tense, or particular words." This is guaranteed through relative clauses, mainly the non-restrictive ones, gerund clauses or through the use of copular verbs (be). Using overt signals, however, is more salient as it leaves the reader with no choice for interpretation, though sometimes, the same elaboration marker could be used to serve different functions. This aspect will be further discussed in the following sections.

3.2. Elaboration Paradigms

3.2.1. Defining:

Defining in academic and scientific writing is a technique used by writers to explain what their words, concepts or ideas mean. This rhetorical function is strategic in determining what writers specifically suggest. It is through definitions that claims and arguments are oriented into a specific direction to suggest something in particular and to discard other potential meanings that the word or the statement could have implied. The defining segment guarantees that the antecedent is free of all ambiguity, uncertainty, or obscurity. The function of definition is to guide the reader while trying to understand claims. Accordingly, definitions boost argumentation and guarantee understandability in academic discourse.

Typically, definitions are identified thanks to such constructions as: *"x is y" "x means y" "x refers to y" "x is understood as y"* and so on. This has lured many researchers in the field of computational linguistics and NLP to come up with algorithms and software for the automatic extraction of definitions from texts and corpora (Rodriguez 2004; Navigliand & Velardi 2010; Pearson 1998; Hearst 1992; Morin 1999). Despite increasing efforts to refine their techniques and tools, these applications are still unable to handle large corpora and to fully analyze definitions. Defining seems to be an easy task but its underlying

mechanisms are more complex and fuzzy semantically and syntactically speaking.

In the literature, definitions were classified as "real" v.s. "nominal" (Svobodova et. al 2000) or "formal" v.s. "naming" (Hamp-Lyons and Heasley 1987). This paper adopts a classification that is based on functional aspects. In other words, definitions are to be categorized according to the functional nature that the defining strings bring about. Thus, four classes have emerged out of tagging, namely: superordination, composition, explanation and naming.

Table 2 (extracted from the results generated by UAM Corpus Tools) shows that computer science writers rely basically on composition and naming strategies while linguistics students rather favour general explanations and do not use naming very often. Chi square test proves that these differences are statistically highly significant.

	Set1 Lingusitics		Set2 Comp Sc					
Feature	Percent	N	Percent	N	T Stat	Signif.	ChiSqu	Signif.
DEFINING-TYPE	N=210		N=172					
superordination	11.9%	25	7.0%	12	1.62		2.63	
composition	11.0%	23	18.0%	31	1.98	++	3.89	++
explanation	19.0%	40	3.5%	6	4.77	+++	21.61	+++
naming	3.8%	8	12.8%	22	3.28	+++	10.54	+++

Table 2: Defining

a. Superordination

Superordination refers to cases where the writer opts for defining a word or a concept by providing a lexically superordinate category known in lexical semantics as hypernym. Table 2 shows that for Linguistics students, superordination is the second most important defining technique used in PhD Introductions whereas it ranks third for the Computer Science ones. In most of the cases, superordination marks the first step in the definition procedure. It is generally followed by an

extension stretch that would cover more precise aspects of the defined part. The following examples extracted from the corpus further illustrate this aspect:

e.g:

(1). PhD<Int<Ling: **The nativist theory** is *an intrinsic [part] of generative theory*

(2). PhD<Int<Ling: **Evolutionary linguistics** forms *a relatively [new field] of research* [that approaches the subfield of linguistics from a Darwinian perspective.]

(3). PhD<Int<CompSc: **mobile ad hoc networking** is *a [popular] area of research*

(4). PhD<Int<CompSc: **AGPF** is *a source loose routing method* [designed to be robust for mobile networks.]

The examples illustrate how a superordinate enables the reader to position themselves in the wider context of the defined item. By providing the general scope within which the concept or the word can be localized, or by highlighting a specific aspect of it, the writer helps in clarifying the perspective from which they would undertake the topic. It is mainly through the additional details (pre or post modifying elements) that come together with the hypernym that the writer directs the reader's expectations.

b. Composition

This category is used as a definition where the definiens (defining segment) provides either the components/parts of an item or the functions assured by it. Composition is considerably used by Computer science post graduates (31% of all definition categories). In the corpus, composition is signaled through the use of such markers as *'consist of'*, *'is made up of'*, *'some of the applications/functions of x are'* etc. Here are some illustrative extracts:

e.g:

(5). PhD<Int<Ling: Bird **song and Gibbon calls** consist of *the repetition of notes and structured groupings of notes.*

(6). PhD<Int<Ling: [...]**a language acquisition device** which *specifies how presented experience determines the section of a particular I-language from the range of possibilities admitted by the specification of permitted hypothesis.*

(7). PhD<Int<CompSc: one of the applications for mobile communication is **sensor networks** which consist of *small devices scattered over an area to collect and share information about their surroundings.*

(8). PhD<Int<CompSc: **an anchored path** is *a list of fixed geographic points.*

Composition could also be equivalent to 'description'. The purpose of composition in academic writing, however, is not to describe for aesthetic or narrative reasons but rather to define for sake of clarity and disambiguation.

c. Explanation

Scientific explanation has the logical structure of an argument. Boutellier (2008: 1) argues that "A scientific explanation then needs to explain the relationship between the premises and the conclusion, so that the premises can be an explanation of the conclusion." Explanations, in this sense, have a basic function of setting the general background to the incoming claims. Table 2 shows that Linguistics students deploy this category more than the others. As for the Computer Science ones, this strategy represents no more than 3.5% of all defining options. Chi Square again proves that this difference is statistically significant.

(9). PhD<Int<Ling: such gestural communication systems are formed by what Tomassello (1996) call **ontogenetic ritualization**, *whereby actions which are initially part of a process become ritualized shortcuts which stand for the whole process.*

(10). PhD<Int<CompSc: **Torus based cryptography (TBC)** may be regarded as *a natural extension of classical Diffie-*

Hellman and El Gamal in a finite field Fp, where key agreement, encryption and signature schemes are performed in the multiplicative group Fx.

The discrepancy in the use of explanations, and the length of the segments themselves, is representative of traditional and conventional methods used in the two different disciplines. Linguistics students master words, stylistic constructions and language in general. Computer science students, however, prefer to go straight to the point and would not expand more than needed. In addition, arguments in Linguistics need to be explained over and over as they rank at the level of abstraction, and as Linguistics struggles to guarantee itself a place in the realm of Science then it has to provide all sorts of proofs to win this debate (Halliday 2006). On the other hand, Computer science is a hard Science, it relies mainly on the laws of mathematics, physics and other related hard sciences. Therefore, lengthy and abundant explanations seem not to be welcome in this discipline. A simple mathematical rule or formula can be sufficient to explain and support a special claim or argument.

d. Naming

Naming could be understood as a reverse definition with the definiendum (the term/idea to be defined) and definien (the defining segment) exchanging position. Chi Square statistics show that the frequency of use of this category is statistically highly significant. This means that Computer science students rely on this category mainly to introduce new concepts, technologies or notions. There are various definitional structures in the language. The one that is used for naming could be summarized according to Hamp-Lyons and Heasley (1987: 27-28) as:

Class + who, which + special feature(s) is + called, known as (etc.) + concept.

(11). PhD<Int<Ling: generative theories of language thus rely heavily on syntax as the driving force of the innovation; they <u>are called</u> *syntacto-centric theories*.

(12). PhD<Int<CompSc: the first concrete instantiation of public key cryptography was called *RSA* after its inventors (Rivest, Shamir and Adleman)

For naming, the definien is considered as an element taken for granted and the fefiniendum is the new item to be introduced. This is common in hard sciences where new names are coined for discoveries and inventions. Lexicographers and dictionary makers rely on such definitions for their updates.

3.2.2. Rewordings

Rewording means stating the same idea in a different way. It is a technique whereby writers restate their previous speech for clarity reasons. Some refer to it as 'paraphrase' or 'restatement'. Unlike definitions, rewordings do not set the limits of what a word or a statement is, they rather express the same idea in a different way. They generally add further details to what has been previously mentioned. Rewordings are most of the times introduced by such markers as '*that is*', '*in other words*' '*this means*' or through discursive elements like brackets, colons or dashes. Rewordings in the analyzed corpus are classified in terms of four different functions: *summarizing*, *generalizing*, *alternating* and *specifying*.

	Set1 Linguistics		Set2 Com Sc					
Feature	Percent	N	Percent	N	T Stat	Signif.	ChiSqu	Signif.
REWORDING-TYPE	N=210		N=172					
summarizing	3.8%	8	1.2%	2	1.61		2.60	
generalizing	3.8%	8	1.7%	3	1.20		1.44	
alternating	8.1%	17	18.0%	31	2.94	+++	8.48	+++
specifyning	21.9%	46	13.4%	23	2.16	++	4.65	++

Table 3: Rewording

Results show that specifying and alternating are the most common techniques used in both corpora but with statistical significance distinguishing both types. Hyland (2007: 270) stresses the point that "While writers may present two 'versions' of the same material, alternative formulations of a single idea rarely constitute identical meanings and tend to go beyond strict paraphrase to present what the writer considers to be the key elements of a prior utterance."

The most important form that a rewording chunk could have is a nominal group. In some cases they simply provide an alternative synonymous category when the head is restricted. When the head is extended we have deeper insight into what the original (antecedent) word, expression or clause means. The semantic functions of the rewording categories varies according to their rhetorical implications and also according to their degree of complexity (post modification). Halliday (2006) argues that "when a figure, which is congruently a clause, is reworded as a nominal group, much of the semantic information becomes hidden."

a. Summarizing

Summarizing involves a paraphrase that restricts the scope of the previous discourse and provides a recapitulation of the most important points. It directs the reader by providing the gist of the message or idea previously mentioned. Summaries are introduced by such markers as '*i.e.*', '*in summary*', '*in short*'.

(13). PhD<Int<Ling: **the nativist position on language acquisition** can be summarized as *the application of domain specific, innate acquisition procedure to an impoverished set of evidence which leads to selection of a hypothesis from a domain specific innately pre-specified space of hypothesis.*

(14). PhD<Int<CompSc: chapter 6 is devoted to an important measure of complexity in quantum computation: the number of queries to an oracle that are required to perform some task, i.e. query complexity of that task.

Summaries in dissertation introductions are not frequent as they are not required by the communicative purpose of introductions. In the few cases identified, writers do not summarize their own ideas but rather other authors' theories and arguments (example 13). Otherwise, summaries are used in the 'thesis outline' move to give a brief idea about what the thesis sections will be dealing with (example 14). Summaries, however, are expected to be found in other dissertation sections like literature review, discussion and conclusion.[2]

b. Generalizing

Generalizing is making a broad statement about something. After providing a series of claims or arguments, the writer draws a concluding remark that does not add any new content but simply restate the previous ideas in a few words giving the argument a general, wider perspective. They come out of logic reasoning, i.e. after providing a set of premises and truths. These categories are introduced by such markers as: 'in general', 'generally', or sometimes they are understood coherently from the ongoing discourse.

(15). PhD<Int<Ling:**The fact that these genes are shared by all members of the species** means that *all creoles share certain features*. This suggests that *evolution is primarily a biological process.*

(16). PhD<Int<CompSc: While not the subject of this thesis, for completeness we briefly describe **symmetric key cryptography**, which is *widely used today* in situations where shared keys amongst parties have already been established.

(17). PhD<Int<CompSc: Torus-based cryptography (TBC) may be regarded as a natural extension of classical Diffie-Hellman and ElGamal in a finite field F_p, where key agreement, encryption and signature schemes are performed in the multiplicative group F^{x}_{p} . *For any positive integer* $_n$, *one can define an algebraic torus* T_n *over* F_p *such that over*

[2] Speculation to be confirmed or refuted in future studies.

F_p^n, this variety is isomorphic to Ø(n) copies of F^x_p, where Ø (n) is the dimension of T_n.

Just like summaries, generalizations are not frequent in PhD Introductions as this section of the thesis is not the room for giving logical deductions. The few instances that were found in the corpus are rather related to cited generalizations or introduced in the interrogative form, implying a need for confirmation in the following chapters of the thesis. For Computer Science sections, generalizations in introductions are not frequent either and when used, they are strictly related to mathematical generalizations upon which authors will draw the basis for their incoming argumentation.

c. Alternating

Alternation is used to introduce a second element that could have the same meaning as the previous one (having a degree of synonymy), but one that would be more specific to the requirements of the context. Two possibilities are available. The first is that the defined word is more general and the alternative one is more technical (example 20), or the other way round (examples 19 and 21). In both cases, the writer provides an alternative to the reader, first to show that they grasp technical jargon, second to facilitate comprehension in case the reader is not totally familiar with the field and its related jargon.

(18). PhD<Int<Ling:There are very many different languages spoken across the world, yet they appear to conform to certain common **rules** or *guidelines*.

(19). PhD<Int<Ling:Thus, a generative theory bids us to focus on **I(nternal)-language** –*the competence* or knowledge of language that is in mind of the individual – rather than **E(xternal)-language** – *the performance* of the individual, or language as a property of a community.

(20). PhD<Int<CompSc: These properties lead us to believe that mobile communication will play an increasingly important role in everyday life through a variety of new, often termed as **ubiquitous** or *pervasive* computing.

(21). PhD<Int<CompSc: [...] **information filtering** (or *routing*), which matches input documents with users' interest profiles...

(22). The fundamental object in quantum computation is **the quantum bit**, or *qubit*, the quantum analogue of the classical bit.

Computer science writers use this technique more often mainly while introducing acronyms. They give the full name of a technology, for instance, and then immediately give its alternative acronym. Moreover, this field of science uses multiple denotations that refer to the same phenomenon or technology (like WiFi and 802.11/ WiMax and 802.16), hence the need to give all possible alternatives.

d. Specifying

This rhetorical technique is the overwhelming category used in both disciplines. It is used to provide minute details about a word or an idea. It has the function of delimiting the scope of the argument being processed. Specifying is marked through the use of reformulation markers like 'in other words' 'more precisely' 'specifically' or covertly deduced from the ongoing discourse context. The following extracts better demonstrate the idea:

(23). PhD<Int<Ling:This takes the following form: how has language arisen in the evolution of Homo sapiens? This question asks what happened in the evolution of humans, from the last common ancestor we share we share with our closest ape relatives (some 5 to 10 million years ago) through the successive hominid species, that gave us language. In other words, *what events in our evolutionary history resulted in our ability to communicate in away very different to that of other species?*

(24). PhD<Int<CompSc: The ABASMUS project addresses the issue of topology control for ad hoc networks. More precisely, *it aims at providing new topology control protocols by considering "injection points" – connections from ad hoc nodes to some infrastructure.*

In these examples, writers try to reformulate their ideas in a clearer and more precise way in order to enhance comprehension. They narrow down the scope of their previous discourse and delimit its range to the precise point they intend their following argumentation, as well as their expected readers, to focus on.

3.2.3. Exemplification

Exemplification involves using illustration through providing supporting items to an idea or an argument for precision and clarification. Writers use examples to prove that their ideas are somehow real and robust and to add credibility to their claims (Hyland 2007). Readers on the other hand need examples to get a clearer view, a more concrete aspect of what writers mean. Examples are often signaled overtly through the use of exemplification markers like 'for example', 'such as', 'for instance', 'like' etc'. They involve either illustrating through providing an example as an entity (abstract or concrete) or as a situation.

Once the rhetorical function is identified the focus shifts to study the linguistic characterizations of the elaboration chunk and see whether they lie at the word, group or clause level. Then, the clause relation linking them to their antecedent is investigated. The elaboration markers are also investigated and classified as either overt or covert.

Results show that computer science students opt for exemplification through entities more than situations while linguistics use both.

	Set1 Linguistics		Set2 Comp Sc					
Feature	Percent	N	Percent	N	T Stat	Signif.	ChiSqu	Signif.
EXEMPLIFYNIG-TYPE	N=210		N=172					
entity	8.1%	17	15.1%	26	2.17	++	4.67	++
situation	8.6%	18	9.3%	16	0.25		0.06	

Table 4: Exemplifying

a. Entity

Exemplification through entities entails the use of illustration by providing a real, somehow concrete and physical example. Opting for this strategy is more dominant amongst computer science students as it matches, to some extent, the nature of scientific discourse. Computer science is a hard science, its immediate results are manifested in our everyday life and for this reason, writers opt for concrete examples to insist on this aspect.
Eg.

> (25). PhD<Int<Ling:A similar position adopted by **some cognitive scientists working in the connectionist paradigm** such as *Bates & Elman (1996)* who argue that domain-general learning techniques may explain more of the language than was previously thought, while allowing that …

> (26). PhD<Int<CompSc: Internet has followed an amazing increase: a growth of 40% per year since 2000. Moreover, most current commercial offers include a DSL-WIFI router, making people more and more comfortable with this technology. At the same time, **small communicating objects** – *PDA, mobile phones, multimedia players, gaming consoles, etc* – are becoming more and more common in our daily life.

Within the process of argumentation, examples in the form of real items or entities are most needed. Their function is to depart from an abstract theories, concept or idea to a more realistic and concrete illustration. Providing names of scientists, titles of books, gadgets and other technologies presupposes a shared knowledge with the reader. Writers would only include examples that are thought to be known, or at least ones that could be easily accessed by the reader.

b. Situation

Situation, as the name suggests refer to a real or possible context in which a phenomenon could happen. These kinds of exemplifications cover elaboration contexts where the writer resorts to giving an

equivalent circumstance similar or close to the point they would like to argue for.

> (27). PhD<Int<Ling:**Empiricism can be made more amenable to the nativist by**, for example, *assuming that the mechanisms used in learning language from experience are not domain-general but domain-specific;* in other words, although knowledge of language is not innate, language specific learning processes are.
>
> (28). PhD<Int<CompSc: The aim is **to use a collection of sensors scattered over an area to collect realtime data to optimize a task in a way that would be impractical to accomplish manually.** For example, *we may wish to create a sensor network to track the health and wellbeing of the people in a city as they go about their daily lives. We may wish to know their heart rate, blood pressure and blood sugar levels in order to detect problems before they become terminal.*

These examples enable readers to construe the text with relevance to their own knowledge of the world. Belonging to the same discourse and discipline community, readers find in examples a link with reality. Examples imply that an idea, a theory, an argument or even an object has roots and backgrounds in real life. As Hyland (2007: 281) argues, the basic function of examples is to "help[s] reinforce the reader's acceptance of the evidential weight of the interpretation."

4. Discussion and Conclusion

The previous results empirically prove that doctoral students are aware of the necessity to use elaboration patterns in their thesis introductions. Elaboration is a conscious and purposeful rhetorical choice made by writers in order to make their discourse clearer and easily understood. Interestingly, these preferences point to fundamental deviations in the ways that these broad domains construct knowledge and help to contribute to the overall understanding of the text. As Halliday (2006: 119) maintains: knowledge is semiotic transformation: to 'know' something is to have transformed it into meaning, and 'understanding' is the process of that transformation. The transformation of experience into

meaning is carried out by lexicogrammar: the words and grammatical structures of a natural language."

In their striving for persuasion and credibility, post-graduate students' writing proves that elaboration is not a straightforward task. The cited examples show how a multitude of strategies are deployed and intertwined to reach a maximum of clarity and trustworthiness. They may use a definition of a concept then reformulate it differently and end up by giving examples. In the process, a single conviction needs to be satisfied: reader's understanding and approval not only of the subject matter but also of the flow of argumentation and how they are logically and rhetorically presented. The same principle is echoing in Rhetorical Structure Theory which states that "all judgements of the reader's states and reactions necessarily stem from the analyst's view of the writer's view, since they are based on the text." Mann and Thompson (1987: 10). Failing to do so at the Introduction part of a dissertation jeopardizes a favorable impression most needed for thesis supervisors, examiners and jury members.

Elaboration paradigms could therefore be viewed as a window to the understanding of a text, to the evaluation of the writer and to the expectations of the reader. Though the implications of this study could not be over-generalized to other genres or disciplines, it is still important to note that the model for elaboration paradigms herein introduced may be applied to other types of discourse and comparable results could be drawn for a better insight into textual and interpersonal interactions.

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