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Prepositional Phrases across Disciplines and Research Genres: A Syntactic and Semantic Approach

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Abstract

Prepositional Phrases (henceforth PPs) are known for their different forms, structures, functions and meanings. This thesis seeks to study this construction from syntactic and semantic perspectives. Two main perspectives to grammar are reviewed: the structural descriptive and the functional. The choice of these two perspectives is motivated by their focus on grammar as related to meaning. This conception of grammar follows from the complementarity between text and context, which makes linguistic studies descriptive of structure and also of the context. The context studied in this piece of research is that of academic writing, focusing precisely on two genres (PhD Theses and Research Articles) and two disciplines (Medical and Social Sciences), representing “the soft-hard continuum” (Hyland, 2004, p. 29). The claim defended by this study is that the grammatical choices of PPs, made possible through the arrangement of the grammar into system networks (Halliday and Matthiessen, 2014), are “activated” by the meaning expressed, which is in turn “activated” by contextual features (Hasan, 2009). For this purpose, a corpus of PhD Theses and RAs from Medical and Social Sciences is collected (one million word). AntConc and UAM CorpusTool have been used to determine the number of words and annotate the randomly-selected and stratified sample. The analysis has revealed the presence of global and local probabilities (Halliday and Webster, 2009), which reflect features of the language as a whole and features related to the register, respectively. Moreover, the prepositional forms are semantically-motivated, with simple prepositions conveying simpler and more general meanings. Furthermore, the distribution of structure has shown that they are statistically related to the context, as patterns of nominalization differ across the registers. Additionally, certain correlations reveal relations between the function of the PP and the preposition introducing it. The semantic analysis has proved that although writings in the field of academic writing avoid direct evaluation in the use of interpersonal meanings, certain correlations reveal that genres may differ with respect to their respective authors. Disciplines may also differ with respect to the choice of meaning, as Medical Sciences opt for spatio-temporal sequencing, unlike Social Sciences, where more varied meanings are selected, thus showing a need in this discipline for more clarity as a persuasive strategy. Space is also shaped differently across the registers, as it is content-dependent. Other probabilities have linked the choice of participants to particular sections as the use of agentive in the Introduction is a sign of anticipating the reader’s reaction.

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List of Abbreviations

- AdjP:** Adjective Phrase
AdvP: Adverb Phrase
Finite-wh-cl: Finite Wh-Clause
IMRD: Introduction Methods Results Discussion
Ing-cl: ing Clause
MA: Medical Articles
MASC : Medical Article Sub-Corpus
MA INT: Medical Article Introduction
MA MET: Medical Article Methods
MA RES: Medical Article Results
MA DIS: Medical Article Discussion
MD: Medical Dissertations
MDSC : Medical Dissertation Sub-Corpus
MD INT: Medical Dissertation Introduction
MD MET: Medical Dissertation Methods
MD RES : Medical Dissertation Results
MD DIS : Medical Dissertation Discussion
MS: Medical Sciences
MSSC: Medical Sciences Sub-Corpus
NP: Noun Phrase
PP: Prepositional Phrase
RA: Research Article
SA: Social Article
SASC : Social Article Sub-Corpus
SA INT: Social Article Introduction
SA MET: Social Article Methods
SA RES: Social Article Results
SA DIS : Social Article Discussion
SD: Social Dissertations
SDSC : Social Dissertation Sub-Corpus
SD INT: Social Dissertation Introduction
SD MET: Social Dissertation Methods

SD RES: Social Dissertation Results

SD DIS: Social Dissertation Discussion

SFL : Systemic Functional Linguistics

SS: Social Sciences

SSSC: Social Sciences Sub-Corpus

Wh-to-inf: Wh to-infinitive clause

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General Introduction

The present dissertation seeks to study the grammatical construction of prepositional phrases in academic writing. The introduction to this thesis starts by situating the research within its theoretical background, and then moves to present the problem it seeks to solve. A third paragraph is devoted to present the objectives from conducting this research, which, in turn, set the ground for the research questions. The major claim follows from these questions as it is meant to reveal the hypotheses posited by the research. Finally, the last paragraph, dealing with the thesis structure, presents the logic behind the followed outline.

0.1. Background to the Study

While focusing on prepositional phrases as a unit of grammatical analysis, the present study can be situated within a structural and grammatical background. Grammatical studies, according to Biber et al. (2007) can be either theoretical, thus focusing on “abstract underlying principles in relation to a model of linguistic competence”, or descriptive, that is, attempting “to provide a more comprehensive characterization of grammatical phenomena in an individual language like English” (p. 6). The choice in the present research is on the descriptive framework as the study concerns only the English Language and, therefore, cannot add to the theoretical background of linguistic phenomena. This would require more than one language to work on. In fact, a descriptive study would look at how words combine to obtain larger units, which means that it focuses on actual language use.

In this context, Halliday and Matthiessen (2014) claim that “text is the form of data used for linguistic analysis; all description of grammar is based on text” (p. 51). Texts are seen as the source of authentic material that would result in accurate descriptions of language, as they lend themselves to quantification. However, a text cannot be studied independently of its context, which means that an accurate description of the grammar of a language needs to include the meaning expressed by this grammar in relation to context. This gave birth to the notion of corpus, which can be either “large-scale” or specific (ibid). Halliday and Matthiessen (2014) argue that “grand designs” resulting from studies of “large-scale” corpora are no longer appreciated, rather the latter “share the commitment to data and to the study of small-scale phenomena” (p. 53).

When a corpus-based study focuses on a specific type of corpus, it accounts for the specificities of that text. In fact, the interaction between the grammar of a text and the context would be based on the text’s preferences, as Hewings and Hewings (2005) claim:

Grammatical choices in speech and writing are made in response to the opportunities and constraints provided by the context in which they occur, and in turn contribute to context. By observing grammatical variations in different contexts we can learn more about those contexts and, conversely, by studying relevant features of context we can learn about their influence on grammar.

(Hewings and Hewings, 2005, p. 2)

The dialogic relationship between grammar and context calls for an approach to grammar which takes meaning, or 'lexis', to use Halliday and Matthiessen's terminologies, into account while analysing texts. Furthermore, they propose two axes of analysis; the syntagmatic (structure), which shows "what *goes together with* what" and the paradigmatic ordering (system), which is revealing about "what *could go instead of* what" (Halliday and Matthiessen, 2014, p. 22).

The organisation of grammar into system networks makes the text "a product of ongoing selection" (Halliday and Matthiessen, 2014, p. 23), where the writer/speaker has the ability to choose from the options in the system. These choices are significant since "meaning resides in systemic patterns of choice" (ibid), that is, since a text is an instantiation of the system, entries would have frequencies and probabilities attached to them. The task of the analyst would be to study the texts and quantify the choices made, as proposed by Sellami-Baklouti (2013):

In this process of analysis, the quantification of choices through their outward structural manifestations gains importance because part of the interpretation of a given option is the frequency of this choice in the text.

These frequencies are important for the interpretation of the text, as well as for the estimation of probabilities in the system.

(Sellami-Baklouti, 2013, p. 219)

The quantification of the text would result in frequencies attached to each option, which then formulate the probabilities in the system associated with that text. Probabilities are either global or local (Halliday and Webster, 2009, p. 252). Global probabilities give details about the language as a whole, while local probabilities distinguish "different registers of a language" (ibid). This relation between text and context underlies the major problem of this study.

0.2. Statement of the Problem

While studying prepositions, linguists admit that these elements have different combinations, different functions in the clause and different meanings, thus presenting to the speaker different moments of choice. The different possibilities represent a system of

paradigmatic choices that can explain “what could go instead of what” (Halliday and Matthiessen, 2014, p. 22), and thus help describe the register of scientific writing and, at the same time, study the intervention of the genre on lexis and grammar.

The study of prepositional phrases is performed on a corpus of academic writing. The choice in the present thesis is to consider two disciplines different with respect to their focus and methodologies (the interpretative and the scientific methods) and two different genres (Research Articles and PhD theses). The question raised in this thesis is whether the disciplinary and generic variations have any impact on the choice of PPs. Other variables such as the sections of each genre may reflect the communicative purposes of the text. The purpose of this analysis is to measure the influence of the ‘hybrid’ communicative purposes (Swales, 2004), on the language use, and more precisely on the distinction of PPs.

0.3. Research Objectives

A number of goals are sought from conducting the present research. The first one is to study the syntax of prepositional phrases by focusing on their different functions and structures. These prepositional phrases are also studied from a semantic point of view in order to expand on their polysemy. The general aim is to seek a correlation between syntactic realisation and meaning (i.e. the interface between syntax and semantics).

These analyses are used, in a second step, to explore the registers and genres of scientific writing. In other words, the aim is to unveil how the linguistic choices (esp. of prepositional phrases) are shaped by the different disciplines and research genres. Different parameters are taken into consideration in the analysis such as the different styles of writing generated by the different types of author (doctoral students writing their theses versus expert authors writing Research Articles), their estimated readers (jury members versus peers and academic community) and the purpose of writing (to be accepted in the research community or to disseminate knowledge).

0.4. Research Questions

This thesis seeks to answer a number of major questions, under which other more specific questions are asked.

RQ1. How are the PPs in the corpus distributed syntactically?

1. What are the types of prepositions used in the corpus (simple/complex)?
2. What are the possible complements and premodifiers that appear in the corpus?
3. What are the grammatical functions of the studied PPs?

RQ2. How are the PPs distributed semantically?

1. Are there cases of functional PPs in the corpus?
2. Are there prepositions introducing oblique participants, and how are they distributed?
3. What is the distribution of the three metafunctional meanings in the corpus (interpersonal, textual and experiential)?
4. How are the different meanings expressed, and how do prepositions extend to express different meanings?

RQ3. How can the syntactic and semantic analyses be linked to the context?

1. Does the quantification of the PPs in the corpus reveal the presence of any global or local probabilities?
2. Are there correlations between the genres or disciplines or sections and the syntactic and semantic distributions?
3. Are there correlations between the syntactic and semantic choices of PPs?

0.5. Major Claim

The claim maintained in the present thesis is that the general context of academic writing, and the more particular and hybrid contexts of register, genre and sections “activate” the semantic choices of PPs, which in turn, “activate” the lexicogrammatical choices of PPs (Hasan, 2009).

0.6. Structure of the Thesis

The investigation of PPs requires a focus on their forms, functions and meanings. Based on these variables, the dissertation is structured into three main parts: review of the literature, methodology, analysis and discussion, in addition to an introduction and a conclusion. The literature review contains three chapters dealing with the syntactic approach, the semantic approach and academic writing. The first chapter on the syntax of prepositional phrases tries to cover the structure-related approaches to prepositions. Starting with the different definitions of prepositions, the chapter outlines the difference between simple and complex prepositions while the degree of grammaticalization of complex prepositions is studied. The following section considers the structure of the prepositional phrase by focusing on premodifiers and complements. After outlining the different complements, these elements are classified according to the amount of information they contain, as clausal elements are considered to be more elaborate than phrasal constructions. The last section of the chapter introduces the different functions of a prepositional phrase, and tries to enumerate the differences between them.

The second chapter presents a semantic approach to PPs. It starts by drawing a comparison between verbs and prepositions based on the view that prepositions are “mini-

verbs” (Halliday and Matthiessen, 2014). Similarly to verbs which can be lexical and function words, prepositions can be seen as ranging on a scale from the most meaningful to the functional, a distinction revisited from a semantic point of view. The focus is then turned to the possible meanings a preposition can express. Starting with the most concrete meanings, the sections cover other abstract and metaphorical ones and draw a comparison between spatial and temporal prepositional phrases.

The third chapter defines academic writing, as it is the focus of the present thesis. After exploring this type of writing as a discourse involving participants, contents and contexts, a genre framework is proposed for the analysis. However, since genre analysis links the text to its context, Hasan’s model (2009) is presented with its classification of context into genre and register. Mapped onto the corpus studied, PhD Theses and RAs are identified as genres, and the disciplines of Medical and Social Sciences¹ as registers. Therefore, the different structures of PhD Theses and scientific Research Articles are outlined before focusing on the disciplinary variations. Finally, a register analysis of each genre is carried out while comparing the disciplinary influence.

The fourth chapter proposes the methodology followed in the thesis. This chapter introduces first the corpus and then presents the criteria set for its selection. The second section proposes the analytical tools, which are both qualitative and quantitative. The quantitative tools are computational, that is based on software programs, and statistical. Two software programs are used in the analysis of the corpus: AntConc and UAM CorpusTool. The first one is a concordance program used to count the number of prepositions, while CorpusTool, is employed to extract “linguistic patterns in text which cannot be explored with simple concordancers” (O’Donnell, 2008, p.1). This section also presents the layers of analysis designed in the research to annotate the corpus. The section on statistical tools presents the notion of population in order to introduce the sampling technique adopted. Measures used in the analysis of the sample such as frequency distributions, hypothesis testing and correlations are also defined. Finally, the chapter closes with an outline of the procedure that will be followed in the analysis.

The fifth chapter presents the syntactic analysis of PPs. It opens with a description of the general frequencies in the sample. This is followed by a first section presenting the results of the simple and complex prepositions that tries to explain their quantitative distributions, the way complex prepositions are formed, the difference in meaning between simple and complex prepositions, and their use across the registers, genres and sections. A second section deals

¹ The studied discipline is Sociology, referred to as Social Sciences.

with the structure of PPs, and capitalises on the clausal versus phrasal complements. Both complements are studied quantitatively and qualitatively to reveal the differences between the realisations, and to study the nominalization patterns adopted across the genres and disciplines. The chapter also describes the distribution of the functions of PPs, and reveals certain links between the choice of the preposition and the function of the phrase. The differences in distributions and the qualitative analysis are then linked to the genres, disciplines and sections.

The sixth chapter presents the semantic analysis. It opens with a description of functional PPs, which are found to be of-phrases in most of the cases. This section tries to explore the type of relations expressed by this preposition. Then PPs introducing participants in the clause are also studied with a focus on the role of agentive, as it is the most frequent. An explanation of the choice of the prepositions introducing each role follows, in addition to the rhetorical purpose of using such devices in each sub-corpus. The third section in the chapter presents the distribution of the three metafunctional meanings and deals with each meaning separately. Although rare in the corpus, the interpersonal and textual references have revealed certain differences with respect to the different authors of each genre, and different methodologies applied in each discipline. The experiential meanings are the most frequent, thus showing a focus on the content of the text rather than on its cohesion or context of interpersonal exchange. The general distribution of these meanings is analysed, and then each meaning is dealt with separately in order to study how prepositions express different meanings, how certain prepositions are associated with particular meanings, and how the choices of meaning reflect differences across the genres, disciplines and sections.

The thesis closes with a conclusion where the main findings are summarised. Besides, certain limitations and implications of the research are presented.

Part One: Literature Review

Chapter One: Syntactic Approach

This chapter seeks to review the literature needed in the study of prepositional phrases as a unit of grammatical analysis. The importance of prepositions is reflected in the description associated with the English language, as being a “prepositional language” (Hofmann, 1993, p. 159). Yet, according to Saint-Dizier (2006), prepositions have not been the focus of different studies because they are:

“...highly polysemic, possibly more so than adjectives, and linguistic realizations are extremely difficult to predict, not to mention the difficulty of identifying cross-linguistic regularities. Furthermore, a number of languages do not use prepositions or postpositions (or make a limited use of them) and prefer other linguistic forms such as morphological marks, e.g. case marks”

(Saint-Dizier, 2006, p. xi)

The problem according to Saint-Dizier (2006) is linked to the syntax and semantics of prepositional phrases. Therefore, the present chapter deals with the syntax of PPs, while the second presents the semantic dimension. The syntactic study of PPs consists in defining prepositions as a unit of grammatical analysis, in analysing their morphological structure, and in determining the structure and functions of the phrases.

1.1. Defining Prepositional Phrases

In order to define prepositional phrases, this section focuses on the different forms and the possible relations that a preposition can have. In the *Penguin Dictionary of Language*, Crystal (1999) defines a preposition as “an item that typically precedes a noun phrase to form a single constituent or structure” (p.271). This definition is similar to many others since it defines prepositions by relating them to other categories. In fact, Biber et. al (2007) maintain that “prepositions are links which introduce prepositional phrases. As the most typical complement in a prepositional phrase is a noun phrase, they can be regarded as a device which connects noun phrases with other structures” (p. 74). Similarly, Quirk et. al (2005) define prepositions by claiming that “central prepositions in English can be defined negatively with three criteria. They cannot have as complement:

1. a that-clause
2. an infinitive clause
3. a subjective case form of a personal pronoun”

(Quirk et al., 2005, p.658)

Prepositions cannot be defined without referring to other particles, which is mainly caused by their connecting function. For this reason, researchers who dealt with prepositions

such as Quirk et al., Biber et al., and Saint-Dizier think that they are function words that belong to the category of closed class items. However, Radford (2009 a) claims that “nouns, verbs, adjectives, adverbs and prepositions, [...] are often called content words” (p. 132) since prepositions, among other word classes, do have meanings; “many of these have the semantic property of marking location...[and] can be modified by *right* in the sense of ‘completely’, or by *straight* in the sense of ‘directly’” (Radford, 2009 b, p.4). This view is also shared by other grammarians such as Van Valin (2004) and Huddleston and Pullum (2005). Keizer (2008) opts for the view that English prepositions are lexical items with the exception of ‘*of*’ and ‘*by*’ when used with deverbal nouns.

The difference between both views is that while the former focuses on syntactic and morphological evidence, the second is based on meaning in distinguishing content and function words. The claim maintained in this thesis is that the distinction cannot be clear-cut; rather it is better seen as a scale ranging from function to lexical words. This scale allows the presence of between cases, where a single preposition can serve as a function or lexical word. The present thesis seeks to study the use of prepositions in order to distinguish the grammatical from the lexical cases. In addition to this distinction, prepositions can be classified according to whether they are simple or complex.

1.2. Simple/Complex Prepositions

Simple prepositions consist of one word, while complex prepositions are either two-word or three-word sequences. This section presents the two types of prepositions, and presents the notion of ‘grammaticalization’.

1.2.1. Simple Prepositions

Carter and McCarthy (2006) gave “a list of more than 50 common simple prepositions” (p.251). They are summarised in the following table.

Table 1. 1 List of simple prepositions

<i>abroad</i>	<i>but</i>	<i>over</i>
<i>about</i>	<i>by</i>	<i>past</i>
<i>above</i>	<i>despite</i>	<i>round</i>
<i>across</i>	<i>down</i>	<i>since</i>
<i>after</i>	<i>during</i>	<i>than</i>
<i>against</i>	<i>except</i>	<i>through</i>
<i>along</i>	<i>for</i>	<i>to</i>
<i>amid</i>	<i>from</i>	<i>toward</i>

<i>among</i>	<i>in</i>	<i>towards</i>
<i>around</i>	<i>inside</i>	<i>under</i>
<i>as</i>	<i>into</i>	<i>underneath</i>
<i>at</i>	<i>like</i>	<i>unlike</i>
<i>before</i>	<i>near</i>	<i>until</i>
<i>behind</i>	<i>of</i>	<i>up</i>
<i>below</i>	<i>off</i>	<i>upon</i>
<i>beneath</i>	<i>on</i>	<i>via</i>
<i>beside</i>	<i>onto</i>	<i>with</i>
<i>besides</i>	<i>opposite</i>	<i>within</i>
<i>between</i>	<i>outside</i>	<i>without</i>

Carter and McCarthy (2006) note that some prepositions like *upon*, *into*, *etc.* are no other than pairs of words that have “over time become fused as simple prepositions” (p.251). The fusion in the case of simple prepositions is different from that in complex prepositions since the latter are separate two or three words that operate, in terms of meaning and syntactic function, as single prepositions (ibid).

Certain simple prepositions share the same form with other word classes such as verbs (following, barring, excluding, etc.), adverbs (across), and conjunctions (after, as, before, since, until, etc.). Prepositions are distinguished for the complements they take, unlike the other parts of speech.

1.2.2. Complex Prepositions

Complex prepositions are composed of more than one element. They can be two- or three-word prepositions. Two-word sequences are made up of an adverb, adjective, or conjunction as the first word and a simple preposition as the second word (Quirk et al., 2005, p. 669). Examples of two-words prepositions are: *ahead of*, *apart from*, *as for*, *as of*, *because of*, *but for*, *due to*, *except for*, *inside of*, *instead of*, *near to*, *out of*, *outside of*, *owing to*, *prior to*, *subsequent to*, *such as*, *thanks to*, *up to*, *etc* (Carter and McCarthy, 2006, p. 252).

Three-word sequences mainly follow the pattern: “Prep1 + Noun + Prep2” (Quirk et al., 2005, p. 670). Quirk et al. (2005) claim that these are the most frequent compared to the other types of complex prepositions. Three-word sequences are classified according to which preposition is Prep 1 or Prep 2. The patterns can be: “in + noun + of; in + noun + with; by + noun + of; on + noun + of” (Quirk et al., 2005, p. 670).

Three-word sequences seem to share some elements with lexical words; it is the noun which is between the two prepositions. However, this form can be a grammatical sequence of words (e.g. *on the shelf by the door*) (from Quirk et al., 2005, p. 671). In this context, Quirk et

al. propose “a scale of ‘cohesiveness’ running from a sequence which behaves in every way like a simple preposition, (eg: *in spite of* the weather), to one which behaves in every way like a set of grammatically separate units” (ibid). Quirk et al. (2005) suggest changing the nominal element in order to distinguish complex prepositions from free sequences. Halliday and Matthiessen (2014) claim that these prepositions “have evolved” from other simpler prepositions (p. 423). The phenomena whereby lexical items change so as to serve grammatical functions is what scholars such as Hopper and Traugott call “grammaticalization” (Hopper and Traugott, 2003, p. 1).

1.2.3. Grammaticalization

While defining the theory of grammaticalization, Heine and Kuteva (2002) assert that “it is [introduced] to describe how grammatical forms and constructions arise and develop through space and time, and to explain why they are structured the way they are” (Heine and Kuteva, 2002, p. 80). They propose “a catalogue of parameters for describing and understanding the evolution of grammatical use patterns and categories” (ibid). These parameters of grammaticalization are:

- a. extension, i.e. the rise of novel grammatical meanings when linguistic expressions are extended to new contexts (context-induced reinterpretation),
- b. desemanticization (or “semantic bleaching”), i.e. loss (or generalization) in meaning content,
- c. deategorialization, i.e. loss in morphosyntactic properties characteristic of lexical or other less grammaticalized forms (*view in in view of*), and
- d. erosion (or “phonetic reduction”), i.e. loss in phonetic substance (*going to* → *gonna*)
(Heine and Kuteva, 2002, p. 80)

Parameters ‘c’ and ‘d’ are not taken into consideration in this context, first because prepositions are not subject to morphemic changes (invariable) and second because the prosodic dimension is not studied in this thesis. However, parameters ‘a’ and ‘b’ are important in the analysis of PPs. In the case of complex prepositions, parameter ‘a’ concerns the fact that two or more items are treated, in new contexts, as one grammatical unit. While parameter ‘b’ is seen in prepositions like ‘in spite of’, where the initial meaning of spite, malice, has been lost, and the whole preposition gained a new meaning as it is “used before one fact that makes another fact surprising” according to *the Cambridge International Dictionary of English*. Hoffmann (2005) maintains that any use of language, including this particular use of prepositions, “is a reflection of the cognitive processes at work during the production of language” (p.2).

The aim of the present thesis is to study the complex prepositions in the corpus, in order to see how their meanings have evolved when changing from simple to complex. However, the influence of the context cannot be limited to the emergence of new meanings; the frequency of usage of complex prepositions may differ from one context to the other. While studying the British National Corpus (henceforth BNC), Hoffmann (2005) came out with the following table, which contains what he considers as the thirty most frequent complex prepositions:

Table 1. 2 The 30 most frequent complex prepositions in the BNC (Hoffmann, 2005, p. 23)

<i>Complex preposition</i>	<i>Frequency in BNC</i>	<i>Complex preposition</i>	<i>Frequency in BNC</i>
in terms of	10,060	in view of	1,507
in front of	6,118	by way of	1,419
in relation to	4,668	with respect to	1,330
in favour of	3,528	in conjunction with	1,267
in addition to	3,426	in line with	1,241
in respect of	2,932	in support of	1,083
on behalf of	2,713	in search of	980
in spite of	2,703	by virtue of	953
on top of	2,516	in return for	937
in accordance with	2,032	in contrast to	877
in response to	2,004	in excess of	835
with regard to	1,656	in place of	775
in charge of	1,630	in need of	774
by means of	1,617	in common with	773
in connection with	1,577	by reference to	660
			Total 64,591

Seeing that the BNC does not represent a particular context or genre, it can be seen as reflecting the normative use of complex prepositions. The use of complex prepositions in the scientific register will be compared to these results in order to check whether the context has any effects on the distribution of these prepositions.

As there is a discrepancy between complex prepositions and free constructions based on the degree of idiomaticity, the difference between complex prepositions and simple prepositions can also be attributed to this fact. In this context, Quirk et al. (2005) claim:

The boundary between simple and complex prepositions is also an uncertain one. Orthographic separation is the easiest test to apply, but anomalies such as writing *into* as one word but *out of* as two words, and *instead of* as two words but *in lieu of* as three, merely emphasize the arbitrariness of the distinction between one and more than one word in writing.

(Quirk et al., 2005, p. 672).

Similar to the view held by Quirk et al., Huddleston and Pullum (2002) describe complex prepositions as idiomatic expressions with varying degrees of fossilization. Accordingly, complex prepositions are seen as having a higher degree of fossilization rather than indicating a syntactic unit (Huddleston and Pullum, 2002, p. 617–23). In this approach, fossilization is not linked to syntactic structure since it is entirely based on meaning. This can be linked to McMichael's assertion that "the simplex category contains usually the most ancient prepositions" (Saint-Dizier, 2006, p. 48). New forms emerge out of the need for new meanings in relation to particular contexts.

Therefore, these elements are better seen as belonging to a continuum ranging from the free grammatical constructions to the fully lexicalized prepositions, that is those treated, in terms of meaning and distribution, as simple prepositions. In the present thesis, prepositions will be dealt with and classified according to whether they are simple or complex. The choice of simple or complex prepositions will be accounted for in terms of meaning, which is thought to be influenced by the context.

Whether simple or complex, prepositions, however, are linked to their complements to form whole PPs. These phrases are dealt with in the following sub-section.

1.3. Structure of a Prepositional Phrase

Unlike most phrases in English which have only one obligatory element, PPs contain two. Downing and Locke (2006) argue that "the internal structure of PPs consists of a preposition and its complement, both of which are obligatory, and an optional modifier" (p.532). In what follows, the different types of complements and modifiers are reviewed.

1.3.1. Prepositional Complements

The prepositional complement is the second obligatory item in the PP. Morley (2000) claims that it is "integral to the structure of the phrase" (p. 56). The link between the preposition and its complement is so sound that grammarians such as Ouhalla (1994), Radford (2009), and Van Valin (2004) claim that a preposition functions like a predicate. In fact, prepositions are said to be [-N] elements since they assign case to their objects, just like verbs

do (Van Valin, 2004, p. 115). Halliday and Matthiessen (2014) maintain that “a prepositional phrase can be interpreted as a shrunken clause, in which the preposition serves as a ‘minor process’, interpreted as a kind of mini-verb, and the nominal group as a participant in this minor process” (p. 329). This view highlights the link between the preposition and its complement, and will be dealt with in section [2.1. The Preposition as a ‘Minor Predicate’].

Focusing on the complement, different syntactic forms can be found after a preposition. Most of the time, a complement is realised by a noun phrase (Biber et al., 2007; Downing and Locke, 2007; Halliday and Matthiessen, 2004; Quirk et al., 2005; Saint-Dizier, 2006). However other elements may function as a prepositional complement. Greenbaum (1996) and Downing and Locke (2006) identify seven possible complements for a preposition.

- **NP:** at home, after which, on account of his age.
- **Adj P:** in private, at last, for good
- **Adv P:** since when, until quite recently
- **PPs:** except in here, from out of the forest
- **Finite Wh-clause:** have you decided about when you’re leaving?
- **Wh + to-inf. Clause:** have you any problem apart from where to stay?
- **-ing clause:** the miners charge the employers with ignoring their claims.

(Downing and Locke, 2006, p. 536).

The complements can be either clausal or phrasal. In addition to this list of possibilities, Biber et al. (2007) claim that certain prepositions can have to-infinitive clauses as complements. The prepositions *but*, *except*, and *save* may, however, be followed by infinitive clauses:

- Governments, whatever their own inclinations, will have no choice [but **to fashion childcare policies**]. (NEWS)

(Biber et al., 2007, p. 103)

These prepositions can also precede that-clauses, unlike the other prepositions, but they are treated as exceptions. The seven possible syntactic forms can be classified into two main sets: phrasal and clausal realisations. Biber et al. (2007) claim that a clausal unit is “structured around a verb phrase” and that this verb denotes either an action or a state (p. 120). Moreover the verb can be accompanied by

[O]ne or more elements which denote the participants involved in the action, state, etc. (agent, affected, recipient, etc.), the attendant circumstances (time, place, manner, etc.), the attitude of the speaker/ writer to the message, the relationship of the clause to the surrounding structures, etc. Together with the verb phrase, these are the clause elements.

(Biber et al., 2007, p. 120)

What makes a clause different from a phrase is the elements that can be added around the verb such as the participants, the circumstances, and the attitude of the speaker/writer. Among the clausal forms, three possibilities are also present depending on whether the clause is finite or not. The choice of a non-finite construction over a finite one results in the loss of medium, mood, subject and tense, while with the choice of a phrasal construction, there is no transitivity, no mood and no tense. Non-finite clauses, according to Biber et al. (2007) “are more compact and less explicit than finite clauses: they are not marked for tense and modality, and they frequently lack an explicit subject and subordinator” (p. 198). Halliday and Matthiessen (2004) describe this phenomenon as being a case of “gradual loss of information”, which is a direct result of what Quirk et al. call “syntactic compression” (Quirk et al., 2005).

1. *(On) reaching* the monument, ...

2. *At* the monument...

(Halliday and Matthiessen, 2014, p.490)

Comparing the sentences, the second one is more condensed than the first, which may result in ambiguity since a condensed expression is least explicit. Therefore, the prepositional complements can be placed on a scale ranging from the least explicit, that is the phrasal realisation to the most explicit which is the clausal realisation. The non-finite realisation can be placed in the middle of this scale. One implication of the presence of such a scale is the possibility of choice of one option among others. Different factors can intervene in this syntactic choice such as the text type. In fact, in written texts, the writer can revise for a more condensed version, which is a major characteristic of written prose (Quirk et al., 2005). Among these seven possibilities, the most probable, in addition to the noun phrase, are the finite wh-clause and the -ing clause (Biber et al., 2007, Quirk et al., 2005). These complements are studied separately in the following sub-sections.

1.3.1.1. Noun Phrases

NPs are the most frequent prepositional complements, according to different grammarians (Biber et al., 2007, Quirk et al., 2005). Biber et al. (2007) maintain that “the typical prepositional phrase may indeed be viewed as a noun phrase extended by a link showing its relationship to surrounding structures” (p. 103). A noun phrase is a group of words formed around a nucleus, which is the noun. The other elements namely the determiner, the premodifier and the postmodifier are optional. This makes NPs classified into simple or complex, depending on the additional components they comprise. The simplest NPs

can be formed of a single noun or a pronoun, while the complex ones are those where an extended postmodifier is used. Nouns are generally used for reference as Biber et al. (2007) state, “nouns are the main lexical means of referential specification” (p. 232). The NP, thanks to its flexible structure, allows the speaker to refer to other entities in different ways, thus including the details needed. This would result in complex structures where the PP and the NP alternate to form “several layers of embedding” (Biber et al., 2007, p. 113), as shown in the following example:

- [the direct result [of [the continuing loss [of [yet another typical feature [of [the English countryside]]]]]]] (NEWS)

(Biber et al., 2007, p. 113)

While studying different registers, Biber et al. (2007) concluded that “[t]he proportion of complex phrases (with four or more words) is much higher in academic prose and news reportage than in the other registers” (p. 117). This result was explained with reference to the lexical density preferred in such registers. The present thesis aims to study NPs functioning as prepositional complements in order to see if the registers studied affect the choice of their structure.

The complexity of the NP is not the only option when it comes to prepositional complements. In fact, certain meanings need to be expressed via a whole clause. The following sub-sections deal with the most frequent clausal complements, namely *wh*-clauses and *ing*-clauses.

1.3.1.2. Wh-Clauses

Wh-clauses are the only type of finite clauses that can occur after prepositions. Downing and Locke (2006) and Quirk et al. (2005) assert that prepositions cannot have a *that*-clause as a complement, although both *wh*-clauses and *that*-clauses are used as nominal finite subordinate clauses. *Wh*-clauses are of two types: *wh*-interrogative clauses and nominal relative clauses. However the difference in terms of meaning between a *wh*-interrogative clause and a *that*-clause is that the *wh*-interrogative leaves a gap of unknown information.

- They did not consult us on *whose names should be put forward*.

(Quirk et al., 2005, p. 1051).

In this sentence, the *wh*-interrogative clause functions as a complement of the preposition ‘*on*’. This embedded clause shows that there is an information gap; the names are not known. These indirect questions are mostly used in conversation, as observed by Biber et

al. (2007) who also claimed that “news and academic prose, on the other hand, are non-interactive and naturally make less use of questions” (p. 211). This research will try to investigate the presence of indirect questions (embedded in prepositional complements), in case they exist, and to study their content and the presupposition behind them.

The second type of wh-clauses is that of nominal relatives, which share the fact that they start with a wh-element. Quirk et al. (2005) maintain:

[I]n some respects nominal relative clauses are more like noun phrases, since they can be concrete as well as abstract and can refer even to persons. In fact, we can paraphrase them by noun phrases containing a noun head with general reference that is modified by a relative clause:

Whoever did that should admit it frankly.

['The person who did that. . .']

I took *what they offered me*.

['. . . the thing(s) that they offered me.]

(Quirk et al., 2005, p. 1056).

The reason why these wh-clauses can be prepositional complement is that they can be replaced by NPs, which are the primary possible complements. While dealing with wh-elements, Quirk et al. (2005) also specify that “the wh-element may express either a SPECIFIC meaning (generally indicated by the absence of the -ever suffix) or a NON-SPECIFIC meaning (generally indicated by the presence of the -ever suffix)” (p. 1059). In addition to whether they express specific or non-specific meaning, these nominal relative clauses replace NPs syntactically and semantically. In fact, the meaning expressed by the clause gives description of the NP, instead of mentioning it explicitly (what they offered me).

Both types of clauses, the interrogative and the nominal relative, seem to replace NPs either by raising questions or by alluding to them. The present thesis aims to study both the frequency and the implications of using wh-clauses as prepositional complements in case they are used in the corpus. In addition to these finite prepositional complements, a preposition can also take an -ing clause as a complement.

1.3.1.3. Ing Clauses

In addition to wh-clauses, -ing clauses are among the non-finite clauses which complement prepositions. To-infinitive clauses are not allowed after prepositions. For instance,

1. *We were annoyed at not to get any news from you
2. We were annoyed at not getting any news from you.

(Downing and Lock, 2006, p. 536)

Sentence ‘1’ is not grammatical because of the verb form ‘not to get’, which is not acceptable compared to the form in sentence ‘2’, ‘not getting’. In this context, Halliday and Matthiessen (2014) distinguish between the imperfective and perfective modes of nonfiniteness, with the imperfective (-ing form) representing the real, or actual mode of nonfiniteness and the perfective (to-infinitive) representing the potential or virtual.

Historically the imperfective combined with the preposition ‘at, in’... the perfective combined – and still does, in the infinitive form with the preposition ‘to’. The meaning of the two aspects is very fluid and indeterminate, in the most general terms, the imperfective means act in progress, actual, present, ongoing, steady state or (dependent) proposition, while the perfective means goal to be attained, potential, future, starting and stopping, change of state or (dependent) proposal.

(Halliday and Matthiessen, 2014, p. 490)

This view specifies that the ing-form (imperfective) is used with prepositions such as ‘at’ and ‘in’, while the infinitive (perfective) is rather used with ‘to’, which means that ‘to’ is classified as a preposition in all the occurrences. This view contradicts the definition of a preposition (section [1.1. Defining a preposition]), where a preposition is recognised thanks to its complementation. Quirk et al. (2005) maintain that to-infinitive clauses, are on times confused with PPs where the preposition is ‘to’. In such cases, it is the complement which is used to distinguish both uses. A preposition, as specified earlier, can take an –ing form, an NP, etc. whereas after the infinitive particle, a non-inflected verb is found. The following examples illustrate this point:

1. Mary went *to the university*.
2. Mary wanted *to go to the university*.

In sentence ‘1’, the NP ‘the university’ is the complement of the preposition ‘to’, while in sentence ‘2’, the non-finite verb phrase ‘go to the university’ is linked to the nonfinite particle ‘to’.

However, the explanation offered by Halliday and Matthiessen (2014) reveals that in most cases prepositions are linked to the imperfective aspect because of the meaning they express. Prepositions are used with the actual, present, ongoing rather than the potential. One possible explanation of the link between prepositions and the real mode of expression is the very nature of prepositions. Indeed, prepositions express relations between two entities, one of them being the complement. This complement, in relation to which another entity is located, can only be something ‘actual’, ‘on-going’ or ‘present’. This can be also observed in NPs, and in wh-clauses, which are used to replace NPs.

1.3.1.4. Conclusion

The different complements that a preposition can have share the fact that they are constructed as nominal elements. However, what is different is the amount of information conveyed in each case; some cases seem to be more explicit than others. The presence of the scale mentioned in section [1.3.1. Prepositional Complements] shows the link between the different possibilities: from a finite clause to a non-finite one to a noun phrase.

In cases where “a figure is constructed as a nominal group” (Halliday, 1998), Halliday (1998) speaks about grammatical metaphor, with metaphor being a “variation in the expression of meanings” (ibid, p. 341). This notion of grammatical metaphor is obtained when one grammatical class or structure is substituted via another one (Halliday, 1993). This means that the metaphor is basically grammatical although changes in words may occur as a result. Halliday (1993) argues that this type of metaphor can be detected mainly in scientific discourse and even “may have evolved from it” (p.174). The claim in this research is that the choice of a noun phrase as a prepositional complement, to the exclusion of the other clausal possibilities, can be an instance of grammatical metaphor. The use of this device is mainly caused by a process of nominalization, which “is the single most powerful resource for creating grammatical metaphor” (p. 656). Halliday and Matthiessen (2004) further explain that “all...embedding in English is a form of nominalization, where a group, phrase or clause comes to function as part of, or in place of, a nominal group” (p. 358). The whole point can be summarised as follows:

This kind of nominalizing metaphor probably evolved first in scientific and technical registers..., where it played a dual role: it made it possible on the one hand to construct hierarchies of technical terms, and on the other hand to develop an argument step by step, using complex passages ‘packaged’ in nominal forms as Themes. It has gradually worked its way through into most other varieties of adult discourse, in much of which, however, it loses its original *raison d’être* and tends to become merely a mark of prestige and power. Notice that when clausal patterns are replaced by nominal ones, some of the information is lost...The writer presumably knows exactly what it means; but the reader may not, and so this kind of highly metaphorical discourse tends to mark off the expert from those who are initiated.

(Halliday and Matthiessen, 2014, p. 730).

Grammatical metaphor is what gives the scientific discourse its character: it allows the language to be at the same time compact and exact. It also raises the lexical density of the whole text since it “packs a large number of lexical items into each clause” (Halliday and Matthiessen, 2004, p. 654). While studying the lexical density of four types of discourse, Biber et al. (2007) notice that:

Since lexical words are the main carriers of meaning, we may expect differences in lexical density to reflect differences in information load.... Since a written text is planned and offers the possibility of re-reading, it can tolerate a much higher information load than conversation....The score for academic prose is intermediate, reflecting the purposes of this register (where the framing of information, including argumentation and evaluation, are also important).

(Biber et al., 2007, p. 62).

Biber et al. (2007) found that the lexical density of academic writing is intermediate. The present thesis aims to study the structure of the prepositional complements, which are expected to reflect the lexical density of the text, and therefore the degree of specialisation. However, the study of the structure of PPs does not include prepositional complements only, as the structure of the PP allows for the presence of a premodifier.

1.3.2. Premodifiers

Unlike complements, premodifiers do not occur in all PPs because they are optional. Looking at the structure of the PP from a generative point of view, adverbs functioning as a modifier in a PP are adjuncts to the preposition rather than complements; that is they are sisters to a bar-category and not to the lexical category (Carnie, 2008, p. 122).

This shows that the relation between the NP complement and the preposition is not similar to the one between the preposition and its intensifier. Following Downing and Locke (2006), a premodifier “intensifies the preposition by adding something semantically specific to the sense of the preposition, such as exactness and immediacy in the case of *right*, together with completion (*right into the policeman’s arms*) or exclusiveness (*only by concentrating hard*)” (p.532). They further assert that “[w]hen modified, the preposition, or sometimes the whole PP, may be graded (*more like a canary*), intensified (*right through the wall*), qualified (*a mile down the road*) or described (*wonderfully on form*)” (p.531).

The present research aims to investigate the structure of the PPs while taking into account the possible premodifiers used mainly that the adverbs used to premodify other elements are one way to convey the value judgement of the writer. Hunston and Thompson (2000) claim that: “evaluation is the broad cover term for the expression of the speaker or writer’s attitude or stance towards, viewpoint on, or feelings about the entities or propositions that he or she is talking about” (p.5). The adverbs used to premodify PPs are one way to express the writer’s viewpoint towards the content of the PP. Whether the writer opts for intensifying, attenuating or reinforcing a particular PP, this means that s/he is intervening in order to reveal his/her own attitude. Since the claim defended is that the use of premodifiers is

linked to overt evaluation, the analysis will try to explore the general tendencies in academic writing, and link this particularly to the genres and disciplines studied.

The study of PPs has dealt with the preposition itself, and with the structure of the phrase it forms. However, these PPs are to be seen from the perspective of the sentence, where they merge with other grammatical constructions, and are therefore assigned functions, which will form the focus on the following sub-section.

1.4. Syntactic Functions

When used in a clause, a prepositional phrase can function as a postmodifier of a noun, an adverbial or a complement. The following sub-sections study each function in details, in addition to certain possible, but minor functions.

1.4.1. Postmodifier

Different grammatical structures can postmodify a noun (relative clause, non-finite clause or PP). According to Quirk et al. (1972), postmodification by prepositional phrases is “by far the commonest type of noun phrase postmodification in English: it is three or four times more frequent than either finite or non-finite clausal Postmodification” (p.883), a result that Biber et al. (2007) proved while studying four types of discourse. Additionally, PPs functioning as postmodifiers of nouns can be turned into relative clauses with an equivalent meaning (Biber et al., 2007, p. 634). Quirk et al. (2005) claim that there is always a relation to a more explicit modifier, and therefore a PP functioning as a postmodifier can be seen as a reduction of a more complex, mainly clausal, postmodifier. These postmodifiers are naturally linked to be-sentences (p.1274).

- The car outside the station → the car is outside the station.

This shows that the elements of a complex NP can be matched with those of a clause. This process of nominalization, may affect the clarity of the expression, but, as mentioned in section [1.3.1.4. Conclusion], this is also a sign of expertise.

Among the studies on postmodification across different registers, Biber et al. (2007) noticed that 20 per cent of all NPs in academic writing have a postmodifier, as “the complexity of noun phrases increases across the registers in a familiar order, with conversation at one extreme and academic prose at the other” (p. 578). They also added that “the frequency of prepositional phrases as postmodifiers forms a scale: relatively rare in conversation to extremely common in academic prose” (p. 606). While dealing with NPs in

academic writing, they found that “noun phrases with postmodifiers are used most commonly for first mentions of a referent in a text” (p. 585). This is mainly because the postmodifier helps identify the referent of the head noun. They also noted that postmodification, in comparison to premodification, is more elaborated “so as to establish the intended reference and provide the salient descriptive details about that referent” (p. 587). While discussing the results they found after studying postmodification in NPs, Biber et al. (2007) concluded:

In academic prose, prepositional phrases as postmodifiers allow a very dense packaging of referential information in a text, typically characterizing non-human entities in relation to other non-human entities. They are more compact than clausal postmodifiers and commonly occur in sequences. The hierarchical embedding relations found with such sequences are often complex. However, they are less compact, and more explicit about the relationships involved, than equivalent sequences of noun premodifiers.

(Biber et al, 2007, p. 607).

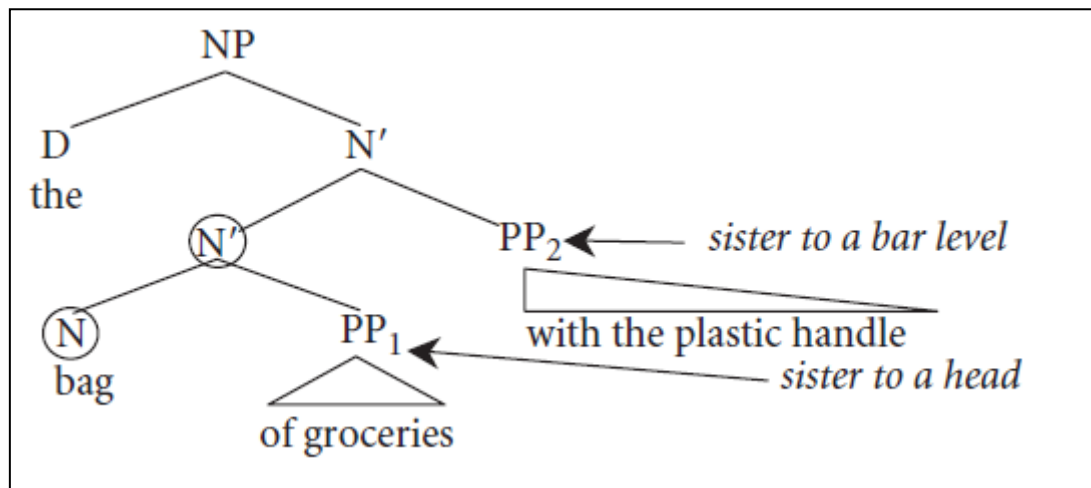
This study stresses the importance of postmodification by PPs in the field of academic writing as it offers compact and clear descriptions, in comparison to other constructions. Furthermore, Biber et al. (2007) outlined the prepositions used to introduce PPs in postmodifier position (p. 635). The following table contains the most common prepositions together with their relative frequencies.

Table 1. 3 Prepositional phrases as postmodifier (Biber et al, 2007, p. 635)

<i>Preposition</i>	<i>Percentage</i>
Of	60-65
In	8 – 10
For	3 – 5
On	3 – 5
To	3 – 5
with	3 - 5

Table 1.3 shows that the preposition ‘*of*’ is by far the most frequent preposition, which can be explained by relying on the adjunct versus complement distinction. From the perspective of X-bar theory, two main types of postmodifiers are distinguished: those that are sisters to the head noun N, and those that are sisters to N’ (N + postmodifier). According to Carnie (2008), the first category of postmodifiers (sister to N) are said to be complements, while the second ones are adjuncts, as can be seen in the following sentence.

Figure 1. 1 Tree diagram: complements versus adjuncts (Carnie, 2008, p. 121)



The structural proximity of complements to the head noun is translated into a proximity in terms of meaning, which means that “the complement will be both adjacent to the head and more importantly closer to the head than an adjunct” (Carnie, 2008, p. 123). Most of the time, of-phrases following the head noun are complements of that noun, as they complement the meaning of the head noun, while the others are adjuncts that add all sorts of extra information. Dowty (2000) adds that “the adjunct ‘modifies’ the meaning of the head, while the complement ‘completes’ the meaning of its head” (p. 2). According to Keizer (2004), the distinction between adjunct (or post modifier PP) and complement is not clear cut as it is rather gradual.

Furthermore, postmodification by PPs can be classified according to the restrictive /nonrestrictive and appositive/ nonappositive distinctions (Quirk et al., 2005, p. 1285).

- The course *on English grammar* starts tomorrow.
[nonappositional, restrictive]
- This course, *on English grammar*, starts tomorrow.
[nonappositional, nonrestrictive]
- The question *of student grants* was discussed yesterday.
[appositional, restrictive]
- This question, *of student grants*, was discussed yesterday.
[appositional, nonrestrictive]

(Quirk et al., 2005, p. 1285)

While the restrictive/nonrestrictive classification is linked to whether the modification helps identify the head noun or not, the appositive/relative distinction is mainly based on the semantic content of the postmodifier. Appositive postmodifiers “contain their antecedents” (Quirk et al., 2005, p. 1244), whereas relative modifiers add extra information about the head noun. Nonrestrictive modifiers are often confused with and mostly seen as instances of adverbials (Quirk et al., 2005, p. 1288).

- The children, *behind the fence*, jeered at the soldier.
- *Behind the fence*, the children jeered at the soldier.

These examples show that the same PPs can be a non-restrictive modifier (first example) or an adverbial (second example) because of its position in the clause. This shows that the nonrestrictive modification is an optional one since adverbials are optional. This information is granted from the writer as part of his/her own way of construing reality (Halliday and Matthiessen, 2004), which means that the writer perceives the scene from a particular angle and wants his/her reader to share this experience with him/her. Choosing to offer this extra piece of information means that the writer has chosen it from among other possibilities in order to reach a particular end. However, with restrictive postmodification, the writer makes an effort to be clear and transparent. In such case, the writer wants to make sure that the reader gets and understands the message. The present thesis will focus on the way the postmodifier is presented (relative/appositive, restrictive/nonrestrictive).

The present study seeks to analyse PPs functioning as postmodifiers in terms of the above mentioned distinctions (appositive/relative, restrictive/non-restrictive, and complement/adjunct) in addition to the prepositions used to introduce them. The purpose is to explain their distribution with reference to the different registers and genres in the corpus. However, as mentioned earlier, certain postmodifiers are confused with adverbials, as the change of function results from a change of position. This grammatical function is studied in details in the sub-section below.

1.4.2. Adverbial

Adverbials are different from the other functions (Subject, Object, and Complement) since they are most of the time optional. Quirk et al. (2005) identify these elements as having:

- a. range of semantic roles;
 - b. propensity for multiple occurrence in the same clause;
 - c. range of realization forms;
 - d. range of possible positions in the clause;
 - e. distinctive grammatical functions;
 - f. flexibility for use in information processing and in displaying textual connections.
- (Quirk et al., 2005, p. 478)

Since these elements are optional, they can occur more than once in a single clause and can have different positions as well. The different meanings that they express will be covered in the following chapter. Among the different realisation forms, the focus is on PPs, which are the most common within the category of adverbials (Biber et al., 2007; Quirk et al.,

2005), and in comparison to locative adverbials, they are ‘the biggest class of realisation types as well as the class that arguably refers most precisely’ (Quirk, 1986, p.41), which means that PPs are at the same time, concise and precise.

In order to study adverbials, different classifications have been made to deal with the different meanings that they express. Two main perspectives are dealt with here: the structural advocated by Quirk et al. (2005) and the functional by Halliday and Matthiessen (2004, 2014) and Biber et al. (2007). The choice of these perspectives among others is attributed first to their comprehensiveness and second to their focus on grammar in relation to meaning.

1.4.2.1. Structural Perspective

According to Quirk et al. (2005), adverbials can be adjuncts, conjuncts, disjuncts or subjuncts. Adjuncts are those elements that resemble the other functions of the clause since they are integrated in the structure of the clause. They express different meanings that will be studied in section [2.7. Metaphorical Prepositions].

A second type of adverbials is that of subjuncts, which have ‘a subordinate role’ in comparison to the other clause elements. Subjuncts can be subordinated to the whole clause, in which case they have a ‘wide orientation’ or they can be subordinated to an element of the clause where they have ‘narrow orientations’ (Quirk et al., 2005, p. 566/7). These meanings will be studied in details in section [2.7. Metaphorical Prepositions].

A third type of adverbials is that of disjuncts, which are used mainly to convey the attitude of the speaker. They can be either style disjuncts or content disjuncts. First, style disjuncts convey the speaker’s comment as to modality and manner (*in short*) or respect (*with respect*) (Quirk et al., 2005, p. 615). Second, content disjuncts are used to make an observation as to “degree of or conditions for truth of content” or “value judgment of content” (e.g.: *of course*).

The last type of adverbials is that of conjuncts. These elements are used to link clauses as Quirk et al. (2005) claim that “they have the function of conjoining independent units rather than one of contributing another facet of information to a single integrated unit” (p. 631). Similarly to the other types of adverbials, conjuncts are classified according to the meaning they express.

The structural classification of adverbials seems to rely heavily on the meaning they express, in addition to certain minor grammatical difference such as their integration in the sentence structure. Another classification of adverbials from an SFL perspective is overviewed in the following sub-section.

1.4.2.2. Functional Perspective

From a functional point of view, the PP can have the following functions in the clause:

The prepositional phrase serves as Adjunct in the modal structure of the clause. Like the adverbial group, it can serve as circumstantial Adjunct or, less commonly, as interpersonal Adjunct; and like the conjunction group, it can serve as conjunctive Adjunct.

(Halliday and Matthiessen, 2014, p. 359)

When studying adverbials, Halliday and Matthiessen (2014) speak about ‘Adjuncts’, a term that they use to refer to sentence elements which are neither subjects nor complements. The distinction between the different types of adjuncts is based on the different metafunctions (Halliday and Matthiessen, 2004, 2014). In the experiential function of language, adjuncts are circumstantials, while “modal adjuncts and conjunctive adjuncts are, respectively, interpersonal and textual in metafunction” (Halliday and Matthiessen, 2014, p. 156).

Circumstantials are said to “occur freely in all types of process, and with essentially the same significance wherever they occur” (Halliday and Matthiessen, 2014, p. 310). They are “optional augmentation of the clause rather than obligatory components” (Halliday and Matthiessen, 2004, p. 175). Unlike the process and the participants of the clause, which form the “experiential centre”, “circumstantial elements augment this centre in some way – temporally, spatially, causally and so on” (Halliday and Matthiessen, 2004, p. 176).

Modal adjuncts can be either mood or comment adjuncts. Mood adjuncts are linked to the mood system: they represent modality (certainly, definitely, usually, always, never, etc.), temporality (eventually, soon, just, still, already, etc) and intensity (totally, utterly, scarcely, etc) (p. 126). Comment adjuncts “express the speaker’s attitude either to the proposition as a whole or to the particular speech function” (p. 129). Examples of comment adverbs are:

- **Propositional:** naturally, wisely, cleverly, etc.
- **Speech-functional:** truly, actually, on the whole.

Conjunctive adjuncts “set up a contextualizing relationship with some other (typically preceding) portion of text” (Halliday and Matthiessen, 2004, p. 132). Examples of conjunctive adjuncts are: *on the other hand, in addition, etc.* They represent the “logico-semantic relations” expressed between clauses, and are therefore cohesive (Halliday and Matthiessen, 2014, p. 611).

Following the functional perspective, Biber et al. (2007) studied adverbials in four different registers and found out that although optional, they “are a common feature of

discourse” as “the information in adverbials...is crucial for fully understanding the proposition in a clause” (p. 765/6). As far as academic writing is concerned, Biber et al. (2007) claim that “they are slightly more common than lexical verbs” (ibid). Among the three types of adverbials, circumstantials are the most common for the different meanings they express and “their ability to co-occur in clauses” (Biber et al., 2007, p. 766).

Biber et al. (2007) also claim that linking adverbials are most common in academic prose although being rare (represent 10 percent of all adverbials), “because this register tends to have an emphasis on conveying logical coherence and building arguments” (p. 767). This is because “linking adverbials allow the writers to mark the development of their arguments, relating one proposition to another - for example, explicitly showing contrasts, restatements, and conclusions” (Biber et a., 2007, p. 767).

Moreover, Biber et al. (2007) maintain that PPs are the most common syntactic realisation of adverbials which is due to their overuse in circumstance adverbials. However, among all stance (interpersonal) adverbials, PPs account for 15 to 20 per cent only, which is almost the same distribution for linking (conjunctive) adverbials (p. 768).

The present research seeks to study PPs functioning as adverbials in order to explain the frequency of each type (circumstantial, modal and conjunctive).

1.4.2.3. Conclusion

The structural and functional approaches give detailed overviews of adverbials, and these approaches rely largely on meaning in their classifications, but while the structural has four main categories, the functional has only three. Moreover, both agree that, from a grammatical perspective, it is difficult to distinguish between the categories. In fact, in the structural description, the similarity between conjuncts and disjuncts led Quirk et al. (2005) to admit that “we find it necessary to look beyond the particular grammatical unit in which they appear” (p. 631). This means that the grammatical criterion is not enough to categorise adverbials. The functional perspective applies, on the other hand, the metafunctions to distinguish between adverbials. The distinctions, however, can be matched. In fact, adjuncts are similar to circumstantials, conjuncts share the same meanings with conjunctive or linking adverbials, and subjuncts and disjuncts are comparable to modal adjuncts. The latter are referred to by Biber et al. (2007) as stance adverbials, which “have the primary function of commenting on the content or style of a clause or a particular part of a clause” (p. 853).

The discussion reveals how important it is to rely on meaning while identifying adverbials, this is why the syntactic analysis will distinguish the different functions, such as

postmodifiers and adverbials, while the semantic analysis will include a classification based on the metafunctions. The last function to be covered in details; that of complements, is presented in the following sub-section.

1.4.3. Complement

Complementation is defined by Quirk et al. (2005) as the “part of a phrase or clause which follows a word, and completes the specification of a meaning relationship which that word implies” (p. 1150). Particularly, this section focuses on the complementation of verbs and adjectives by PPs.

Verbs can have different relations with prepositions, as there are three types of verbs: phrasal, prepositional and phrasal prepositional verbs. In the case of phrasal verbs, the preposition is rather seen as a particle related to the verb, rather than to the complement. These particles do not form PPs, unlike prepositional verbs where the PP can function as an independent unit (Downing and Locke, 2006, p. 58). Therefore, they will not be the focus of this study. PPs functioning as verb complements may have one of these patterns:

- Copular verbs: The children are *at the zoo*.
- Monotransitive verbs: They agreed *on the meeting*.
- Complex transitive verbs: We considered him *as a genius*.

Complements of adjectives are similar in range to those of verbs. Adjectives can be classified according to whether they are predicative, attributive or postpositive (Quirk et al., 2005, p. 418). Predicative adjectives are those which function as subject complement or object complement. Most predicative adjectives take complementation (aware of, able to, fond of, etc.) and some of them are not acceptable without the complementation (Quirk et al., 2005, p. 433). In this context, the present thesis seeks to study those PPs functioning as complements of verbs or adjectives in order to investigate the link between this function and the choice of the preposition.

However, these functions are not the only possible ones as far as PPs are concerned, as other, minor functions, are also possible. Certain functions are not as common as those reviewed in the previous sub-section. In fact, PPs can function as prepositional complements, adverbs postmodifiers and nominal.

- Prepositional complement: He picked up the gun *from under the table*.
- Complement of an adverb: Unhappily *for Tanya*, the telephone was in a corner of the living room.
- Nominal: *Between 6 and 7* may be convenient

(Quirk et al., 2005, p. 658)

This piece of research will look at the different functions a PP can have while taking into account their relative frequencies. The aim of the analysis is to see if any correlations between the function and the choice of the preposition exist.

1.4.4. Conclusion

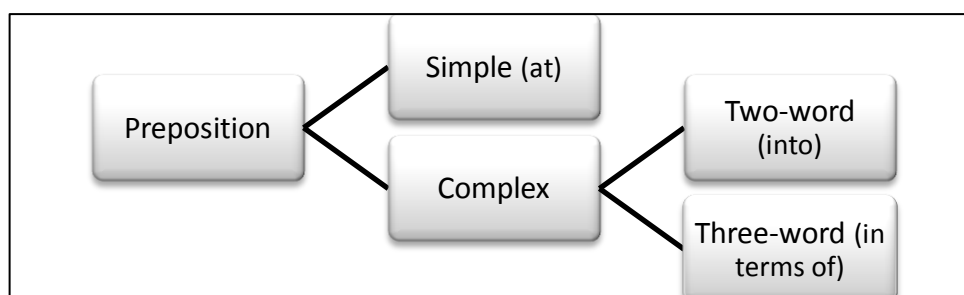
This section has tried to overview the possible functions of a PP. First, the light was shed on postmodifiers, where the different classifications of this function have been presented. Then, the function of adverbials is considered from two perspectives, the structural and the functional. Following this, PPs functioning as complements of verbs and adjectives are presented. These three functions are the most frequent as far as PPs are concerned. However, other functions are possible but relatively less frequent.

The purpose of this study is to analyse the functions of PPs, to distinguish those that are optional from the obligatory sentence elements, mainly that Keizer (2008) classifies all the functions according to whether they are obligatory “required” or optional (p. 240), and to see if any link to the choice of the preposition exists.

1.5. Concluding Remarks

This chapter has attempted to study PPs from a syntactic perspective. It has started by identifying prepositions, since they are the nuclei of PPs, and then has summarised the major views to their classification as lexical or function words. Then, section [1.2. Simple/Complex Prepositions] has presented the difference between simple and complex prepositions and ended with an explanation of the grammaticalization process, through which complex prepositions are formed. The study of the prepositions type has been recapitulated in the following figure.

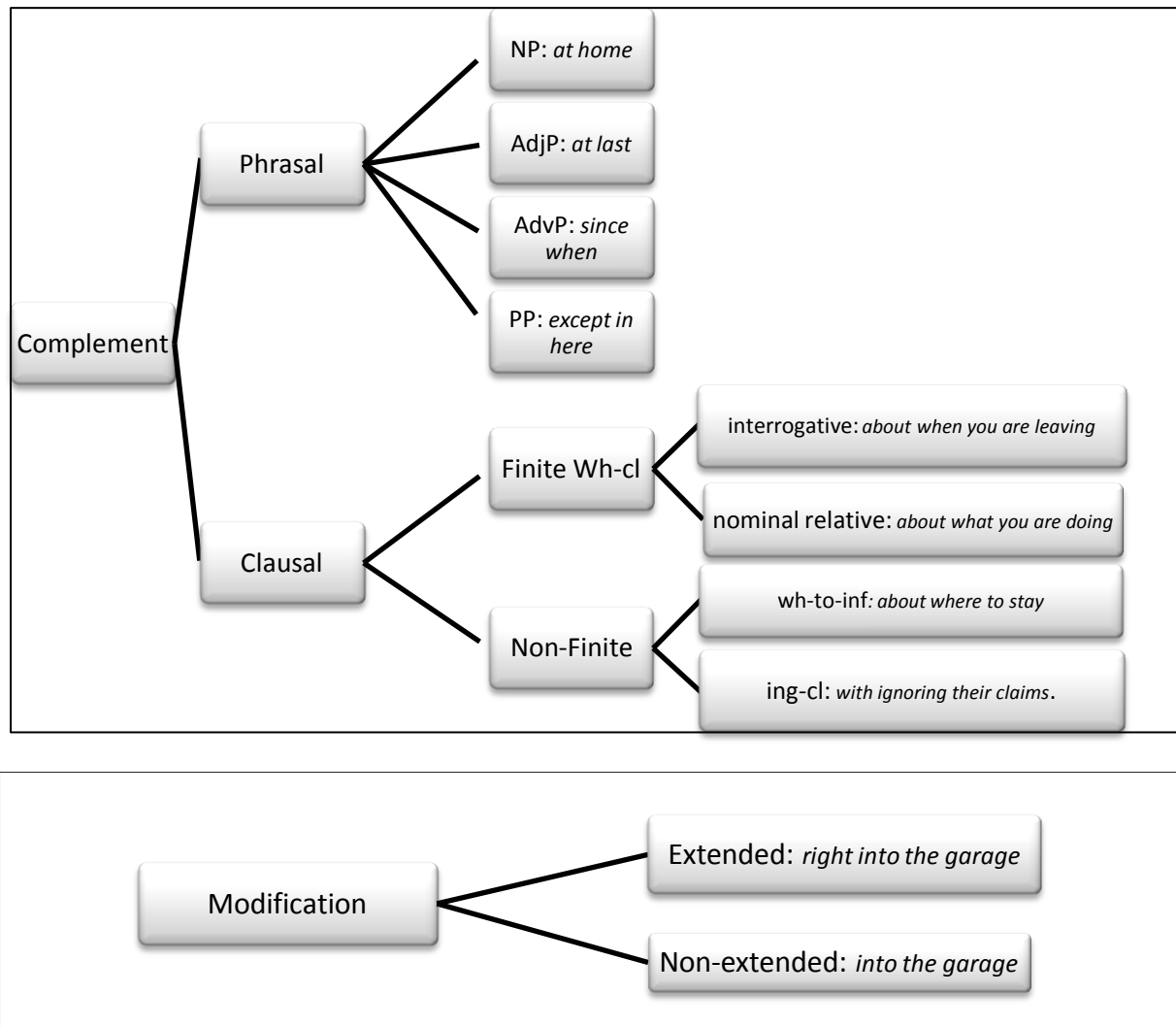
Figure 1. 2 Simple/complex prepositions



After studying the preposition, the light is then shed on the whole prepositional phrase in section [1.3. Structure of a Prepositional Phrase], where the different complements are overviewed, and the distinction between phrasal and clausal units is analysed in terms of

grammatical metaphor (Halliday and Matthiessen, 2004, 2014). Additionally, as part of the study of the structure of PPs, the same section has also dealt with premodifiers of PPs, which are classified according to the meaning expressed. The study of structure is summarised in the following figure.

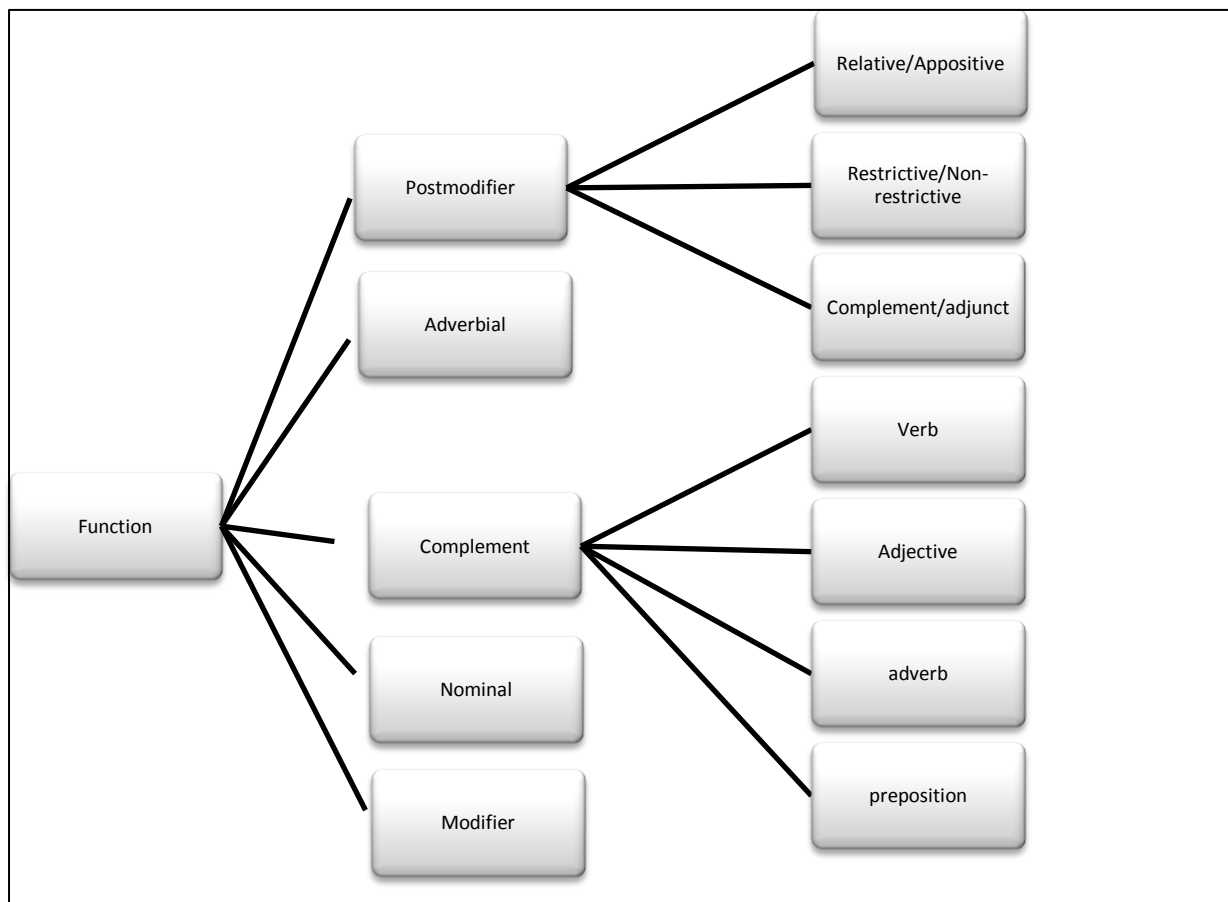
Figure 1.3 Structure of PPs



The last section in the chapter has dealt with the functions a PP can have in the clause. First, PPs functioning as postmodifiers are examined while taking into account the distinctions used to classify them, namely the complement versus adjunct, the relative versus appositive and the restrictive versus non-restrictive distinctions. The link to other structurally different postmodifiers is set, thus revealing the importance of PPs as noun postmodifiers. The second function covered in the chapter is that of adverbials, which have been presented from two different angles: the structural and the functional. The third function is that of complements, as PPs can complement verbs and adjectives. These functions, although being the most frequent, are not the only possible ones, and therefore, the chapter illustrates those

prepositional functions which are rather rare. Meanwhile, other studies about PPs have been cited in order to compare this thesis' results with respect to them. The study of functions has been summed up as follows:

Figure 1. 4 Functions of PPs



The syntactic analysis, and mainly the review of functions, has revealed how important it is to take the prepositional meaning into consideration in order to decide about the function, and the link to the preceding elements. Consequently, the semantic approach to prepositions will be the focus of the following chapter.

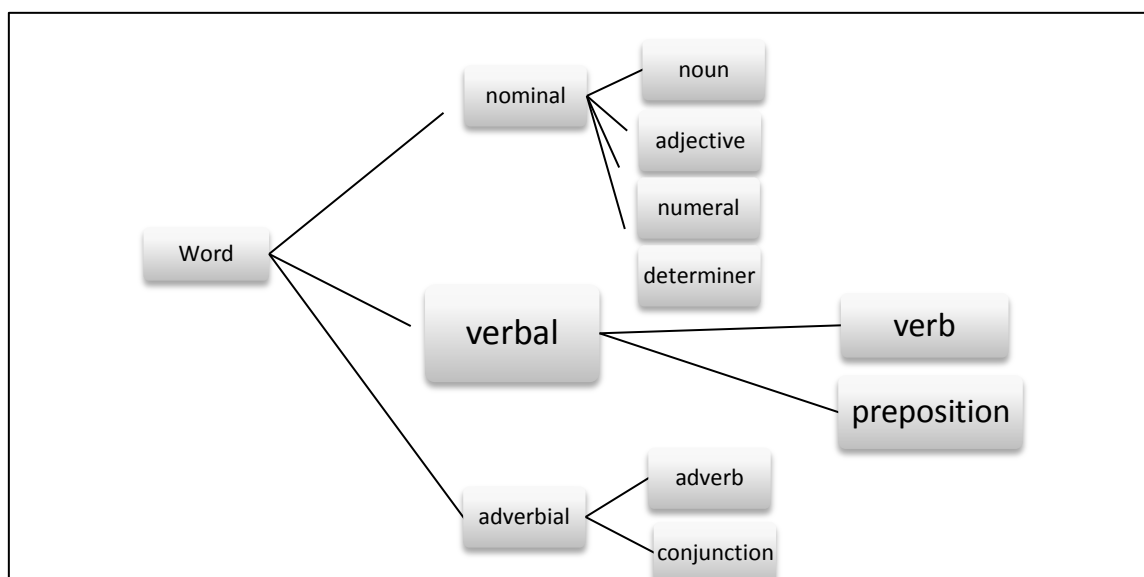
Chapter Two: Semantic Approach

One goal of this thesis is to study the meanings expressed by PPs. These grammatical units contain two obligatory elements, namely the preposition and the complement, which are thought to generate the meaning of the whole phrase (Larson, 2010). Quirk et al. (2005) think that the preposition, syntactically speaking, establishes a relation between two entities one of them being the prepositional complement. From a functional perspective, the linking role played by the preposition is further stressed by the claim that “the preposition serves as a ‘minor process’” (Halliday and Matthiessen, 2014, p. 329). Therefore, in order to present a semantic overview of PPs, the chapter will start by expanding on the predicate-like nature of prepositions, and then will look at the different prepositional meanings starting from those expressing place, as it is thought to be the most congruent meaning.

2.1. The Preposition as a ‘Minor Predicate’²

While expanding on the function of prepositions, Halliday and Matthiessen (2014) claim that “a prepositional phrase is not an expansion of anything but a clause-like structure in which the Process/Predicator³ function is performed by a preposition and not by a verb” (p. 423). The similarity between prepositions and verbs led to the classification of prepositions as belonging to the verbal class, as indicated in the following figure.

Figure 2. 1 Word class recognized in a functional grammar of English (Halliday and Matthiessen, 2014, p. 75)



² The term is adapted from Halliday and Matthiessen (2004, 2014).

³ The Predicator/Complement functions are interpersonal, while Process/Range are experiential.

Prepositions are thought to belong to the verbal class, as shown in figure 2.1, because the latter “indicates in a general way its potential range of grammatical functions” (Halliday and Matthiessen, 2014, p. 76). Therefore, prepositions are seen as having functions similar to those of a verb. This idea is further stressed by the fact that prepositions, like verbs, have complements, and this complement “is felt to be essentially no different from the complement of a full Predicator” (Halliday and Matthiessen, 2014, p. 424). Similarly, Larson (2010) maintains that “the same pattern of constituency seen with verbs and their complements holds with prepositions and their complements” (p. 254). In fact, PPs and non-finite clauses may seem to share, on certain occasions, the same ‘internal structure’ (e.g. *across the lake* and *crossing the lake*).

As exceptions to PPs which are clause-like structures, ‘of-phrases’ occur most of the time as postmodifiers, because, according to Halliday and Matthiessen (2014), “they are not typical prepositional phrases”, rather they function as “structure marker in the nominal group”(p. 425). The following sub-section expands on these PPs.

2.2. Of-phrases

The difference between of-phrases and the other PPs recalls the lexical versus function distinction, about which Keizer (2008) concluded that “all English prepositions are lexical elements to be represented in the lexicon with a meaning definition” (p. 240) and that the only two prepositions that may have, on particular instances, a grammatical function are ‘*of*’ and ‘*by*’. These prepositions are exceptionally function words when associated with deverbal nouns, e.g. “the treatment of the patient by the doctor” (p. 248).

Other cases may also seem devoid of meaning, these are cases where an ‘of-phrase’ is used with certain partitive constructions (*a set of books*, *a piece of cake*, *a lot of trouble*, etc.) (Biber et al., 2007, p. 635/6). In such functions, of-phrases may express, according to Biber et al. (2007), a close semantic relationship between the head and the NP in the of-phrase.

While reviewing the function of ‘*of*’ in of-phrases, Owen presents Sinclair’s argument (1991) which calls for a special treatment of this particle. Sinclair (1991) proposes that ‘*of*’ is not similar to all the other prepositions since it does neither introduce PPs in adjuncts (*She lives in France*) nor PPs as postmodifiers in noun groups. In the example “the horns of the bull”, Sinclair (1991) thinks that both nouns are heads since they both play an important role in determining the meaning of the whole phrase.

From a functional perspective, when an of-phrase postmodifies a noun, the resulting NP contains a head (structural head) and a thing (the semantic core) that are separate

(Halliday and Matthiessen, 2014, p. 383/396). They add that “what is being constructed is a phenomenon that from one point of view appears as a single entity and from another point of view as two” (Halliday and Matthiessen, 2014, p. 396).

To conclude, the preposition ‘of’ is used in order to link two elements in an NP or as a part of a “lexicalised quantifier” (Owen, 2007) since it does not have a clear meaning or set of meanings. Referring back to the distinction between lexical and function words, the claim here is that this preposition is not a lexical item since it is almost devoid of meaning, rather it is a function word; it is used to link items together. The role of this preposition is grammatical since the paraphrase is not different in terms of meaning. The presence of the preposition can be seen as one way to organise the NP in order not to confound the head of the NP with that of the PP although in certain constructions both heads seem to be important in the generation of meaning (e.g. a set of books, a book set).

In addition to ‘of’, Keizer (2008) claims that ‘by’ in deverbal NPs is also a function word (the treatment of the patient by the doctor). In this example, the preposition is used to introduce the agent of the action. In this context, Halliday and Matthiessen (2004) maintain that some participants in the clause are introduced by PPs, the following sub-sections studies those prepositions used to introduce thematic roles.

2.3. Thematic Roles

The study of thematic roles emerged as a response to the need of having a detailed description of the arguments of verbs. Kallfass (2004) argues that they are used to “explain the more specific relations between a predicate and its specific arguments” (p.3). Most roles in a clause are nominal elements; however, some of these are introduced by prepositions. Halliday and Matthiessen (2014) identify certain oblique participants. These are:

- Agent(ive): the bridge was built *by the army*.
- Beneficiary: I sent a letter *to my love*.
- Range: I spoke to him *in fluent Russian*.

(Halliday & Matthiessen, 2004, p.330)

Prepositions are thought to assign roles to their arguments (Saint-Dizier, 2006), and mainly to introduce oblique participants in the clause. Halliday and Matthiessen (2014) maintain that “the preposition does function like some highly generalized kind of process, by reference to which the nominal group that is attached to it establishes a participant status” (p. 329).

The present thesis aims to study the cases where PPs are used to introduce participants in the clause. The purpose is to identify which participants are introduced via prepositions, and therefore, the cause for introduction as indirect/oblique participants in the clause. The predicate-like nature of prepositions does not only influence this type of participants, but also the different meanings expressed by PPs, and overviewed in the following section.

2.4. Prepositional Meanings

The different meanings expressed by PPs are studied by scholars such as Burton-Roberts (1986), Halliday and Matthiessen (2004, 2014), Hofmann (1993), Quirk et al. (1985, 2005), etc. Most semantic accounts are designed for those PPs functioning as adverbials. This study will investigate the different meanings regardless of their functions, in order to see if any correlations between meaning, function and structure occur.

According to Quirk et al. (2005), most PPs have the meaning of place and time while the other meanings are derived from those denoting place, that is the other meanings (time, instrument, cause, etc) have a link, based on metaphorical extension of place prepositions, to the locative meaning.

Many place prepositions have abstract meanings which are clearly related, through metaphorical connection, to their locative uses. Very often prepositions so used keep the groupings (in terms of similarity or contrast of meaning) that they have when used in a literal reference to place. This is often true for example of temporal usage. One may perceive a stage-by-stage extension of metaphorical usage in such a series as (a) to (d):

- a. In shallow water [purely literal]
- b. In deep water [also metaphorical: 'in trouble']
- c. In difficulties [the noun is not metaphorical, but the preposition is.]
- d. In a tough spot ['in a difficult situation'; the preposition is analogous to that of c), but another locative metaphor is introduced by the noun. The result is a phrase that could not occur in a literal sense, because spot would then require at or on (dimension-type 0)].

(Quirk, et al., 2005, p.685)

In this example, the same preposition is used to show the link between spatial purely literal meanings and metaphorical extensions of space. In the example they gave, Quirk et al. (2005) prove that the process of meaning extension proceeds gradually and that almost all meanings expressed by PPs can be traced back, through metaphor, to the original spatial meaning. Being the most congruent meaning, spatial prepositions are studied in the following section, then temporal and metaphorical senses.

2.5. Spatial Prepositions

Different studies on prepositional meanings revealed that the same preposition can have different meanings; but place is the most basic (Biber et al., 2007; Downing & Locke, 2006; Halliday & Matthiessen, 2004; Quirk et al. 2005). In fact most PPs express place and most place adjuncts are PPs.

Different classifications are offered, the most detailed description is offered by Quirk et al. (2005), who speak about destination and position from negative and positive perspectives. These distinctions are also classified according to dimension, since “when we use a preposition to indicate space, we do so in relation to the dimensional properties, whether subjectively or objectively conceived, of the location concerned” (p. 673). This means that a preposition implicitly carries the point of view of the writer/speaker since it situates an entity with respect to another one as seen from the angle of the writer. The following table designed by Quirk et al. (2004) summarises these distinctions.

Table 2. 1 Space and dimension (Quirk et al., 2005, p. 673)

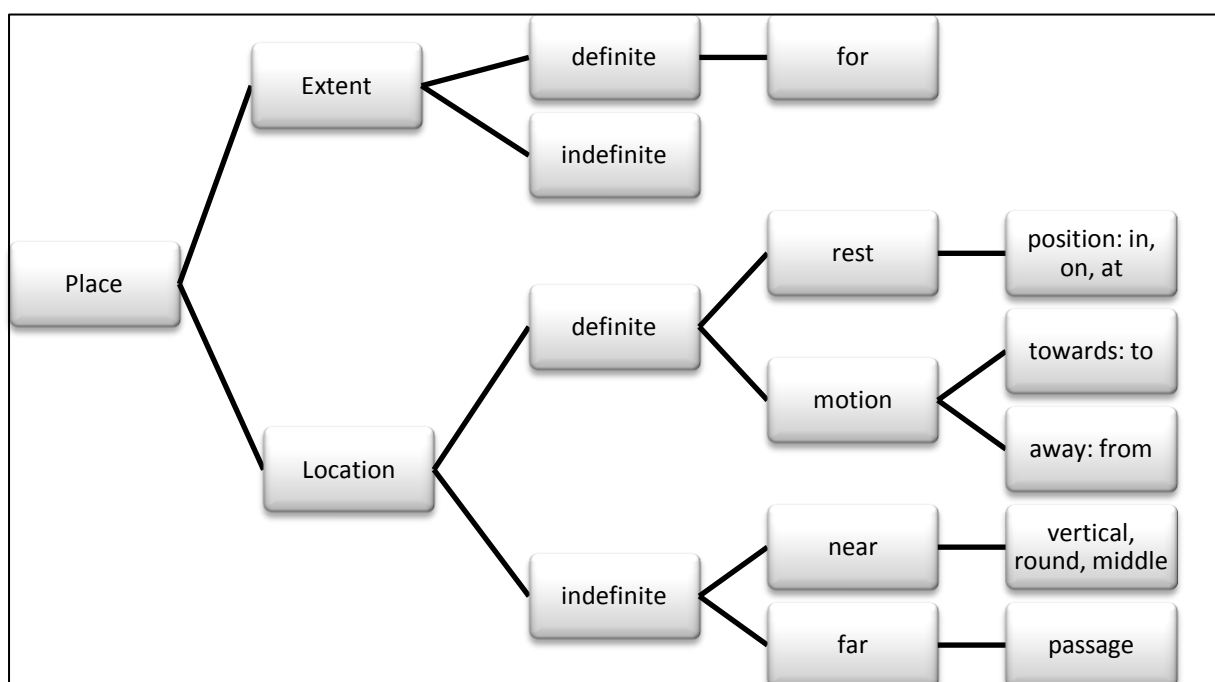
<i>destination</i>	<i>position</i>	<i>destination</i>	<i>position</i>	
<i>to</i> → X	At • X	(away) from X →	Away from X •	Dimension-type 0 (point)
<i>on (to)</i> —	on —•	off —	off —•	Dimension-type 1 or 2 (line or surface)
<i>in(to)</i> □	in □	Out of □	Out of □ •	Dimension-type 2 or 3 (area or volume)
<i>Positive</i>		<i>Negative</i>		

Positive position and destination are expressed mainly by the prepositions: at, to, on, onto, in, into (Quirk et al., 2005, p. 675). Quirk et al. (2005) maintain that between the meanings of destination and position there is a relation of cause-effect. In fact, saying that ‘Ann went to Oxford’ means that “Ann was at Oxford”. However, source or negative position is expressed through: away from, off, out of. The same relation of cause-effect exists between both meanings

While reviewing the different approaches to the syntax and semantics of spatial prepositions, Asbury et al. (2008) argue that “spatial adpositions are divided between those which denote the ontological categories of *Path* (e.g., to, from, via) and *Place* (e.g., in, on, up)” (p. 1). This distinction has been a result of the influential work of Jackendoff (1973) on conceptual structure.

The model offered by Halliday & Matthiessen (2004, 2014) construes the different meanings as a system of pair choices. Space is first of all seen as either extent (walk for seven miles) or location (work in the kitchen). Each of which can be definite (at home) or indefinite (near). Locations can be either absolute (in Australia) or relative (near). And finally, Location can show either rest (in Sydney) or motion (to/from Sydney). However, this functional perspective does not account for the positive/negative dimension mentioned earlier. Although Quirk et al.’s model contains more details; the functional classification highlights the different choices by presenting all the possible meanings as networks in a system of choices (figure 2.2).

Figure 2. 2 Classification of prepositions expressing place (Halliday and Matthiessen, 2014)



Such classification of prepositions shows the different moments of choice to express a particular spatial indication. In the present study the organisation of the different meanings in a systemic way will be profitable in the analysis of the corpus since it will be meaningful at two levels of the interpretation: on the one hand it allows the study of the particular construal made by the author and second it uncovers the rejected alternatives.

The focus on space is caused by its importance in being one of the three deictic dimensions (participants, space, time) that people use to talk and understand each other (Svorou, 1994). Different scholars have studied the notion of space in language mainly from cognitive, philosophical and linguistic perspectives (Evans & Green, 2006; Heine, 1997; Lakoff; Langacker, 1987, 2008; Svorou, 1994; Talmy, 2000). The present thesis takes into consideration advances from cognitive linguistics, and seeks to explain the role of conceptual metaphor in linking the different meanings expressed by a preposition, as shown below.

2.5.1. Cognitive Approach

The aim of the different studies conducted in cognitive linguistics is to investigate how language construes scenes from real life; that is how to reproduce reality using language mainly that the latter offers different possibilities of encodings or construals. Svorou (1994) proposes an intermediate level between language and experience, which is cognition. Although different definitions are propounded, what is agreed on is that this cognition contains representations of reality used to understand and communicate new information (Svorou, 1994). Therefore, the role of the speaker's cognition is important both in construing and exchanging experience. The following sub-section looks at the notion of construal, then proposes a link between the different meanings expressed by PPs.

2.5.1.1. Construals

Following Svorou (1994) spatial expressions can be ranked on a scale of *explicitness* since each expression “carries a different degree of explicitness in the encodings of referents in the world” (p.6). Langacker (2008), on the other hand, speaks about the degree of *specificity* defined as “the amount of detail with which spatial relations are described” (Svorou, 1994, p. 6). To illustrate both concepts, Svorou (1994) gives the example of “on the left hand side of Main Street as you go towards downtown, next to the Utica subway station”, which shows a high degree of *explicitness* because “it makes use of surrounding landmarks” and a high degree of *specificity* since “it not only tells us about the surrounding objects, but also the direction of travel...” (p. 6).

When speaker and hearer share the same ‘Here and Now’, the speaker may use a low degree of explicitness. However, where the writer and reader do not share the same deictic dimensions, like the situation of the corpus under study, the writer needs to be explicit and specific so that the reader does not get lost. On the other hand, scientific writing is aimed at

specialists who are knowledgeable about the field of science; therefore, some details can be seen as useless if the writer knows who the reader is.

While dealing with spatial PPs, the aim of the present thesis is to study how specific and explicit are the different genres and disciplines in encoding these elements. In other words, how writers are going to reconcile the need for explicitness with specificity in order to communicate the maximum of information and at the same time to avoid the unnecessary information which can be understood by the expert reader and can divert his/her attention.

The relevance of the cognitive approach to the semantic analysis of the spatial PPs is seen in the relation that it bears to the systemic classification of meanings. In fact, analysing PPs by reference to the system of choices reveals the writer's own construal in comparison to other possible construals.

Additionally, entities can be located only when an "asymmetrical relation" (Langacker, 1987) is observed between the entity to be located and another one with respect to which it is located (e.g. size, containment, support, orientation, order, direction, distance, etc.). In describing this asymmetrical relation, Talmy proposes the notion of figure and ground where figure refers to the entity described and the ground the reference entity according to which the first is being described (Talmy, 2000, p. 184). On the other hand, Langacker (2008) defines Trajector (TR) as "the most prominent participant...the entity construed as being located, evaluated, or described" with respect to the Landmark (LM) (p. 70).

The notion of construal shows that the writer is faced by different moments of choice; the choice of the figure and ground elements, and the choice of the degrees of specificity and explicitness of the preposition. The present thesis intends to analyse the implications behind the choices made by the authors of academic writings and then to link them to the highly conventionalised context of writing. Another issue that has been studied from a cognitive perspective is the plurality of meanings expressed by a single preposition.

2.5.1.2. Polysemous Prepositions

Prepositions have "distinct meanings associated with a single form" (Tyler and Evans, 2003, p. 4). These elements can be taken as cases of homonymy, monosemy or polysemy.

The homonymy approach, which claims that the different prepositional meanings are not related, has been rejected as different studies showed that a link exists between the prepositional meanings and that synchronically, new meanings emerged out of older ones

(Brugman, 1983, 1988; Brugman and Lakoff, 1988; Coventry and Mother, 2002; Keizer, 2008; Tyler & Evans, 2001, 2003, 2004; Van der Gucht, 2007).

The second approach to meaning is monosemy. Tseng (2000) describes this approach as focusing on a core sense, that is, each preposition has one core sense from which all the meanings are derived in context (p. 23). A single core meaning needs to be so abstract that it is sometimes hard to be identified.

However, Tyler and Evans (2003) argue for the polysemy approach where “the meanings associated with a spatial particle such as *over* are related in some fashion” (p. 7). They concluded that the central meaning is not linguistic in nature rather it is conceptual. In fact, “the linguistic utterance acts as a minimal prompt for conceptual construction which is far richer than the combined information provided by the lexical items” (Tyler and Evans, 2003, p. 15). Any act of interpretation involves recalling experiences from the real world. For instance the preposition ‘*in*’ prompts the concept of ‘containment’, experienced by our bodies since early childhood (Tyler and Evans, 2003, p. 26/7).

Evans and Tyler (2004) claim that “a particular Trajector (TR) can, in conjunction with a particular Landmark (LM), affect the interpretation of the preposition in context” (p.1). Based on section [2.4. Prepositional Meanings], the meaning of a preposition changes with respect to the immediate linguistic context. These extensions are made possible through when the complement is metaphorical, thus resulting in abstract meanings, or when the preposition is explored metaphorically, in which case a new meaning emerges. The conceptual core meaning of a preposition extends meanings through conceptual metaphor.

2.5.2. Conceptual Metaphor

Lakoff and Johnson (1980) claim that metaphor is not only a literary device used to embellish one’s language and style since “our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature” (Lakoff and Johnson, 1980, p. 3). In a conceptual metaphor, the knowledge of the concrete world is mapped onto more abstract domains in order to be able to talk and think about them. Therefore in a conceptual metaphor, a concrete domain known as the source domain and an abstract domain, called the target domain. This means that the speaker will be using words from the concrete domain to speak about the target domain.

Applying this on the use of prepositions, the source domain is mainly that of place since it is the most concrete. The other target domains vary differently, but the claim is that they are linked, based on the conceptual polysemy, to the concrete source domain. The core

conceptual meaning of prepositions ‘prompts’ a concept that is originally spatial (Tyler and Evans, 2003).

The principle of conceptual metaphor will be adopted while dealing with different meanings of the same preposition. Metaphorical prepositions are those which are used primarily to denote space and then extend their meanings to other functions such as manner, means, etc. In this context, Halliday and Matthiessen (2014) argue that “abstract space is the source of various expressions that serve as realizations of other types of circumstance such as Manner (walk on one’s legs), Role (cut into cubes)” (p.318). These different meanings are said to be metaphorical since they have a link to the original spatial meaning and this link between the meanings is a case of polysemy.

The core meaning of a polysemous preposition is considered conceptual rather than linguistic. This conceptual core meaning is an abstraction of an originally spatial meaning , and is applied in case a preposition is used in context, to express a concrete, an abstract or a metaphorical meaning.

2.5.3. Conclusion

This section has sought to review some of the literature about spatial prepositions. It started with an identification of the different meanings expressed by prepositions from different perspectives, which then resulted in a systemic classification that will be adopted in the analysis (figure 2.2). However, semantic investigations of prepositions revealed the importance of the cognitive approach in explaining their use (Hlioui, 2013). In fact, the cognitive approach explains, through the degrees of specificity and explicitness, how prepositions construe reality. Additionally, this approach also explains the relation between prepositional meanings. This relation is thought to be based on conceptual polysemy, where the conceptual congruent meaning is originally spatial, from which a conceptual meaning is derived, and where the other meanings are derived via conceptual metaphor.

Based on the systemic classification of spatial meanings (figure 2.2), the purpose of the present thesis is to investigate the choice of prepositions used to construe one description of reality in light of what could have been said but was not. Both the degrees of specificity and explicitness will be taken into account in order to measure the influence of the context on their choice. Moreover, the analysis seeks to study the different meanings expressed by each studied prepositions in order to explore the conceptual polysemy of prepositions. The aim is to consider the role of the context of scientific writing on the choice and interpretation of spatial meanings.

Different meanings are conceptually built based on space. Halliday and Matthiessen (2014) claim that “[i]n the modern elaborated registers of adult speech and (especially) writing, the circumstantial elements have evolved far from their concrete origins – especially the spatial ones” (p. 332). The following sub-section deals with the closest meaning to space: time.

2.6. Temporal Prepositions

At, on, in, over, during, for, since and *until* are prepositions used to denote time. Most of these prepositions are used primarily to express space. The link between temporal and spatial prepositions is attributed to the link between these notions philosophically and physically. Boroditsky (2001), who dealt with the Mandarin and the English speakers’ conceptions of time, argues that:

Across languages people use spatial metaphors to talk about time... Those aspects of time that are not constrained by our physical experience with time are free to vary across languages and our conceptions of them may be shaped by the way we choose to talk about them.

(Boroditsky, 2001, p.4)

The claim brought by Boroditsky (2001) is that temporal meanings are either expressed by words from the spatial experience or, otherwise, result from choices made by the speech community. This means that each language encodes different ways of expressing certain temporal relations, and it is up to the speaker to choose among all the possibilities available in language.

The concepts of space and time have been the focus of different reflections by philosophers and investigations by physicists and mathematicians (DiSalle, 2006, p.1). In fact, theories that explain time are partly based on place; that is “where the moment or interval in time is understood analogously to a point or area in space” (Jaszczolt, 2009, p. 32). This was a direct result of the theory of relativity established in the beginning of the 20 century, which claims that space and time are “intertwined” (Jaszczolt, 2009, p. 6).

Casasanto and Boroditsky (2008) concluded after studying six psychological experiments that “people are unable to ignore irrelevant spatial information when making judgments about duration, but not the converse” (p. 579). This conclusion confirms the asymmetry in metaphor between space and time. They also came to prove, while trying to answer the question “is the way we think about time dependent on space even when we’re not using language at all?”, that language use reflects the way we think about these concepts; “that the metaphorical relationship between space and time observed in language also exists in

our most basic representations of distance and duration” (Casasanto and Boroditsky, 2008, p. 579/580).

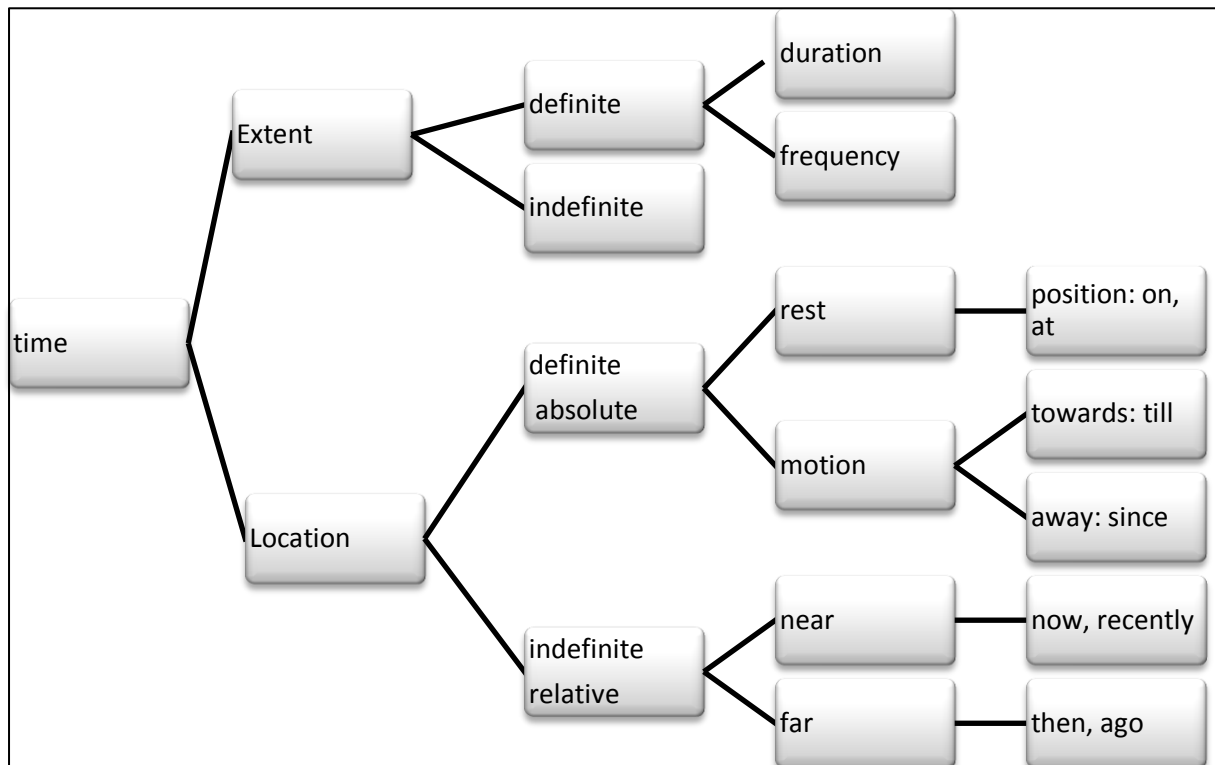
Different classifications of temporal references have been advocated by grammarians. According to Quirk et al. (2005) “[t]emporal relations are especially dependent for their expression upon figurative extension of locative items such as *in* and *at*.... As with space, several subroles can be distinguished, some of them closely analogous to those of space” (p. 481). The sub-roles distinguished by Quirk et al. (2005) are:

- **Fixed position:** on Sunday, last week
- **Duration:** until, up to, since, from
- **Frequency:** frequently, three times
- **Relationship:** still, already

Similar to this classification is the classification given by Biber et al. (2007), who maintain that time circumstantials may express:

- **Position in time:** tomorrow, in January, nowadays
- **Duration:** for a week, years, for fifteen years
- **Frequency:** every single day, very often
- **Relationship:** before, after, still

These two classifications seem to be similar; however, the model offered by Halliday and Matthiesen (2014) is different as it includes more details. It also clarifies the parallel drawn between the spatial and temporal meanings, where for some meanings (position) the same prepositions are used whether to denote space or time. The merit of such classification is that it draws a clear parallel to spatial references. Based on these classifications, the following figure presents the classification that will be adapted in the analysis.

Figure 2. 3 Classification of prepositions expressing time

The systemic organisation of temporal meanings would be of great use in the analysis since it reveals the similarities to spatial meanings. Additionally, such organisation would highlight the choice of the writer in comparison to the other rejected alternatives. The analysis will explore this dimension and will link the choices in the corpus to the context of the disciplines and genres studied.

In addition to the notion of time which is constructed after space, other meanings are also derived from PPs used primarily as place indicators.

2.7. Metaphorical Prepositions

Despite their limited numbers, prepositions can express different meanings,. The same prepositions used to construe spatial experience are also used to talk about other domains through metaphorical extension, as mentioned in section [2.5.2. Conceptual Metaphor]. The present section seeks to review the different meanings expressed by PPs. The following subsections present the different meanings expressed by each function, from two main perspectives: the structural and the functional.

2.7.1. Structural Perspective

The account given by Quirk et al (2005) concerns adverbials. From a structural perspective, they are four types: adjuncts, subjuncts, disjuncts and conjuncts. According to Quirk et al (2005), PPs functioning as adjuncts can have the following meanings, in addition to space and time:

Table 2. 2 Structural classification of meanings (adjuncts) (Quirk et al., 2005, p. 695/714).

<i>Meanings</i>	<i>Examples</i>
Means/agentive	<p><u>Manner:</u> She performed the operation <i>with great skill</i>.</p> <p><u>Means:</u> They left <i>by plane</i>.</p> <p><u>Instrument:</u> She tried to open the lock <i>with a knife</i>.</p> <p><u>Agentive:</u> They were noticed <i>by no one</i>.</p> <p><u>Stimulus:</u> I 'm astonished <i>at your reaction</i>.</p>
Cause/purpose	<p><u>Cause:</u> She lost her job <i>because of her age</i>.</p> <p><u>Reason:</u> He was fined <i>for drunken driving</i>.</p> <p><u>Motive:</u> She did it <i>out of kindness</i>.</p> <p><u>Purpose:</u> Everyone run <i>for shelter</i>.</p> <p><u>Destination:</u> I'm leaving <i>for Seattle</i>.</p> <p><u>Target:</u> This novel is aimed <i>at a young audience</i>.</p>
Accompaniment:	I'm so glad you're coming <i>with us</i> .
Support and opposition	He's always arguing <i>with his sister/ against nuclear power</i>
Having	A man <i>with a red nose/of courage</i>
Concession	I admire him <i>in spite of/despite/ for all/ for all his faults</i>
Respect	She is advising them <i>with respect to law</i>
Exception and addition	We had a pleasant time <i>except for/ with the exception of the weather</i>
Subject matter	She is lecturing <i>about/on new techniques of management</i> .
Material/ingredient	This cake is made <i>with eggs</i>
Standard	He is good <i>at games</i> . He is not bad <i>for a youngster</i>
Reaction	I was surprised <i>at his refusal</i> .

Two main ranges of meanings are expressed by PPs functioning as adjuncts: the cause/purpose spectrum and the means/agentive spectrum. The other meanings are not grouped. The second category of adverbials is that of subjuncts, which cannot have the same role as

adjuncts and are rather subordinate in the clause. The meanings they express are represented in the following table.

Table 2. 3 Structural classification of meanings (subjuncts) (Quirk et. Al, 2005, p. 567)

<i>Meanings</i>	<i>Sub-meanings</i>	<i>Examples</i>
Wide orientation	viewpoint	He has done better <i>from a personal point of view</i> .
Narrow orientation	Subject-oriented	<i>With great pride</i> , he accepted the award.
	Emphasizers	I can't tell you <i>for sure</i> .
	Intensifiers	Downtoners: I didn't enjoy it <i>in the least</i> .
	Focusing	restrictives: The workers, <i>in particular</i> , are dissatisfied with the government. Additives: <i>in addition</i>

The third category is that of disjuncts which have ‘a superior role as compared with the sentence elements’ (Quirk et al, 2005, p. 613). These adverbials are meant to comment on the style or the content of the whole sentence.

Table 2. 4 Structural classification of meanings (disjuncts) (Quirk et al., 2005, p. 615)

<i>Meanings</i>	<i>Sub-meanings and Examples</i>
Style	Modality and Manner: <i>In short</i> , he is mad but happy. Respect: Mildred seemed to enjoy the concert, <i>from what her brother told me</i> .
Content	Degree of or condition for truth of content: He won the race <i>in spite of/ despite his injured leg</i> . Value judgement of content: <i>Of course</i> , nobody imagines that he will repay what he borrowed.

Finally, the last type of adverbials is that of conjuncts, which “have the function of conjoining independent units rather than one of contributing another facet of information to a single integrated unit’ (Quirk et al, 2005, p. 631).

- **Listing:** in the first place
- **Summative:** in conclusion, in sum
- **Appositive:** in other words
- **Resultative:** as a result
- **Inferential:** in that case
- **Contrastive:** in contrast,
- **Transitional:** in the meantime.

(Quirk et al., 2005, p. 631)

The meanings expressed by the four sub-categories of adverbials seem to be interrelated, and Quirk et al (2005) speak about blends of meanings, where more than one interpretation is possible. In addition to the structural perspective which claims to be based on grammar, the functional approach gives other classifications based on meaning.

2.7.2. Functional Perspective

From a functional perspective, two classifications are overviewed: Biber et al’s (2007) and Halliday and Matthiessen’s (2014). Starting with the classification offered by Biber et al (2007), three main types of adverbials are proposed: circumstantial, stance and linking. Circumstantial adverbials are said to be ‘the most varied class, as well as the most integrated into the clause structure. Circumstance adverbials add information about the action or state described in the clause, answering questions such as ‘How, When, Where, How much, To what extent?’ and ‘Why?’ (Biber et al, 2007, 763). The classification is presented in the following table.

Table 2. 5 Functional classification (Biber et al., 2007, p. 776- 879)

<i>Circumstantial</i>	<i>Stance</i>	<i>Linking</i>
Process: manner (manner proper; comparison; accompaniment) means; instrument; agent Contingency: reason/cause; purpose; concession; condition; result Extent/degree: amplifier; diminisher Addition/restriction: addition; restriction Recipient	Epistemic Actuality and reality, Source of knowledge, Limitation (on the whole, in general) Viewpoint or perspective (in my view) Attitude (for all I/we know/care) Style (in short, in a word, in brief)	Enumeration and addition (for one thing, for another, in addition) Summation (in sum, in conclusion) Apposition (in other words, for example) Result/inference Contrast/concession Transition (by the way)

Instead of looking at meaning alone, the framework addressed by Halliday and Matthiessen (2014) focuses on the function of expressions in language. The classification of the meanings expressed by PPs is part of the description of adjuncts in SFL. The three layers of meaning in SFL are reflected on adjuncts. In fact, experiential adjuncts are circumstantial elements, interpersonal adjuncts are modal adjuncts and textual adjuncts are the conjunctive ones (Halliday and Matthiessen, 2014, p. 156), as revealed in table. The classification is summarised in the following table.

Table 2. 6 Functional classification (Halliday and Matthiessen, 2014, p. 187-193)

<i>Circumstantial</i>	<i>Modal</i>	<i>Conjunctive</i>
Manner (means, quality, comparison, degree)	Mood (temporality, modality, intensity)	Appositive (in other words, for instance)
Cause (reason, purpose, behalf)	Comment adjunct (propositional, speech functional)	Corrective (at least)
Contingency (condition, concession, default)		Dismissive (in any case)
Accompaniment (comitative, additive)		Summative (in short, in conclusion)
Role (guise, product)		Verificative (in fact, as a matter of fact)
Matter/ Angle		Additive (in addition)
		Adversative (on the other hand)
		Variative (on the contrary, except for)
		Temporal: (at the same time, at once)
		Comparative (in the same way)
		Causal (as a result, for this reason)
		Conditional (in that case, under the circumstances)
		Concessive (despite)
		Respective (in this respect)

Table 2.6 summarises the functional classification as propounded by Halliday and Matthiessen (2014).

2.7.3. Conclusion

This section has tried to summarise the major semantic classifications of PPs. What can be deduced from the classifications is that the major meanings are similar across the perspectives, as shown in the following figure.

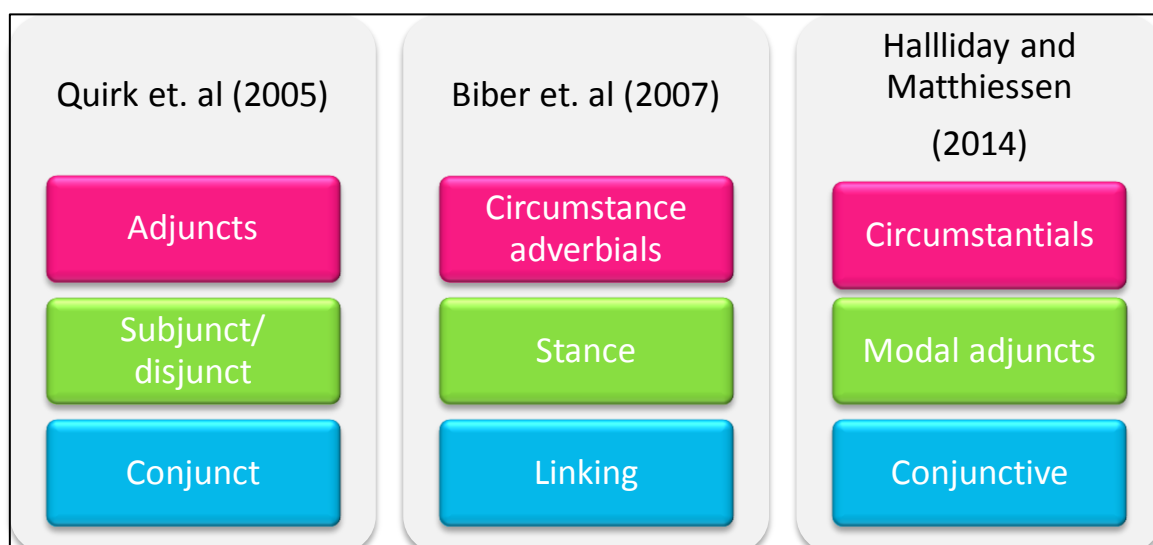
Figure 2. 4 Classification of adverbials from three perspectives

Figure 2.4 shows that the classifications, although using different terminologies, are almost similar with respect to the major semantic and grammatical features.

Seeing the similarity between the approaches, the purpose of the present thesis is to come up with a classification based on the ones overviewed, to analyse the corpus. Starting with adjuncts or circumstances and particularly with the meaning of process, Quirk et al. (2005) include the meaning of stimulus, while Biber et al. (2007) give a detailed account of manner PPs: manner proper, comparison and accompaniment. This last meaning, however, is not necessarily linked to manner; which can be seen in Halliday and Matthiessen’s account. Besides what Halliday and Matthiessen (2004) call ‘quality’ is ‘manner’ in the structural approach. The meaning of agent, which, according to Biber et al. (2007) and Quirk et al (2005), belongs to the category of adverbials, is treated, in the functional framework, as a participant in the clause. In the present thesis, participants are treated separately.

The second spectrum of meanings according to the structural perspective includes recipient and target, which are seen as participants within the clause. The meanings of contingency seem to be absent from the structural approach, which tends to treat them as a comment on the clause. Accompaniment in SFL accounts for accompaniment in the structural perspective in addition to additive disjuncts. These latter meanings do not really seem to convey a meaning of comment, so they will be considered part of the circumstantial adjuncts. The meaning of ‘respect’ in the structural account is parallel to the meanings of matter in SFL, while ‘angle’ is a textual rather than experiential element. As for ‘having’, it can be seen as a subtype of accompaniment. The meanings of ‘target’, although seemingly expressing place, is rather metaphorical, and need to be distinguished from purpose, unlike ‘intended destination’, which is spatial. The meanings of amplifiers and diminishers mentioned by Biber et al (2007) as part of circumstances seem rather to be personal comments on part of the clause. The following table summarises the differences and gives the adopted classification.

Table 2. 7 Meanings expressed by adjuncts/circumstantials

	<i>Quirk et al. (2005)</i>	<i>Biber et al. (2007)</i>	<i>Halliday and Matthiessen (2014)</i>	<i>Adopted Classification</i>
Process	Manner	Manner (manner	Manner	Manner (manner
	Means	proper, comparison,	Means	proper,
	Instrument	accompaniment)	Quality	comparison)
	Agentive	Means	Comparison	Means
	stimulus	Instrument	degree	
		agent		

Cause	Cause	Reason	Cause	Pure cause
	Reason	cause	Reason	Reason
	Motive	Purpose	Purpose	Result
	Purpose	Concession	behalf	Motive
	Destination	Condition		Behalf
	target	result		Purpose Target
Contingency	Concession		Contingency (condition, concession, default)	Condition Concession Default Contrast
Other Meanings	Accompaniment	Extent/degree	Accompaniment	Accompaniment
	Support and opposition	Addition/restriction	(comitative, additive)	(comitative, having, material/ ingredient,
	Having	Recipient	Role (guise/ product)	exception and addition)
	Respect		Matter	Role
	Exception and addition		Angle	Respect
	Subject matter			Standard
	Material/ingredient			Support and opposition
	Standard			
	Reaction			

As for modal adjuncts, stance adverbials or disjuncts and subjuncts, the classification offered by Quirk et al (2005) seems to be quite interesting at the level of grammar, showing whether the comment is on part of the clause or on the whole clause, however, it is not all the time possible to determine which comments have a wide orientation, and which ones have a narrow orientation. Besides the meaning of concession cannot be characterised all the time as a comment, although it expresses an unexpected result with respect to the reader. This is also the case for temporality, which in these cases expressed through adverbs rather than PPs. The choice in the present thesis is to deal with three main categories of stance adjuncts: intensity (including emphasizers, intensifiers, focusing, limitation, etc), style and content, as revealed in the following table.

Table 2. 8 Meanings expressed by stance/modal adjuncts

<i>Quirk et al. (2005)</i>	<i>Biber et al. (2007)</i>	<i>Halliday and Matthiessen (2014)</i>	<i>Adopted Classification</i>
Subjunct	Epistemic:	Mood adjuncts:	intensity
Wide-orientation	Actuality and reality	Temporality	

(viewpoint)	Source of knowledge	Modality	
Narrow-orientation	Limitation	Intensity	
(emphasizers, intensifiers, focusing)	Viewpoint/ perspective		
Disjunct	Attitude	Comment adjuncts:	style
Style (modality, manner, respect)		Speech-functional	
Content (truth, value judgement)	Style	Propositional	content

Table 2.8 reveals that the three main classifications of the interpersonal adjuncts is almost similar, except for the meaning of point of view, which is not taken into account in the SFL overview. The cause behind this choice is the meaning of ‘angle’, which is classified as experiential. The adopted classification does not account for this meaning too. Moreover, the different meanings of modality, emphasizers, intensifiers, and focusing are summarised in one meaning: intensity, first because most of these meanings are realised via adverbs, and second, because the different shades of meanings may result in low frequencies in the analysis phase.

The last type of adverbials is not accounted for in the functional approach because of the claim that they express the same meaning as circumstantials. The other classifications of linkers are quite detailed but also similar. The adopted ones are: addition, summation, appositive, resultative, contrastive, and transitional.

Table 2. 9 Meanings expressed by conjunctive/linking adverbials

<i>Quirk et al. (2005)</i>	<i>Biber et al. (2007)</i>	<i>Halliday and Matthiessen (2014)</i>	<i>Adopted Classification</i>
Listing	Enumeration	and Appositive	Addition
Summative	addition	Corrective	Summation
Appositive	Summation	Dismissive	Appositive
Resultative	Apposition	Summative	Resultative/causal
Inferential	Result/inference	Verificative	Contrastive
Contrastive	Contrast/concession	Additive	Transitional
transitional	Transition	Adversative	Verificative
		Variative	Adversative
		Temporal	Spatio-temporal

Comparative	Comparative
Causal	respective
Conditional/concessive	
Respective	

Tables 2.7, 2.8 and 2.9 summarise the semantic classifications studied in this chapter, and give the classification that will be adopted in the analysis of the present thesis. This classification, although concerning only adverbials, will be adopted in the analysis of all the PPs, regardless of their functions. The purpose is to investigate the frequency of meanings, the way they expressed, and to identify correlations between the prepositional meanings and functions in case they exist.

2.8. Concluding Remarks

The present chapter has sought to study prepositions from a semantic perspective. Based on the similarity to verbs/predicates in their relation to sentence arguments (Halliday and Matthiessen, 2004, 2014; Larson, 2010; Radford, 1988), the first section has investigated the link between prepositions and their complements, as far as meaning is concerned.

However, not all the prepositions are considered as bearing this similarity to verbs since ‘of-phrases’ only link constituents in NPs, and therefore function as postmodifiers. Other prepositions, distinguished for introducing participants in the clause, carry thematic roles [2.3. Thematic Roles].

Except for these cases, prepositions carry different meanings classified by function. The most congruent of these is space, which presents, according to the cognitive perspective, one particular construal of reality. The cognitive perspective is also addressed to solve the problem of the various meanings expressed by one single preposition. Opted for is the ‘principled polysemy’ model by Tyler and Evans (2004), which stipulates the presence of a core conceptual meaning that links, via metaphorical extension, the spatial meaning to the others. In a conceptual metaphor, space can be either concrete or abstract, wherefrom other meanings are derived, the closest being time. Space and time are thought to be related, and the present thesis has opted for two parallel classifications (figure 2.2 and 2.3) to analyse the corpus and explore, meanwhile, the similarities and differences between the notions.

The chapter ends with a review of the metaphorical meanings expressed by prepositions, from two different perspectives: the structural and the functional. Tables 2.7; 2.8 and 2.9 summarise the classifications reviewed, and offer the classification that will be adopted in the analysis. The aim of this research is to study the semantic choices made in the

corpus, and to link them to the context of writing, which is the genres of PhD Theses and Research Articles and the disciplines of Medical and Social Sciences. In order to have better insights into these genres and disciplines, the following chapter focuses on academic writing.

Chapter Three: Academic Writing

This chapter seeks to identify ‘academic writing’ as being the register chosen to study the PPs from syntactic and semantic perspectives. Academic writing is different from other instances of language use because of its characteristics, defined by Bloomfield as:

The use of language in science is specialized and peculiar. In a brief speech the scientist manages to say things which in ordinary language would require a vast amount of talk...the scientist use of language is strangely effective and powerful...it is this peculiar use of language which distinguishes science from non-scientific behaviour.

(Bloomfield, 1939, p. 1)

Bloomfield stresses the peculiarity of the language of science, which has a “prototypical syndrome of features” characterising it (Halliday, 1988). Language use in the academia is influenced by the content it carries, the participants in the process of writing, and the setting within which it is created. Although the focus of the present thesis is on the grammatical category of PPs, the syntactic description is not meant to be purely formal and surface-level, i.e., focusing on formal aspects of language. Rather the orientation of the present research is to link the piece of writing to its context through answering the question “why a particular type of conventional codification of meaning is considered appropriate to a particular institutionalized socio-cultural setting” (Bhatia, 1993, p. 4-5). Therefore, the present thesis proposes the generic perspective to study academic writing in order to seek form-function correlations within genres (Bhatia, 1993, p. 11).

Therefore, after presenting ‘genre analysis’ as a theoretical framework to analyse the corpus [section 3.1. Genre Analysis], this chapter looks at the different genres and disciplines opted for in the thesis [section 3.2. Research Genre and 3.3. Disciplinary Variations] and ends with a register analysis of each sub-corpus [section 3.4. Register Analysis].

3.1. Genre Analysis

There are different views and terminologies describing genre analysis. Bhatia (2004) defines and summarises the major trends as following.

Genre analysis is the study of situated linguistic behaviour in institutionalized academic or professional settings, whether defined in terms of *typification of rhetorical action*, as in Miller (1984), Bazerman (1994) and Berkenkotter and Huckin (1995), *regularities of staged, goal-oriented Social processes*, as in Martin, Christie and Rothery (1987) and Martin (1993), or *consistency of communicative purposes*, as in Swales (1990) and Bhatia (1993).

(Bhatia, 2004, p. 22)

Genre analysis as the study of academic and professional writings is approached differently. The New Rhetoric School is an ethnographic type of study which deals with the socio-cultural dimension of genres, thus representing them as ‘stabilized for now’ forms of action “that are open to change and subject to negotiation” (Hyland, 2006, p. 48). This view of genre emphasizes the social context of written communications, and focuses “more on the situational contexts in which genres occur than on their forms and have placed special emphases on the social purposes, or actions, that these genres fulfill within these situations” (Hyon, 1996). Within this view of genre, ethnographic approaches are deployed while little attention is paid to the text itself, and Miller (1994) argues that “a rhetorically sound definition of genre must be centred not on the substance or the form of discourse but on the action it is used to accomplish” (p. 151).

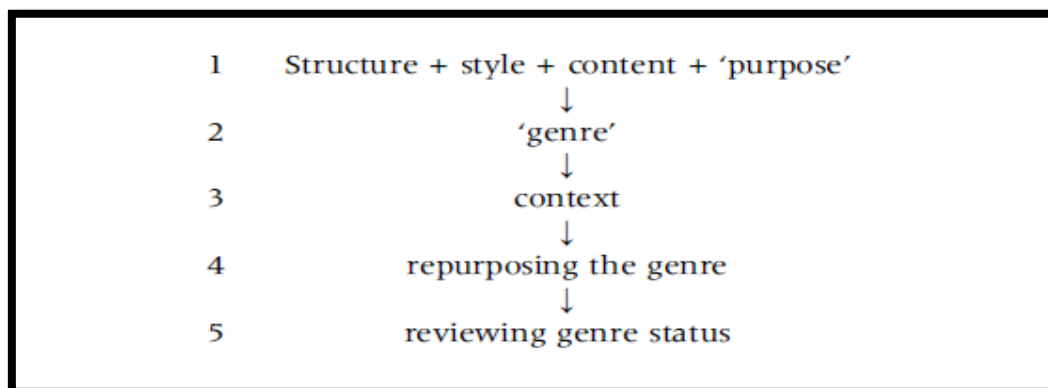
Ethnographic studies are criticised for not dealing with the wording of the texts in addition to the practices of the writers while studying a particular discourse. Although the New Rhetoric tradition focuses on context in its analysis of academic writing, it links it to the ‘University’ and its different professions (Hyon, 1996), which is different from the perspective adapted in a linguistic analysis. While trying to study research genres, Bazerman wrote a book about the sociology of science by “looking at the worlds in which these texts served as significant activity” (Bazerman, 1988, p. 4).

In addition to the New Rhetoric tradition, Bhatia (2004) presents Martin’s definition of genre as a “staged, goal-oriented Social process” (Martin and Rose, 2008, p. 8). This definition shows that genre is seen as a process, that is a series of actions with a particular purpose. This process is social since it involves the doer with respect to other people. It is also ‘goal-oriented’, and this emphasizes the notion of purpose created by the word *process*; as people use a particular genre to reach certain purposes. This process to attain a particular purpose is ‘staged’ since it is divided into steps.

The third view, according to Bhatia (2004), considers genre as a set of ‘communicative purposes’ (Swales, 1990). This means that every genre is defined by the social purpose it aims to serve. Askehave and Swales (2001) reconsider this view and claim, based on examples, that genre cannot be defined only by its cognitive or social purposes, as one genre can have several different purposes. In fact, the “uncertainties surrounding communicative purpose undermine its claimed role as a means of assigning genre membership” (Askehave and Swales, 2001, p. 195). In place of these communicative purposes, Askehave and Swales (2001) propose the expression ‘repurposing the genre’ as part of two different procedures: ‘text-first’ linguistic/ ESP approach or a ‘situation-first’ new

rhetoric approach (Swales, 2004, p. 72). Seeing that the analysis in this thesis is linguistic, only the first procedure is reproduced below.

Figure 3. 1 A text-driven procedure for genre analysis (Askehave and Swales, 2001)



This procedure proposed by Askehave and Swales (2001) reveals that for a linguistic analysis of genre, the start is not only from the communicative ‘purpose’ of the text but also its structure, style and content. Additionally, the first and the second steps include the words ‘purpose’ and ‘genre’ in quotes to show that their status is provisional since genres are not static. This view of genre as a complex phenomenon, and this would influence the way to study genre. Bhatia (2002) suggests that “ instead of using generic descriptions as models for linguistic reproduction of conventional forms to respond to recurring social contexts,... they [genre descriptions] can be used as analytical resource to understand and manipulate complex inter-generic and multicultural realisations of professional discourse” (p. 3). Therefore, the analysis will be focusing on the linguistic description to understand the genres at work, but these conclusions will be fluid and subject to changes each time one feature of the context is introduced in the analysis. Genre in this way is seen as a hybrid reflection of the complex realities of a professional communication.

Figure 3.1 reveals that in the third layer, Askehave and Swales (2001) speak about ‘context’. This notion has been the focus of different schools, and adapted in this thesis is the systemic functional linguistics approach. The choice of this perspective is because it “operates from the premise that language structure is integrally related to social function and context” (Bawarshi and Reiff, 2010, p. 29). The view adapted by Hasan (2009) gives an account of genre from an SFL perspective. Based on the seminal work of Halliday (Halliday and Matthiessen, 2004, 2014), she adds another stratum to the analysis of language; namely CONTEXT, and places it above that of Semantics as it is text external.

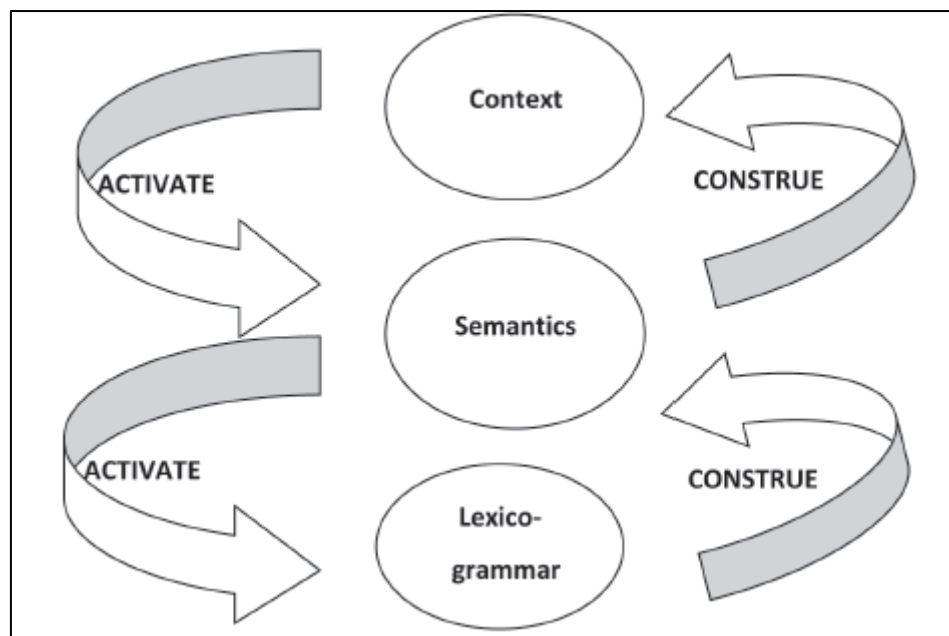
SFL recognizes five strata: context is the highest stratum in the theory, and it is language external. The remaining four strata are language internal: SEMANTICS and

LEXICOGRAMMAR are the elaboration of...content, and PHONOLOGY and PHONETICS, that of expression.

(Hasan, 2009, p. 170)

Among these strata, those of context, semantics and lexicogrammar are relevant to the approach of the present thesis. Hasan (2009) also specifies that the way to approach these three strata is ‘dialectic’; in fact, “looking from above, contextual choices **ACTIVATE** semantic choices activate the lexicogrammatical ones; looking from below lexicogrammatical choices **CONSTRUE** semantic choices construe contextual ones” (p. 171). Sellami-Baklouti (2013) has summarised this dialectic relation in the following diagram.

Figure 3. 2 Relations between context, semantics and lexicogrammar (Sellami-Baklouti, 2013, p. 222)



Seeing that the present work is based on a grammatical analysis of PPs, the analysis would be in the direction of *construal*, starting from choices at the level of lexicogrammar which would be explained in terms of the meanings they express, which would reflect the context.

Based on the view of genre as reflecting multiple realities, the classification of context offered by Hasan (2009) helps construe these different realities, as it differentiates between two types of contexts. The context of culture, which reflects language as a system, is identified as the genre. Following Martin (1992), genre as a staged goal-oriented social process can be analysed through register; a configuration of field, tenor and mode, reflecting respectively the ideational, interpersonal and textual dimensions of language (Gardner, 2012).

The merit of using this SFL model is to be able to link the context of culture (genre) to the context of situation (register) and also to the choices made in the text:

Genres are ‘realised through register’ (Martin, 1992, p. 505). Registers in turn are realised through the lexicogrammar, and it is the richness and applicability of Systemic Functional Grammar that marks SFL approaches as distinctive among accounts of academic writing (Ravelli & Ellis, 2004).

(Gardner, 2012, p. 54)

The present thesis seeks to adopt a generic framework in the interpretation of the lexicogrammatical choices made in the corpus. This implies that the syntactic analysis of PPs will be linked to the semantic analysis, which will be explained with reference to the context: the genres of PhD theses and Research Articles, and the registers of Medical and Social Sciences. The following sub-sections present the two genres and registers.

3.2. Research Genres

The present thesis aims to compare two written research genres, namely PhD Theses and Research Articles, which Koustantoni (2006) describes as “two key genres used by scientific communities for the dissemination and ratification of knowledge”. Koutsantoni (2007) further explains that:

Both genres are produced at advanced stages of individuals’ enculturation in disciplinary communities (Prior, 1991), present original research (Knorr-Cetina, 1981; Philips and Pugh, 2000), aim to persuade the academic community to accept new knowledge claims (Latour and Woolgar, 1979; Shaw, 1991), and are the result of Social negotiations between authors and disciplinary gatekeepers (Bazerman, 1988; Berkenkotter and Huckin, 1995; Knorr-Cetina, 1981; Meyer, 1990).

However, despite their similarities, these two academic genres differ as regards the status of their authors in academic discourse communities and the power asymmetries between themselves and the gatekeepers.

(Koutsantoni, 2007, p. 23)

PhD Theses and Research Articles are shaped differently for various reasons. First, the authors of these genres differ; for while PhD Theses writers are said to be students, Research Articles’ writers are rather expert authors (mainly if these articles are published in renowned journals), as suggested by Koustantoni, (2006). Moreover, the audience of these genres differs as well. Research Articles are meant to address a wider range of researchers simply because they are published while PhD Theses primarily address a limited number of jury members from the domain of research. This entails that the genre of Research Articles is influenced by the journals where they are published whereas PhD Theses answer the requirements of the

research community. Furthermore, PhD Theses and Research Articles differ in terms of their content. Written by qualified researchers, Research Articles tend to be more focused than PhD Theses which makes them “the main means employed by the hard sciences for the introduction of new findings and claims in the community” (Koutstantoni, 2006, p.20). PhD Theses, on the other hand, are written by novice researchers, or students who are starting their research career. All these differences influence the way the genres are written, as studied in the following sub-sections.

3.2.1. PhD Theses

Gosling and Noordam (2011) define a PhD Thesis as being:

- A formal document, quite substantial in length that presents original data in support of a particular thesis or supposition.
- A comprehensive body of data that supports a particular hypothesis and is well-supported with appropriate evidence.
- A thorough analysis and interpretation of the data you have collected.
- A document in which *every statement* is supported by citing the scientific literature or your own (original) work.
- A document in which every statement must be correct and defensible in a logical and scientific sense.

(Gosling and Noordam, 2011, p. 180)

The definition given by Gosling and Noordam (2011) shows that a PhD Thesis is not like any other type of writing, in fact, it capitalises first and foremost on the scientific content. In a PhD Thesis, the researcher is expected to investigate original data in order to support or refute a hypothesis formulated by the researcher him/herself. It is also the “culminating genre of doctoral education” (Swales, 2004, p. 99). In fact, “for a majority of master’s students, the dissertation/thesis is the most sustained and complex piece of academic writing they will undertake” (ibid). Being the last step in a doctoral education, the PhD dissertation opens the doors for the researcher to be accepted in the scientific community. This is “because of the high standard to which the thesis/dissertation is held” (Dong, 1998, p. 369). Therefore, the PhD dissertation signals a movement in the status of the researcher as Goldbort maintains that “in their transition from preprofessional to professional writing, graduate students must demonstrate competence in using the language of science, both spoken and written, as a rite of passage into their research community” (p. 213).

While investigating the effect of academic writing on students’ perception of themselves, de Poel and Gasiorek (2012) emphasize the status of the PhD student as a starting researcher since

Research has demonstrated that there is a persistent gap between staff and student expectations with respect to what is considered “good” academic writing... Students often do not know what qualities their instructors are looking for in their writing, and as such do not have confidence in their ability to write in this context. Students’ confidence in their writing capabilities has been found to influence their writing motivation as well as writing anxiety, grade goals, and depth of processing.

De Poel and Gasiorek (2012, p. 294)

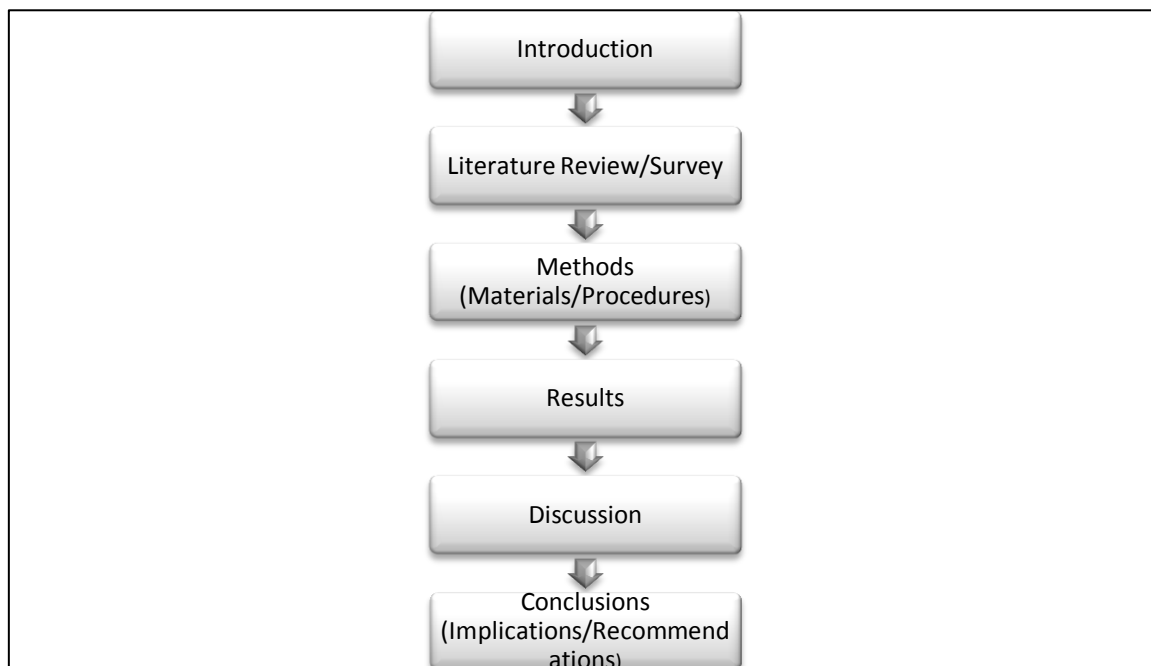
In the process of passage to professionalism, students meet different hurdles based on their lack of knowledge as to what constitutes good writing De Poel and Gasiorek (2012) argued that the uncertainty of students can be reflected in their writings, and possibly in the depth of dealing with the knowledge in their theses.

PhD Theses have different structures and different sections. For a deeper identification of this genre, these variables are dealt with in the following sub-sections.

3.2.1.1. Possible structures

Two main types of PhD Theses exist: “the standard or traditional dissertation” and “the complex (article-compilation) pattern” (Swales, 2004, p. 107/8). The standard dissertation is described by Swales (2004) as being “a ‘blown-up’ version of the IMRD structure of Research Articles, even though the dissertation will be typically ten to fifteen times longer than the standard Research Article” (p. 107). Besides, Swales argues that “this format, with variations, is the most usually put forward in the various handbooks and manuals that offer advice to the dissertation/Thesis writer” (ibid). The structure of this type of dissertation is formalized as follows:

Figure 3. 3 Structure of a traditional dissertation (Swales, 2004, p. 107)



While studying the structure of PhD Theses, Paltridge (2002) distinguished four types: ‘traditional: simple’, ‘traditional: complex’, ‘topic-based’ and ‘compilations of Research Articles’. The different structures available to the doctoral students show, as expressed by Swales (2004), that “the doctoral dissertation...is in a state of considerable flux, and this will certainly continue, partly as a result of technological change” (p. 110). It seems that the genre of PhD theses allows some flexibility, but nonetheless, has some obligatory features. For further analysis, the following sub-section studies the basic sections of PhD Theses.

3.2.1.2. Basic Sections

In addition to front matter and back matter which include the title, the copyright, the acknowledgement, the abstract, the table of contents, the references and the appendices, the other sections form part of the “text” (Goldbort, 2006, p. 217-218). The basic sections of the main text are the Introduction, the Methods, the Results and the Discussion.

First, the Introduction defines the topic of the dissertation; “what is the scientific problem being studied? Why was this particular problem selected?” (Goldbort, 2006, p. 224). Swales (1990, 2004) claims that an Introduction contains three moves: “establishing a territory”, “establishing a niche” and “occupying the niche”. The first move, according to Swales (2004) concerns “giving background information” and “defining terms” (p. 116). The second move takes “the form of elaborating on a particular research problem, as opposed to indicating a gap” (ibid). The third move is the most elaborated in the Humanities and Social

Sciences (Swales, 2004). It is the move where the writer is going to announce his/her research in addition to the principle findings and indicate the structure of the article.

Additionally, Swales (2004) notes also that disciplinary variations may influence the “length and citation density” of the introductory paragraph (p. 117). In an investigation on Introductions of PhD Theses, San Miguel and Nelson (2007) proves that what makes a literature review acceptable is “framing a real-world problem as a research issue; incorporating one’s own (and others’) professional knowledge; and using the literature to contextualise and theorise the issue under investigation” (p. 72). These three steps reflect Swales’ moves analysis, which, in turn, confirms the real purpose of the introduction.

Second, the Methods section includes the major tools used in the analysis of the Thesis. According to Swales (2004), Methods in a PhD Thesis are more elaborated than those in a Research Article because of the constraints in terms of space imposed on the latter. Swales (2004) claims that students who need more elaborated Methods have to consult recent PhD Theses since a dissertation gives “more scope to discuss methodological problems than would be the case in article” (p. 114/6). He also claims after studying the Methods of a scientific Thesis that there is “a causal rather than a chronological account and that the author avoids those purposive, justificatory statements (“In order to control for X, we did Y”) that have been found to be common in certain Social science Methods sections” (p. 114/5).

The Methods section seems to be influenced by the difference in research genres and disciplines as well, and the change seems to be reflected in the length and the meanings presented.

The third section according to the IMRD structure is that of Results. This section answers the purposes and questions raised from the Introduction and the Methods. This section is characterised by the use of statistics, graphics, figures, etc. in order to analyse the data previously specified, as Goldbort (2006) maintains that “the results component of the IMRAD relies most heavily on showing rather than just telling the scientific story” (p. 232). Goldbort (2006) also maintains that this section contains the shortest text despite the fact that it should be of “utmost clarity, simplicity and directness” (p. 233). Many textbooks highlight the importance of simplicity, for instance, Tischler, in his booklet designed for scientific writing, claims that “because the results comprise the new knowledge that you are contributing to the world, it is important that your findings be clearly and simply stated” (p. 14). Certain disciplines, however, tend to include the Results and the Discussion in the same section (Swales, 2004, p. 226).

The final component in an IMRD structure is that of the Discussion, where the researcher needs to show “the relevance of [the] research and the conclusions that can be drawn from it” (Holtom and Fisher, 1999, p. 64). This section, according to Goldbort (2006) “calls for a critical look at the study that interprets and assesses the reported findings, pointing up their significance, limitations, and implications in the context of both the hypothesis and current knowledge in the field cited from the reviewed literature” (p. 233). This section is generally known for reflecting the voice and viewpoint of the researcher. Goldbort maintains that this section “is the place for the writer to demonstrate not only critical competence in interpreting and assessing the findings, but also the professional authority necessary to argue for their significance convincingly” (p. 236). In fact, the discussion of the findings has to show the points that diverge from other research on the same topic, and also has to explain these differences, which are actually the main cause of conducting all the research. This section may also contain the limitations of the research and may suggest future research directions to overcome these weaknesses, which is most of the time part of the conclusion chapter. Bunton (2005) studied the structure of PhD conclusions and came to the conclusion that “[m]ost Conclusions were found to restate purpose, consolidate research space with a varied array of steps, recommend future research and cover practical applications, implications or recommendations” (p.223), which means that the conclusion is the space where the writer gives his/her general overview of the whole research.

This section has sought to identify the features characterising PhD theses, in addition to a review of the possible theses structures and basic sections. The purpose of the present thesis is to study the syntax and semantics of PPs, and to link these choices to the context of culture; the genre. Particularly, this study seeks to identify the differences between the sections of a PhD Thesis through the lexicogrammatical choices made in the corpus. In addition to PhD Thesis, the corpus is made up of Research Articles, which will be studied in the following sub-section.

3.2.2. Research Articles

While trying to define a RA, Day and Gastel (2006) propose that it “is a written and published report describing original research results” (p. 19). By “original” research, Day and Gastel (2006) mean that it should be “valid (i.e., primary) publication” (ibid). However, the definition does not stop at this level since Day and Gastel (2006) assume that “a scientific paper must be written in a certain way, as defined by tradition, editorial practice, scientific ethics, and the interplay of printing and publishing procedures” (ibid). In addition, Day (2007)

proposes that the focus on publishing research has been growing this last ten years out of the national policies.

Moreover, Swales (2004) admits that “this prestigious genre, with its millions of exemplars a year, is a dynamic textual institution undergoing, like nearly all genres, continuous if slow evolution” (p.217). One of the factors causing the evolution of this genre is the emergence of electronic communication, and particularly e-journals, which have impacts on science in general and on Research Articles in particular. In general, science is accessible to anyone in the world, which means that it is witnessing a rapid growth. This, in turns, means that the number of scientists who are able to communicate their knowledge is growing and that scientists need to build on what they read instead of researching topics that may have been addressed. This change in the pace of publishing science and in its readability affects the genre of RAs.

In this respect, Swales (2004) speaks about “the discursual and rhetorical impacts” of the development in information technology (p. 217). These changes are mainly caused by the presence of a preconceived reader in the mind of the scientists especially that a RA “is, of course, in its final form a product, but that product is patently the outcome of a complex process” (Swales, 2004, p. 218). Swales (2004) holds this view because “a manuscript is most often slowly gestated, undergoes several drafts, and receives multiple inputs from co-authors, colleagues, reviewers, and editors” (ibid).

Swales (2004) further specifies that “the writers of RAs need to manifest deference to and solidarity with their respective research communities, which, through their various gatekeeping roles, exert considerable power and influence” (p. 218). Another result of the emergence of e-journals is the severe restrictions put on articles, which would make publishing a difficult and competitive task.

Among the conditions for a RA to be accepted is the IMRD structure, which is described as coming “into almost universal use in research journals” (Day and Gastel, 2006, p. 9). The cause behind the choice of this structure is that it facilitates the job of the reviewer and gatekeepers as it divides the contribution into its main important parts, so that they can judge each one separately. Additionally, this structure helps the readers go through the article easily, as it adds to the clarity of the content.

The Introduction of a Research Article should, according to Harmon and Gross (2010), contain three different steps. They are: defining “a research territory”, establishing “a limited problem in that territory”, and suggesting “a solution to this problem” (Harmon and Gross, 2010, p. 4). These steps can be seen as a reflection of the Swales’ moves (1990) mentioned

above: “establishing a territory”, “establishing a niche” and “occupying the niche”. The differences between an Introduction in a PhD Thesis and one in a Research Article are the length, the literature review, etc. In a Research Article, the writer has to make “a favourable first impression” in a limited space (Harmon and Gross, 2010, p. 13). The importance of this section lies in persuading the reader to read the article, which means that an Introduction needs to be clear and rhetorically well-organized so that it catches the reader’s interest.

The second section in a Research Article is the Methods, where the researchers need “to inform the reader by what means the authors solved the problem stated in the introduction” (Harmon and Gross, 2010, p. 67). A Methods section is said to be clear when it involves information about “the participants, the measures and the procedure(s)” and when it is replicable (Hartley, 2007, p. 45). However, seeing that an author needs to care about the space attributed to this section, not all the details would be included, which means that this section is relatively short or “clipped” (Swales, 2004, p. 220).

The third section in a Research Article is that of Results. This section, described by Harmon and Gross (2010) as belonging to the “heart of the matter”, is devoted to present “the main data that support (or reject[ing]) the hypotheses in the form of tables and graphs” (Heartly, 2007, p. 47). However, the presentation of Results should be arranged in a story-like manner and “this story is clearer if the sequence of topics addressed in the Results section is the same as that articulated in the introduction and the method(s) sections” (ibid). Harmon and Gross (2010) emphasize two elements in the Results section; “how to (1) present your findings in tables, figures, and their accompanying text and (2) show how the limitations of your methods qualify the factual status of your findings” (p. 42).

The last element in a Research Article is that of Discussion or Conclusion. In fact, this section is most of the time linked to that presenting the results as the distinction between them is not always sharp (Swales and Feak, 2004). According to Swales (1990), while *Results* are about describing results, *Discussion* is about re-describing them. In this context, Harmon and Gross (2010) think that a Discussion section should emphasize “how to (1) construct an argument that turns the findings from results into evidence for new scientific claims and (2) limit and qualify your claims so that they are in conformity with the evidence” (p. 42). What is peculiar for a Discussion section, however, is the “call for further research” (Heartly, 2007, p. 48). Swales (2004) considers Discussion to be the opposite, in terms of rhetorical structure, of the Introduction section. In fact, while the Introduction starts from general outside literature and then moves to the internal study, the Discussion puts more light on the study and then moves outward by discussing the limitations and implications of the research.

To conclude, this section has tried to review the genres studied in the corpus in terms of their structures and basic sections. Four main sections make up a Research Article, which seem to be similar but shorter than those of a PhD Thesis. The present thesis aims to take these sections into consideration in the analysis of the corpus, so that they are compared within and across the genres. This comparison will be based on the semantic and syntactic choices of PPs, as part of linking the text to its context of culture, or genre. The claim maintained in this thesis is that the context is also the context of situation or register, which is reflected, in the case of academic writing, in the discipline.

3.3. Disciplinary Variations

Contexts reflect the purpose of the text or its genre. One way to explore the relation between the context and the text is through the register configuration, defined by Coffin and Donohue (2012) as:

Register is used to map the relationship between the context and the lexicogrammatical choices. In SFL, three key dimensions of context are seen as shaping and being shaped by language: field (the topic), tenor (the roles and relationships of the interlocutors) and mode (how written or spoken a text is).

(Coffin and Donohue, 2012, p. 66)

Applied on the studied corpus, the topic, the relationship to other interlocutors and the way the text is devised reflect, in addition to the genre, the discipline of that text. Bernstein (1996) defines a discipline as:

A discourse as a singular is a discourse which has appropriated a space to give itself a unique name . . . for example physics, chemistry, sociology, psychology . . . these singulars produced a discourse which was about only themselves . . . had very few external references other than in terms of themselves . . . created the field of the production of knowledge . . .

(Bernstein, 1996, p. 23)

Disciplines, although belonging to academic discourse, seem to vary. Each discipline has a name, a space, and a special type of discourse or ‘singular’. The discourse related to each discipline is different from other types of disciplinary discourses as each discipline is seen as a ‘tribe’ (Becher and Trowler, 2001) “with its particular norms, nomenclature, bodies of knowledge, sets of conventions and modes of inquiry” (Hyland, 2004, p. 8). Bazeman (in Martin and Veel, 1998) maintains that “scientific language is no unitary or stable thing... Scientific discourse is evolving and multiple, emerging in relation to the specialties, projects, methods, problems, social configurations, individual positioning and other dynamics that drive scientific activities” (p. 16).

Texts seem to reflect these differences just as “people are socialised into the language of social class or gender, so too are students socialised into the language and ways of thinking of academic disciplines through participation in lectures, reading textbooks and writing assignments” (Gardner, 2012, p. 54). A study by Berkenkotter, Huckin and Ackerman (1991) on a student who was initiated into a discourse community revealed that both the student’s type of discourse and way of thinking have changed during the acculturation process. Gardner (2012) adds that “groups of psychologists, chemists or sociologists construe their disciplines: what counts as evidence, as argument or as ‘rationale’”, thus forming the “ideology” of the discipline (p. 54). One way to distinguish disciplines by what they study and the way they deal with it is through identifying the ‘research paradigm’ (Ernest, 1994, p. 19), which will be defined in the following sub-section and which sets the floor for the identification of the two studied disciplines.

3.3.1. Research Paradigm

Kuhn (1970) defines a paradigm as “the entire constellation of beliefs, values, and techniques shared by members of given communities” (p. 175). Ernest (1994) speaks about three research paradigms: the scientific, the interpretative and the critical. “What is central to the scientific research paradigm is the search for general laws predicting future educational outcome” (Ernest, 1994, p. 22). This method is employed in physical and experimental sciences, where the data is mainly measured quantitatively through surveys, comparative experiments, etc. The second paradigm adopted in “sociological and social science research” is “concerned with human understanding, interpretation, inter-subjectivity...”, and relies largely “on qualitative forms of enquiry...triangulation...to overcome the weaknesses of subjectivity” (Ernest, 1994, p. 24). The third paradigm “resembles the interpretative paradigm but is not just concerned with understanding, but also with Social critique and Social and institutional change and, possibly Social justice, with participant engagement and validation” (Ernest, 1994, p. 28).

Based on this distinction, Becher (1989) classifies sciences into hard and soft, pure and applied. Hard sciences correspond mainly to natural sciences, and can be linked to the scientific research paradigm, while soft sciences are mainly those of the humanities and Social Sciences (Becher, 1994, p. 152). The following table summarises the differences between the two types of science based on an account by Koutsantoni (2007).

Table 3. 1 Hard versus soft sciences (Koutsantoni, 2007, p. 35)

<i>Hard Sciences</i>	<i>Soft Sciences</i>
<ul style="list-style-type: none"> • Clear criteria for establishing and refuting claims to new knowledge • Concerned with universals • Explanations derive from a systematic scrutiny of carefully controlled variables • Impersonal and value-free • Collective activity (laboratories and research groups) 	<ul style="list-style-type: none"> • A diversity of criteria and a lack of consensus • Focus on particulars • Variables are less controlled and more numerous, which makes explanation weaker. • Personal and value-laden • Individualism

The distinction of hard and soft sciences seems not only to be based on, but also adds to, the distinction between scientific and interpretative paradigms or how to deal with knowledge by presenting the repercussions of the methodology. In fact, hard sciences deal with clear criteria, and provide systematic explanations which lead to universal conclusions, and this makes the writing impersonal mainly that more than one author may be producing the text. On the other hand, in soft sciences the presence of different variables and the lack of consensus about the criteria to claim new knowledge lead to personal choices and individualistic interpretations that would make the text value-laden.

However, not all disciplines can be classified as either hard or soft as different methodologies, within the same discipline, can be followed. A researcher may adopt both the quantitative and qualitative tools in a piece of research, which would make the classification of certain disciplines problematic. Disciplines, therefore, are not considered as either hard or soft but rather as varying on a scale ranging from hard to soft.

In addition to the hard/soft distinction, Biglan (1973) speaks about life and non-life sciences, where life sciences deal with human beings unlike non-life sciences. Based on the above mentioned distinctions, the present thesis investigates writings from Medical and Social Sciences, as instances of hard and soft sciences, respectively. Although these disciplines deal with the Human Being, and are classified as life sciences, their methodologies are responsible for their classification as hard versus soft. In fact, while Medical Sciences deal with the human as a body and build on experiments and observations to reach universal conclusions, Social Sciences focus on the person within his/her society and try to understand the relation between both based on case studies or observations, and the results are most of the time linked to a particular society or category of people. The purpose from this choice is to unveil how the different strategies, methodologies, ideologies, etc. would influence the language use.

For a deeper understanding of the disciplinary differences, the following sub-sections present each one separately.

3.3.2. Medical Sciences

According to Gotti and Salager-Meyer (2006), medicine is “both an *area of knowledge* (of body systems, their diseases and treatments) and the applied practice of that knowledge to *Medical praxis*” (p. 9). The focus of Medical sciences is on the human body, and on trying to maintain or restore a healthy state. The daily work of practitioners influences the way they conduct research. In fact, based on observation and experimentation, researchers in the Medical Sciences investigate one or more case studies and try to identify, based on the different circumstances, the illness or injury and then find a solution for that problem. By producing “testable and replicable results for publication in research papers”, research in Medical Sciences can be seen as adapting the scientific or positivist research paradigm, which means that it can be classified among the hard sciences (Gotti and Salager-Meyer, 2006, p. 10).

According to Voce (2004), this paradigm focuses on “an objective, true reality” where knowledge is seen as consisting of “verified hypotheses that can be regarded as facts or laws” (p. 2) and also as probabilistic (true for most cases). A conclusion presented in Medical Science can be seen as “general propositions explaining causal relationships between variables” and generally, the role of research is to “scientifically explain / describe, predict and control phenomena” (Voce, 2004, p.3). Furthermore, while the findings are seen as “observable”, the type of reasoning is “deductive” (Voce, 2004, p.4). In this respect, deductive reasoning is defined as “a conclusion [that] states with certainty a relationship between two or more premises. It has to be certain, because it simply makes explicit a relationship that is already there (but not directly obvious) in the combination of the claims that are serving as premises” (Allen, 2004, p. 90). This type of reasoning is largely based on logical analysis and certain conclusions since it is based on existing premises. This means that the job of the researcher, in such a paradigm, is to make explicit links that already exist.

The importance of medicine led to the focus on the discipline’s discourse by researchers, and published research from “linguistic, diachronic, socio-historical and cross-linguistic analyses of oral and/or written Medical discourse” can be found in *The Annual Review of Applied Linguistics*, *English for Specific Purposes*, *Historical Pragmatics*, and *English for Academic Purposes* (Gotti and Salager-Meyer, 2006, p. 13).

Among these studies, Fløttum (2006) compared Medical Research Articles to others in Economics and Linguistics in three languages, and came up with the conclusion that that “Medical articles resemble each other to a certain extent, whatever language they are written in” as “discipline has greater influence than language” (p. 263). The disciplinary comparison

also revealed Argumentation in Medical writing is not personal, rather “the presentation of facts or observations” is done “in ‘neutral’ utterances which at first glance appear as both objective and deprived of personal traces” (Fløttum, 2006, p. 264). Fløttum (2006) also adds that “Medical research is cumulative and need not discuss basic conceptual systems” which implies that “Medical authors need not guide the reader or make explicit transitions from one section to another” (Fløttum, 2006, p. 264).

A pioneering work by Nwogu (1997) has been conducted on Medical RAs in order to identify the moves within this genre. He found out the Medical Research Article is made up of eleven moves:

1. Begin by providing some background details about the subject matter of the research investigation.
2. Conduct a brief review of previous studies.
3. Introduce the new research and state research objectives.
4. Identify the source of data and the method adopted in collecting them.
5. Discuss the methods adopted in the analysis of data.
6. Discuss the statistical procedures adopted in the analysis of data, if any.
7. Discuss results which are consistent with the objectives of the study.
8. Discuss results which deviate from expected outcomes.
9. Discuss the main results and their significance.
10. Explain and justify results and approaches adopted in achieving them.
11. Provide a conclusion and indicate implications of the research.

(Nwogu, 1997, p. 124)

The first three moves form the Introduction of the RA, while moves 3, 4 and 5 form the Methods section. Moves 7 and 8 are within the Results section, and the last three moves form the Discussion. These moves are not necessarily present in all RAs, and they are specific to Medical writings.

Furthermore, Sellami-Baklouti (2013) has studied clause structure in Medical and linguistics Research Articles’ abstracts and concluded that the Medical sub-corpus has “a higher frequency of parataxis”, that can be explained by “the looser grammatical integration which is displayed by the Medical abstracts and supported by the higher probability of clauses simplexes in that sub-corpus” (p. 240). This, in turn, is explained by the nature of Medical Sciences where “findings are based on experimental methods” (Sellami-Baklouti, 2011, p. 521), and therefore, do not need to be stated overtly.

The aim of the present thesis is to compare texts from the Medical field to others from Sociology in order to explore how disciplinary variations can be depicted from linguistic choices. To reach this purpose, the following sub-section introduces ‘sociology’.

3.3.3. Sociology

The second science dealt with in the present thesis is that of Sociology which is one field of the Social Sciences that is defined by Ferrante (2011) as “the study of human activity as it is affected by social forces emanating from groups, organizations, societies, and even the global community” (p. 4). This means that Sociology studies the human being with reference to the sociological context s/he is living in.

Research within the sociological perspective belongs to the interpretative paradigm, where reality is rather ‘subjective’, which means that it capitalises on “what people think, feel, see” (Voce, 2004, p.2). The individual, as a social entity, is observed in relation to other variables in society, and the knowledge sought is “based not only on observable phenomena, but also on subjective beliefs, values, reasons, and understandings” (ibid). The researcher is called to look at particular cases having a problem or characteristic in common and then to interpret, based on the different variables, the influence of outside factors on the human being.

While studying Results sections in RAs from Sociology and Organic Chemistry, Bruce (2009) reported his informant’s view that “in sociology, the approach to research varies from scientific or positivist through to naturalistic or interpretative. Thus, data from research may be either quantitative or qualitative (or often a combination of the two)” (Bruce, 2009, p. 111). Seeing that Sociology combines both methodologies, it cannot be characterised as a soft or hard science, rather it can be situated on a scale between the two poles closer to the soft side. In fact, when studying RAs from different disciplines, Lin and Evans (2012) found that not all RAs from Social Sciences can be characterised as empirical (Lin and Evans, 2012, p. 157).

Furthermore, in this field, inductive rather than deductive reasoning is adapted. The inductive reasoning is defined by Allen (2004) as

In an inductive argument, unlike deduction, if the premises are true, then the conclusion is only probably true and how big a chance that it is true depends on the weight of evidence presented in the premises. The conclusion, then, in an inductive argument is not guaranteed by the premises, but only supported by them. Often, the difference expresses itself in the way that an inductive conclusion does not state an implicit relationship but goes beyond the premises to make a new claim altogether.

(Allen, 2004, p. 91)

Unlike the deductive reasoning which highlights a conclusion already present in the premises, the inductive reasoning adds a new claim in the conclusion. This shows that the role of the researcher is to come up with a new interpretation of a particular problem or situation, and this interpretation should be based on strong possible evidence.

The studies on the language of Social Sciences are not numerous compared to those on Medical Sciences. However, among the few available, Holmes (1997) compared RA Conclusions in three disciplines namely History, Political Sciences and Sociology to those in Natural Sciences, and found out that “although there were fundamental similarities to the natural sciences, Social Science Discussion sections also displayed some distinctive features” (p. 321). Holmes (1997) further explains that the difference is related to the presence of “lengthy Background sections” after the Introduction and before the Methods, which “might reflect the absence of an agreed theoretical framework and what Bazerman (1988:35) calls “a fixed codified literature” (Holmes, 1997, p. 328). Lin and Evans (2012) maintain that Social sciences, among other disciplines, tend to use the ILMRD or ILMRDC patterns instead of the conventional IMRD pattern, with L standing for Literature Review (Lin and Evans, 2012, p. 158).

The view that Social Sciences put more emphasis on the Introduction rather than the Discussion is related to the lack of consensus, which actually influences the other moves. The importance of the Introduction in Sociology is stressed by Bruce (2010) who found that Sociologists tend to refer to themselves and to other sections of the text (Bruce, 2010, p. 160). Swales (2004) focused on two studies of Results sections from Medical (Williams, 1999) and Sociology (Brett, 1994) and came up with the conclusion that while Medical Sciences do not capitalise on the Results section in comparison to the Discussion sections, Sociology writers use comments in the Results sections because of their “need to urge and persuade the reader...in attempting to establish meaningful statements about humans and their patterns of behaviour” (Brett, 1994, p. 55). This informant also claimed that “the reporting of findings need to account for the multiplicity of intentions and views of the human subjects of the research ... also the writer has to anticipate and pre-empt multiple critiques or interpretations of their findings by readers” (Bruce, 2009, p. 111). In fact, Golebiowski (2009) reports that “research prose of social sciences and humanities is more heavily contrastive than that of hard sciences” since the writer has to mention other opposing views (Golebiowski, 2009, p. 168).

The difference between Social Sciences and other hard sciences can be also seen in the way the Methods are presented. Bruce (2008) claims that in physical sciences Methods are ‘fast’, while in sociology they are ‘slow’ as “‘fast’ Methods sections that report research in the physical sciences generally employ a *means-focused* discourse structure, and ‘slow’ Methods sections in social science reports tend to employ a combination of *chronological* and *non-sequential* descriptive structures” (Bruce, 2008, p. 38).

The present thesis seeks to study the difference between the chosen disciplines in terms of the lexicogrammatical choices, and particularly, aims to identify the way sections of the same genre are shaped differently as a result of the disciplinary variations.

3.3.4. Conclusion

This section has looked at disciplinary variations and has focused on two main disciplines: Medicine and Sociology, as they will be the focus of the analysis. Different studies have dealt with the language of each discipline and have revealed differences in their writings. Both linguistic and generic methods have been used in those studies but both heading towards a better understanding of the way knowledge is shaped. These studies did not focus only on disciplines; rather the comparisons took the variable of genre or rhetorical structures into consideration. Disciplines cannot be studied in default of genres as the latter are the means to represent disciplines. Therefore, a text from science is influenced and shaped by a hybrid type of context, where variables of the discipline, the genre and the section are interwoven. In order to capture these differences, a register analysis of each sub-corpus is opted for.

3.4. Register Analysis

Biber and Conrad (2009) define a register as “a variety associated with a particular situation of use (including particular communicative purposes)” (p.6). The situation of use or the context of situation is said to reflect, in this case, the discipline, however, the situation cannot be disentangled from the communicative purposes of a text, which in fact define the genre. According to Biber and Conrad (2009), describing a register would include “three major components: the situational context, the linguistic features, and the functional relationships between the first two components” (Biber and Conrad, 2009, p. 6). This means that a register analysis seeks to link the linguistic analysis of words and structures to the situational context also involving the communicative purposes. This explains a basic argument put forward by Biber and Conrad (2009) stating that “linguistic features are always *functional* when considered from a register perspective. That is, linguistic features tend to occur in a register because they are particularly well suited to the purposes and situational context of the register” (Biber and Conrad, 2009, p. 6), which means that “the linguistic differences among registers can be derived from situational differences, because linguistic features are functional” (p. 9). Linguistic structures have different functions based on the situation of use.

The analytical framework of registers and genres proposed by Biber and Conrad (2009) is summarised as follow.

Table 3. 2 Model of Register Analysis following Biber and Conrad (2009, p.40)

I. Participants	<ul style="list-style-type: none"> A. Addressor(s) (i.e. speaker or author) <ul style="list-style-type: none"> 1. single / plural / institutional / unidentified 2. Social characteristics: age, education, profession, etc. B. Addressees <ul style="list-style-type: none"> 1. single / plural / un-enumerated 2. self / other C. Are there on-lookers?
II. Relations among participants	<ul style="list-style-type: none"> A. Interactiveness B. Social roles: relative status or power C. Personal relationship: e.g., friends, colleagues, strangers D. Shared knowledge: personal and specialist
III. Channel	<ul style="list-style-type: none"> A. Mode: speech / writing / signing B. Specific Medium: <ul style="list-style-type: none"> Permanent: taped / transcribed / printed / handwritten / e-mail / etc. Transient speech: face-to-face / telephone / radio / TV / etc.
IV. Production circumstances	real time / planned / scripted / revised and edited
V. Setting	<ul style="list-style-type: none"> A. Is the time and place of communication shared by participants? B. Place of communication <ul style="list-style-type: none"> 1. Private / public 2. Specific setting C. Time: contemporary, historical time period
VI. Communicative purposes	<ul style="list-style-type: none"> A. General purposes: narrate / report, describe, exposit / inform / explain, persuade, how-to / procedural, entertain, edify, reveal self B. Specific purposes: e.g., summarize information from numerous sources, describe methods, present new research findings, teach moral through personal story C. Factuality: factual, opinion, speculative, imaginative D. Expression of stance: epistemic, attitudinal, no overt stance
VII. Topic	<ul style="list-style-type: none"> A. General topical “domain”: e.g., domestic, daily activities, business /workplace, science, education / academic, government / legal / politics, religion, sports, art / entertainment, etc. B. Specific topic C. Social status of person being referred to

This model of register analysis encompasses seven main elements. The first one focuses on the participants, the relations among them, and the “on-lookers” since, according to Biber and Conrad (2009) “characteristics like the speaker’s age, sex, level of education,

occupation, and social class can all be important determinants of linguistic variation” (p. 41). The category of “on-lookers” includes “participants who observe but are not the direct addressees of the register”, besides “the role of the on-lookers might have more practical importance than the addressee” (p. 42).

The second element in the analysis deals with the relation between the participants and generally seeks to answer the question “to what extent do the participants directly interact with one another?” (Biber and Conrad, 2009, p. 42). This section also concerns the social status of the members of the exchange.

The channel of communication is an important step in the register analysis, where a major distinction is made between speech and writing. Biber and Conrad (2009) also deal with the “production circumstances” as a fourth step in the analysis. The written registers are mostly characterised by being well-planned compared to speech. Moreover, written texts grant the reader another chance to understand the text.

While dealing with the setting, the analyst needs to know whether the time and place of communication are shared or not. In general, in written texts, the setting is not shared between the author and the reader, “however, some written texts do assume that the reader has knowledge of the time (and sometimes place) of production (Biber and Conrad, 2009, p. 44).

The sixth element of the register analysis is important as it covers the communicative purposes of the communication, which are responsible to a large extent for determining the genre and type of writing. Biber and Conrad (2009) maintain that a combination of communicative purposes may exist for just one text type. This step of the analysis concerns also the type of information conveyed, that is, whether it is factual, personal opinion, speculation, etc (p. 45/6). Furthermore, inseparable from the communicative purpose of communication is the “expression of stance” (ibid). Stance can be expressed by revealing either one’s “personal attitude” or “epistemic stance” (i.e., “the extent to which information is certain or generalizable, or explanations of the source of the information”) (ibid).

The last element in a register analysis is that of “topic”. According to Biber and Conrad (2009) a text can be situated within a broad general topic or can be accorded a more specific one. They also think that a topic is largely responsible for the choice of vocabulary in the text. Some words or grammatical constructions are thought to be reflective of “a particular social status” that the writer needs to claim.

The aim of such analysis is to define the situational and cultural contexts forming the register or genre of writing, and this allows, in turns, to account for the linguistic choices.

This analytical framework will be applied on each of the sub-corpora: RAs and PhD Theses in Social and Medical Sciences.

3.4.1. Register Analysis of Research Articles

This sub-section aims to perform a register analysis of RAs in the Medical and Social Sciences. First, the authors of RAs are researchers specialised in the Medical and Social fields. Oftentimes a RA can be written by just one researcher or a group of researchers under a particular institutional setting, which indicates that the names do not matter as does the title. Concerning the RAs studied in this thesis, the authors are supposed to be qualified professionals since the journals published in “Elsevier” require a high quality research as Luey (2010) claims that “mediocre work can be published in less prestigious journals” (p. 10).

The readers of these RAs can be seen as belonging to two main groups. The first readers are a limited number of editors who judge the acceptability of the article according to the publication principles of the journal. The second group is unlimited as it encompasses all researchers or students who are specialised, or interested in that field of research.

The relation between author(s) and readers differs based on the type of the reader. In case it is an editor, the author(s) should expect a response, which can be positive or negative, to their article. In fact, according to Luey (2010), among the “keys to quality publishing”, the author should be “communicating clearly with journal editors” (p. 10). In order to ensure such a successful communication, authors need to expect the editors’ questions and comments as much as possible, and try to convince them of the importance of their research.

Research Articles published in academic journals must present new findings and convince readers of the trustworthiness of the research and the significance of the findings relative to what is already known about the topic; the readers are expected to already have expert background in the research area and so they are relatively equal in status to the writer.

(Luey, 2010, p. 113)

Traces of the negotiation process are expected in RAs from all disciplines, which makes this genre highly persuasive. In case the reader belongs to the second unlimited group, as specified above, the relation between the author and the reader can be seen as one of inequality since a “Research Article occupies a prominent position in research publications, and is considered the main means employed by the hard sciences for the dissemination of knowledge, the publicisation of claims, and their ratification” (Koutsantoni, 2007, p. 164).

For both types of readers, a direct relation among participants is absent. In fact, for certain journals, the author may not know the editors of his/her article and the interaction

between them is restricted to the Research Article itself and the editors' report, due to blind reviewing. Authors and readers may be colleagues, friends or strangers, as the readers are unlimited. This may influence the reading process, as Biber and Conrad (2009) claim that

[S]ome situational characteristics vary by the individual situation. For example, one reader might skim a newspaper article or academic article very quickly, while another reader will read the same article in detail. Writers and editors know that both types of readers exist. Linguistic features may relate to meeting the needs of both such readers.
(Biber and Conrad, 2009, p. 113)

Considerations of the reader are also discipline-specific, since the latter plays an important role in shaping the expectations of both participants. The way a Research Article is built and the type of arguments and language is largely dependent on whether it is from Medical Sciences or Sociology. Shared knowledge in Medical Sciences is built on previous findings, while in Sociology; authors tend to argue for most of their choices.

The channel of communication of RAs is mainly written and can be in the form of hard or mainly soft copies since they are taken from online journals. The emergence of this relatively new medium of publication has influenced the process of writing. In fact, these articles can be read and understood by people of the discipline from all around the world, which means that it is not culture specific. All this led to the emergence of 'international scientific writing' where "the non-native English academic who wishes to obtain international recognition through publication will necessarily have to adopt the discourse conventions which characterise international scientific writing" (Martín, 2003, p. 26).

The lay-out of a Research Article shows certain degrees of formality, as writers need to abide by the constraints on form, proposed by the publishers. Authors have the opportunity to write and revise and edit their articles before and after sending them to the journal, as Biber and Conrad (2009) specify that "academic prose conform[s] to the prototypical production and comprehension circumstances of writing. The authors have time to plan, revise, and edit.... Readers also have the opportunity to re-read what has been written as many times as they care to" (p. 113). These production circumstances can also be influenced by the discipline as the above mentioned studies have shown that inductive sciences capitalise on how ideas are linked and on explaining the different methodological steps more than deductive sciences, which would imply more focus on the language.

The setting of the register is shaped by electronic publication, as well. This means that time and place are not necessarily shared by participants although indications of the date of publication exist for the sake of referencing.

The communicative purposes of RAs can be either general or specific. Generally speaking, the major communicative purpose of a RA is to communicate knowledge. Moreover, a Research Article is to inform and explain as “all academic writing is expected to go further than just narrating events. It needs to explain and interpret the information that is presented” (Biber and Conrad, 2009, p. 113). Specifically, the sections are “regarded as subregisters, differing mostly in their communicative purpose”, and although these sections share “the same physical context: the same author, same readers, same production circumstances... there are important linguistic differences across article sections, associated with the shifts in communicative purpose” (Biber and Conrad, 2009, p. 45).

The different communicative purposes of each section of the article may reflect variations in the functions assigned to linguistic items and structures. These communicative purposes can also differ with respect to discipline. For instance, seeing that Sociology is interpretative, the communicative purposes of the writer may differ from those in Medical Sciences, and this would influence the language of the whole article and of the sections as well, which explains the rationale behind different studies comparing sections across disciplines. Additionally, factuality also differs across the disciplines studied since they belong to the inductive versus deductive types of reasoning. In fact, while Medical Sciences build on facts to reach universal conclusions that can reach the level of facts, Social Sciences are interpretative, and this makes the given explanations stand as justified opinions.

Although the genre of academic writing focuses mainly on the information conveyed, stance is expressed for various reasons as Hyland (2009) maintains that “the expression of personal opinions and assessments is a ubiquitous feature of human interaction and, despite its apparently impersonal facade, central to academic writing” (p. 1). Speaking about Hyland’s investigation of Research Articles, Biber (2006) adds that:

Hyland (1996a, b) is one of the most important studies in this area of research, documenting the range of functions and grammatical devices used to express tentativeness and possibility in academic Research Articles. For example, content-oriented hedges have two major functions: indicating the accuracy of a proposition (e.g. adverbials like generally, approximately, partially, possibly), or limiting the writer’s commitment to a proposition (e.g. the present work indicates, the model implies.). Hyland (2002a) extends this line of research by investigating the ways in which authors refer to themselves (and when they do not refer to themselves) in academic prose. One of the themes that Hyland has developed over recent years is that academic Research Articles are interactive, in that authors actively try to involve the reader in the communication process.

(Biber, 2006, p. 98)

Research about RAs has stressed the relation between the writer and the reader. These cases of hedging can be considered genre-specific, however, other choices may be emanating from the topic. The RAs studied in the present thesis are from the Medical and Social Sciences. The purpose of the present investigation is to link the register variations to the linguistic choices

There are some grammatical differences that might at first seem to be related to topic. For example, passive verbs are much more common in science and engineering textbooks than in humanities textbooks. However, these differences are influenced mostly by the differing communicative purposes of these disciplines rather than simply by differences in topic.

(Biber and Conrad, 2009, p. 47)

Following this claim, differences between the two disciplines are to be linked to the communicative purposes of each of them. The present study seeks to investigate these differences, in case they exist, in order to define the different communicative purposes, which can be linked to the different methodologies, focus, types of findings, etc. In addition to RAs, the register analysis seeks to characterise PhD Theses in Medical and Social Sciences.

3.4.2. Register Analysis of PhD Theses

For a deeper characterisation of PhD Theses, a register analysis is applied. The participants in this register are first the students working on the thesis and also the committee responsible for the evaluation of their work. Unlike RAs, PhD Theses can be written only by one person; the students him/herself with the advice of one or more supervisor(s), while the committee, encompassing a number of experts in the research domain, is to decide whether the thesis is acceptable or not. This may influence the relation between the participants. In fact, the interaction between them is to be restricted, most of the time, to written material: the thesis itself and a report about it. Once the thesis is accepted, an oral defence is planned.

Seeing that the committee is responsible for whether the thesis will be accepted or not, the social roles of the participants are not equal. In fact, the committee is powerful, and this can be reflected in the students' writings. Swales (2004) linked the lack of innovation in PhD Theses to the fact that "not all doctoral students believe in their hearts that their dissertations are *really* making a substantial and original contribution to their field" (Swales, 2004, p. 117). This uncertainty and lack of power on the part of doctoral students have implications on the writing of the thesis.

The channel of this register is mainly written; students have to type and print their dissertations. They also have the time to read, revise and edit, in order to avoid mistakes. A

PhD Thesis is not conceived to be published whether as a hard or soft copy. The setting of reading a PhD Thesis is close to its writing, both in terms of space and time. Seeing that the PhD Thesis is realised on a relatively long span of time (around three years), the student has time to read and revise his/her drafts so that s/he can provide an acceptable piece of research. It is also important to note the major role played by the supervisor in guiding the doctoral student, which means that the submitted draft has gone through different stages of corrections, editing and proofreading.

The main communicative purpose of writing a Thesis is for the student to guarantee the status of the researcher. A PhD Thesis is the first serious attempt in the world of research for the student who is expected to bring in some kind of new knowledge. The communicative purposes of the doctoral student are also shaped by the discipline. Medical students attempt to come up with conclusions based on deductive reasoning, while Sociologists tend to give new interpretations of observed social cases. The sections forming the PhD Thesis have their own communicative purposes, and reflect the disciplinary differences. Doctoral students are supposed to prove their abilities to conduct a methodologically acceptable piece of research. For this reason, PhD theses tend to elaborate more on their methodology and arguments.

This might influence the way stance is expressed in PhD theses, compared to RAs. In fact, Swales (2004) maintains that PhD Theses may “lack a certain explicitness with regard to the role and innovative character of the writer’s own research”, which is a result of the uncertainty about one’s research (Swales, 2004, p. 117). This would lead the researcher to express his/her stance in a way different from an expert as students are “more likely to double-hedge their claims” (Swales, 2004, p. 119).

As for the topic, generally, a PhD Thesis is a relatively long piece of research meant to prove the eligibility of the student. Specifically, the topic of the Thesis is largely influenced by the discipline, the department, the group of research, etc.

The present thesis aims to rely on this register analysis of PhD Theses in Medical and Social Sciences in order to explain the linguistic choices in the text.

3.4.3. Conclusion

This section has sought to identify the main characteristics associated with the two registers studied in the present thesis. The aim is to stress the similarities and the differences in order to link the linguistic choices to the wider context as Hyland (2006) claims that “one way of characterizing genres is in terms of the ways broad social purposes are systematically

linked with context through lexical and grammatical features” (p. 46). The similarities and differences between the registers can be summarised in the following table.

Table 3. 3 Register analysis of PhD theses and RAs

	<i>Research Articles</i>	<i>PhD Theses</i>
Participants	specialists	Students
Relations	Two types: editors (equality) and wide readership	Committee + supervisor + colleagues (less powerful)
Channel	Online, typed	typed
Production	Revised and edited	Revised and edited
Setting	different	close
Communicative purpose	Inform, explain, interpret + discipline specific	Inform, explain, interpret + discipline specific
Topic	Social Sciences: inductive research Medical Sciences: deductive research	about the Human Being. about the human body.

3.5. Concluding Remarks

The present chapter has sought to characterise academic writing which draws its importance from its content: science. However, any language use is shaped by its content, participants and context(s). In order to take these variables into account while analysing the PPs in the corpus, genre analysis is employed as it encompasses details about structure, style, content and purpose, and links them to context (Askehave and Swales, 2001). Among the different approaches to context, the model designed by Hasan (2009) within SFL is adapted in the analysis as it differentiates context of culture (genre) from context of situation (register). Among the different genres within scientific writing, PhD Theses and RAs are chosen for their importance and relative similarity. The chapter reviews the characteristics of each genre and their possible structures. The context of situation corresponds to the register, which is translated in scientific writing into discipline. Disciplinary variation has received much attention as it captures differences within the language of science. Different distinctions have sought to classify disciplines such as the soft versus hard and life versus non-life distinctions. In the present thesis, the light is shed on two life sciences: the Medical Sciences and the Social Sciences, which reflect respectively the hard versus soft distinction. In order to link the different variables of discipline, genre and section to the linguistic choices in the text, a register analysis is applied on PhD Theses and RAs while taking into account the disciplinary differences.

After reviewing the syntax and semantics of PPs, in addition to specificities of the academic writing, the light is shed on the methodology adopted in this study.

Part Two: Methodology

Chapter Four: Methodology

The present chapter presents the methodology followed in this thesis. The first section will present the corpus and its selection criteria. A second section will focus on the analytic tools used in the analysis of the corpus, which include mainly quantitative and qualitative methods. The quantitative methods include both computational and statistical tools, with the computational presenting the two software used in the analysis: AntConc and CorpusTool. The statistical tools identify the notions of population and sampling, and define frequency distributions, hypothesis testing and correlations.

4.1. The Corpus

After presenting the corpus, the reasons for its selections are outlined in the present section.

4.1.1. Presentation

The corpus is a collection of PhD Theses and Research Articles from the domains of Medical and Social Sciences (Appendix A). Collecting Research Articles was made possible thanks to the electronic academic journals available online, while PhD Theses are extracted from an online database.

The Medical Research Articles are randomly taken from several journals published in *Science Direct* in order to obtain a representative corpus (Among the journals: Oncology, Obstetrics and Gynecology, Hematology, Cell and molecular biology, Cancer research, Chemotherapy, Gene therapy, Epidemiology, Endocrinology, Physiology, Virology, Biochemistry, Bacteriology, Otorhinolaryngology, Cardiovascular research, Microbiology, Immunology, Molecular Genetics, Molecular and Medical Pharmacology, Pathology, etc.).

This is also the case for the articles from Sociology, which belong to the sub-fields of Criminology, Demography, Anthropology, Social and Economic research and Management.

However, collecting the PhD Theses was not as easy. In fact, PhD Theses are treated as books and libraries' permissions are required for their download. Various universities offer some of their theses, but these were not taken into account seeing that their quality was not confirmed. Proquest, a website providing electronic information to libraries publishes theses on condition that they are not used for commercial ends.

Based on these two genres and two disciplines, the corpus is divided into four main parts, as shown in the table below:

Table 4. 1Corpus distribution

	<i>Medical Theses</i>	<i>Medical Articles</i>	<i>Sociology Theses</i>	<i>Sociology Articles</i>	<i>Total</i>
Number of words	270000	245000	280000	246000	1041000
Number of items	8	50	5	30	93

The choice of the number of Research Articles and PhD Theses is motivated by the number of words that they contain. In fact, the Medical and Social Research Articles contain almost the same number of words (245000 and 246000, respectively), which is also the same case for the Theses (270000 and 280000, respectively). The number of items was not taken into consideration during the selection of the corpus since the analysis will measure the number of prepositions against the number of words rather than the number of RAs or PhD Theses.

4.1.2. Selection Criteria

The choice of academic writing comes as a result of the importance of such discourse, as science would not progress without language. Language has the ability to change and suit itself to the needs of science. Compared to previous decades, science is growing more and more specific, and inventions are made on a daily basis, yet, language has been able to parody all this diversification and progress. Moreover, the English language has been associated with the language of science, and “the use of English clearly continues to increase over time” (Research Trends, 2012), as has been revealed by studies on the status of English as the language of scientific communication.

The choice of RAs and PhD Theses among other genres in academic writing is attributed to their importance for the researcher. In fact, a PhD Thesis is the first important step in the career of the researcher as it allows him/her to be accepted in the research community. On the other hand, the competence of the researcher is measured by his/her publications, i.e. articles. These two genres display how researchers would be “climbing an academic ladder” (Swales, 2004, p. 3), since PhD Theses represent the acceptance into the world of research, while RAs, and mainly those published in international journals, are markers of expertise and proficiency.

The choice of electronic journals is mainly attributed to the quality of the articles they offer mainly that such articles target scholars from all over the world. Journals in *Science Direct* are edited by the renowned publisher *Elsevier* and offer recent articles from different domains and from different writers regardless of their origins as it produces “one-quarter of

all the scientific and technical content in the world” (Sciencedirect advertiser information)⁴. The restrictions made by this publisher concern the quality of research and the language, namely English. Elsevier, for instance, offers Language Editing Services to “authors who wish to publish in scientific, technical and Medical peer-reviewed journals and would like assistance either before they submit an article for peer review or before it is accepted for publication”⁵.

Furthermore, the choice of the disciplines is triggered by their being both life sciences, that is, dealing with the human being. However, Medical Sciences as an experimental science represent what is known as ‘hard sciences’, while Sociology is more likely to be among ‘soft sciences’ [section 3.4. Disciplinary Variations]. The disciplines are different in the way research is done, data is collected, results are drawn, etc. They are also different with respect to what constitutes good findings, as a result of the deductive and inductive approaches they adopt, respectively.

The differences in terms of genres and disciplines are explored in a corpus of one million words as “corpora give us the opportunity to quantify and make it particularly easy to quantify forms” and these quantifications are particularly useful in the “examination of variation between registers” (Hunston, 2007, p.27). The methods for quantification, namely the analytic tools adopted in the analysis, are explored in the following sub-section.

4.2. Analytic Tools

The tools used in the analysis of the corpus and covered in this section are both quantitative and qualitative.

4.2.1. Quantitative analysis

Quantitative research, according to Aliaga and Gunderson (2002), is “explaining phenomena by collecting numerical data that are analysed using mathematically based methods”. In fact, unlike qualitative analysis, quantitative tools are used only when the data are numerical. This view is also maintained by other specialists such as Punch (2000), who argues that “quantitative research is empirical research where the data are in the form of numbers” (p. 3). However, Punch (2000) maintains also that the “ways of conceptualizing the reality being studied” and the “methods” determine the nature of the research; that is whether it is quantitative or qualitative (p. 4). Seeing that the present thesis studies Research Articles

⁴ Extracted from : <http://www.elsevier.com/forms/sd/form.html>

⁵ Taken from : <http://www.elsevier.com/wps/find/authorhome.authors/languagepolishing>

and PhD Theses, the data are not numerical. In fact, it is the way to look at these types of writings and the methods used which necessitate the introduction of the quantitative tools. In the analysis of the corpus, the prepositions are to be extracted but in order to study their distribution, frequency measures are to be used. This is reflected in the definition provided by Jonker and Pennink (2010) who claim that “quantitative roughly means in terms of ‘quantities’ implying the extent to which something either does or does not occur in terms of amount, number, frequency, etc” (p.65). Johnson (2008) defines the following goals for applying a quantitative analysis:

- data reduction: summarize trends, capture the common aspects of a set of observations such as the average, standard deviation, and correlations among variables;
- inference: generalize from a representative set of observations to a larger universe of possible observations using hypothesis tests such as the Hest or analysis of variance;
- discovery of relationships; find descriptive or causal patterns in data which may be described in multiple regression models or in factor analysis;
- exploration of processes that may have a basis in probability: theoretical modeling, say in information theory, or in practical contexts such as probabilistic sentence parsing.

(Johnson, 2008, p. 3)

These steps reveal how a quantitative analysis needs to be undertaken in order to reach reliable findings. Quantitative tools are among the technical tools that can be used in the analysis of discourse in addition to computational tools, as claimed by Triki and Sellami-Baklouti (2002). The analysis will be using computational tools to annotate texts and to make calculations. Once correlations are observed, they are tested for the hypotheses they may indicate. Based on the relations that may be discovered, the qualitative analysis is undertaken to come up with certain causal links, and probably some theoretical explanations. For this purpose, the computational tools and the statistical tools applied in the quantitative analysis are presented in the following sub-sections.

4.2.1.1. Computational tools

Computational linguistics is the field of linguistics that explains how computational tools can be used in text analysis (Triki and Sellami-Baklouti, 2002, p. 2). The use of the computer in research is, according to Triki and Sellami-Baklouti (2002), one way to obtain “better results about language” (ibid). This field is also referred to as Natural Language Processing where there is a “construction of computer programs to process words and texts in natural language” (Bolshakov & Gelbukh, 2004, p. 25).

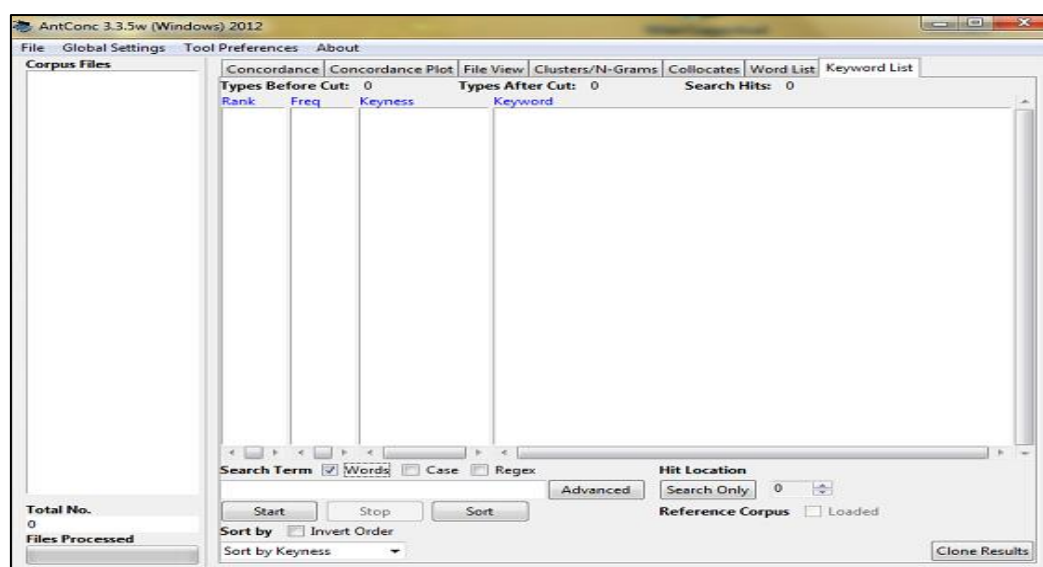
The first step in the analysis of the corpus consists in the extraction of all the prepositions based on ‘AntConc’, one of those concordance programs that are designed to perform such tasks like extracting lists of words from electronic texts. Other types of software are designed to perform more sophisticated operations. In the case of the present thesis, the chosen software is called CorpusTool.

This sort of analysis is also the focus of corpus linguistics, seen by O’Keeffe and McCarthy (2010) as “associated in the minds of linguists with searching through screen after screen of concordance lines and wordlists generated by computer software, in an attempt to make sense of phenomena in big texts or big collections of smaller texts” (p. 3). They further explain that this analysis is primarily based on the extraction of particular words or phrases from large amount of texts. In the present research, prepositions are first extracted using AntConc to have a general overview on the distribution of this part of speech in the corpus. Then CorpusTool will be used to annotate the examples. The annotation of the corpus will be based on systems, which would allow the categorization of PPs.

4.2.1.1.1. AntConc

This software is a free concordance program by Laurence Anthony (Japan) that can be downloaded from the website (http://www.antlab.sci.waseda.ac.jp/antconc_index.html). The program runs different operations such as: extracting keyword lists, extracting word lists, collocations, clusters in addition to the concordance function. The present thesis makes use of the version 3.3.5w 2012 designed for windows. After double-clicking on the icon of AntConc, the following window in figure 4.1 opens.

Figure 4. 1 Windows 1 of AntConc



Afterwards, any *.txt* file can be opened by clicking on ‘Open File’ in the File menu at the top left corner. Sixteen files have been created according to discipline, genre and section, and named ‘S’ for Social, ‘M’ for Medical, ‘A’ for article, ‘D’ for dissertation, ‘INT’ for Introduction, ‘MET’ for Methods, ‘RES’ for Results and ‘DIS’ for Discussion. Then, by clicking on ‘wordlist’ and ‘start’ buttons, the list of all the words used in the text will be displayed, as shown in figure 4.2.

Figure 4. 2 Window 2 AntConc

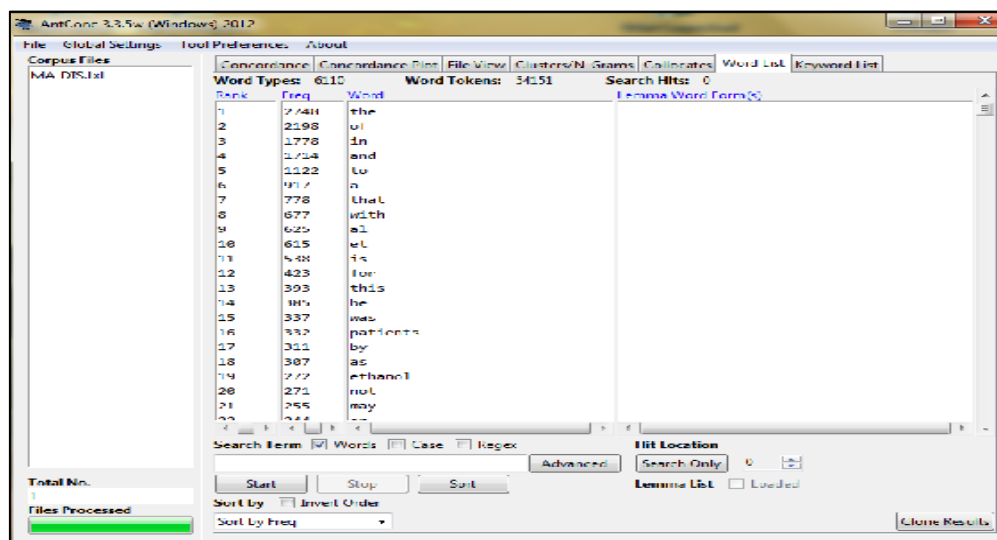


Figure 4.2 shows the word list for the document MA DIS.txt, with a frequency digit in front of every word. Then, manually, all the prepositions are extracted with their frequency digit. This operation is repeated for all the documents of the corpus. Appendix B contains four tables summarising the distribution of the prepositions in the four sub-corpora.

The second software CorpusTool is more than a simple concordance as it performs other functions introduced in the following sub-section.

4.2.1.1.2. Corpus Tool

According to O’Donnell (2008) the designer of CorpusTool, the new software is created to explore “linguistic patterns in text which cannot be explored with simple concordancers” (p.1). Different layers of annotation can be chosen by the analyst starting from the document level to the semantic and syntactic ones.

The present thesis makes use of version 2.8.14 available since 2011⁶, which is accompanied with a manual by Mick O’Donnell, published in February, 2011. The user needs

⁶ <http://www.wagsoft.com/CorpusTool/index.html>

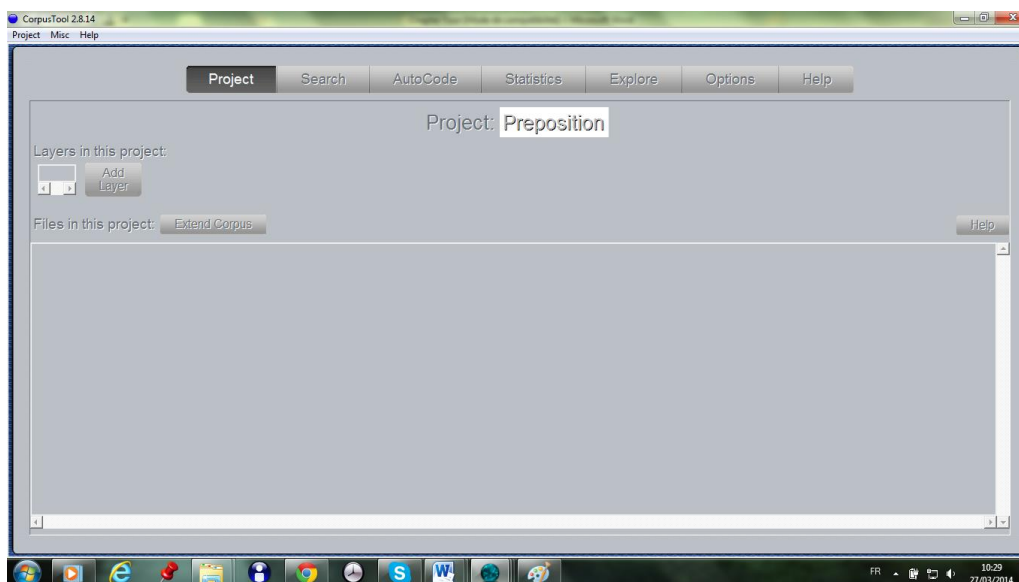
first to start a new project by pressing the button 'start a new project'. This window allows the user to name the project and to store it in the folder s/he wants (Figure 4.3).

Figure 4. 3 Window 1 CorpusTool

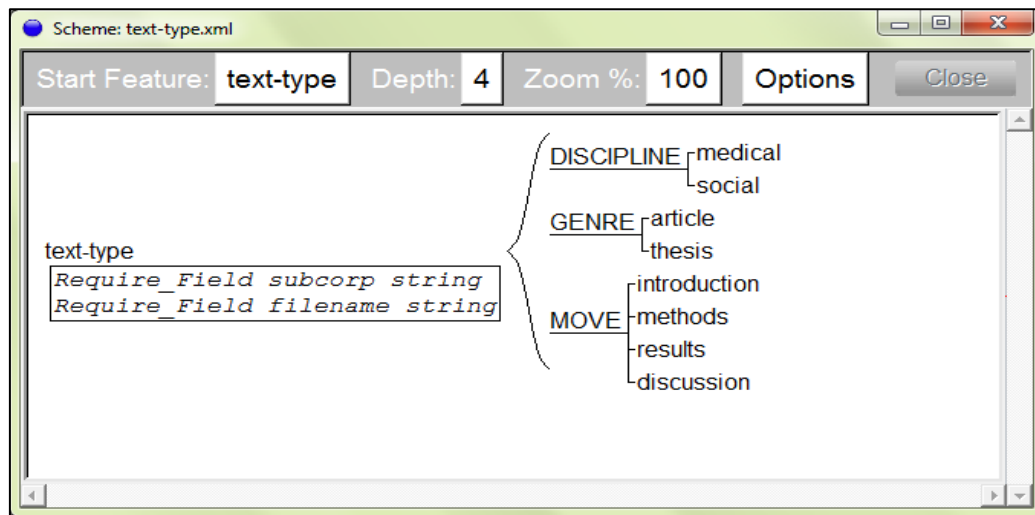


After pressing the 'Finalise' button, a project in the form of a folder containing all the necessary details is created. The first project created in the present thesis is entitled 'Preposition' (figure 4.4).

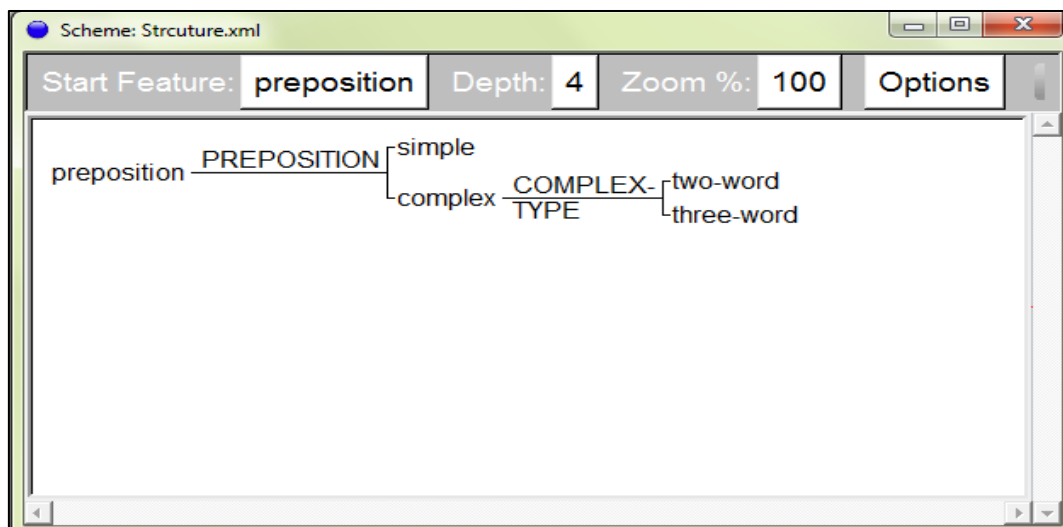
Figure 4. 4 Window 2 CorpusTool



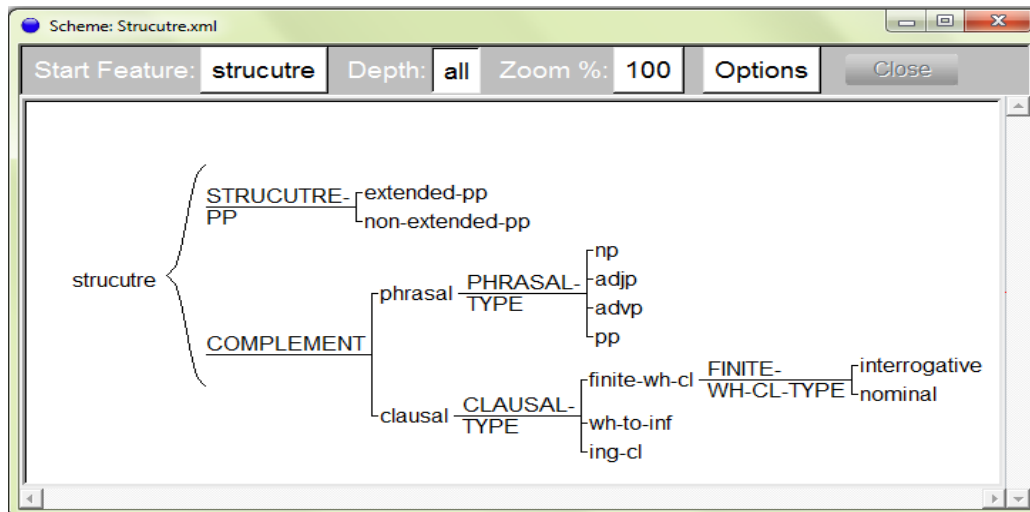
The following step consists in adding the layers of analysis, which cover the different types of analysis and the classification of the corpus. The system used in the identification of text-type is the displayed in figure 4.5.

Figure 4. 5 Window 3 CorpusTool

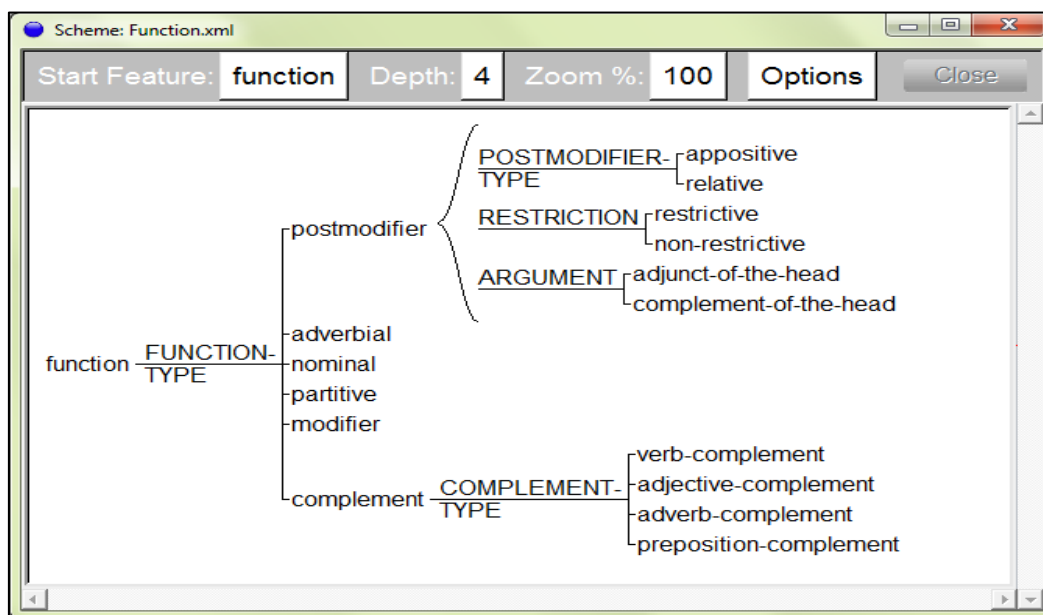
In addition to the layer organising the text-type at the document level, other layers are added in order to analyse the corpus. These layers contain systems used in the annotation of the prepositional phrases. The first system is used to describe the prepositions themselves, whether simple or complex as shown in figure 4.6.

Figure 4. 6 Window 4 CorpusTool

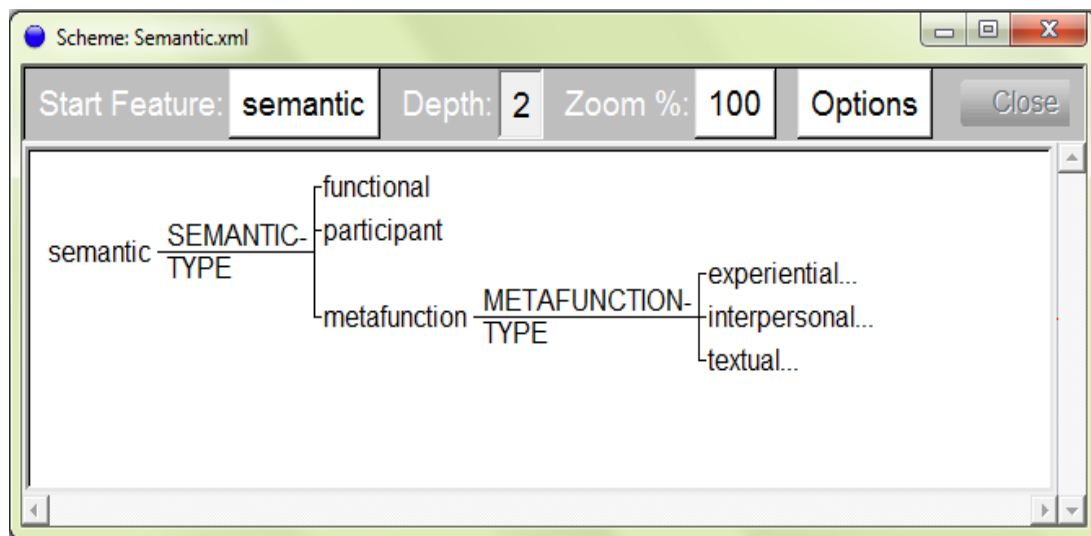
Furthermore, another system is designed to describe the structure of PPs, which can be extended, that is containing a premodifier, or non-extended. The structure of PPs is mainly differentiated according to the prepositional complement. Structurally speaking, the complement can be either phrasal (NP, AP, AdvP or PP) or clausal (Finite, non-finite or ing clause), as revealed in figure 4.7.

Figure 4. 7 Window 5 CorpusTool

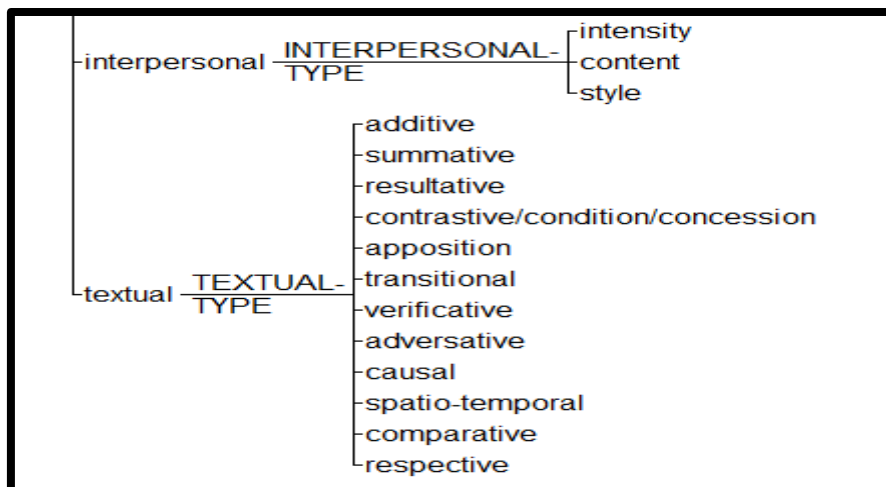
In addition to the study of the structure of PPs, the present thesis investigates their different functions. Figure 4.8 shows how the system is designed.

Figure 4. 8 Window 6 CorpusTool

In addition to the study of functions and structures, the focus on PPs is extended to cover the meanings they express. Within the semantic analysis, the PP is annotated for being functional, meaningful or introducing a participant. The participants are: recipient, benefactive and agentive. The meanings are arranged by metafunction, as revealed in figure 4.9.

Figure 4. 9 System for semantic annotation

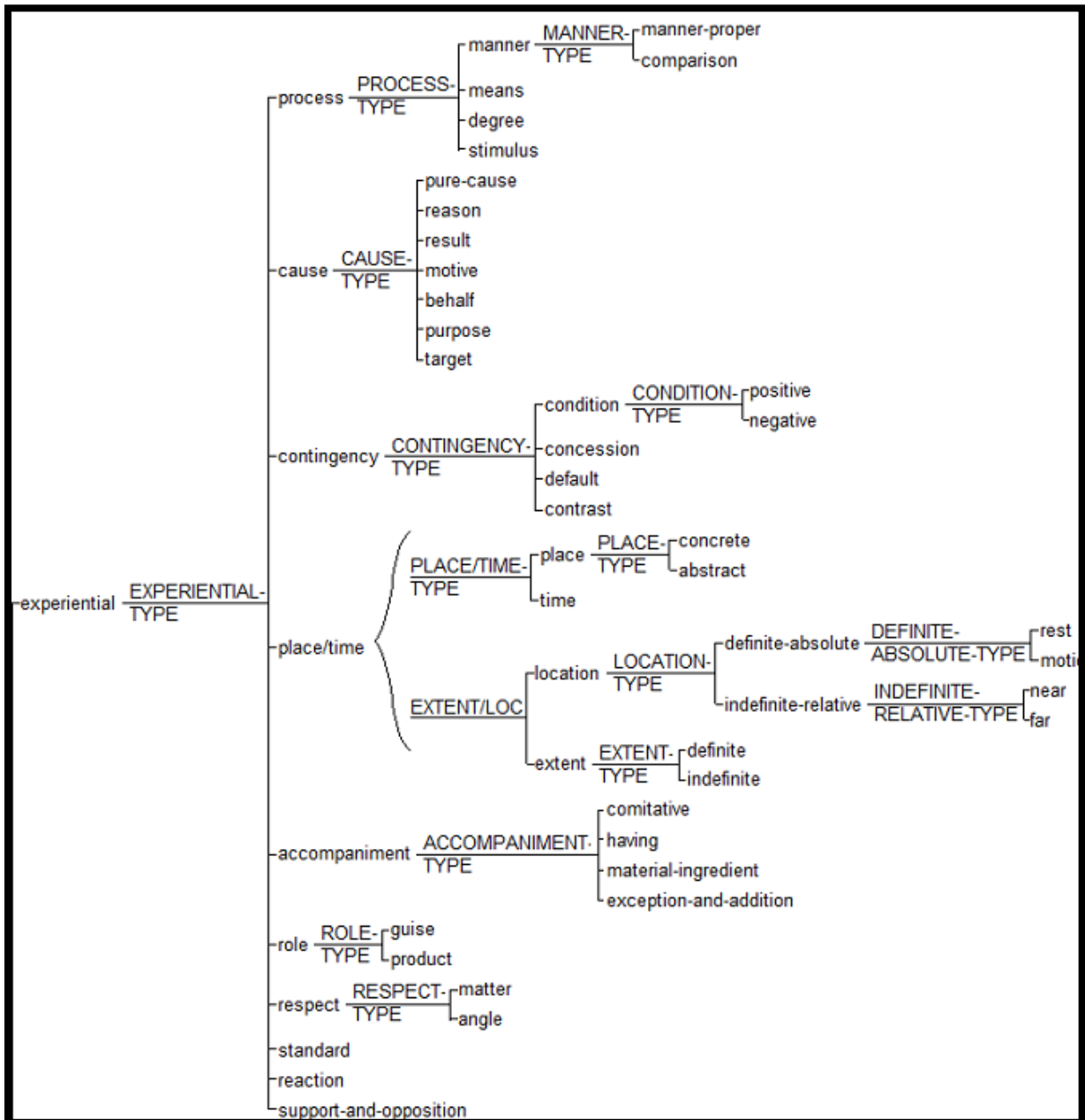
Interpersonal meanings are classified into intensity, content and style, while textual meanings are: additive, summative, resultative, contrastive, apposition, transitional, verificative, adversative, causal, spatio-temporal, comparative and respective, as summarised in figure 4.10.

Figure 4. 10 System for the interpersonal and textual meanings

In addition to these, the experiential meanings are displayed in Figure 4.11⁷.

⁷ These systems are the ones produced in the conclusions of chapter one [1.5. Concluding Remarks], and chapter two [2.8. Concluding Remarks].

Figure 4. 11 System for experiential meanings



These layers of the analysis are used in the annotation of the corpus. Finally, in order to add files in the program to be annotated, the user needs to click the button of ‘Extend Corpus’, and then the selected files having the format of a text (i.e., .txt). Then, statistics drawn from the annotation of the corpus can be displayed, and examples can be searched for. The following sub-section introduces the statistical tools used in the analysis.

4.2.1.2. Statistical tools

In the online encyclopaedia of Britannica, statistics is defined as “the science of collecting, analyzing, presenting, and interpreting data⁸”. Statistics applies quantitative measures of any type of data, called ‘population’ (Triki and Sellami-Baklouti, 2002, p. 39). In linguistics, statistics is related to corpus linguistics, defined by Baker (2010) as being “firmly rooted in empirical, inductive forms of analysis, relying on real-world instances of language use in order to derive rules or explore trends about the ways in which people actually produce language” (p. 94). One major advantage of exploring corpora quantitatively is that “it can enable researchers to quantify linguistic patterns, providing more solid conclusions to be reached” (Baker, 2010, p. 94).

In certain cases, the corpus is so extended that an analysis of all the items is almost impossible. In fact, when a pilot study was performed, it was obvious that analysing the one-million word corpus is not feasible for temporal and logistic reasons. Kothari (2004) claims that “many a time it is not possible to examine every item in the population, and sometimes it is possible to obtain sufficiently accurate results by studying only a part of total population” (p. 55). Therefore, a decision was taken to analyse a sample of PPs. The techniques adopted in the sampling procedure, the measurement applied in the analysis and the hypothesis testing tools are presented in the following sub-sections.

4.2.1.2.1. Sampling

Following Triki and Sellami-Baklouti (2002), “the use of samples in statistical study is less tedious than the use of the whole population; it is less time consuming and is much easier to handle than large amounts of data” (p. 39). However, they warn from the imprecise selection of the sample as “the results obtained are then applied to the whole population” (Triki and Sellami-Baklouti, 2002, p. 39).

The first step in the sampling procedure is to decide on the size of the sample, which can be computed, according to Kothari (2004) by applying the following rule:

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2 (N - 1) + z^2 \cdot p \cdot q}$$

Where

⁸ <http://www.britannica.com/EBchecked/topic/564172/statistics>

N= size of population

n = size of sample

e = acceptable error

z = standard variate at a given confidence level

p = sample proportion

q = 1-p

The size of the population is 129.796, while the confidence level in Social Sciences is 95% corresponding to 1.96 (Kothari, 2004, p. 175). The acceptable error is 0.05, and the sample proportion is thought to be 0.2 as every eighth word in English is a preposition (1/8).

The sample would be:

$$n = [(1.96)^2 * 0.2^2 * (1-0.2)^2 * 129796] / [0.05^2 * (129796-1) + (1.96)^2 * 0.2^2 * (1-0.2)^2]$$

$$n = 245,13$$

The sample should contain 245 prepositions. Moreover, when selecting the sample, different techniques exist. The present thesis makes use of ‘probability sampling’ and particularly ‘stratified random sampling’ (Kothari, 2004; Triki and Sellami-Baklouti, 2002) because the corpus is divided into four main parts: Medical PhD Theses, Medical RAs, Sociology PhD Theses and Sociology RAs. Besides, each sub-corpus is further divided into four sections: Introduction, Methods, Results and Discussion. Kothari (2004) defines this method as:

If the population from which a sample is to be drawn does not constitute a homogeneous group, then stratified sampling technique is applied so as to obtain a representative sample. In this technique, the population is stratified into a number of non-overlapping subpopulations or strata and sample items are selected from each stratum. If the items selected from each stratum is based on simple random sampling the entire procedure, first stratification and then simple random sampling, is known as stratified random sampling.

(Kothari, 2004, p. 16)

When applying the stratified random sampling on the corpus, prepositions are randomly but systematically selected from each sub-corpus. For example, if a sample of the preposition ‘of’ is to be extracted from the corpus, the first decision should be about the number of items. The chosen number is 160, which should be equally divided between the four sub-corpora, which would mean 40 per sub-corpus. Knowing that each sub-corpus is further divided into four sections, 10 from each section will be extracted. These items are randomly and systematically selected, which means that the first item is selected randomly then the others are selected at equal intervals. In this context, Babbie (2013) claims that

“simple random sampling and systematic sampling both ensure a degree of representativeness and permit an estimate of the error present” (p. 212). For instance, if the document contains 60 pages, the first item is selected from page 5, while the others are selected from every sixth page. Moreover, all the items are selected from the first occurrence in the second paragraph.

After the sampling is done, the analysis relies on certain statistical tools such as frequency distributions, hypothesis testing and correlations.

4.2.1.2.2. Frequency distribution

Among the different statistical tools, frequency distribution “can give a rough idea about the central tendency of the variables” (Triki and Sellami Baklouti, 2002, p. 46). This distribution is based on the grouping of the different values “on a continuous scale”, according to Johnson (2008) who also claims that “to describe the frequency distribution of our data we need to group the data into contiguous ranges of scores (bins) of similar values and then count the number of observations in each bin” (p. 8). This measure would allow the drawing of histograms and frequency polygons. For example, if a linguist wants to study the number of syllables per word in a given text, s/he needs first to give the number of syllables for each word, then count the number of words with one syllable, two syllables, etc. These observations are then arranged, which would allow the researcher to define, for a particular text, which words are more frequently used based on the number of syllables they contain. Consequently, a histogram can be drawn showing the word frequency with respect to the number of syllables per word by including the values of the number of syllables in the horizontal axis and the respective number of words on the vertical.

In the analysis of PPs, frequency distributions are computed for the different structures, functions and meanings. For instance, when studying the prepositional complements, PPs are annotated as to whether the complement is phrasal or clausal. Then, the frequency of each is displayed, in addition to the percentages. The results can reveal differences in the distribution of certain variables, and this can lead to the formulation of hypotheses.

4.2.1.2.3. Hypothesis testing

In addition to the measures of frequency, quantitative methods in linguistics draw from statistical tools for hypothesis testing. Testing a hypothesis is effective when

We often want to ask questions about mean values. Is this average voice onset time (VOT) different from that one? Do these two constructions receive different average ratings? Does one variant occur more often than another? These all boil down to the

question is \bar{x} (the mean of the data x_i) different from \bar{y} (the mean of the data y_i)?

(Johnson, 2008, p. 38)

Hypothesis testing allows deeper, more revealing and more complex scientific observation of the data, “about the distribution of variables in a set of data or the differences between sets of data” (Triki and Sellami Baklouti, 2002, p. 54). Testing a hypothesis is based on observing a phenomenon, formulating a hypothesis about that phenomenon and then testing the hypothesis for significance before drawing conclusions. In the present thesis, a hypothesis can be tested in case a phenomenon about the distribution of a variable is observed (Triki and Sellami Baklouti, 2002, p. 54). The first step in testing a hypothesis is the null hypothesis H_0 , which states that the observed distribution is not significant. The purpose then is to be able to reject this null hypothesis, and adapt the alternative hypothesis H_1 stating the opposite of H_0 . This can be done through deciding on the significance level, below which the researcher’s hypothesis can be safely maintained. Among the tests, the chi-square test seems to be appropriate for research in linguistics. This test “makes it possible to value the difference found between an observation and an expected theoretical model or to test a hypothesis about the distribution of the characteristics concerned” (Triki and Sellami Baklouti, 2002, p. 57). The formula of the test is:

$$\chi^2 = \sum (O - E)^2 \div E$$

with;

E: being the expected frequency

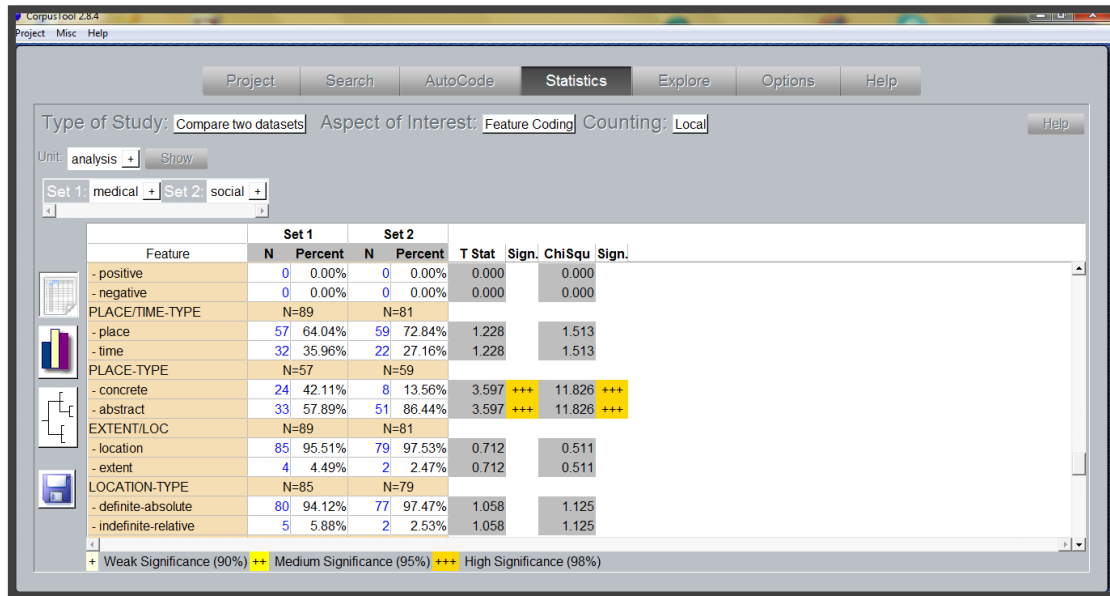
O: the observed frequency

E: computed by multiplying the line total by the column total and dividing the product by the general total:

$$E = \text{line total} \times \text{column total} \div \text{general total}.$$

In the present research, the value of the chi-square test is provided by the software analysing the corpus (CorpusTool) for each comparison. For instance, the spatial meanings expressed by PPs can be either concrete or abstract. When comparing two data sets (Medical texts versus sociology texts), the software displays a high significance (three pluses) for the distribution of these two meanings, as shown in figure 4.10.

Figure 4. 12 Window 7 CorpusTool



This can be explored by claiming that the distribution of the concrete and abstract places is not even, and that the choice of one of them is related to the type of the text, in fact, Kothari (2004) maintains that “as a test of independence, χ^2 test enables us to explain whether or not two attributes are associated” (p. 237). It is also important to note that CorpusTool classifies results of the chi-square test according to their significance: high (+++), medium (++) and low (+). Triki and Sellami-Baklouti (2002) maintain that in the humanities and Social Sciences “where measurement is less exact, a level $p \leq 0.05$ is quite common” (p. 56), which means that even results of medium significance are taken into account.

In addition to hypothesis testing, statistical tools allow to measure correlations between sets of variables, as illustrated in the following sub-section.

4.2.1.2.4. Correlation

A correlation between two variables exists if the high value of one is linked to the high value of the other. Kothari (2004) claims that correlation, and particularly Yule’s Coefficient, shows “the degree or intensity of association between two or more sets of attributes” (p. 145). According to Triki and Sellami Baklouti (2002), this coefficient is based on the question “if an individual has property A, does this mean that it is probable that it also has property B?” (p. 65). This coefficient is applied on tables having four main values. The formula for this coefficient is:

$$Q = (A-B) / (A+B)$$

The values of A and B are extracted from the table “by multiplying the four observed values 2 by 2 ‘in a cross’” (Triki and Sellami-Baklouti, 2002, p. 65)). The coefficient ‘Q’ situated between -1 and +1, is rejected when ranging between [-0.3, 0.3] and the correlation is seen as “doubtful or null” (ibid) otherwise the correlation does exist.

In this research, Yule’s Coefficient is computed after observing that the distribution of the meanings of place and time is correlated to the discipline of the text (Medical Sciences versus Sociology). Once the coefficient obtained is outside the rejection interval, it is possible to claim the presence of the correlation.

These statistical tools, in addition to the computational tools, form part of the quantitative analysis, which cannot be the only one adopted, as the qualitative tools are equally important.

4.2.2. Qualitative analysis

In addition to the quantitative methods that can be used in linguistics, qualitative tools are equally important. Following Punch (2000), “qualitative research is empirical research where the data are not in the form of numbers” (p.3). Jupp (2006) adds that a qualitative research is mainly based on “interpretivism, constructivism and inductivism” (p. 249), which means that it focuses on the interpretation of meaning, on constructing realities and on the focus on particular instances since “the essence of qualitative research is to identify the characteristics and structure of phenomena and events examined in their natural context” (Jonker and Pennink, 2010, p. 77). However, the space given to the researcher within a qualitative paradigm to interpret individual cases may lead to subjective findings since, according to Jonker and Pennink (2010), “the qualitative researcher is completely involved in his research; this can easily result in uncontrollable subjectivity” (p. 90). Jupp (2006) also criticises the qualitative paradigm since

Qualitative research is sometimes seen as lacking the rigour of quantitative research, producing ‘soft’ data that is subjective and not easy to replicate, often based on small samples or case studies. There are difficulties in meeting the usual scientific criteria of validity, reliability and representativeness.

(Jupp, 2006, p. 249)

In order to overcome the criticism associated with the qualitative and quantitative paradigms, scholars such as Angouri (2010) call for combining methods in linguistic research (p. 29). Angouri (2010) who reviewed different studies on mixed methods research claims, based on the views of Greene et al. (1989), that “combining the two paradigms is beneficial for constructing comprehensive accounts and providing answers to a wider range of research

designs” (p. 30). The way the paradigms are combined should be decided by the researcher based on the questions s/he wants to answer

[T]he methods and data used (quantitative, qualitative or both) should follow from, and fit in with, the question(s) being asked. In particular, quantitative questions require qualitative methods and data to answer them, and qualitative questions require qualitative methods and data to answer them.

(Punch, 2000, p.4)

Punch (2000) suggests that qualitative questions are to be answered using quantitative tools and vice versa. In this context, Bryman (2006) wrote an article on how to combine the different methods and was able to prove that the main merit from using both methods is that the results “may not be predictable” (p. 111).

This is, of course, a feature of much research. Qualitative research is often depicted as a research strategy whose emphasis on a relatively open-ended approach to the research process frequently produces surprises, changes of direction and new insights. However, quantitative research is by no means a mechanical application of neutral tools that results in no new insights. In quantitative data analysis, the imaginative application of techniques can result in new understandings. If the two are conducted in tandem, the potential – and perhaps the likelihood – of unanticipated outcomes is multiplied.

(Bryman, 2006, p. 111)

Having non-anticipated results can be seen as the goal of research, and can overcome the main drawbacks of using only one of the methods. In the present thesis, qualitative questions would be answered using quantitative data, and quantitative data would be interpreted qualitatively, as summarised in the following procedure.

4.3. Procedure

The first step in the research was to collect the corpus, which consists of PhD Theses and RAs from Medical Sciences and Sociology. These documents, which are downloaded in a pdf format, have been converted into Word documents using a free pdf converter⁹. Then all the extra information such as the abstracts, the acknowledgements, the table of contents and the references is omitted since only the main body of the PhD Thesis or Research Article will be analysed. These texts are then further classified into 16 Word documents classified by genre, discipline and section (an electronic version is available).

⁹ <http://www.freepdfconvert.com/>

The following step consists in extracting the frequencies of the prepositions in each one of the documents using AntConc and ordering them in tables (Appendix B). Then the values of each preposition in all the tables are computed, as shown below.

Table 4. 2 Distribution of the most frequent prepositions in the corpus

	<i>MA</i>	<i>MD</i>	<i>SA</i>	<i>SD</i>	<i>Total</i>
of	7924	8879	8133	9296	34232
in	5630	5450	5308	6297	22685
to	2278	2749	2418	3075	10520
for	1866	2101	2434	2279	8680
with	2581	2681	1396	1417	8075
as	881	1699	1551	2156	6287
by	1345	1299	1158	1215	5017
on	716	1306	1446	1433	4901
from	1056	656	872	940	3524
at	846	706	541	1086	3179
between	366	567	580	458	1971
after	482	255	162	331	1230
about	37	297	325	413	1072
Total	26008	28645	26324	30396	111.373

Table 4.2 displays the most frequent prepositions in the corpus, in addition to their frequencies in each sub-corpus. The total number of prepositions in the whole corpus is 129.796. Seeing that this number is difficult to handle, the choice in the present thesis is to work on a sample rather than on the whole corpus, as mentioned in section [4.2.1.2.1. Sampling]. In order to be able to draw generalisations about the corpus, the choice of the sample has to be random. Since the corpus is divided into 4 main sub-parts, and that many prepositions are studied, the stratified type of sampling is chosen, as it is “a method for obtaining greater degree of representativeness by decreasing the probable sampling error” (Babbie, 2013, p. 212).

The sampling needs also to depend on the frequencies of prepositions. Since the digits are difficult to conceive of, the following figure shows the percentages attached to every preposition.

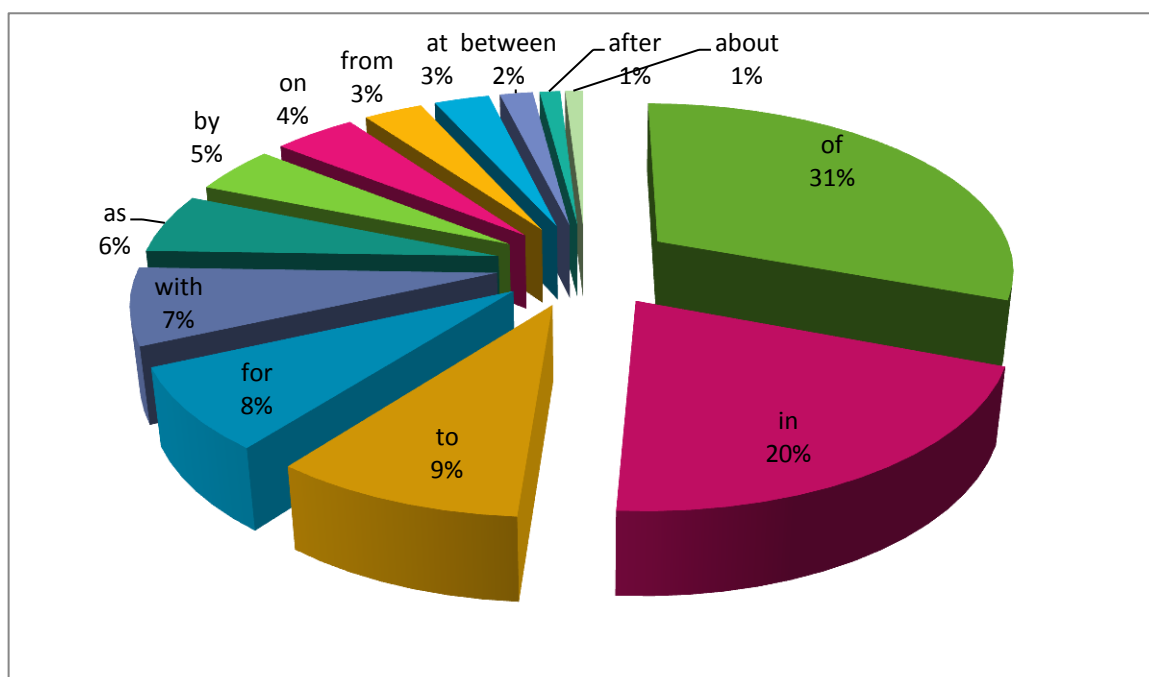
Figure 4. 13 Most frequent prepositions in the corpus

Figure 4.13 shows that the most frequent prepositions are ‘of’ and ‘in’, representing 31 and 20 per cent of all the prepositions, respectively, while the other prepositions account for frequencies ranging between 9 and 1 per cent. These differences would lead to differences in the selection of the sample as the first set of prepositions (of and in) is more frequent than the second set. Stratified sampling consists in selecting the sample from the parts of the population rather than the whole population at large. Therefore, the sample of prepositions will be taken from the four sub-corpora equally. Additionally, the sample will take the frequency of the prepositions into consideration. Therefore, from each most frequent preposition (of and in), 40 examples will be taken from each sub-corpus, and from the second group of prepositions, 8 examples will be randomly and systematically selected from each sub-corpus. The following table summarises the distribution of the sample.

Table 4. 3 Sample distribution

<i>The preposition</i>	<i>Number of items selected</i>
<i>Of and In</i>	40 from each sub-corpus = 160 cases for each preposition
<i>For, with, as, by, on, from, at, between, after, about</i>	8 from each sub-corpus = 32 cases

Therefore, 160 sentences containing ‘of’ are inserted into a Word document, and the same procedure is repeated for the preposition ‘in’. The other set contains 32 occurrences for

each preposition. Once the sample is extracted, the sentences are given references (Appendices C, D and E), to facilitate their annotation and retrieval.

The Word documents are then transformed into plain texts to be incorporated into the software CorpusTool. After editing the layers of analysis, the annotation of the PPs starts. The first layers concern the genre, register and section, so that each PP is situated within its contexts. Then the PPs are annotated for the type of preposition they contain, that is, whether simple or complex. The following system concerns the prepositional complements, which can be either phrasal or clausal, with sub-types under each option. The functions of adverbial, postmodifier, complement, etc. are used in the annotation of the PPs, too. Finally, the semantic analysis is developed to tag each PP with its corresponding meaning.

Once the annotation of all the PPs is done, the software carries out a range of statistical analyses, “revealing patterns that the eye might miss” (O’Donnell, 2008). In this respect, Biber and Conrad (2009) confirm that

Registers can be identified and described based on analysis of either complete texts or a collection of text excerpts. This is because the linguistic component of a register analysis requires identification of the *pervasive* linguistic features in the variety: linguistic characteristics that might occur in any variety but are much more common in the target register.

(Biber and Conrad, 2009, p. 6)

The goal of linking the patterns of the PPs studied can be fulfilled even if only samples are studied, because registers are identified in terms of their ‘pervasive’ linguistic features. In this case, these linguistic characteristics will be sought in the patterns resulting from the analysis of PPs. This is based on Halliday’s definition of register variation as “systematic variation in probabilities; a register is a tendency to select certain combinations of meanings with certain frequencies, and this can be formulated as the probabilities attached to grammatical systems” (Halliday, 2005, p. 66). Therefore, the differences in the distribution of PPs can be seen as defining the contexts where they are situated as Sellami-Baklouti (forthcoming) claims that “the analysis of lexicogrammatical choices in the text helps construe meanings, hence, context”, which “helps explain the motivation behind such semantic and lexicogrammatical choices” (p. 2).

Mirroring the structure of the thesis, the analysis is divided into two main chapters: the first on the syntax of PPs, and the second on the semantics of PPs, while taking the context of scientific writing into account all along the two chapters. The first chapter focuses on the frequency of prepositions in the corpus, the type of prepositions (simple or complex), the structure of PPs and their functions.

The second chapter deals with the meanings expressed by PPs, after focusing on those cases where the preposition is used to introduce an oblique participant. The meanings expressed by PPs are arranged according to their metafunctions, and meanings are studied separately starting from the most congruent (place). The purpose of the chapter is to analyse how these meanings are expressed, and also how they can be linked to the contexts of genre, register and sections.

It is important to note that each step of the analysis will take into consideration the different sections of the PhD Theses or Research Articles (Introduction, Methods, Result and Discussion). Differences may exist in terms of structure between the Research Article and the PhD Thesis, however, Swales (2004) maintains that:

[T]here is still a wide perception that there is a standard or traditional format for the doctoral Thesis (Dudley-Evans, 1999), which is essentially a ‘blown-up’ version of the IMRD structure of Research Articles, even though the dissertation will be ten to fifteen times longer than the standard Research Article

(Swales, 2004, p.107)

The analysis of PPs will try to explain the differences as well as the similarities in the use of PPs, which would reflect differences or similarities in contexts.

Following the two chapters of the analysis, the dissertation ends with a conclusion where the major findings are summarised, the implications and the limitations are presented.

Part Three: Analysis and Discussion

Chapter Five: Syntactic Analysis

This chapter presents the syntactic analysis of the PPs in the corpus. It is structured as follows: a first section presents the general frequencies of PPs, a second one deals with the simple and complex prepositions, a third analyses the structure of PPs and a fourth studies their functions.

5.1. General Frequencies

Among the one million words studied in the corpus, 129,796 words are prepositions, thus representing almost 13 percent of all the words in the corpus. This result supports the claim held by Mindt and Weber (1989) that every eighth word in English is a preposition [Chapter One: Syntactic Approach], and therefore, they can be thought of as important categories as far as the English language is concerned. This result can be seen as a “global probability”, that is “pertaining to the language as a whole, in all contexts and registers” (Halliday and Webster, 2009, p.252) which means that they can be revealing of general characteristics of the English Language.

Among these prepositions, only those in table 4.2 are taken into consideration (111,373 prepositions). They represent 86 percent of the total number of prepositions in the corpus. However, these prepositions do not seem to be equally distributed across the sub-corpora, as shown in the following table:

Table 5. 1 Percentage of prepositions in each sub-corpus

	<i>MA</i>	<i>MD</i>	<i>SA</i>	<i>SD</i>	<i>Total</i>
Number of words	206832	278865	208285	249931	943913
Number or prepositions	26008	28645	26324	30396	111373
Percentage	12.5%	10.2%	12.6%	12.1%	11.7%

Table 5.1 presents only those prepositions studied in the corpus, which actually seem to differ slightly from one sub-corpus to the other. Dissertations seem to contain less prepositions than RAs, especially those in the Medical Science. This can be linked to the reduced size of the RA, and the relative freedom of expanding on ideas in dissertations. Prepositions in this case can be seen as a condensed choice to express meaning, which can be replaced by other, more elaborate structures.

Besides, the studied prepositions, presented in table 4.2, do not have equal frequencies, as certain prepositions like *of* and *in*, are more frequent than others. In fact, according to the British National Corpus¹⁰, prepositions vary in terms of their relative frequencies, as summarised in the following table.

Table 5. 2 Comparison of the corpus' results to the BNC

BNC		Corpus	
Preposition	Frequency	Preposition	Frequency
of	29391	of	34232
in	18214	in	22685
to	9343	to	10520
for	8412	for	8680
with	6575	with	8075
on	6475	as	6278
by	5096	by	5017
at	4790	on	4901
from	4134	from	3524
as	1774	at	3179
into	1634	between	1971
about	1524	after	1230
like	1064	about	1072
after	927		
between	903		

Table 5.2 shows that *of* and *in* are the most frequent prepositions in both corpora. Less frequent are the prepositions *to*, *for* and *with*, which have almost similar distributions in the studied corpus and the BNC. However, the distribution of the remaining prepositions reveals certain differences as certain prepositions are more frequent in the studied corpus (*as*, *between* and *after*), while others are either less frequent than the prepositions in the BNA (*on*, *at* and *about*), or not among the studied prepositions (*into* and *like*).

These results reveal that the studied corpus seems to have common features with the BNC, mainly that *of* and *in* are the most frequent prepositions, but also, it seems to have certain characterising features. The differences in distribution can be understood as reflecting local probabilities which are “particular to one subsystem or text type, or even to one body of text” (Halliday and Webster, 2009, p.252). These local probabilities result from “difference in the frequency patterns” which “is perhaps the main feature that distinguishes different

¹⁰ The frequencies are published in the Companion Website to ‘Word Frequencies in Written and Spoken English: Based on the British National Corpus’ (<http://ucrel.lancs.ac.uk/bncfreq/>) extracted on the 11th of April, 2014.

registers of a language” (Halliday and Webster, 2009, p.252). The differences, therefore, can be explained in terms of the register studied, as the BNC does not reflect one particular type. The use of prepositions *as*, *between* and *after* can be linked to the register of scientific writing, and both the syntactic and semantic analyses will try to account for the choices.

Local probabilities can characterise a whole corpus or even smaller chunks, as the corpus itself reveals differences between its sub-parts. The following figure summarises the distribution of the studied prepositions in the four sub-corpora.

Figure 5. 1 Distribution of prepositions across the sub-corpora

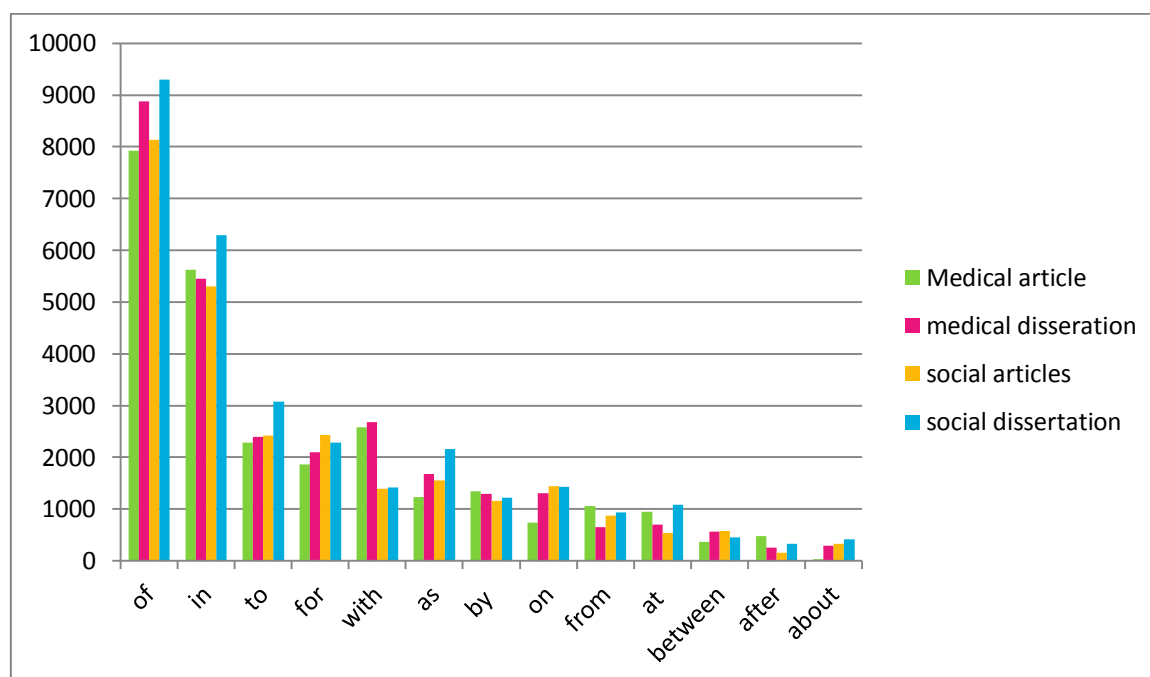


Figure 5.1 reveals that while certain prepositions have almost the same distribution across the four sub-corpora (*by*, *between*), others may reveal certain differences. For instance, larger concentrations of the preposition *of* are found in dissertations, while the preposition *with* seems to be more frequent in the Medical register.

These general distributions seem to reveal global as well as local frequencies, where “language...varies...according to the use (functional, or diatypic, variation). This functional variation takes the form of different registers and genres” (Halliday and Webster, 2009, p. 246). The purpose of the syntactic and semantic analyses is to explore the choices made in the corpus and to link them to the registers of Medical and Social Sciences and to the genres of Research Articles and PhD Theses. Syntactically speaking, the moments of choice linked to the use of prepositions are related to the type of the preposition, the structure and the function of the whole phrase. The following section starts with simple and complex prepositions.

5.2. Simple/Complex Prepositions

Prepositions can be either simple or complex (figure 4.6). The results reveal that most prepositions are simple, as shown in the following figure.

Figure 5. 2 Simple versus complex prepositions

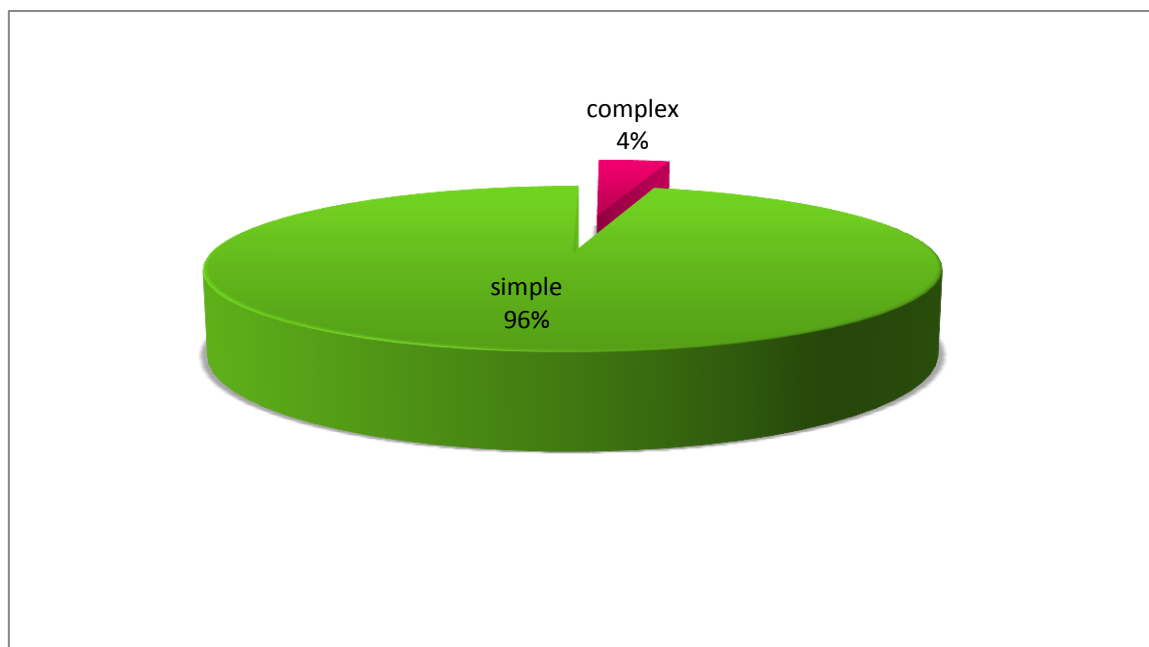


Figure 5.2 shows that 96 percent of the prepositions studied in the corpus are simple prepositions (774 cases), while only 4 percent are complex (32 cases). This result can be compared to the BNC classification of prepositions (table 5.2) where the preposition ‘*into*’ is classified among the most frequent prepositions in that corpus. This shows a tendency towards simplicity in the studied corpus, that is, in the register of scientific writing. The study of simple prepositions needs to take into account the meanings they express, which is the focus of the following chapter.

Complex prepositions are either two-word or three-word prepositions. The 32 cases of complex prepositions (Appendix F) include 13 two-word prepositions and 19 three-word prepositions, the following sub-sections deal with each type separately.

5.2.1. Two-word Prepositions

The studied sample contains 13 two-word prepositions, they are: *instead of* (1 occurrence), *out of* (1 occurrence), *into* (7 occurrences) and *within* (4 occurrences). The first two are formed around the preposition *of*, where the preposition is added to an adverb (instead) or associated with another preposition (out). These two prepositions are different from the other occurrences as *within* and *into* have been fused into one word (Carter and

McCarthy, 2006). This difference in form (one word versus two words) can be seen as reflecting a composite meaning for *out of* is ‘*from among*’, according to the online Cambridge Dictionary¹¹, as shown by the example from the corpus:

- **SA INT 8.** In 1996, 23 *out of 64 countries* with below-replacement fertility had policies to raise fertility ([Tsui, 2001] and [Caldwell et al., 2002]).

This example shows that 23 countries from among 46 followed a particular policy. This meaning seems to be linked to the original spatial meaning of *out of*, where a person or thing departs from an original position or status. In this case the origin is the 46 countries and what are involved in the policy or departing from the origin, are the 23 countries. *Out* contributes the meaning of departure, whereas *of* has a meaning of source.

Another two-word preposition is *instead of*, where the preposition *of* has been added to the adverb *instead*, which expresses the meaning of ‘*in place of*’¹².

- **MD DIS8.** *Instead of the three levels of cut off points of the recommended daily defined doses of AEDs*, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).

The adverb (*instead*) and the preposition (*instead of*) seem to have the same meaning, and it is possible to identify them as adverb or preposition thanks to the preposition *of*. Unlike *out of*, where the addition of *of* seems to contribute to meaning, the case of *instead of*, is different, as *of* is only added to mark the difference in word category, which means that it is rather a function word in this case.

On the other hand, *into* and *within* are graphologically treated as one element, unlike *out of*. In the case of ‘*into*’, *in* and *to* are two prepositions classified by Quirk et al (2005) as being positive, showing a movement inside, however, while *in* is static and denotes containment, *to* expresses a destination. The linking of these prepositions gives a meaning of a passage to a precise point, or “to the inside or middle of a place”, as defined in the Online Cambridge Dictionary. The meaning seems to have emerged from *to*, with a specific focus on the target of the passage, as highlighted by the meaning of containment expressed by *in*.

- **MA RES 8.** In terms of risk categories (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified *into a different risk*

¹¹ http://dictionary.cambridge.org/dictionary/british/out-of_1?q=out+of

¹² <http://dictionary.cambridge.org/dictionary/british/instead?q=instead>

set using arterial age in place of observed age (16% would go to a lower risk stratum and 12% to a higher risk stratum).

- **MD MET 3.** The following method for infection of the cells seeded *into appropriate tissue culture dishes* was used throughout the experiments, unless otherwise specified for particular HCMV infection assays.
- **MD MET 9.** The beta coefficient estimate and standard error for each study were entered *into the analysis*, which produced a global (i.e. average) OR and associated 95% confidence interval.
- **SA RES 2.** When breaking down the organizational variables *into the effects of unionization, casualization, globalization, and downsizing*, Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).
- **SD INT 5.** Axinn and Yabiku (2001) identify a crucial association between attitudes and transitions *into marriage* at the neighborhood level.

The choice of the preposition *into* in these examples seems to be linked to certain words like: *reclassify*, *seed*, *enter*, *break down*, and *transition*. The preposition in these cases highlights the resulting product, thus the “movement to the inside or middle of a place” is shaped by the context to cover the meaning of metaphorical movement to a particular status.

Similarly, *within* is made up of *with* and *in*, which denote proximity and containment, respectively. According to the Online Cambridge Dictionary, it expresses “inside or not further than an area or period of time”¹³, as shown in the following examples.

- **MA RES 10.** Hypotension (defined as systolic blood pressure less than 90 mm of mercury), present in two individuals when IV ribavirin was initiated, was managed with fluids and vasopressors, and resolved *within 24 h*.
- **MD RES 9.** SNP data were screened *within BeadStudio* using a two-step procedure.
- **MD DIS 1.** *Within the three different cell lines generated in this part of the study*, namely cell lines depleted of hDaxx, or expressing hDaxx PAH1 or hDaxxMSIM, ATRX had a dispersed localisation pattern.
- **SD INT 1.** When speaking specifically to legislative shifts in execution methods, there is little or no evidence *within the literature* which indicates that modes of punishment were designed or adopted to be exclusively used against one particular group or race of individuals, particularly in the post-industrial United States.

Similar to *in*, which has different meanings in different contexts, *within* tends to express time, place (concrete and abstract), etc. The use of the preposition *within* seems to provide a more specific variant of *in*, which can be seen in:

- ...there is little or no evidence *within the literature*.
- ...there is little or no evidence *in the literature*.

¹³ <http://dictionary.cambridge.org/dictionary/british/within?q=within>

These examples reveal that *within* is not adding to the meaning expressed, but to its specificity, and this would show that two-word prepositions which are fused do not carry a composite meaning. Rather, their meaning has fused too, and a loss of the meaning of proximity resulted during the grammaticalization process [section 1.2.3. Grammaticalization], to give way to a more specific meaning of containment than *in*.

The process of forming complex prepositions seems to reveal different statuses for the resulting preposition, as prepositions formed of two separate words are different from those where the prepositions are linked. In the present thesis, only two separate prepositions exist, whereby the addition of *of* can be either for grammatical or semantic purposes. However, linked two-word prepositions reveal how new, slightly different, meanings, are formed out of the old ones. It also shows that one of the prepositions contributes the central meaning (*to in into, in in within*), whereas the other helps shapes the new meaning, which means that these prepositions tend to have one simple, rather than composite meaning. Prepositions which have been fused into one word seem to have acquired new meanings, unlike separate prepositions, which either reflect complex meanings or are combined for grammatical purposes. Other prepositions are formed out of the combination of three words, and are dealt with in the following sub-section.

5.2.2. Three-word Prepositions

Among the studied prepositions, 19 are three-word prepositions. They are distributed in the corpus as follows.

Table 5. 3 Three-word prepositions in the four sub-corpora

	<i>Medical</i>	<i>Social</i>
PhD theses	2	7
	<ul style="list-style-type: none"> • in adherence with • in terms of 	<ul style="list-style-type: none"> • in regard to • in the face of • in the case of (2) • at the time of • at the end of • at the top of
Research Articles	5	5
	<ul style="list-style-type: none"> • in the same manner as • in combination with • in addition to • in terms of • in place of 	<ul style="list-style-type: none"> • in addition to • in terms of (2) • in relation to • in contrast to

Table 5.3 shows that the prepositions that have been tagged as ‘three-word’ are both three-word or four-word prepositions. Among the possible structures stated in section [1.2.2.Complex Prepositions], the patterns used in the corpus are *in + noun + as/with/of/to* and *at + noun + of*. Certain nouns are indefinite, while others are definite and even premodified (in the *same* manner as). These prepositions seem different as far as their grammaticalization process is concerned. In fact, since the noun manner can be premodified by the adjective *same*, the whole preposition can be subject to change and this means that it is not a fixed form. Besides, the preposition *in the case of* has another form (*in case of*), according to the list proposed by Quirk et al. (2005) [section 1.2.2.Complex Prepositions].

These prepositions show some flexibility in their use, thus showing a low degree of fossilization [section 1.2.3. Grammaticalization], unlike the other set (in addition to, in terms of, etc.). The most frequent of these is *in terms of*, which is the most frequent complex preposition in the BNC (Hoffmann, 2005, p.23), as stated in table 1.1 [section 1.2.3. Grammaticalization]. Prepositions like *in front of*, *on behalf of*, *in charge of*, etc. do not exist in the studied sample despite their relative frequency in the BNC. The choice of the complex prepositions seems to be motivated by the meaning they express as certain prepositions entailing human interaction are not among the sampled PPs. Such prepositions require contextual features to be understood, which is a sign of oral discourse (Tannen, 1985), where “the explicit and clear statement of information” is sacrificed “for the demonstration of interpersonal involvement” (Tannen, 1985, p. 126). The context, as formed of the immediate surroundings, is not adopted in such writings, rather the content is focused on.

This context of academia seems rather to opt for other complex prepositions. It is the search for certain specific meaning that has led to the choice of *in adherence with*, *in combination with*, etc. For instance, the preposition *in addition to* can be related to the argumentative nature of scientific texts, where the author has to enumerate variables:

- **MA RES 2.** In type 1 EN tumors, the K5+ basal/myoepithelial cells, ***in addition to the K8+ luminal cells***, are part of the tumor epithelial cell population.
- **SA RES 1.** ***In addition to the analyses reported***, we also consider the possibility that predictors of the fear of specific crimes may have differential effects, consistent with recent research (e.g., [Ferraro, 1995] and [Rountree, 1998]).

This complex preposition is a cohesive device used to clarify for the reader the logical arrangement of ideas. The need for clarity emerges from the written channel, as authors have to lexicalise not only the ideas, but also the relations between them to avoid possible ambiguities.

Certain prepositions seem to have specific and new meanings, others, however, can be expressed via simpler prepositions (*at the time of*). This can be linked to the frequency of these prepositions in the sample. In fact, the Social Sciences Sub-Corpus (SSSC) seems to contain more of these PPs than the Medical Sciences Sub-Corpus (MSSC). Based on table 5.3, Yule's coefficient is computed:

$$Q = (A - B) / (A + B) \text{ with } A = 2 * 5 = 10, \text{ and } B = 7 * 5 = 35$$

$$Q = (10 - 35) / (10 + 35) = -0.55$$

This result is beyond the rejection interval, which means that a correlation in the distribution of complex prepositions exists between the two genres and disciplines studied. The use of these PPs in the PhD dissertations can be contrasted to those used in RAs in terms of quality as the latter cases are more grammaticalised forms:

- **SA RES 9.** This is clearly evident in media reports where the attack is interpreted *in relation to Australia's 'exceptional' self-identity as the 'lucky country'*.
- **SD DIS 6.** Incidentally, *in the case of respondents who previously participated in traditional Chinese religious practices*, such as worshipping ancestors or propitiating the Earth or Kitchen gods, a pattern emerges of greater previous participation among lower income respondents, as well as those with less education (see Table 7-4).

The presence of the grammaticalized forms in the RAs can be linked to the different stages of proofreading that the article has gone through before being published in a peer-reviewed journal. According to Gardner (2012), this can be explained by the conformity of RAs authors to the norms. The other less common forms reveal the unstable style of writing of young researchers.

The difference between the grammaticalized forms and the other less fixed forms mirrors a difference in meaning between the constructions. In fact, prepositions like '*at the top of, at the time of, and at the end of*' have meanings that can be easily recovered from their components. The first preposition *at* supplies a meaning of specific position, while the noun defines that position. The preposition *of* does not seem to convey meaning; rather it is used to mark the border of the preposition. The other more fixed prepositions are prepositions like *in terms of, in place of, in adherence with*. These prepositions, and especially *in terms of*, do not seem to be easily predictable from the meanings of the words in it. The first preposition carries the conceptual meaning of containment within the noun 'terms', where a term is defined as a period of time. The whole preposition is not temporal; rather it seems to have gained a meaning of respect.

Based on the correlation in table 5.3, the PPs in the SDSC are different from those in the MDSC in terms of quantity (7 versus 2). The difference in distribution between the sub-corpora can be related to the personal choices made by the authors, and to the instability in terms of style:

- **MD MET 7.** In addition, data obtained from patients' records were recorded and stored *in adherence with the Data Protection Act 1998.*
- **SD MET 4.** Resilience is the process of adapting well *in the face of adversity, trauma, tragedy, threats, or even significant sources of stress--such as family and relationship problems, serious health problems, or workplace and financial stressors.*

The relative stability in RAs can be linked first to the different stages of reviewing and proofreading, and second to the expert choices made by the authors. In the SD sub-corpus, the authors seem to be looking for certain precision, which they try to impose through the choice of complex prepositions that could have been expressed in a simpler way. This shows that doctoral students are in the process of learning the 'preferred forms' of their discipline.

The analysis has also revealed a difference in the distribution of three-word prepositions as far as the sections are concerned, as shown in the following table.

Figure 5. 3 Distribution of three-word prepositions across the sections

	<i>PhD Theses</i>	<i>RAs</i>	<i>Chi-square</i>
Introduction	2	1	0.532
Methods	3	1	1.552
Results	0	6	7.892
Discussion	4	2	1.310

Table 5.3 shows that most three-word preposition in RAs are grouped in the Results section, which is not the case in the genre of PhD Theses. This result is further stressed by the chi-square test which shows a high significance for this line. This shows the importance of this section within this genre

- **MA RES 8.** *In terms of risk categories* (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified into a different risk set using arterial age *in place of observed age* (16% would go to a lower risk stratum and 12% to a higher risk stratum).
- **SA RES 1.** *In addition to the analyses reported,* we also consider the possibility that predictors of the fear of specific crimes may have differential effects, consistent with recent research (e.g., [Ferraro, 1995] and [Rountree, 1998]).

The use of these complex prepositions is one way to emphasise one particular reading of the situation, mainly that certain cases are fronted. These devices show that in the Results section, researchers are not contented with simply presenting their results, as they start linking or contrasting them. Moreover, the use of these complex prepositions answers the need of the authors to present their results in the “utmost clarity, simplicity and directness” (Goldbort, 2006, p. 233).

To sum up, complex three-word prepositions reveal certain differences as some of them are more grammaticalized than others. Prepositions which have more fixed forms seem to have new and unpredictable meanings. On the other hand, the use of these forms in the corpus shows that those grammaticalized forms seem to be more appropriately used, while the others are indicators of unstable styles of writing, thus distinguishing expert and peer-reviewed writings. These prepositions also stress the section of Results, as they help construe clear and direct versions of reality.

Prepositions, whether simple or complex, are heads of phrases that will be studied in the following section.

5.3. Structure of PPs

Structurally speaking, two obligatory elements exist in a PP namely the preposition and its complement. Additionally, possible premodifiers may exist. This section will be divided into two main sub-sections, the first one focusing on the complements, while the second will study premodifiers.

5.3.1. Prepositional Complements

Based on the system designed for the annotation of the corpus, prepositional complements are first annotated according to whether they are phrasal or clausal. The following figure summarises the frequency of each type in the studied sample.

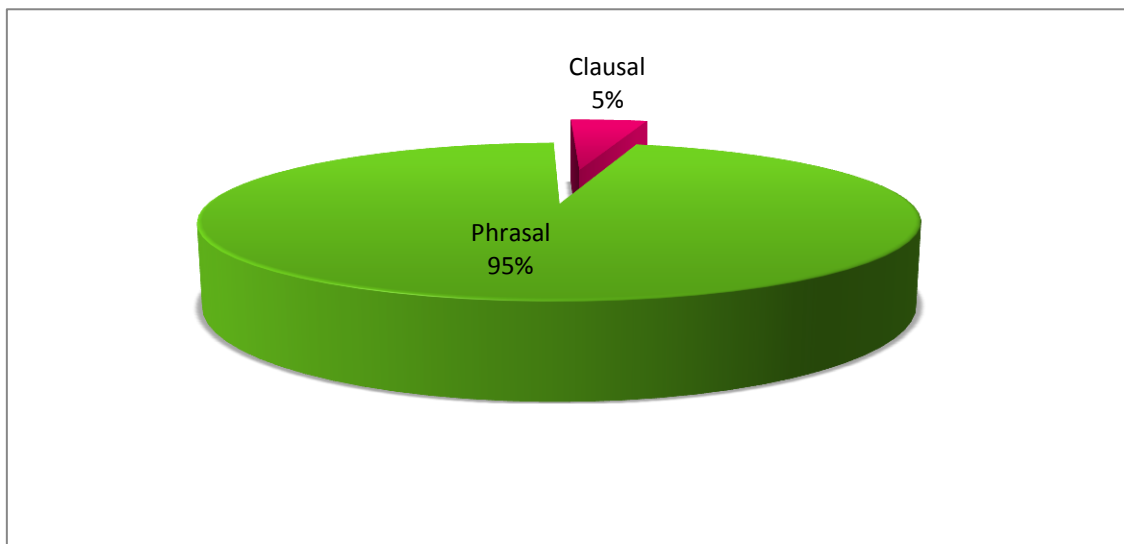
Figure 5. 4 Prepositional complements

Figure 5.3 shows that 95 percent of the complements are phrasal, while only 5 percent are clausal. This result reveals the tendency to simplicity in the corpus, which can be linked to the register of scientific writing. In fact, the language of science is characterised by being at the same time concise and precise, and such preferences reveal that more compact choices are made. This result seems to vary across the two registers, as shown in the following table.

Table 5. 4 Phrasal versus clausal complements in the Medical and Social Sciences

	<i>Medical</i>	<i>Social</i>	χ^2
Phrasal	406	364	5.181
Clausal	12	24	5.181

Table 5.4 shows that the two studied sciences do not share exactly the same distribution, and in fact, the software used for corpus annotation, Corpustool, reveals a medium degree of significance as far as the application of the chi-square test on this table is concerned. This implies that the distribution of prepositional complements is not even across the two sciences, and that clausal realisations are rather associated with the SSSC, while the phrasal complements are frequent in both sub-corpora, and especially the MSSC.

The relative frequency of phrasal constructions in the MSSC reveals that this register opts for more compact options than does the other register. On the other hand, the relative frequency of clausal complements shows that construing reality in this register requires the use of certain extended structures in the SSSC. In fact, the “syntactic compression” (Quirk et al., 2005) in this case may result in a “loss of information” (Halliday and Matthiessen, 2004)

that could hinder the communication of meaning [section 1.3.1. Prepositional Complements]. For further analysis, the following sub-sections deal with both types of complements.

5.3.1.1. Clausal complements

Clausal constructions can be either finite or non-finite, the analysis has revealed that all the cases are non-finite clauses, which are considered to be reduced in comparison to Finite clauses. Among the non-finite possibilities, wh-to-infinitive clauses are not present in the sample, as all the clausal complements are ing-clauses. This construction is reduced from an affirmative clause, whereas wh-to-infinitive clauses are rather exclamative in meaning, which explains their absence. In fact, writing academic texts does not involve asking direct questions, although science is about answering problematic questions. Questions are not expected because they presuppose a direct interpersonal relationship between the speaker and the hearer, whereas in such type of writing, the writer is not supposed to engage into a personalised conversation with the reader, as the scientific content receives all the attention.

The clausal forms used in the sample are ing-clauses, with the imperfective (-ing form) reflecting the real, or actual mode of non-finiteness (Halliday and Matthiessen, 2014). The choice of this form is in favour of the claim held in section [1.3.1.3. Ing Clauses] that there is a link between prepositions and the actual mode of expression, based on the nature of prepositions as an element linking two things. Such forms indicate the progress of a real action, and, indeed, Halliday and Matthiessen (2014) claim that “non-finite clauses are clauses, that is, they can be expanded to include other elements of clause structure” (p. 425). This means that the choice of these forms over other nominalised possibilities is due to these additional elements (Appendix E contains a list of all the clausal prepositional complements).

- **SA DIS 20.** However, current government policy seems to have been going in the opposite direction *by shifting health care financing to the private sector and household incomes* through user-fees such as copayments.
- **SD INT 20.** This dissertation considers these issues *by examining two time periods in a particular state* rather than one incident or act at a single moment in time (see Gusfield & Michalowicz, 1984).
- **MD MET 29.** *After removing the fix solution and washing the coverslips twice in PBS*, 0.5 ml of permeabilisation solution [10% (w/v) sucrose, 0.5% (v/v) NP40, in PBS] was added and the cells were incubated at room temperature for 10 min.

In these cases, opting for a clausal form allows the writer to introduce other clause constituents “to the private sector and household incomes”, “in a particular state”, “twice” and “in PBS”. Such construction shows first that the authors have opted for situating what they

say with respect to real action, and not questions. Second, certain details, thought to be worth mentioning, are included in these clauses via circumstantial elements, so that descriptions are more accurate.

Certain clausal complements do not seem to include other elements in the clause:

- **MA INT 17.** For leukemias and childhood sarcomas, chromosomal translocations leading to the production of chimeric proteins serve as initiating genetic events.
- **MD DIS10.** Family studies may have a better chance of detecting rare variants, and any association between them and common diseases, than population studies.
- **SD MET 8.** In a second step, I also account for changes in the individual and labor market characteristics, to obtain the net effect of entering marriage on earnings, including the measures for the German and US data described above
- **MA DIS 8.** Importantly, GDNF was highly effective in reducing heavy drinking after a short period of deprivation.
- **SA RES 30.** Table 2 also shows that the covariance between the intercepts and the slopes is substantially reduced in the Full Model after adding the substantive covariates, although this covariance is still significant at the .05 level.

The use of the ing-form in these cases seems to highlight the *process* (*entering marriage on earnings*), which could be lost in case of a nominalization. This can be seen if compared to a nominal form:

- **MA INT 17.** For leukemias and childhood sarcomas, Chromosomal translocations... serve as initiators of genetic events.

This change shows that the ing-form gives a more realistic impression, as the “*chromosomal translocations*” are more clearly identified as having actually started the process of “*initiation*”. The need for such clear descriptions varies from one sub-corpus to the other, as shown in the following table.

Table 5.5 Clausal complements in the sample

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
PhD theses	8	16	24
RA	4	8	12
Total	12	24	36

Table 5.5 reveals that clausal forms seem to be associated with the discipline of Sociology and the genre of PhD Theses. First, authors in Sociology tend to use more clausal constructions than their counterparts in Medical Sciences. This can be related to the epistemic nature of each science [section 3.4.3. Sociology]. Sociology relies on inductive reasoning whereby the truth of the conclusions follows from “the weight of evidence presented in the

premises” (Allen, 2004, p. 91). Expanding on certain actions for the purpose of clarity can be seen as one way to provide clear and precise arguments, so that the author can reach certain conclusions:

- **SA INT 14.** Yet this prediction alone cannot serve as the basis for formulating hypotheses about systematic differences in attitudes, as definitions of patients’ best interests may heavily depend on specific circumstances of each particular case.
- **SA RES 29.** These results obtain even after controlling for demographics, resources, Social connectedness, and overall number of memberships and active memberships.
- **SA DIS 20.** However, current government policy seems to have been going in the opposite direction by shifting health care financing to the private sector and household incomes through user-fees such as copayments.

These examples taken from RAs in the SSSC show the precision of the descriptions contained in the clausal complements. Besides, these forms reveal the presence of an agent for their actions, which means that the authors, although not directly mentioning the agent, are alluding to him/herself. In the first two examples, the actions of ‘formulating’ and ‘controlling’ are performed by the researcher him/herself. In the third sentence, the agent of ‘shifting’ is the ‘current government policy’ which is mentioned in the same sentence.

The first examples show the reluctance of the author to refer overtly to him/herself in a finite clause, and reveal that s/he is trying to allude to his/her actions. While studying identity in academic writing through first person pronoun references, Hyland (2002) claims that “writers in the hard sciences and engineering prefer to downplay their personal role to highlight the issue under study, while a stronger identity is claimed in the humanities and Social sciences papers” (p. 352). According to Hyland (2002) this is due to the fact that “authors make a personal standing in their texts to establish a credible scholarly identity, and to underline what they have to say” (p. 353). In the case of the examples cited above, referring to one’s actions is one way to add to the credibility of the research, which is contrasted to claims for objectivity in hard sciences.

In addition to the disciplinary difference, table 5.5 shows that ing-forms are associated with PhD Theses. This difference in distribution can be linked to the extended size of PhD Theses since students do not have space constraints, as do the authors of RAs. Besides, the expertise of the author plays a role in such choices as “‘expert’ writers...tend to be less explicit in their expositions than we might expect in dissertations” (Swales, 2004, p. 117). According to Swales (2004), the “implicitness” of *expert* writers underlies a “tacit understanding” between them and their readers, which is the result of a relatively long

experience with different research activities. Students, on the other hand, strive for clarity in order to answer any claims against the validity of their research while it is being evaluated.

Furthermore, these clausal complements are distributed differently across the sections of each genre, as summarised in the following table:

Table 5. 6 Clausal complements across the sections

	<i>Introduction</i>	<i>Methods</i>	<i>Results</i>	<i>Discussion</i>
PhD theses	5	5	7	7
RAs	4	1	3	4
Total	9	6	10	11

Table 5.6 shows the clausal complements are distributed differently across the four sections. In PhD theses, the use of clausal complements seems to be similar across the sections, except for a slight rise in the Results and Discussion sections. This relative rise can be explained by the size of these sections, as the Results and their Discussion are judged by students to be important, and to be the place where they can reveal their contribution(s).

Table 5.6 also shows that a difference between RAs and PhD Theses exists in terms of the distribution of clausal complements. This difference is mainly clear in the Methods section, and can be explained with reference to the difference between this section in both genres. In fact, Methods in RAs are rather “clipped” (Swales, 2004), while in PhD Theses, they are rather “extended” especially that “discursive method discussions” are “one special feature of dissertations” (Swales, 2004, p. 113).

The distribution of the clausal complements shows that it responds to the external factors of the context. The larger context of scientific writing seems to be behind the choice of ing-forms over other possibilities. More specific factors such as the discipline, the genre and the section explain certain distributions that have been proved to be statistically skew, and this answers the third major research questions of the present dissertation [0.4. Research Questions].

These clausal complements represent only 5 percent of all the complements, as 95 percent are rather phrasal.

5.3.1.2. Phrasal Complements

Phrasal complements are four types: NPs, AdjPs, AdvPs, and PPs. Among the 770 phrasal complements, only one preposition has been tagged as having an AdjP as complement, as all the other cases are NPs. These cases seem to be rare in language:

- **SA DIS 17.** Classic ... and contemporary ... Social theories have always viewed peer influence *as vitally important* in the development of deviant behavior.

The use of the AdjP '*vitally important*' as a complement of the preposition *as* is a way to describe '*peer influence*'. Such descriptions are not widely used in the scientific discourse because they are not precise; they are just claims. In this example, the author is making final statements in the Discussion section of a RA in Sociology to argue for the importance of one variable in his/her research. The AdjP in this case is thought to be evaluative mainly that the adjective '*important*' is premodified by the intensifier '*vitally*'. The author in this case is convinced that '*peer influence*' is an important variable, and wants to transfer this view to his/her reader. Although claims for objectivity in scientific writing are maintained, certain findings are highlighted to stress the contribution made in the RA.

In addition to this AdjP, all the other complements are NPs. Unlike a predicative adjective, which "describes the state or process in which the referring expressions are involved" (Hurford, Heasley and Smith, 2007, p. 37), a noun is used for reference (Fontaine, 2008). As prepositional complements, the choice made in the corpus is to refer to things rather than to describe states. This can be associated with the nature of preposition which are mainly used to link two things. The corpus has revealed that two main types of reference are made: references to texts and references to the world.

5.3.1.2.1. Textual Reference

Some of the references made by NPs complementing prepositions are textual, that is, referring either to the text itself or to an external one. Most references are made in the SS sub-corpus (3 in the MS sub-corpus and 7 in the SS sub-corpus). The references to the text are:

- **MA DIS 7.** *In the present study*, alcohol use was prospectively examined at 6-month intervals using a comprehensive, validated instrument.
- **SD INT 14.** Several positive and useful implications *for this study* are clear.

In the Discussion sections of PhD Theses, the reference made in the Medical seems to refer to a precise section in order to build on that argument in the analysis. The references in the Social Sciences text seems to clarify the features of the text, and is therefore meant to account for certain choices in the methodology.

- **MD DIS1.** As discussed in Chapter 1 and in Section 3.1 *of the present Chapter*, ND10 components constitute a part of cellular intrinsic defence mechanism against both HCMV and HSV-1.

- **SD DIS 1.** While functionalism is a viable theoretical perspective in examining the meaning of execution ritual, interactionism and dramaturgy were considered more suitable perspectives for this study, and thus will remain the primary features *of this discussion*.
- **SD DIS 24.** The results *from my dissertation* are not to prove that marriage is not a beneficial societal institution.

The difference between the disciplines may be in a way responsible for the difference between these two references. In fact, the Medical and Social Sciences differ with respect to their methodologies. Medical Science follows a scientific methodology which means that it tries to draw general conclusions from available data, whereas Social Sciences are rather interpretative, trying to interpret cases in society, quantitative and qualitative data, questionnaires, etc. Interpreting data means that different views can exist, and while taking this into consideration, the PhD student tries to answer the questions that s/he expects from his readers, and this means that these choices are primarily linked to considerations of the reader(s).

The two disciplines seem to differ with respect to the choices made in the Results section of RAs.

- **MA RES 24.** In summary, results *from the present experiment* indicate that during the second postnatal week of life pups are highly sensitive to the ethanol's stimulating effects, and also that there may be age-related differences in sensitivity to ethanol's motor effects across age.
- **SA RES 1.** Before examining the results *of the multivariate analyses*, we first present Table 2, which has the descriptive statistics for each of the four ethnic and racial subgroups represented in our sample.

In the SSSC, a reference is made to “the results *of the multivariate analyses*”, while in the MSSC, authors refer to the “results *from the present experiment*”. Both NPs show that their respective authors make reference to their results in the Results section, and this can be seen as a way to draw the attention of the reader to one of the most important points in the RAs. However, each author seems to modify those results in his/her own way. In the Medical Sciences, those results emerge from “an experiment”, while in the Social Sciences, they are linked to “multivariate analyses”. Again the methodology followed in each discipline can be the cause for these choices, as Medical Sciences rely basically on experiments, while in the Social Sciences, data are analysed preferably from different perspectives.

Other references are made in the Introduction section from the SA sub-corpus

- **SA INT 19.** While racial threat theory has been proffered *by a number of studies* as a macro-level explanation for understanding fear of crime, arguably the most often utilized

theoretical framework for explaining fear of crime/perceived risk is Social disorganization theory (Shaw and McKay, 1942).

- **SA INT 1.** A number *of studies* focus on cross-national variations in chemical emissions and natural resource consumption

Referring to other studies is one way to situate one’s work with respect to others, as a part of “establishing a territory” (Swales, 2004). This would allow the researcher to identify a gap in the literature, and to “establish a niche” based on that. These references are associated with SSSC, as in soft sciences, authors need to argue for the choice of the topic. The presence of such references in RAs shows that the author wants to refer to other literature in a concise way, unlike PhD Theses, where authors do not have constraints on length. Such references reveal the reliance on other previously accepted research, which can be a warrantee of the quality of the advocated one. This may also mean that the researcher is knowledgeable about other studies, and therefore, expert in his/her domain. Publishing a Research Article in an international journal is challenging for researchers as it requires a relatively high degree of expertise.

In addition to the references made to the text, whether text-internal or text-external, other references are made to the world, or to the context.

5.3.1.2.2. Contextual Reference

In order to analyse the contextual references, a number of complements has been selected from the sample and presented in the following table (Appendix F contains the randomly selected examples).

Table 5. 7 Prepositional complements classified by discipline and genre

	<i>Medical</i>	<i>Social</i>
PhD Theses	<ul style="list-style-type: none"> • Prevalence <i>of HSV-1 infection</i> • the purpose <i>of their use</i> • significant <i>difference in rates of seizure freedom</i> • transitions <i>between them</i> • <i>by their respective investigators</i> 	<ul style="list-style-type: none"> • the conflict model <i>of lawmaking</i> • the liberal or conservative slant <i>of the media organization.</i> • a brief history <i>of execution method shifts</i> • <i>In the German data</i> • <i>in years</i> • <i>in months</i> • <i>in the US data</i> • <i>in a way similar to hometown societies</i> • a central concern <i>in the congregational life</i> • <i>for the year 1910</i>

RAs	<ul style="list-style-type: none"> • The primary determinant <u>of progression through T cell development</u> • one round <u>of amplification</u> • the result <u>of severe axonal degeneration on EMG</u> • two sets <u>of genes</u> • changes <u>in energy intake</u> • the neurons <u>in the BLA</u> • SCC <u>in 10 patients</u> • <u>about the structure and function of MHC class I molecules outside of mammals.</u> • <u>after the acquisition of HBO equipment</u> • <u>as the inhibition rate.</u> • <u>at the 2-carboxamide function</u> 	<ul style="list-style-type: none"> • world production <u>of CO2</u> • an average <u>of 13.29 years of overlapping trade and CO2 data</u> • <u>in the face of threat</u> • increases <u>in trust in government</u> • <u>in Australia</u> • of the impacts on young people <u>in rural and remote areas</u> • respondents <u>with two tests</u> • <u>to carbon production</u> • <u>about the industries that show the greatest impact on carbon emissions</u>
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These examples reveal that the contextual references are either made to entities in the world, both concrete and abstract, or to nominalised actions. The complements referring to entities in the world are ‘two bands, cellular intrinsic defence mechanism, genes, a functional T cell receptor, the hospital, our lab, and 10 patients’ in the MSSC and ‘years, CO2, the four ethnic and racial sub-groups, German data, congregational life, the year 1910, Australia, and rural and remote areas’ in the SSSC. Each of the sets seems to reflect the subject matter of the Medical and Social Sciences, respectively. Most of the references made in MSSC are concrete, and this results from the subject matter of this science. In fact, Medical Sciences tend to give names to different parts, even tiny ones, and symptoms in the body. On the other hand, sociology refers to more abstract notions like years, month, life, etc. and concrete places like Australia. Since it is focusing on the human being as a Social entity, most references are made to this abstract context.

The second type of complements is those referring to nominalised actions. These are ‘infection, use, progression, amplification, degeneration, and intake’ in the MSSC, and ‘lawmaking, organization, shift, threat, trust, and production’ in the SSSC. The references in the MS sub-corpus are technical terms that denote whole actions or procedures. The process of nominalization in this case has associated nouns with certain actions done by researchers in the field or with discovered processes in the human body. Using such terms would require background knowledge in Medical Sciences in order to decipher the meaning of the whole contribution, and this is what characterises scientific discourse. In fact, Martin (1993) claims that while the use of language in science is technical, ‘abstraction’ dominates language use in

the humanities (published in Halliday and Martin, 1993, p. 221). Technicality in this case results from nominalising whole actions or processes, which require background knowledge for their understanding, and therefore, distinguish the expert from the non-expert.

In Medical Sciences, knowledge concerns the recent advances in the field, which are codified using technical terms as they refer to whole actions, or discoveries, which forms part of what Bazerman (1988) calls ‘fixed codified literature’. Each technical term makes the reader recall a whole procedure or piece of research. Nouns are said to be inherently referential (Baker, 2004), which means that they are used to refer to entities in the world. In the case of these technical terms, these nouns are created for the purpose of reference but this reference is not made to known entities in the world, rather to procedures and discoveries known to the specialists in the field. The role of reference to processes rather than entities makes the use of nouns depart from their original function, and therefore it can be seen as metaphorical.

These technical words are more frequent in the genre of RAs (5 occurrences among 8). They can be seen as signs of compactness and also expertise. Authors of RAs need to opt for compact choices because of the constraints established by the publishers, and at the same time need to have specific references, so that their articles make precise contributions to the field of research. Besides, this also means that they are more socialised with the practices in their disciplines.

The nominalised references in the SSSC seem to be shaped differently. These words do not seem to carry complex meanings that need expertise to be deciphered. For example, ‘*lawmaking*’ is the nominalised form of ‘*to make laws*’. This expression can be obvious to the reader; however, the way this action is done is not. The use of nominalization in the SS sub-corpus seems to be different as it is partially accessible to the non-expert.

In this context, Tannen’s distinction between orality and literacy (1985) is based on how context-dependent a text is. In a text, the author can be situated between two poles: the oral-like text where s/he relies on the context to convey the necessary information, and the written-like text where the author “decontextualise” his/her discourse. Tannen (1985) further argues that on certain occasions authors of written texts sacrifice “the explicit and clear statement of information for the demonstration of interpersonal involvement” (p. 126), which means that features of context are signs of interpersonal involvement. In the studied corpus, PhD theses and RAs are classified as two written genres. However, in the Medical context, technical words need contextual knowledge to be understood. This means that the author in “sacrificing the explicit and clear statement of information”, although scientific writing is

about precision and clarity. On the other hand, by doing so, the author is shaping one particular interpersonal type of involvement, s/he is framing this relationship by selecting only one category of people: experts in the domain. Medical discourse, in this case, tends towards orality as it is context-bound, and particularly, it is bound to the context of the discipline, or the situational context.

Following the same argument, the texts in the SSSC seem to be less context-bound, as nominalization does not yield technical terms, they are rather partially accessible to the non-expert. The nominalised forms would result in two different readings of the text: the expert's and the non-expert's. The difference in nominalization across the two disciplines can be linked to their methodologies, as Medical Sciences are deductive [section 3.4.2. Medical Sciences] in the sense that research in this science helps discover existing realities, which means that discoveries, once proved, need to be treated as realities. This explains the presence of technical terms to refer to processes, and concrete nouns to refer to concrete discoveries. Such nominalised forms are not present in the same way in Social Sciences because the latter is rather inductive, that is each piece of research makes contributions in the sense of making new claims and new interpretations. These conclusions are not classified as realities, and therefore, need not be nominalised for easy reference.

To conclude, the orality versus literacy distinction, in this case, is not a matter of deliberate choices made by the author as it is rather a matter of discipline or context. The analysis shows that while Medical Science is 'oral-like' in the sense that it relies on context and sacrifices clarity, Social Science can be situated between the two edges as it does not make as much reference to context.

NPs functioning as prepositional complements can have two types of reference: textual and contextual. However, these NPs (table 5.7) differ with respect to their structures, which will be the focus of the following sub-section.

5.3.1.2.3. Complexity of the NPs

In addition to the type of the reference made by the NP (textual or contextual), NPs (table 5.7) functioning as prepositional complements seem to vary as far as their own structure is concerned. These NPs range from simple, containing just the head, to complex, by the use of modification. The pronoun 'them', complement of the preposition 'between' is the simplest NP as it represents only the head. Other NPs contain the head and a determiner (*my dissertation, two tests*) while certain may have a premodifier (*the inhibition rate, the 2-carboxamide function, their respective investigators*). Most complex NPs are those containing

postmodification (*the structure and function of MHC class I molecules outside of mammals, the acquisition of HBO equipment, young people in rural and remote*).

The second type of NPs, which is the most frequent as far as these examples are concerned, makes references to ‘*their respective investigators, the 2-carboxamide function, the inhibition rate, carbon production, two tests, the year 1910*’. These references seem to be varied reflecting methodological details, referencing to the text itself, temporal references, references to the object of study, etc. What is peculiar about these NPs is that most premodifiers are also nouns, although nouns are most of the time premodified by adjectives, as Biber et al (2007) claim that “common adjectives (i.e. non-participial adjectives) are the most common category of premodifier in all registers” (Biber et al, 2007, p. 589). Yet, as far as academic prose is concerned, Biber et al. (2007) maintain that “nouns are also very common as premodifiers” and that they account for “30 per cent of all premodifiers in academic prose” (Biber et al., 2007, p. 589). They explain the use of nouns as premodifiers of other nouns by the need for brevity even at the expense of explicitness. It is thought that in addition to the purpose of brevity, these constructions allow for a condensation of information and specific referencing as the main aim of a noun is reference.’ With the growing need for more specific notions and references, these constructions become more frequent, as they facilitate reference to such notions.

The third type of NPs is made complex because of the postmodifiers it contains. Postmodification is used to narrow down the scope of the head noun, and this is mainly when the postmodifier is an ‘of-phrase’.

- **MA INT 31.** However, beyond the gene sequences, little is known *about the structure and function of MHC class I molecules outside of mammals.*
- **MA MET 29.** Our review included patients both before and *after the acquisition of HBO equipment* at our institution (1998).

In such cases the preposition ‘*of*’ is functionally used to link two nouns: the head to the complement, without a valuable addition of meaning. The function played by the preposition is to distinguish the head from the other elements of the phrase, and therefore, to give it more prominence (of-phrases as postmodifiers will be studied in details in section [5.4.1. Postmodifiers]). Postmodification can involve PPs other than of-phrases, in which case, the preposition links the head to the complement but with a clear meaning:

- **SA INT 21.** In our discussion of the impacts *on young people in rural and remote areas,* we begin by providing a brief summary of recent changes in such areas.

In this case, the preposition ‘*in*’ conveys the meaning of physical containment, which makes this postmodifier undistinguishable from adverbials. Although clausal prepositional

complements are used to denote actions, phrasal complements can range from simple to complex, and therefore, convey complex meanings through packing the information in modifiers of the head noun. In these cases, the reference of the head noun is thought to be insufficient, which led the author to opt for postmodification as a way to achieve a more specific kind of reference.

However, in order to pack a large amount of information, Social Sciences tend to use ‘metaphors of transitivity’ (Simon-Vandenberg, Taverniers and Ravelli, 2003) which are NPs not referring to procedures outside the text but rather packing processes from inside the text.

- **SA MET 7.** We adapt a predictive modeling strategy to the problem of identifying increases in trust in government following the 9/11 attacks.

The NP ‘increases in trust in government’ is a nominal version of ‘the trust in government has increased’. Such cases are labelled ‘metaphors of transitivity’ because the transitivity system of the original clause has departed from its initial ordering and nature. The main verb of the clause has been packed into a noun, which refers to the whole action, and has moved into a prominent position; head of the NP. In the functional analysis of sentences, the verb is said to determine the arguments of the sentence. Although there is a reduction of the sentence into an NP, a parallel between the forms still exists as the most important element has kept its focal position. As for the arguments of the verb, which is in this case the subject, it has moved into a postmodifier position of the head noun. One possible explanation for the change of position from left-most position of the verb to the right-most position of the noun could be to differentiate the type of construction, and therefore, to avoid cases of structural ambiguity that may hinder the communication process.

According to Halliday (1987), the use of nominalization in written and particularly in scientific discourse is one way of ‘objectifying’ the message. In fact, the difference between ‘the trust in government increased’ and ‘the increase in trust in government’ is that while the first can be denied, the second has backgrounded the increase by treating it as a thing that can be dealt with later on as “taken-for-granted objects” (p. 69). Such nominalization would facilitate talking about the increase, but would also make the reader accept it as the problem dealt with in the article.

Nominalization seems to be explored differently across the disciplines, for while it is a source for creating technical words in Medical Science, it is used mainly as a way to condense writings, background information, and talk about processes, in Social Sciences. This has been revealed in the analysis of NPs functioning as prepositional complements. However, the

structure of the PP allows for a premodifier that can be optionally inserted. The following sub-section studies these elements.

5.3.2.Premodifiers

Unlike prepositional complements, which are obligatory constituents, premodifiers are optional. The corpus analysis has revealed that among the 807 PPs tagged in the sample, only 3 have been annotated as extended, that is premodified. These are:

- **MD DIS 3.** Thus, HMGN1 and HMGN2 appear to have some redundant functions, particularly *in the regulation of pluripotency-related genes*, but they also have isoform-specific roles in the regulation of some neuronal lineage genes.
- **SD INT 8.** The findings from these studies are rich and varied, especially in regard to institutional responses to changing Social and structural conditions, the changing nature of denominational affiliation, the different fates of mainstream and evangelical churches, and the extent of local churches' provision of Social services.
- **SD RES 15.** In prior electrocutions, witnesses had been in the room along *with the condemned*, separated only by a red rope.

The premodifiers in these examples are 'particularly' and 'especially' and they convey a restrictive meaning. These adverbs are said to be evaluative as they convey the speaker's comments. In the first example, the writer is pointing to particular redundant functions, those in the '*regulation of pluripotency-related genes*', while in the second example the researcher reveals the point where the findings are richer. The adverb '*along*' is used to emphasise the meaning of '*with*', which means that the scope of this adverb is just on the preposition rather than the whole PP. These restrictions of meaning have an interpersonal dimension as they address the reader, they are meant to draw his/her attention to a particular point, judged by the writer as the most important. The use of these adverbs is linked to the genre of PhD Theses, which means that the strategy of highlighting, via an evaluative adverb, the most important points is done by students and not by expert researchers. Such overt evaluation is not expert-like.

Premodification, unlike complementation of prepositions, seems to carry evaluation. The relative absence of these elements, mainly from the genre of RAs, shows that the choice in academic writing is to convey precise information, and then leave the evaluation to the reviewers. Authors of scientific writings opt for persuading the readers of the quality of their research by presenting accurate and rigorous content rather than using overt evaluation.

Both premodifiers and complements are part of the structure of PPs, which, in turn, can be included in other larger structures, and have functions within them. The following section presents the results of the functions of PPs.

5.4. Function of PPs

PPs can function as a constituent in the clause: it can be an adverbial, a complement or a nominal, and as part of other constituents, such as postmodifier of a noun, modifier, or in a partitive construction [section 1.4. Syntactic Functions]. The corpus analysis has yielded the following results.

Figure 5. 5 Functions of PPs

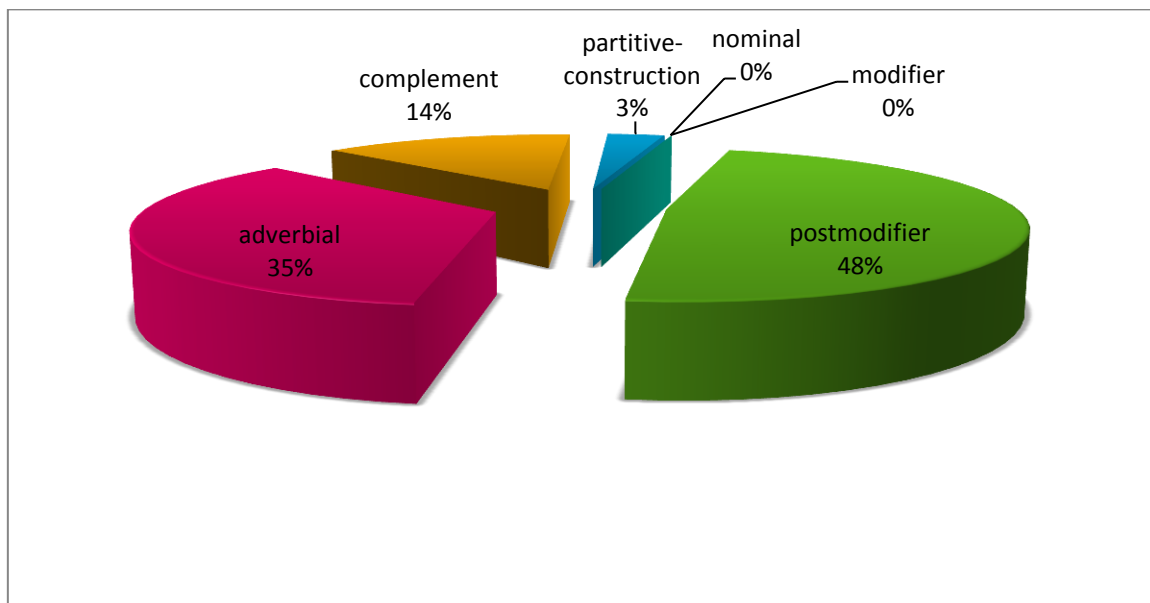


Figure 5.5 shows that most PPs function as postmodifiers in NPs. The second most frequent function is that of adverbials. Less frequent are complements and partitive-construction. The figure also shows that no PP in the corpus has been annotated as having the function of a nominal or modifier. These two functions are not commonly realised via PPs, and the sample does not seem to contain unusual or rare structures. Authors of academic discourse try to avoid such problematic cases in order to communicate precise pieces of information. The use of PPs as subject or premodifier of a noun may result in an ambiguous and unclear structure. Such complex structures are not associated with written discourse, as Halliday (1994) claims that although it “has a much higher lexical density; at the same time, it has a much simpler sentential structure” (p. 328).

On the other hand, the annotated PPs function as postmodifiers, adverbials, complements or as a partitive-construction. The results have revealed that certain prepositions are associated with particular function, more than others. The following table summarises the distribution of each preposition.

Table 5. 8 Distribution of prepositions by function

	As	For	To	Of	In	With	Between	On	By	From	After	About	At
Postmodifier	2	10	12	200	67	12	27	19	1	10	4	19	5
Adverbial	11	17	3	2	136	7	4	6	30	10	28	0	25
Complement	19	5	17	7	19	12	1	7	1	12	0	12	2
partitive	0	0	0	26	0	0	0	0	0	0	0	0	0

Table 5.8 shows that certain prepositions seem to be associated with certain functions. For instance, most of the *of*-phrases have the function of postmodifiers. Additionally, the prepositions ‘*between, with, on* and *about*’, occur most frequently in phrases functioning as postmodifiers. The function of adverbials seems to be associated with ‘*for, in, by, after, and at*’, while complements are headed by ‘*as, to, with, and about*’. Partitives are only formed of *of*-phrases, whereas the preposition ‘*from*’ seems to be equally distributed across the three main functions. For further analysis, these three main functions will be dealt with separately in the following sub-sections.

5.4.1. Postmodifiers

PPs functioning as noun phrase postmodifiers form around 50 percent of all the prepositions in the sample. This shows that postmodifiers seem to be more important, in this register, than adverbials. In fact, a study by Biber et al. (2007) reveals that postmodifiers are most common in “academic prose” (p. 578). This can be linked to the structure of the NP which is complex in this register. PPs are rather linked to NPs, via postmodification, thus making them more complex, as they are attached to the clause as adverbials. Halliday (1994) associates this with the need to “accommodate more lexical items in the clause” (p. 65), which in the case of written discourse results in complex NPs, but simpler sentence structure.

Postmodifiers in the corpus are classified according to the type of postmodification, the type of restriction, and the type of the argument. Therefore, a first sub-section will deal with the appositive versus relative and restrictive versus non-restrictive distinctions, and a second sub-section will present the complement versus adjunct classification.

5.4.1.1. Appositive versus Relative

Based on the classification seen in section [1.4.1. Postmodifier], the following table summarises the distribution of relative and appositive PPs according to the disciplines.

Table 5.9 Appositive versus relative postmodification

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Relative	186	186	372
Appositive	9	7	16

Table 5.9 shows that most postmodifiers are classified as relative, while only 17 cases are appositives. As mentioned in section [1.4.1. Postmodifier], the difference between these can be linked to their semantic content for appositives “contain their antecedents” (Quirk et al., 2005, p. 1244), while a relative adds to the meaning of the head. Seeing that most postmodifiers in the corpus are relative, it can be claimed that postmodification is used to further specify the head. In fact, appositives are thought to be evaluative as the appositive itself (in this case the PP) is given a label (the head of the NP) (Halliday and Matthiessen, 2004; Hunston, 2008, 2010). The general tendency in the corpus is to add information about the head, rather than to evaluate.

In the studied sample two main prepositions are used to introduce appositives: *of* and *about* (Appendix G contains all the occurrences). Quirk et al. (2005) claim that *of*-phrases can introduce appositives mainly because there is an equivalence to a “copular relation” where the “subjects are put into *of*-phrases” (p. 1284).

- **MA INT 6.** The concept *of vascular or arterial age* has been proposed in several previous studies.
- **MA INT 7.** Elderly patients who may benefit from a multifactor intervention are difficult to identify because many are unaware of their increased risk *of falling* and do not report those issues to their physicians.
- **SA DIS 4.** The question *of where kinship norms come from* is an important yet underanalyzed issue in the growing research on family solidarity.

In these cases, ‘*vascular or arterial age*’ is ‘*the concept*’. The preposition ‘*of*’ seems to be equivalent to the copular ‘*be*’, which has been deleted in the process of nominalization and replaced by ‘*of*’. The choice of this preposition to replace the copular seems to follow from the similar characteristics of the preposition ‘*of*’ and the copular ‘*to be*’. In fact, similar to ‘*be*’, which links the subject to the complement in a clausal structure, the preposition ‘*of*’ links two NPs, in a phrasal structure. The difference between the copula and the preposition is the order of the NPs, for while the subject takes an initial position in the clause, it comes as a complement of ‘*of*’ in the nominalised version. The use of the preposition ‘*of*’ in such case can be seen as ‘functional’.

The other appositives are introduced by the preposition ‘*about*’, as shown in the following example:

- **MA MET 32.** The resulting final 44-item CTI contained 3 questions concerning the frequency of falling, 3 questions *about the circumstances of the current fall*, 5 questions concerning the fall history, and 33 questions regarding modifiable risk factors.
- **MA DIS 31.** However, we could not draw conclusions *about the effect of intra-LV dyssynchrony on clinical outcomes* from our study.
- **MD MET 31.** The GeneCards database integrates information *about human genes, proteins and diseases*, extracted from over 80 databases including both OMIM and Entrez Gene.
- **SA RES 32.** A further expansion of the analysis to Model 4 suggests that denomination itself entails little information *about attitudinal differences*, once church attendance and trust in scientific cosmology have been taken into consideration.
- **SA DIS 32.** Thus, among whites, racial/ethnic preferences, as well as ideas *about different racial/ethnic groups*, are strongly gendered.
- **SD MET 32.** First, the historic nature of the CLS survey, the size of the study, and the fact that information *about the study* is widely available, allowed me to present this research as an important academic research project.
- **SD RES 31.** There is nothing against the system at all and the fact is there has been a great deal of senseless, sensational talk *about the execution*...

Although classified as appositives, these examples seem to be different from the other PPs introduced by the preposition ‘*of*’. In example SA DIS 4, ‘the question’ is ‘where kinship norms come from’, while in MA MET 32, ‘the question’ is about ‘the circumstances of the current fall’. The first case can be classified as a ‘full’ appositive as the relation between the head and the prepositional complement is one of equality, while the second is rather ‘partial’ since the prepositional complement is not itself the question, but rather its paraphrase (Quirk et al., 2005, p. 1302). The choice of the preposition is linked to the relation between the appositive and its antecedent. The conceptual meaning of ‘proximity’ has been applied between the head and the appositive.

These appositives are introduced by nouns such as: information, question, conclusion, ideas, etc. They are thought to be epistemic, rather than attitudinal (Biber, et al., 2007), which can be explained by the need for certainty, rather than expressing attitudes in the academic writing. Yet, the two disciplines seem to use quite different terminologies. In the MSSC, the appositives are introduced mainly by ‘question, information and conclusion’, while in the SSSC, the nouns are ‘information, idea and talk’. Both disciplines focus on ‘information’, but the way they deal with it seems to be different. In fact, while Medical Sciences raise questions and seek conclusions, Social Sciences rather focus on ideas and talks, and this would reflect a difference between the way each science deals with the data or information it has. In fact, the

deductive reasoning adopted in Medical Sciences looks at data and tries to come up with conclusions in the Discussion section, while in the inductive reasoning, researchers try to find explanations to problems, which can be qualified as ‘ideas’, rather than ‘conclusions’, that are particularly associated with the Discussion section.

In addition to the distinction between appositive and relative, another distinction is used to qualify postmodifiers; the restrictive versus non-restrictive PPs. The quantitative analysis reveals that only one case is thought to be non-restrictive, while all the other are restrictive.

- **SD RES 16.** That reference, *with its implication of Jewish practices*, would have been out of context in Chinese Protestant churches, where the term “Sunday School” is standard.

This postmodifier is non-restrictive because of the commas including the PP. In this case, the postmodifier is thought to be shared by the writer and the reader either because of earlier mention or because it is common knowledge. The inclusion of this known piece of information can be for purposes of comparison through drawing the reader’s attention to a previously known idea and bringing it to light to make the difference clearer.

The relative absence of this type of postmodification can be linked to the principle of compactness as non-restrictive postmodification is when the writer assumes that the reader already knows a piece of information, and yet repeats it. Unless an idea is brought to light for one purpose, the use of non-restrictive postmodification would be redundant. Seeing that scientific writing needs clarity, the repetition of information would divert the attention of the reader. Moreover, generic constraints on length would keep the writer from using such modification.

In addition to these classifications, a third one is adopted in the analysis of the sample, namely the complement versus adjunct distinction.

5.4.1.2. Complement versus Adjunct

In addition to the classifications in terms of type and restriction, postmodifiers are also classified as to whether they are complements or adjuncts to the head. The following table summarises this distribution in the sample.

Table 5. 10 Complements versus adjuncts

	<i>Medical</i>	<i>Social</i>	χ^2
Complement	112	88	5.444
Adjunct	83	105	5.444

Table 5.10 shows that among the PPs functioning as postmodifiers, Medical Sciences make use of more complements, while adjuncts are more frequent in the SSSC. This result is further confirmed by the chi-square test, which indicates a high significance for this distribution, thus revealing that it is not even. The results have revealed that those classified as complements are of-phrases which ‘complete’ the meaning of the head, whereas those headed by other prepositions are adjuncts since they ‘modify’ the meaning of the head (Dowty, 2000, p. 2). As mentioned in section [1.4.1.Postmodifier], this distinction is not clear-cut. The view followed in the analysis is that the preposition ‘of’ expresses an ‘intrinsic relationship’ between two NPs (Langacker, 2008, p. 343).

The analysis has revealed that most of-phrases in the Medical Sciences are the only postmodifiers of the head while in Social Sciences other postmodifiers may exist, and this would explain the results in table 5.10. In fact, it seems that the use of a noun specified by a complement in Medical Sciences is enough to make references, while in Social Sciences, multiple modifications are needed to make successful references.

- **MA RES 3.** The signaling properties of the R834Q substitution were compared to those of the most frequent AL mutation, D835Y.
- **MA INT 3.** In addition to its importance in normal development, dysregulation of the Wnt pathway can have potent oncogenic effects.
- **SA MET 3.** Indices 1–4 represent an assessment of government policy on the insurgency and Index 5 characterizes the influence of the insurgents on the overall system.
- **SA DIS 3.** This could only be overcome by a linkage of organization-level data to individual-level data.
- **SA RES 3.** System Dynamics combines the theory, methods, and philosophy needed to analyze the behavior of systems in management, environmental change, politics, economic behavior, medicine, engineering, and other fields.

For instance, the Medical sub-corpus contains examples such as ‘dysregulation of the Wnt pathway, properties of the R834Q substitution’ while ‘an assessment of government policy on the insurgency, a linkage of organization-level data to individual-level data’ is taken from the SSSC. The NPs used in the Medical Sciences sub-corpus (MSSC) seem to be more compact than those in the Social Sciences sub-corpus (SSSC), however, the presence of technical terms in the Medical instances adds to this compactness as those terms pack a large amount of information. In fact, the NPs in SSSC can be understandable by non-experts, while those in MSSC are discipline-specific and are not accessible to lay people.

The complexity in SSSC is at the level of grammar, while in the MSSC it is rather at the level of the lexical items. Martin (1993) speaks about ‘technicality’ versus ‘abstraction’ as characterizing features of science and the humanities, respectively. The aim of science is to

‘organize the world in a different way’ (p. 205), and for this reason, sciences make use of taxonomies. For instance, ‘bacteria’ and ‘viruses’ are both direct causes of infectious diseases and are therefore taxonomies used to classify these diseases. The writer further maintains that in order to explain why the world is organised in a particular way, scientists need these taxonomies, or technical terms. On the other hand, studies in the humanities seem rather to report how the world is organised and in order to attain this aim, researchers make use of abstractions, which ‘can be very challenging’ (Halliday and Martin, 1993, p. 213). Texts in the humanities can be ‘much more heavily nominalized than scientific writing’ (Halliday and Martin, 1993, p. 213), as revealed by the following examples:

- the behavior *of systems* in management, environmental change, politics, economic behavior, medicine, engineering, and other fields
- a linkage *of organization-level data* to individual-level data.
- the influence *of the insurgents* on the overall system
- an assessment *of government policy* on the insurgency

Postmodification in the SSSC is multiple and indicative of a nominalization process. The first postmodifier, corresponding to the of-phrase represents the subject of the clause, while the second (in management..., to individual..., on the overall system, on the insurgency) is linked to the original verb (behave, link, influence, and assess).

Nominalization seems to yield different constructions in the Medical and Social Sciences. In the Medical Sciences, the resulting NPs are simpler in terms of structure, yet the process relies on technical terms to convey the necessary reference. However, in the Social Sciences, the constructions are more complex, thus revealing a more complex process of nominalization [SA MET3].

The examples also show that the postmodifiers in the Research Articles show more consistency than those in the PhD Theses. In fact, the postmodifiers in the Medical Articles are compact, while it is not the case for all those in the MDSC:

- **MD DIS3.** HMG1 and/or HMG2 knockdowns altered the expression *of many of the neural lineage genes* in day 3 *of neural differentiation* but not in undifferentiated cells.

The meaning of this sentence is not really clear because of the multiple postmodification. The presence of different postmodifiers related to the same head in addition to the high density of technical terms cannot be understood easily by the reader.

On the other hand, almost all the examples in the SASC are cases of multiple postmodification except for:

- **SA INT 3.** Hypothesis 3: Establishments with a greater proportion ***of recently hired workers*** have greater earnings inequality within the organization.

In this case, the ‘of-phrase’ is itself a postmodifier within another postmodifier. The other cases from PhD Theses do not contain cases of multiple postmodification, which shows that the process of nominalization is not well-developed in this sub-corpus. For instance,

- **SD RES 3.** The News & Observer has historically contained a small informational column entitled “Under The Dome”, which attends to business ***of the State’s Legislature which is housed in a domed building downtown.***

This example shows that the reliance of the writer on clausal elements is quite remarkable; two successive Wh-clauses are used as postmodifiers causing a problem in meaning. Nominalization of clausal elements can be seen as a way to pack information so that the author can refer to it again without causing such ambiguity of meaning. It is not an ornament in the sentence; rather nominalization facilitates the communication of knowledge through condensing information.

The Research Articles, whether in Medical or Social Sciences, tend to abide by the norms of the discipline more than PhD Theses do. The use of language, and particularly postmodifiers in this case, reveals a difference between the writers of each genre. The Research Article writer seems to be more aware of the specificities of the discipline and is able to apply them. The PhD student, on the other hand, uses different strategies, as far as postmodification is concerned, which actually reveals his/her ambivalence. The PhD student is in the process of discovering the norms of the discipline and the norms of academic writing in general. These norms are not taught; the student has to infer them him/herself. For instance, the writer of a PhD Thesis in Medical Science would infer that the use of multiple postmodification may hinder the clarity of the language, and would, therefore, avoid that. Similarly, the PhD writer in the Social Sciences would be criticised for the ambiguity of expressions such as that in (SD RES 3), and would as a result recognise the importance of nominalization in his/her discourse. This finding confirms Wenyan’s (2012) claim that the lack of nominalizations in Medical writings by Chinese researchers is behind their lack of proficiency in academic English. To solve this problem, he proposes that “in teaching English academic writing to Chinese, attention should be paid to the application of nominalization” (p. 86).

In addition to complements, postmodifiers can be adjunct to the head. However, not all the prepositions are frequently used as postmodifiers, as shown in table 5.8. In fact, the

prepositions ‘*between*’ and ‘*on*’ are most frequently used as postmodifying adjuncts. For further analysis, the following examples are extracted.

- **MA MET 27.** The vt/v0 ratio, representing the normalized difference *between the amount of dTTP incorporated at the zero time point and at different time points*, was then plotted against time.
- **MD INT 28.** Association *between viral DNA and ND10* have sparked substantial interest in their roles as domains with anti-viral properties in an attempt to explain the mechanism, reasons and consequences of this association.
- **SA MET 27.** Frame analysis is particularly applicable to the media due to its appreciation of the link *between the production and consumption of the news story*.
- **SD RES 28.** Axinn and Yabiku (2001) document a crucial association *between attitudes and transitions into marriage* at the neighborhood level, suggesting that not only individuals’ attitudes play a role in their marriage decisions, but also the views of those surrounding the couple.

The function of the preposition ‘*between*’ as a postmodifier can be linked to the meaning it expresses. In fact, ‘*between*’ expresses the spatial relation of a trajector with respect two or more landmarks that can extend to express a more abstract meaning, where an entity is identified with respect to two or more objects or entities. This would necessitate the presence of the figure, which is going to be categorised with respect to other landmarks. The trajector would correspond to the head noun (difference, association, link, association), while the landmarks are contained within the complement of the preposition (the amount of dTTP incorporated at the zero time point *and* at different time points, attitudes *and* transitions into marriage, the production *and* consumption of the news story, viral DNA *and* ND10). Cases where the preposition ‘*between*’ is used are found to follow almost the same pattern: noun + preposition + complement (plural or two coordinated items), which explains why most PPs headed by the preposition ‘*between*’ are cases of postmodification.

As for the preposition ‘*on*’, 19 among 32 occurrences were classified as postmodifiers (table 5.8). The examples reveal that this preposition can be used in a NP which has undergone nominalization:

- **MA MET 22.** The effect of heparin *on the clearance of PAPP-A* was examined by the coinjection of heparin 1 mg with PAPP-A.
- **MD DIS 21.** Our combined results suggest that UMOD may have a role in regulating blood pressure, possibly through an effect *on sodium homeostasis*.
- **SA MET 21.** It should be pointed out that none of the friend-influence environments in Table 1 corresponds to the idealized alcohol-free environment discussed in the section *on research design*.

- **SD MET 22.** A search of using electronic archival finding aids also generated a 1929 report *on capital punishment in North Carolina*, albeit this report was not produced by the Highway and Public Works Commission nor the Prison Department.

In cases of nominalization, of-phrases are thought to introduce the subject. This process has resulted in the use of the preposition ‘*on*’ to introduce the patient ‘the clearance of PAPP-A’.

- **NP:** The effect of heparin *on the clearance of PAPP-A*
- **Clause:** Heparin has affected the clearance of PAPP-A

This preposition is not originally used with the verb, but emerges in the nominalization process to highlight the meaning of undergoing an action, which may have been lost during the process of nominalization. In a clausal form, the affected argument directly follows the verb, thus revealing the direction of the ‘effect’. However, when turned into a noun, the latter is followed by an ‘of-phrase’ introducing the subject, which would make the affected element far from the action. The preposition ‘*on*’ in this case seems to highlight this meaning.

In addition to postmodifiers, PPs function as adverbials in 35 percent of all the examples in the corpus, as shown in figure 5.4.

5.4.2. Adverbials

This function is similar to postmodifiers, and particularly adjuncts, as they are optional additions to the clause, but while postmodifiers are contained within NPs, adverbials are rather added to the structure of the clause. This would imply that while postmodifiers modify the meanings of their head nouns, adverbials influence the verb or the whole clause, which means that their scope is larger. In SFG, adverbials are called circumstantial elements, that is, those elements used to augment the sentence by giving information about possible circumstances of time, place, manner, etc. Halliday and Matthiessen (2004) claim that these elements carry the same “significance wherever they occur” (Halliday and Matthiessen, 2004, p. 260). The results have revealed that they are distributed in the corpus as follows:

Table 5. 11 PPs functioning as adverbials

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
PhD Theses	69	72	141
RAs	75	63	138
Total	144	135	279

Table 5.11 shows that adverbials are almost distributed equally across the four sub-corpora. The SSSC seems to contain less adverbials (135 cases), and this can be explained by the use of adjuncts as part of postmodifiers (table 5.10). On the other hand, adverbials are more frequent in RAs in Medical Sciences, which again can be linked to the distribution of postmodifiers. This result can be compared to the distribution of adjuncts in the following table.

Table 5. 12 PPs functioning as adjuncts to the head

	<i>Medical</i>	<i>Social</i>
PhD Theses	40	45
RAs	43	60
Total	83	105

Table 5.12 shows that adjuncts to the head are more frequent in, while they are less frequent in Medical Sciences (both genres).

- **SD RES 2.** However, a latent effect of this hyper-reporting, complete with vivid adjectives concerning the nature of the executions, was *in all likelihood* (A) the main catalyst for an increase *in negative public sentiment* (P) which was soon to follow.
- **MD DIS 1.** Within the three different cell lines generated *in this part of the study* (A), namely cell lines depleted of hDaxx, or expressing hDaxx PAH1 or hDaxxMSIM, ATRX had a dispersed localisation pattern.

These examples show that PPs headed by the preposition ‘in’ function as adverbial (marked A) or postmodifier (marked P) in the example from the SSSC, while it is an adverbial (A) in the example from the MSSC. These examples reveal two different ways of construing reality. In Social Sciences, data are described via NPs (increase), which can be linked to the function of the researcher as an observer. On the other hand, in Medical Sciences, the research involves certain actions that are described via clauses, and these clauses are augmented with circumstances to further specify the details of the experiments.

Adverbials are realised by different PPs, however, based on table 5.8, certain prepositions seem to be associated with this function more than others. These are: ‘in, for, by, after, and at’. This table also shows that the preposition ‘in’ is the most frequent, since the sampling method was stratified, thus reflecting the frequency of ‘in’ as a preposition.

PPs headed by the preposition ‘in’ and functioning as adverbials seem to have an uneven distribution, as revealed by the following table:

Table 5.13 Distribution of PPs headed by 'in' in the Medical and Social Sciences in the Results and Discussion sections

Adverbials	Medical	Social	Chi-square
Results	23	12	4.16
Discussion	13	24	4.97

Table 5.13 shows that the distribution of adverbials in Medical and Social Sciences in the Results and Discussion sections is not even as the chi-square test shows a medium significance. This implies that the use of adverbials can be associated with the Medical Results and the Social Discussion sections. The Results section seems to be more augmented circumstantially in the Medical Sciences than it is in the Social Sciences:

- **MD RES 5.** Most GST-DDX3C remained bound to the beads but sufficient protein was eluted for use *in ELISA*.
- **MA RES 5.** Crystals of BF2*2101-11-mer and BF2*2101-10-mer grew *in the space groups P212121* with one molecule per crystallographic asymmetric unit and *in P21* with two molecules *in the asymmetric unit*, respectively.

Results seem to be provided with respect to certain circumstantials presenting the variables of the research. The use of circumstantials helps describe the different circumstantials at work in the experiments. This can be linked to the idea mentioned above that research in Medical Sciences is about doing experiments, which translates into action verbs while writing. On the other hand, interpretations of results in Social Sciences in the Discussion section require the use of these circumstantials to come up with comparisons. The researcher in the Social Sciences provides results of statistics, questionnaires, etc. his/her job is to discuss those results:

- **SA DIS 1.** There may, *in fact*, be other relevant variables that are not included *in the models* presented *in Table 1 and Table 2*.
- **SD DIS 1.** While this model is useful *in sociological explanations of white-collar crime, organized mob activity, or political misconduct*, it is somewhat insufficient *in accounting for or addressing institutional acts* which have no apparent malicious agency, such as the case presented *in this study*.

The type of verbs changes from the Results to the Discussion sections in the SSSC (are not included, presented), and therefore, the used PPs function as adverbials. The sections of Results and Discussion reveal the different tasks of the researcher in the Social Sciences, who is an observer of the Results, but an analyst in the Discussion.

Furthermore, the use of adverbials has an effect of restricting the circumstances, which means that in Medical Sciences, results need to be restricted so that exact details are

conveyed, whereas in Social Sciences, the Discussion is rather restricted. In Medical Sciences experiments and their results have to be stated clearly, while Social Sciences tend to come up with conclusions in the Discussion section where limited generalisations are sought.

Another reason that may explain the use of circumstantials in the Medical Results section is the relative compactness of this section. In fact, Nwogu (1997), claims that there are only two moves within the Results, unlike the others which are made up of three, and these are: “discuss results which are consistent with the objectives of the study” and “discuss results which deviate from expected outcomes” (Nwogu, 1997, p. 124). In order to make this section concise and encompassing all the possible details, these phrasal circumstantials are used.

Other prepositions, according to table 5.8, are present in the corpus as adverbials (for, by, after and at). The meanings of these prepositions seem to be related to their functions, however, by-phrases for instance, can only be adverbials as they follow passive verbs:

- **MD RES 19.** This was achieved *by infecting HF-ShLuci and HF-ShATRX cells* on coverslips with 0.2 infectious units per cell of ADSubUL82 and processing for immunofluorescence with anti-IE1 and anti-ATRX antibodies at 12 hours post infection.
- **SA RES 20.** The loss of Australians in Bali, however, was alternatively rationalized *by references to national heroic narratives and mythologies*.

By-phrases as adverbials can be linked to the process of passivisation in academic writing. This tool is important as it allows the author to hide his/her agentivity but, at the same time, to highlight the actions of the research. By-phrases in these examples do not introduce agents, but rather actions, which shows that the voice of the researcher is not detected from self-mention, but rather from references to actions. The by-phrases construe actions as generating other actions, which is a metaphorical way of expressing causal links.

Furthermore, PPs headed by the preposition ‘*after*’ are also classified as adverbials in most of the cases because this preposition links actions:

- **SA MET 30.** We attempt to address these questions *after briefly discussing our research strategy*.
- **MA MET 30.** *After completion of this interval*, pups were returned to their respective holding cages where they remained for 10 min.

One of the actions is the prepositional complement, while the other is the verb modified by the adverbial. The link of this preposition to the function of adverbials can be linked to the fact that it can be either a preposition or a subordinator. Although the second example (MA MET 30) is a PP, it is very similar to the first (SA MET 30) where both readings are possible (PP or subordinate clause). Although the preposition ‘*after*’ is similar to

other prepositions in that it takes an NP or ing-clause as a complement, it has some affinities with subordinating conjunctions used to introduce adverbials in the clause.

The function of adverbials seems to be linked to the meanings by the PP. For further analysis, adverbials will be analysed semantically in the following chapter. However, in addition to postmodifiers and adverbials, the syntactic analysis deals with complements in the following sub-section.

5.4.3. Complements

PPs function as complements in 14 percent of the cases studied, as revealed in figure 5.4. These PPs are linked to other words such as verbs, adjectives, adverbs and prepositions. The following table summarises the distribution of the different types of complements across the registers.

Table 5. 14 PPs functioning as Complements

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Verb-complement	56	33	89
Adjective-complement	9	11	20
Preposition-complement	3	0	3
Adverb-complement	0	2	2
Total	68	46	114

Table 5.14 shows that verb complements are the most frequent in the sample. They are followed by adjectival complement, while adverb and prepositional complements are rare. Verb-complements are mainly PPs headed by ‘*as, to, from and about*’ (table 5.8). These are cases when verbs require PPs as their complements, rather than NPs. The meaning of the verb seems to be completed by the preposition, as the latter highlights one specific interpretation:

- **MA DIS 17.** After calculation of correlation coefficients for pleconaril and compounds Va–d, both volume and lipophilicity were identified ***as important determinants of anti-CVB3 activity*** in the present study.
- **SA INT 17.** When income, occupational status, and family structure are considered ***as additional indicators of family background***, the improvements in the family background of blacks over the 20th century are more modest.

These cases are PPs headed by the preposition ‘*as*’ and functioning as complements of ‘to be identified’ and ‘to be considered’. These verbs are complex transitive, that is requiring one object and one complement of that object. The complement of the object is, in this case,

introduced by ‘*as*’. The preposition helps identify the different constituents of the sentence, establishes a link to the main verb, and highlights the equality between the object and the complement:

- We identified *both volume and lipophilicity* (Object) *as important determinants of anti-CVB3 activity* (complement of the object).

The preposition highlights the meaning of equality, which is equivalent to a copular relation between the object and the complement

- *Both volume and lipophilicity* are *important determinants of anti-CVB3 activity*.

The use of the complex transitive verb ‘identify’ followed by the preposition ‘*as*’ conveys this meaning of equality between object and complement, and additionally, reveals the presence of an agent who has created this equality, unlike the copular version. These cases are most frequent in the Medical PhD Theses (table 5.14). Their distribution across the sections is summarised in the following table.

Table 5. 15 Distribution of PPs functioning as complements of verbs across the sections

	<i>Medical</i>	<i>Social</i>	<i>Chi-square</i>
Introduction	22	6	4.776
Methods	10	8	0.409
Results	10	5	0.163
Discussion	12	14	3.989

Table 5.15 shows that the use of PPs as verb complements seems to be linked to the Introduction of Medical PhD Theses and to Discussion of both Medical and Social Sciences. The use of the complex transitive verbs in the Introduction and Discussion highlights the contribution made by the researcher mainly that these verbs are mental:

- **MD INT 18.** Importantly, interactions between CD4+ T cells and B cells are *recognised as a crucial step in the anti-viral immune response*, since the B cells act as antigen presenting cells in this case.
- **SA DIS 18.** These *might be taken as a starting point* for analysing the diffusion of policies that foster inequality, or even of inequality itself, across national boundaries.

These examples reveal the similarity between the Introduction and the Discussion, as the section where the researcher needs to highlight his/her contribution. However, this does not seem to be the case across the two genres, as these cases are not present in the

Introduction of Social PhD Theses. In fact, this strategy seems to be explored differently in this text:

- **SD INT 18.** Madow (1995) *refers* to this media/public detachment as ‘epistemological relocation’, whereby the violent execution is moved “...from the domain of firsthand, everyday experience and sense perception to the sphere of ‘abstract consciousness’” (p. 478).

The complex transitive pattern is used in Social PhD Theses to introduce other literature, which is an important component of this Introduction section. However, it also shows the ambivalent character of the PhD dissertation, as they “may ...lack a certain explicitness with regard to the role and innovative character of the writer’s own research” (Swales, 2004, p. 117). This ambivalence is associated with the Social Sciences since they are interpretative, and students do not really know how far they can go with their analysis, unlike Medical Sciences where the results are reached before students start writing their dissertations.

In addition to the preposition ‘*as*’, table 5.8 shows that the preposition ‘*to*’ is frequently used to complement verbs.

- **MD INT 12.** This is because phenytoin binds preferentially to the sodium channels in an inactivated state (Rogawski and Loscher, 2004).
- **SA MET11.** In theory, this variable should be negatively related to carbon production; that is, countries that ratify Kyoto should institute policies that slow or reduce their per capita CO2 emissions.
- **SD DIS 12.** The majority of the chapter is devoted to the interpretation of the findings reported in Chapter 4.

These examples shows that unlike the preposition ‘*as*’ which is associated with verbs such as ‘identify, act, consider, and cite’, ‘*to*’ is rather linked to verbs such as ‘add, bind, relate, and devote’. The link between the verb and the preposition is primarily semantic. The preposition ‘*as*’ is not spatial, but it is used as a ‘basis of comparison’ (Quirk et al., 2005, p. 665), while the preposition ‘*to*’ has the meaning of movement, and is therefore used with action verbs denoting metaphorical movement. These PPs are associated with the MSSC, as 10 occurrences are found in this sub-corpus, while only 3 exist in the SSSC. Those in the SSSC are linked to relational verbs (related to, attributes to, and devoted to), while in the MSSC, the verbs denote both actions and relations. In the Methods section, the verbs are mainly action:

- **MA MET 12.** Nonidet P-40 detergent (NP-40) was added to a final concentration of 1% before PNGase F addition.

- **MD MET 11.** Pellets were resuspended in 20 ml of STET and transferred to 50 ml beakers.
- **MD MET 12.** This does not reflect very extreme low blood pressure (unlike the cases who have very extreme high blood pressure) because in the adult population the blood pressure distribution curve is skewed to the right.

The prepositions in these cases complement the meaning of the verb by indicating its direction. They describe real actions that took place in the experiment. However, those used in the results are:

- **MA RES 11.** We then quantitated DN c-Jun expression levels and compared these to virally transduced cells before transplantation (i.e., input).
- **MA RES 12.** The pattern obtained pointed as well to the homogeneity of the self-assembled multimers.
- **MD RES 12.** Cluster plots of the 119 SNPs with a GC adjusted P value $\leq 1 \times 10^{-4}$ were visually inspected, leading to the exclusion of 39 poorly clustered SNPs.

In these examples, the preposition ‘to’ seems to complement the meaning of the verb differently. The preposition specifies the effect or result of the verb, thus narrowing the scope of its meaning. In the Results section, the use of these verbs complemented by the preposition ‘to’ helps identify the main results and comparisons made in the research. On the other hand, the three cases in the SSSC are:

- **SA MET11.** In theory, this variable should be negatively related to carbon production; that is, countries that ratify Kyoto should institute policies that slow or reduce their per capita CO₂ emissions.
- **SA DIS 12.** Seal (2002: 131) claims there is little mention of the armour in oral tradition, and attributes the ‘fascination’ to ‘books, films, poems, plays, even Nolan’s paintings’.
- **SD DIS 12.** The majority of the chapter is devoted to the interpretation of the findings reported in Chapter 4.

The use of these PPs as complements shows the object of the relation, as the verb links one thing to another. The preposition specifies the entities to which this relation is made. A comparison between these cases and the examples from the MSSC reveals a difference between the two sciences. In Medical Sciences, data are concrete, results can be compared and pointed to, while in the Social Science, the main task of the researcher is to find links, to relate events and ideas, and to find explanations to problems. Therefore, while the complements in the Medical Science indicate direction and specific entities, those in the Social Sciences denote relations.

In general, the choice of the PPs functioning as complements seems to be related to the communicative purpose of the section or the genre. Additionally, differences of methods may

influence the choice of certain meanings, which would affect the grammatical function. In addition to complements, table 5.8 shows that certain PPs function as partitive constructions.

5.4.4. Partitive Constructions

In addition to the function of postmodifier, table 5.8 shows that of-phrases can have the function of a partitive, where the phrase is part of another construction. The use of this construction is summarised in the following table.

Table 5. 16 Partitive constructions in the sample

	<i>Medical</i>	<i>Social</i>
PhD Theses	6	3
RAs	5	11

The distribution of the partitive constructions shows that most cases occur in the Social Sciences. In order to check if any correlation between the variables exists, Yule's coefficient is computed:

$$Q = A-B/(A+B)$$

$$\text{With } A = 6*11 = 66 \text{ and } B = 5*3 = 15$$

$$Q = 66-15 / (66+15) = 51/81 = 0.629$$

The computed coefficient in this case is outside the rejection interval, which means that a correlation between the variables of the table does exist. This implies that the distribution of the partitive construction is not even, and that the use of these constructions can be linked to the Social Sciences, and particularly to RAs.

The term partitive constructions is used in the present dissertation to refer to any 'of-phrase' that is part of another construction, which is reviewed in section [2.2 Of-phrases]. In fact, certain 'of-phrases', which come after nouns, cannot be considered as postmodifiers to those nouns seeing the close relation in meaning. The expressions used in the corpus are 'series, number, variety, total, set, etc' which are considered as 'quantifying collectives' according to Biber et al. (2007). These expressions are used whenever the writer is not sure about the quantity of items or when mentioning the exact digit is not really important. Only one case of these is found in the MSSC, whereas the other nine instances are in the SSSC. This can be explained mainly by the difference between the disciplines; in fact, Social Sciences do not capitalise on exact numbers the way Medical Sciences do. For instance,

- **SA MET 7.** Later in the survey, respondents were presented with a series *of statements about their relationships with their parents.*

In this example, the number of statements is not specified as it does not seem to be necessary to the writer. The absence of the exact number can also be an avoidance of redundancy as in the case of:

- **SA RES 6.** In Table 4, we display **this same set** *of analyses* for the restricted working class schema.

In this case, *the analyses* are mentioned in *table 4*, so that it is needless to repeat that again. On the other hand, among the quantifying expressions, the MSSC makes use of ‘a triad of’, which is precise unlike the other expressions, and this shows the Medical sciences struggle for precision and exactness.

- **MA INT 5.** Melkersson-Rosenthal syndrome (MRS) is a rare, noncaseating granulomatous disease that is characterized by a **triad** *of facial paralysis, orofacial edema, and lingua plicata* (scrotal tongue, or fissured or furrowed tongue).

The results have also revealed that the distribution of these constructions may vary according to the sections, as summarised in the following table.

Table 5.17 Distribution of partitive constructions by section

	<i>Medical</i>	<i>Social</i>	<i>Total</i>	<i>Chi-square</i>
Introduction	2	4	6	0.365
Methods	4	3	7	0.682
Results	0	4	5	3.741
Discussion	5	3	8	1.643

Table 5.17 shows that the sections contain almost the same number of partitive constructions, but their distribution across the disciplines seems to differ, and particularly those in the Results section. All the examples belong to the SSSC:

- **SA RES 1.** Before examining the results of the multivariate analyses, we first present Table 2, which has the descriptive statistics for *each* *of the four ethnic and racial subgroups* represented in our sample.
- **SA RES 5.** Table 3 presents estimates from three regression models for *each* *of the three racial contrasts* (Black-white, Hispanic-white, and Asian-white).
- **SA RES 6.** In Table 4, we display this same *set* *of analyses* for the restricted working class schema.
- **SD RES 8.** *None* *of the economic factors* reaches statistical significance.

These examples are cases where one element is emphasized (each of, one of, none of). In these sentences, used in the Results section in the SSSC, the word ‘each’ is well defined by the writer, and is used to focus on all *the three racial contrasts* separately, and *the four ethnic and racial subgroups*. *None* is the negative form of *each*, it denies that any element, *of the economic factors*, reaches statistical significance, which means that all the elements have been investigated. These examples from Research Articles in the Social Sciences show how writers in the Results section try to underline certain positive features in their research, which is one way to make the choices in the research clear to the reader.

On the other hand, table 5.17 shows that most partitive constructions are associated with the Discussion of Medical texts:

- **MD DIS1.** As discussed in Chapter 1 and in Section 3.1 of the present Chapter, ND10 components constitute a *part of cellular intrinsic defence mechanism* against both HCMV and HSV-1.
- **MD DIS3.** HMG1 and/or HMG2 knockdowns altered the expression of *many of the neural lineage genes* in day 3 of neural differentiation but not in undifferentiated cells.
- **MD DIS6.** The study was also implemented in a real world setting, at the time of an initial specialty consult visit, and highlights the strengths and limitations of using this *type of setting* to disseminate CAPtDA tools into practice.
- **MA DIS 1.** It appears that E proteins are regulating, perhaps directly, two *sets of genes*.
- **MA DIS 4.** Chemokine CCL20 is a group *of cytokines that have chemotactic effects on various white blood cell subtypes such as neutrophils, monophils, and lymphocytes*.

Unlike the examples from the SSSC, these examples are introduced by collective nouns: set, many, group, etc. These nouns determine the way the prepositional complement is conceived. Collective nouns (set, group), as their name indicates treat the complements as different elements that need to be seen as one. Part is partitive as it conceives of the complement as one thing, where only one part is taken into consideration. This tendency to group and unite elements is contrasted to the uses of ‘each’ in the SSSC, where different elements are treated as separate. One possible interpretation is the different methodologies followed in these sciences. In Social Sciences, case studies are dealt with, and the results are interpretations that concern only those cases studied. In the Medical Sciences, however, a deductive approach is adopted, which means that generalisations are sought in the conclusion.

5.5. Concluding Remarks

This chapter has tried to present the results of the syntactic analysis of the studied prepositions and PPs. For this purpose, the chapter has started with a description of the general frequencies of prepositions. Certain prepositions like ‘*of* and *in*’ are more frequent

than the others, which is the ‘global probability’ reflecting the general linguistic choices in English. Additionally, RAs contain more prepositions than PhD dissertations, and this is thought to be a ‘local probability’ revealing the needs for condensed texts in this genre (Halliday and Webster, 2009, p.252).

Following this general description [section 5.1. General Frequencies], the chapter has been divided into three main sections focusing on the preposition itself, the structure and the function of the whole PP. In section [5.2 Simple/Complex Prepositions], a study of two-word and three-word prepositions has been undertaken. In the register of academic writing, simplicity is favoured as the use of complex prepositions is limited, compared to the BNC.

Two-word prepositions are classified into two main categories depending on whether the prepositions are separate or fused, as the latter type seems to have developed new, and slightly different, meanings compared to the meanings expressed by each preposition separately. The separate two-word prepositions which are not fused, however, carry complex meanings, or are joined to distinguish one part of speech from the other.

The distribution of three-word prepositions seems to be informative about the nature of the context of academic writing. In fact, compared to the list of the most frequent complex prepositions of the BNC, those in the studied corpus show how this register opts for less context-dependent choices (Tannen, 1985). The chosen prepositions seem to vary as to their degree of grammaticalization since the most grammaticalized forms have new and unpredictable meanings, and seem to contrast the sub-corpora quantitatively and qualitatively, thus distinguishing the expert and peer-reviewed writings from other types of writing.

Prepositional complements, in addition to the premodifiers, are studied in section [5.3 Structure of PPs]. The results have pointed to the importance of nominalization in academic writing as 95 percent of the complements are phrasal. Although limited, the use of clausal complements seems to be, according to the chi-square test, associated with the Social Sciences. Clausal complements highlight the reality of the process they are describing, and this can be linked to the weight of evidence that needs to be provided in Social Sciences, in addition to the need to claim an academic identity. As for phrasal complements, almost all the cases are NPs, known for their ability to make reference. The references made in the corpus are studied and classified as being textual or contextual. Textual references are made to the text itself, or to other literature, while contextual references are made to abstract notions, concrete things or to nominalised processes. These nominalizations are sources of technical words in the Medical Sciences and ways to condense writings, background information, and talk about processes, in the Social Sciences.

The last sub-section deals with the functions of PPs [5.4. Function of PPs]. The results have shown that certain prepositions are associated with certain functions, which means that certain grammatical functions are closely motivated by the meanings expressed by the preposition. Postmodifiers are mostly realised by of-phrases, and reveal differences among the writers of each genre. Adverbials are optional additions that help emphasise the Results in the MSSC and the Discussion in the SSSC, thus highlighting the most important section in each discipline. Certain complements, on the other hand, reveal the similarity between the Introduction and Discussion sections, in addition to the indecisive character of students' writings. Finally, partitive constructions, through their different distributions, show that Social Sciences come up with conclusions about individual case studies, while those in the Medical Sciences deductively draw general conclusions.

This chapter has tried to analyse PPs from a syntactic perspective. It has tried to link the analysis to the context of academic writing, namely the registers of Medical and Social Sciences, and to the genres of RAs and PhD Theses. The analysis has revealed that PPs cannot be fully studied from a syntactic perspective only, the meanings they express need to be studied as well. For this purpose, the following chapter present the semantic analysis of PPs.

Chapter Six: Semantic Analysis

This chapter aims to present the results of the semantic analysis. Therefore, it will be divided in accordance with the systems designed in the literature (chapter two). The first classification (figure 4.9) distinguishes PPs which are thought to serve a grammatical function [2.2. Of-phrases], from others used to introduce participants [2.3. Thematic Roles]. The second system classifies the meanings expressed by PPs into experiential, interpersonal and textual. These results are summarised in the following figure:

Figure 6. 1 Semantic classification of PPs

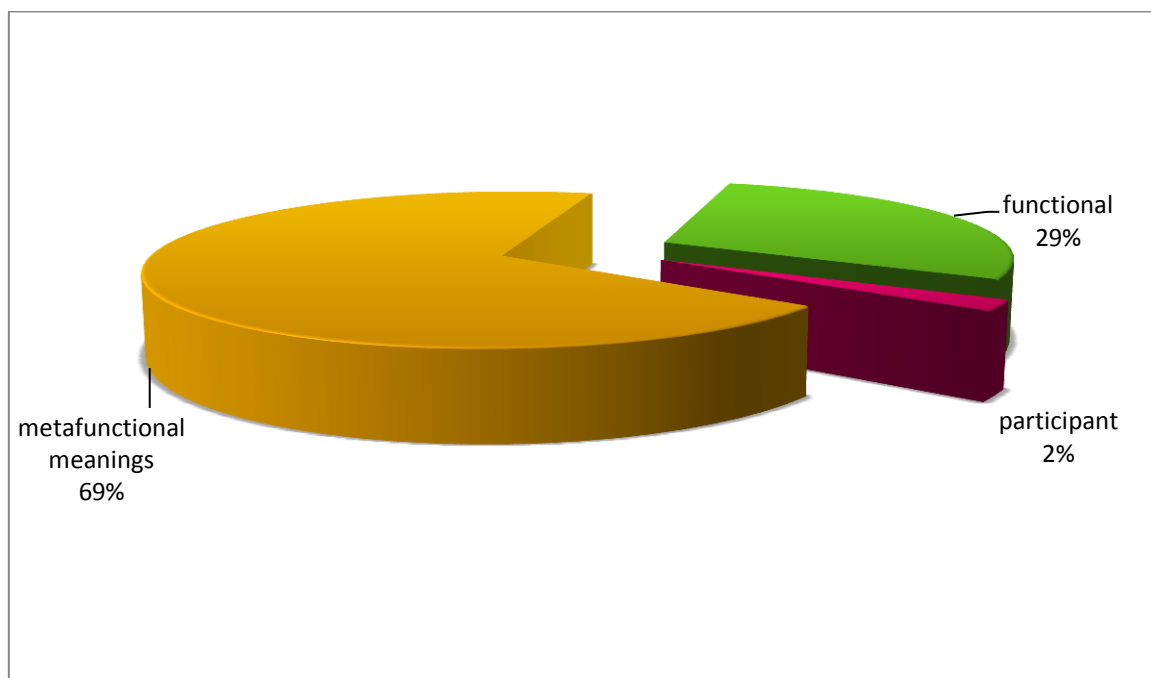


Figure 6.1 shows that most PPs express one of the three metafunctional meanings, while almost 30 percent of all the PPs are functional. The figure also shows that prepositions introducing participants are almost rare in the sample. Therefore, a first sub-section will deal with the functional PPs, a second will focus on those introducing participants, and a third one will present the metafunctional meanings.

6.1. Functional PPs

The annotation of the corpus has revealed that 29 percent of all the PPs are classified as functional. In the studied sample, all these PPs are of-phrases. Among the 235 of-phrases annotated in the sample, 232 are functional, while only three cases convey meanings. These are:

- **MD DIS8.** *Instead of the three levels of cut off points of the recommended daily defined doses of AEDs*, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).
- **SA INT 9.** There exist, *of course*, a multitude of theoretical perspectives on globalization, ranging from Ritzer's (1993) unstructured 'McDonaldization' to Robertson's (1995) semi-structured 'glocalization' to Castells' (1996) highly structured 'network society.'
- **SD DIS 3.** Wardell was the most highly decorated soldier *of the six participants studied and seemed almost embarrassed by the awards*.

These examples have not been classified as functional because they convey a precise meaning. The meaning, in the first two cases, does not come from the preposition 'of', but rather from the other element, namely *instead* and *course*. *Instead of* has been studied as part of two-word prepositions [5.2.1. Two-word prepositions], and the analysis has revealed that the addition of 'of' to the adverb *instead* is meant to differentiate the two words grammatically. As for 'of course', this expression literally expresses 'of the ordinary course', according to the Online Etymology Dictionary. The medial words (the ordinary) have been omitted through time, but the meaning is still the same as the word 'course'. In this case the preposition 'of' conveys a meaning of belonging or source. The expression seems to have changed through time, and the use of the preposition shows that it used to be rather lexical.

In the third example, the preposition 'of' has the meaning of 'among'. Similar to the original meaning in 'of course', this preposition conveys a meaning of source, where one soldier is seen as belonging, or retrieved from the source of 'six participants...'

The syntactic analysis of of-phrases revealed that most of the cases are postmodifiers, and particularly complements to the head. In cases of grammaticalization, these phrases are thought to introduce the subject. From a semantic perspective, of-phrases are thought to link two heads (Sinclair, 1991), as both play important roles in determining the meaning of the overall expression. On the other hand, Halliday and Matthiessen (2014) distinguish between head and thing, with head being the syntactic head, and thing the semantic core. The analysis reveals that three main types can be distinguished, those where an of-phrase follows a grammaticalized noun, those where it follows a simple noun, and those which are part of partitive constructions.

The first set comprises of-phrases complementing grammaticalized nouns. The syntactic analysis has revealed that these PPs introduce the subject of the clausal form.

- **MD RES1.** *The appearance of the two bands* corresponding to major ATRX isoforms of approximately 280 kDa and ATRXt (a truncated ATRX isoform) was consistent with previously published work (Berube et al, 2000; Garrick et al, 2004).

The PP ‘*of the two bands*’ complements the noun ‘*appearance*’, which is derived from the verb ‘*appear*’:

- ***The two bands*** appeared.

The relation, in this case, between the of-phrase and the noun it complements is similar to that between a subject and a predicate, where participants, corresponding to the subject, “are directly involved in the process, bring about its occurrence or being affected by it in some way” (Halliday and Matthiessen, 2014, p.221). Participants are generally seen as being involved in the process, and this relation is translated in the nominal version through the use of the preposition ‘*of*’. In such case, the preposition cannot be classified as purely grammatical, that is not carrying meaning, but rather as conveying this meaning of involvement, which is thought to be related to its conceptual meaning of source.

The second type concerns those of-phrases which follow simple nouns. In such cases, the PPs are said to specify the meaning of the head, or to ‘elaborate’ on it, according to Halliday and Matthiessen (2014). Elaboration is a semantic relation that holds when one constituent specifies or describes another one (Halliday and Matthiessen, 2014). In this case, it is applicable on heads and their postmodifiers. While certain postmodifiers extend or enhance the head, of-phrases rather elaborate on it. In these cases, there is no addition of a new meaning; rather the postmodifier is thought to be part of the reference that the author wants to make.

- **MD RES5.** Bacterial expression vector pKK223-3 (Amersham Pharmacia Biotech, Sweden), containing ***the B domain of Staphylococcus aureus protein A*** (SpAb) fused to GFP, was kindly donated by Takashi Aoki (Department of Biochemistry, Health Sciences University of Hokkaido, Japan) (Aoki et al., 2002).
- **MD DIS7.** ***Remission rate of elderly patients*** with focal epilepsy on sodium channels blocking AEDs was 89% compared to 90% in those on AEDs working mainly by potentiation of GABA inhibitory effect with insignificant difference noticed (p-value = 0.8).
- **SD INT 8.** The findings from these studies are rich and varied, especially in regard to institutional responses to changing Social and structural conditions, the ***changing nature of denominational affiliation***, the ***different fates of mainstream and evangelical churches***, and the ***extent of local churches’ provision of Social services***.

In these cases, the of-phrases seem to answer questions with *which* (which domain?, which rate?, which fates?, etc.), which shows that there is a need to specify the information provided by the head. Such constructions seem to be clear, with no ambiguity. The whole NP seems to refer to just one entity which is defined in a complex way with the head introducing a general noun (domain, rate, fate, etc.) and the PP specifying it. There seems to be a dialogic

relation between the head and the PP. In fact, while the PP specifies the head, the meaning of the head seems to be included in the meaning of the complement, and this relation of inclusion is expressed by the preposition ‘*of*’.

In other cases, the PP does not seem to specify the head, but to describe it:

- **MA INT 6.** *The concept of vascular or arterial age* has been proposed in several previous studies.

This example shows that the head and the postmodifier have the same reference, as the postmodifier is only describing the head. Both, the noun and the postmodifier can be considered as heads, thus referring to the same thing, but from different perspectives. The ‘concept’ is itself ‘the vascular or arterial age’, but while the first is an abstraction, the second presents the reference.

The third set involves those of-phrases which are part of other constructions. These constructions have been analysed from a syntactic perspective in section [5.4.4. Partitive Constructions]. Although syntactically treated as a unit, these constructions seem to have evolved from the use of separate nouns and prepositions:

- **MA MET 8.** . Pups representative of both pre-exposure conditions (ethanol or air) were assigned to *one of two conditioning groups*.
- **SA INT 10.** The resulting literature is diverse and crosses multiple disciplines, but *most of this work* can be categorized as engaging one of three major topics: racial identity and identification, psychological well-being, and racial stratification.
- **SA RES 1.** Before examining the results of the multivariate analyses, we first present Table 2, which has the descriptive statistics for *each of the four ethnic and racial subgroups represented in our sample*.

These examples show that constructions like ‘*one of, most of and each of*’ have emerged from simpler constructions, namely noun + postmodifier. The preposition seems to express the meaning of source, whereby the head is taken from a source, which is the prepositional complement.

The use of functional PPs has revealed that of-phrases cannot be classified as purely grammatical, as they convey a meaning of source or involvement. These PPs are not “typical”, according to Halliday and Matthiessen (2014), as they function as “structure marker” (p. 425). However, the analysis has revealed that the choice of the preposition ‘*of*’ as a marker of structures is caused by its intrinsic meaning. In addition to these peculiar PPs, other prepositions are used to introduce oblique participants in the clause.

6.2. Participants

Certain prepositions introduce oblique participants in the clause [2.3. Thematic Roles]. Participants introduced by PPs can have three main roles: recipient, benefactive or agentive. The analysis has revealed that these participants are equally distributed in the two registers and two genres, as shown in the following table.

Table 6.1 Participants introduced by prepositions

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Recipient	2	1	3
Benefactive	1	1	2
Agentive	6	7	13
Total	9	9	18

Table 6.1 shows that the two registers have almost the same number of participants and that the role of agentive is the most frequent. For further qualitative analysis, the following agentive roles are studied.

- **MA INT 19.** The transition from DP to SP stage, directed by TCR-mediated positive selection, involves the activity of E protein transcription factors HEB and E2A encoded *by the genes Tcf12 and Tcf2a*, respectively.
- **SD RES 20.** The ubiquity of reference to Agape at all the Chinese churches I have observed suggests that it is a core value – presumably the single most important value held *by Chinese Protestants*.

These participants are introduced into the clause using the preposition ‘by’, which originally denotes the meaning of ‘proximity’. The role of the agentive is a direct result from passive transformations where the subject moves from sentence initial position to a post-verb position. When moved from its original position, the subject is introduced by the preposition ‘by’, which can be linked to the conceptual meaning of the preposition. The conceptual meaning of the preposition ‘by’ has extended to denote a semantic and positional proximity between the verb and the argument.

By-phrases are the only resource in language used to introduce an agentive in the clause. This role is oblique, that is introduced by a preposition, because it has not originated in that position, it is rather moved from a front position. The use of the preposition ‘by’ to introduce it can be linked to the meaning of proximity it expresses. The preposition plays an important role in making the participant prominent when it comes in a final position in the clause. The role played by this preposition is similar to ‘of’, where the conceptual meaning of

source has been applied between two grammatical constructions, namely the head and the postmodifier.

According to Biber et al. (2007), “passives are most common by far in academic prose” as they account for 25 per cent of all verbs (Biber et al., 2007, p. 476). Passivization is a strategy used in discourse in order to change the order of elements in the clause, and therefore to highlight one piece of information. In the above mentioned examples, it is used to underline the agentive of certain actions, which is part of the findings of the research:

- **MA DIS 20.** The antiviral activity of this compound appeared to be strongly influenced *by the strain of the coronaviruse tested.*
- **SA MET 19.** Berry points out, however, that the advocacy explosion was led *by groups wishing to influence public policy (1989).*

Furthermore, such constructions would allow the writer to pick up a topic and keep talking about it even if it has undergone some action, rather than done it. The presence of such constructions in scientific writing can be seen as one way to maintain the cohesion of the text, and therefore, to make the comprehension of the text easier. Besides, these constructions are used for the brevity of the text as writers tend to link, by coordination and subordination, different VPs to the same subject:

- **MD INT 19.** While IE gene expression *does not require* de novo protein synthesis and *is activated by viral and host cell transcriptional factors*, Early and Late gene regulation is highly dependent on the synthesis of IE gene products (Honess & Roizman, 1974).

These constructions can also result from cases where the author is trying to avoid the subject, as it is statement is not thought important.

- **SD MET 19.** At times, a letter to the Governor regarding the death penalty would be accompanied *by a newspaper article containing information pertinent to the citizen's concern.*

Furthermore, the results have shown that the distribution of the role of agentive varies with respect to the section, as shown in the following table:

Table 6. 2 The role of agentive across the four section

	<i>PhD theses</i>	<i>RAs</i>
Introduction	3	3
Methods	2	1
Results	1	1
Discussion	1	1

Table 6.2 shows that most of the PPs with the role of agentive are found in the Introduction section, which can be seen as a linguistic strategy to draw the attention of the reader towards one particular reading of the situation. This is important in the Introduction section, as the researcher needs to argue for a gap in the literature, and present his/her piece of research as a solution. Stressing the agentivity of an entity through introducing it in a by-phrase helps the researcher construe their arguments, and build on that agentivity.

In addition to the role of the agentive, prepositions are also used to introduce recipients and benefactives. These two roles are introduced by the prepositions ‘*to*’ and ‘*for*’, respectively. Such PPs are considered as participants in the clause rather than adverbials because they form part of the main verb complementation pattern.

- **MA INT 12.** Special attention was given *to the possibility that schedule of exposure to ethanol vapor would modulate ethanol-mediated motivational learning.*
- **MA MET 12.** Nonidet P-40 detergent (NP-40) was added *to a final concentration of 1%* before PNGase F addition.
- **SA DIS 12.** Seal (2002: 131) claims there is little mention of the armour in oral tradition, and attributes the ‘fascination’ *to ‘books, films, poems, plays, even Nolan’s paintings’.*

In these cases, the verbs ‘give, add, and attribute’ are used as complex transitive (give/add/attribute something to someone/something), which is also the case for the role of benefactive:

- **MD RES 13.** The association results *for each cohort* and the combined summary measure are presented, as well as measures to assess heterogeneity between component studies.
- **SD MET 13.** Guest (2003) speaks of performing many favors *for members of the Chinese churches he sampled.* presumably as a means to build trust or a sense of mutual obligation.

In the first sentence, the role of benefactive is introduced within an NP rather than a clause, but this NP seems to emerge from the nominalization process of a clausal form. The difference between recipient and benefactive is that while the recipient is an actual receiver, the benefactive is an intended receiver (Quirk et al., 2005, p. 696/7). The verb selects its argument, and therefore, is responsible for whether the receiver is actual or just intended. Besides, the meanings expressed by ‘*to*’ and ‘*for*’ are different, for while ‘*to*’ expresses a positive destination to a particular point, ‘*for*’ has rather a blurred meaning as Lindstromberg (2010) claims that “more about intention rather than movement” (Lindstromberg, 2010, p. 224/230). The two prepositions, in addition to the verb, seem to be responsible for the difference between the roles.

These cases where a preposition introduces a participant and helps identify that participant reveal the role played by the preposition as a type of process. Prepositions bear a similarity to verbs, which are principally responsible for determining the participants in the clause. In the cases of oblique participants, it is not only the verb which is responsible for the meaning expressed, the preposition plays an important role too.

In addition to functional PPs, and to PPs introducing participants, the other PPs are categorised as expressing three types of meanings: interpersonal, textual and experiential which will be the focus of the following sub-section.

6.3. Metafunctional Meanings

According to the results presented in figure 6.1, PPs which have been annotated as expressing one of the three metafunctional meanings account for 69 percent of all the PPs. Seeing that all the *of*-phrases are functional, it can be claimed that almost all the prepositions, with the exception of *of*-phrases, are classified as interpersonal, textual or experiential. The following figure summarises the distribution of these meanings.

Figure 6. 2 Metafunctional meanings

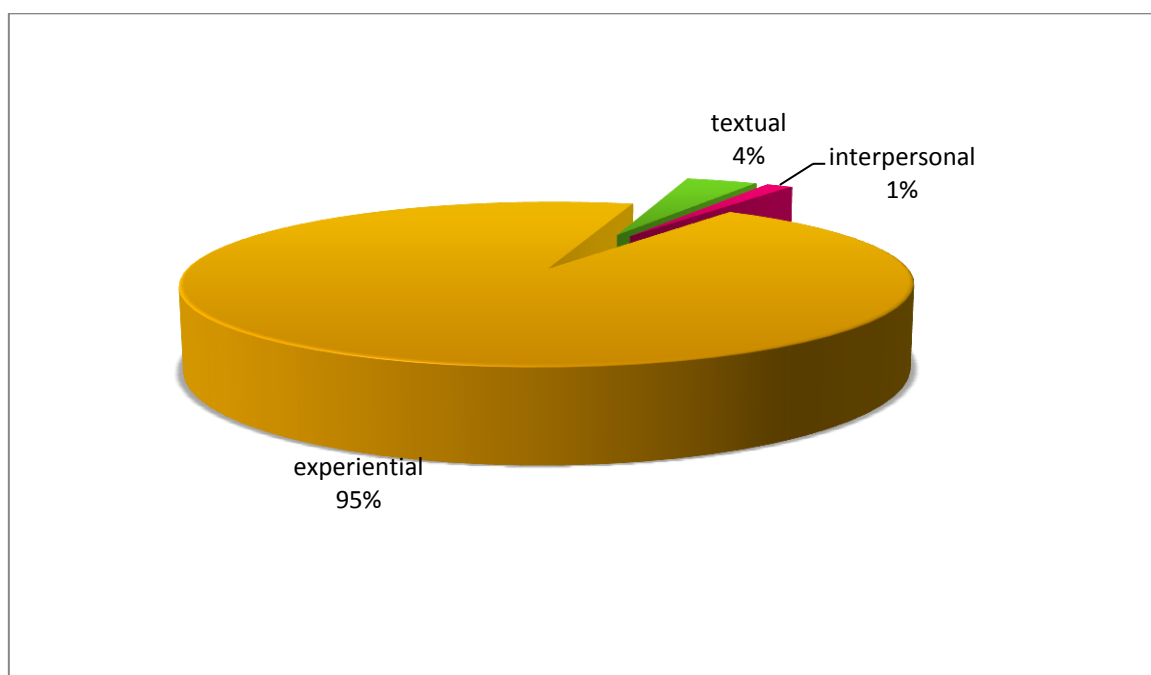


Figure 6.2 shows that experiential meanings are the most frequent in the sample, and that textual references are more frequent than interpersonal ones, although both frequencies are still low. This can be related to the nature of scientific writing, where authors need to reflect on how the experience in the text is construed. Authors of scientific texts focus on the scientific content, and on how to make it as clear as possible through the addition of

circumstantials. The textual references are not thought to be that important since few PPs have the textual function of “creating relevance to context” (Halliday and Matthiessen, 2004, p. 61), which means that the focus is on the content and not how cohesive the text is. The scarcity of interpersonal references can be linked to the fact that it is most of the time realised through adverbs rather than PPs. Besides, this proves that while the ultimate purpose of writing science is to communicate it to others, the relations between the author and his/her audience are not stressed as a way to make academic writing independent of people and places. This is also one way to focus on the content, as the less-context dependent the text is, the more content-focused it is (Tannen, 1985).

For further analysis, the following sub-sections deal with each meaning separately.

6.3.1. Interpersonal Meanings

Certain PPs in the sample have been annotated as expressing interpersonal relations. The results have revealed that all the 8 occurrences are found in the SSSC. There are three meanings within the interpersonal metafunction: intensity, content and style. ‘*In part*’, ‘*in no small measure*’ and ‘*in all likelihood*’ are the intensity adverbials used in the sample, while others (*in general, in fact, of course*) are categorised as content adverbials, as their scope extends to the content of the clause. Style adverbials like ‘*in short, in brief*’ are not found in the sample. Knowing that these adverbials are used to signal a change of style, it seems that such devices are not thought to be important in this type of writing.

Most content and intensity adverbials are realised by PPs headed by the preposition ‘*in*’, which can be linked to the meaning of containment that this preposition conceptually expresses. In fact, it allows the containment of the overall proposition in a particular point of view (general, fact, part, etc.).

Intensity adverbials are used to signal the degree of an action. The cases in the sample have the function of hedging certain claims (SA RES3) or while indicating causality (SD INT2) or effect (SD RES2).

- **SA RES 3.** The number of MZ-twin pairs is small *in part* because we are able to include a twin pair in the analysis only if information is available for both members of a twin pairs as well as for the friends of both members of the twin pair.
- **SD INT 2.** These were disgusting spectacles to the Social elite, *in no small measure* because the crowds drawn to them came for the crass carnival atmosphere rather than any serious moral or civic purpose.
- **SD RES 2.** However, a latent effect of this hyper-reporting, complete with vivid adjectives concerning the nature of the executions, was *in all likelihood* the main catalyst for an increase in negative public sentiment which was soon to follow.

In this context, Hyland (1998) asserts that “[h]edges are employed to achieve a single primary objective: to overcome the inherent negatability of statements and gain the reader’s acceptance of a knowledge claim” (p. ix). The claims made in these samples concern certain results while the one in the Introduction is about linking an event to a particular cause. Hedging the results is one way to have them accepted as they would not be refuted easily. Hedging certain causal relations in the Introduction reveals that these claims are the ones brought and defended in the thesis.

The other types of interpersonal PPs are cases where the content adjuncts ‘*in general, in fact and of course*’ are used. According to Halliday and Matthiessen (2004), these adverbials carry a validating meaning. What writers are validating are statements to be taken as common knowledge (SA INT 8).

- **SA INT 8.** Beyond those women who decided to run for public office, women ***in general*** were also more likely to see the political under-representation of women as a problem.

In this case, the use of the comment is one way to make the reader accept the claim as a general one, or as a common truth. The second occurrence of ‘in general’ is in the Discussion section of a RA in Social Sciences, and particularly in the research limitations.

- **SA DIS 7.** ***In general***, our initial model reflects the available literature on individual citizens’ trust in government.

The writer in this case is validating the claim that the model s/he came up with reflects the available literature, which means that any limitations to the model are caused by limitations in the literature, which are beyond the scope of the researcher. In addition to the claims for validity, another interpersonal adjunct is used

- **SA DIS 1.** There may, ***in fact***, be other relevant variables that are not included in the models presented in Table 1 and Table 2.
- **SA DIS 8.** Results may thus be interpreted as causal when they are, ***in fact***, panel-specific or period-specific.

‘*In fact*’ is a factual adjunct used to claim that what is said is presented as a fact. The facts presented in the Discussion of RAs in the Social Sciences are the limitations of the article (SA DIS1), and when claiming the truth of the findings. This means that authors admit as facts some of their findings, and also the limitations of their research, which gives the impression that the author is aware of the advantages and drawbacks of his/her research, and thus s/he can be qualified as an expert. Moreover, this verificative meaning makes the

negotiation between the writer and the reader clear, as far as the discussion of the research limitations is concerned, as admitting one's limitations is one way to anticipate the reaction of the reader.

Other interpersonal adjuncts convey almost the same meaning of validation as they assert the truth of what is said:

- **SA INT 9.** There exist, *of course*, a multitude of theoretical perspectives on globalization, ranging from Ritzer's (1993) unstructured 'McDonaldization' to Robertson's (1995) semi-structured 'glocalization' to Castells' (1996) highly structured 'network society.'

In this example, the assertive adjunct '*of course*' is used to state 'the existence' of other theories in the literature, and this highlights the awareness and the knowledge of the author. In fact, the researcher needs to situate his/her work with respect to other literature, and the use of an assertive interpersonal adjunct highlights the expertise of the writer.

The interpersonal adjuncts of hedging and validating are only found in the SSSC. The fact that sociologists tend to hedge new claims and validate or assert others shows that there is a negotiation between the writer and someone else. Hedging or validating ones claims presupposes the presence of a reader in addition to the active role of this reader. The writer knows in advance what the reader may think and what questions s/he might ask, and this anticipation leads to the presence of such persuasive tools.

Although rare in Social Sciences, interpersonal adjuncts are totally absent in the sample of Medical writings. The need to hedge or validate claims is not as important as it is in Social Sciences since the Medical claims are defended in the research itself, as the analysis is going to show whether these claims are to be maintained or not. On the other hand, research in Social Sciences does not reveal clear-cut results, as all claims can be refuted or criticised. Validation is also absent in Medical Sciences since while Sociologists need to prove all their claims, as they are interpretations, researchers in Medical Sciences are based on recent advances, which are taken as general truth. Medical Scientists do not need such type of persuasion because the rigour of their description is enough to prove the validity of their claims.

The distribution of hedgers (intensity adjuncts) and validators (content adjuncts) seem to be influenced by the genres studied, as revealed in the following table.

Table 6. 3 Content and intensity adjuncts in the Social RAs and PhD theses

	<i>Content</i>	<i>Intensity</i>	<i>Chi-square test</i>
PhD theses	0	2	4.444
RAs	5	1	4.444

Table 6.3 shows that content adjuncts are only found in RAs, whereas hedgers are rare and can be found in PhD Theses. The chi-square test indicates a medium significance for this result, which means that the distribution is not even, and that content adjuncts are associated with PhD Theses. This difference between the genres can be associated with their respective authors, for while RAs writers try to make strong claims, PhD students do not attempt this at all, rather they tend to hedge some of their claims. This validates Swales’ claim (2004) of “unassuming objectivity” (p. 117), as PhD students do not assume that what they are presenting are actually original claims. Doctoral students hedge their claims because they are not sure they (claims) will be accepted. Authors of RAs validate their claims because they are sure of their findings and they know the limitations of their research. Although these strategies are different and reveal differences among students and expert researchers, they can be both seen as persuasive techniques, and they stress the negotiation process and the reader-awareness in academic writing.

These adjuncts seem also to have different distributions with respect to the sections. The following table summarises their distribution in the Results and Discussion.

Table 6. 4 Distribution of content and intensity adjuncts in the Results and Discussion

	<i>Content</i>	<i>Intensity</i>
Results	0	2
Discussion	3	0

Table 6.4 shows that intensity adjuncts are found in the Results, while content adjuncts are rather associated with the Discussion. By applying Yule’s Coefficient on this table, the result is:

$$Q = \frac{A-B}{A+B}$$

With $A = 3 \times 2 = 6$ and $B = 0$

Therefore $Q = \frac{6}{6} = 1$

The result is beyond the rejection interval, which validates the correlation between hedgers and the Results section on the one hand, and content adjuncts and the Discussion, on the other hand. Linking this to the above-mentioned result in table 6.2, it is possible to claim that authors of RAs raise their findings and limitations to the level of facts and validate their

claims (SA DIS 7), while the results are rather hedged. According to Lewin et al. (2001), Social Sciences authors tend to “express superiority of present research to past research” (p. 65), while evaluating the congruence of their findings. This move can be seen as the strongest claim, as other possibilities may simply include “express consistency with past research” (ibid), which shows that authors of RAs, unlike PhD students, are more confident in the contributions they make.

In addition to the interpersonal adjuncts, which are the rarest, certain PPs are classified as being textual adjuncts.

6.3.2. Textual Meanings

Certain PPs express textual meanings, these are devices for expressing “logico-semantic relations that obtain between text spans of varying extent, ranging from clauses within clause complexes to long spans of a paragraph or more” (Halliday and Matthiessen, 2004, p. 538/9). Textual adjuncts are also called conjunctive since their primary function is to “relate the clause to the preceding text” (Halliday and Matthiessen, 2004, p. 81). The following table summarises the distribution of these adjuncts in the Medical and Social Sciences.

Table 6.5 Textual adjuncts in the Medical and Social Sciences

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Additive	2	0	2
Resultative	0	1	1
Contrastive	1	1	2
appositive	0	2	2
Spatio-temporal	8	7	15
Total	11	11	22

Table 6.5 presents the different meanings expressed by textual references in the Medical and Social Sciences. Certain meanings like summative, transitional, verificative, etc. are not expressed by these PPs. Rather, most PPs express spatio-temporal meanings, which shows that a chronological order is followed in most of the cases. The table also shows that while Medical authors opt for addition and contrast, authors in Social Sciences choose more diversified meanings like apposition and result, as shown by these examples:

- **MD MET 7.** *In addition*, data obtained from patients' records were recorded and stored in adherence with the Data Protection Act 1998.
- **MD DIS 6.** *In addition*, differences in decisional conflict between consult groups also could not have been found.

Contrast is expressed via:

- **MD INT 2.** *In contrast*, methylation of histone H3 residues K9 and K27 and of histone H4K20 is associated with repressed chromatin.
- **SA RES 25.** *At the opposite end of the spectrum*, members of local groups are most likely to feel "a lot of control" over their organization (15 percent), versus 10 percent for translocal group members and 6 percent for national group members.

While appositions are mainly cases like:

- **SA RES 13.** On the first anniversary of the attack, *for example*, Australian survivors, families of the dead and government leaders participated in a commemorative service held in Bali with their Indonesian equivalents (Fischer, 2006).
- **SD MET 14.** In essence, early newspaper reporting was, *for all intents and purposes*, the only manner in which society could define and validate itself.

In addition to the spatio-temporal meanings, the two registers seem to divert as to the choices of conjunctive devices. In this respect, Hyland, and Tse (2004) claim that these conjunctive devices are called transitions and they are part of the "interactive resources" that "refer to features which set out an argument to explicitly establish the writer's preferred interpretations" (Hyland and Tse, 2004, p. 168). Each author seems to opt for a 'preferred interpretation' for while in Medical Sciences, mere additions are accepted, more varied meanings are appreciated in the Social Sciences, as they highlight certain readings.

In a study on Research Article abstracts, Sellami Baklouti (2011) has come up with the conclusion that "hard disciplines abstracts ...display...a higher probability of absence of overt conjunctive adjuncts" (p. 514) at the level of clause simplexes and she explained the difference between the disciplines with reference to their respective methodologies. In fact, the rigour of hard sciences is rather explicit in presenting their variables, and "this rigor in the scientific methodology of hard sciences makes logico-semantic relationships uncontroversial" (Sellami Baklouti, 2011, p. 514). This study shows that the presence of conjunctive linkers in Social Sciences RAs and PhD Theses is not genre-related, rather it is register-specific. Social Sciences as part of soft sciences seek rigour in writing as they deal with interpretations of premises where "the conclusion is only probably true and how big a chance that it is true depends on the weight of evidence presented in the premises. The conclusion, then, in an inductive argument is not guaranteed by the premises, but only supported by them" (Allen,

2004, p. 91). The researcher in soft sciences needs to make extra efforts while writing his/her research because s/he has to argue for the presented premises, and needs therefore to make the logico-semantic relations as explicit as possible for the clarity of his/her argument.

In addition to these textual adjuncts, table 6.5 shows that the most frequent textual meaning is the spatio-temporal. Most of these references are spatial, while only two cases have temporal references:

- **SD INT 25.** *At the time of the study* it was estimated that 830,000 male and female Vietnam theater veterans (26%) had symptoms of PTSD (Price, 2006; Schlenger et al., Weiss et al. 1992).
- **SD MET 25.** *At the end of each scenario*, they were asked to answer a series of questions about their attraction to the organization as an employer.

These two textual adjuncts are extracted from SDSC as expressing time. While the first describes the circumstances taking place at the time of the study, the second is about the events at the end of each scenario. The difference between these adjuncts can be related to the sections where they are situated. The first example describing the time of the study is part of the literature that needs to be provided in the Introduction of PhD Theses, thus revealing the importance of this section in the Social Sciences. However, the reference to the time of study results from the length of the process.

As for the spatial references, they can be made to the study:

- **MA INT 3.** *In the present study*, we demonstrated that TCR γ gene rearrangement in fetal thymocytes was perturbed by the E47 deficiency in a dosage-sensitive fashion.
- **MA MET 5.** The ratio, $100 \times (\text{mean fluorescence intensity of PGE1} - \text{mean fluorescence intensity of ADP} + \text{PGE1}) / \text{mean fluorescence intensity of PGE1}$, is expressed *in this study* as a VASP index corresponding to a ratio of the VASP phosphorylation of activated platelets versus at-rest platelets and expressed as a percentage of platelet reactivity.
- **MA DIS 7.** *In the present study*, alcohol use was prospectively examined at 6-month intervals using a comprehensive, validated instrument.
- **MD MET 5.** Immunofluorescence (IF) analysis *in this project* was carried out to study the distribution of HMGN proteins and the expression of neural and glia markers.
- **SA MET 5.** *In this paper*, we describe patterns of change in segregation for the 100 most populous metropolitan areas (as of the 2000 census) in the U.S.
- **SA DIS 4.** *In this study* we examined the consequences of marital dissolution on psychological well-being over the five-year period between the two waves of the National Survey of Families and Households.
- **SD DIS 1.** While this model is useful in sociological explanations of white-collar crime, organized mob activity, or political misconduct, it is somewhat insufficient in accounting for or addressing institutional acts which have no apparent malicious agency, such as the case presented *in this study*.

The use of the PP ‘in this study’ comes in contradiction to ‘other’ studies, which means that the author is going to announce something peculiar, not found in other studies. This conjunctive device can be used in Introductions as part of “occupying the niche” (Swales, 2004, p. 227), and stating one’s voice. In the Methods section, the use of this PP is meant to introduce certain variables adopted in the research. In the Discussion, the textual reference is rather associated with the “accomplishments” of the research (Lewin et al., 2001, p. 62).

Other spatial references are not made to the whole research but rather to specific sections:

- **MD INT 9.** *In the graph on right side of figure*, unbroken line indicates theoretical blood pressure (BP) of the population that is not affected by factors that increase BP; the shaded area indicates SBP in the hypertensive range
- **MD RES 2.** HD-ED cells were infected with dl 1403 strain at MOI 1.2, infection was allowed to proceed overnight and the cells were processed for FRAP analysis, as described *in Materials and Methods* (Chapter 2, Section 2.5.2.5).
- **MD RES 10.** The results shown *in Figure 4.4* confirmed the previous results obtained HCT116 cells.
- **SA RES 5.** *In Table 2*, we present the effects of the broad and restricted White working class variables with no controls.

These examples show that most of the references are made in the MSSC, and that they are made to graphs and figures, while that in the SSSC refers to a table. This reveals the reliance in Medical Sciences on graphs and figures, as data are interpreted quantitatively. Figures facilitate the interpretation of those data by revealing correlations, in case they exist. Such devices are “concerned with ways of organizing discourse, rather than experience, to anticipate readers’ knowledge and reflect the writer’s assessment of what needs to be made explicit to constrain and guide what can be recovered from the text” (Hyland and Tse, 2004, p. 168). Therefore, textual adjuncts are seen as ways of organising the text and of attracting the reader to what is thought to be most important.

In addition to the textual meaning expressed by PPs, figure 6.2 shows that most PPs express experiential meanings, which will be the focus of the following sub-section.

6.3.3. Experiential Meanings

Unlike interpersonal meanings which explore the relation between the author and his/her audience, and textual references which are meant to express logico-semantic relations in the text, experiential adjuncts construe the experience of the author. These elements help present a precise content through describing the circumstances around the experience that the

author needs to cover. These circumstances are classified according to the meanings they express. By annotating the sample using the system in figure 4.11, the following results have been observed.

Figure 6. 3 Experiential meanings

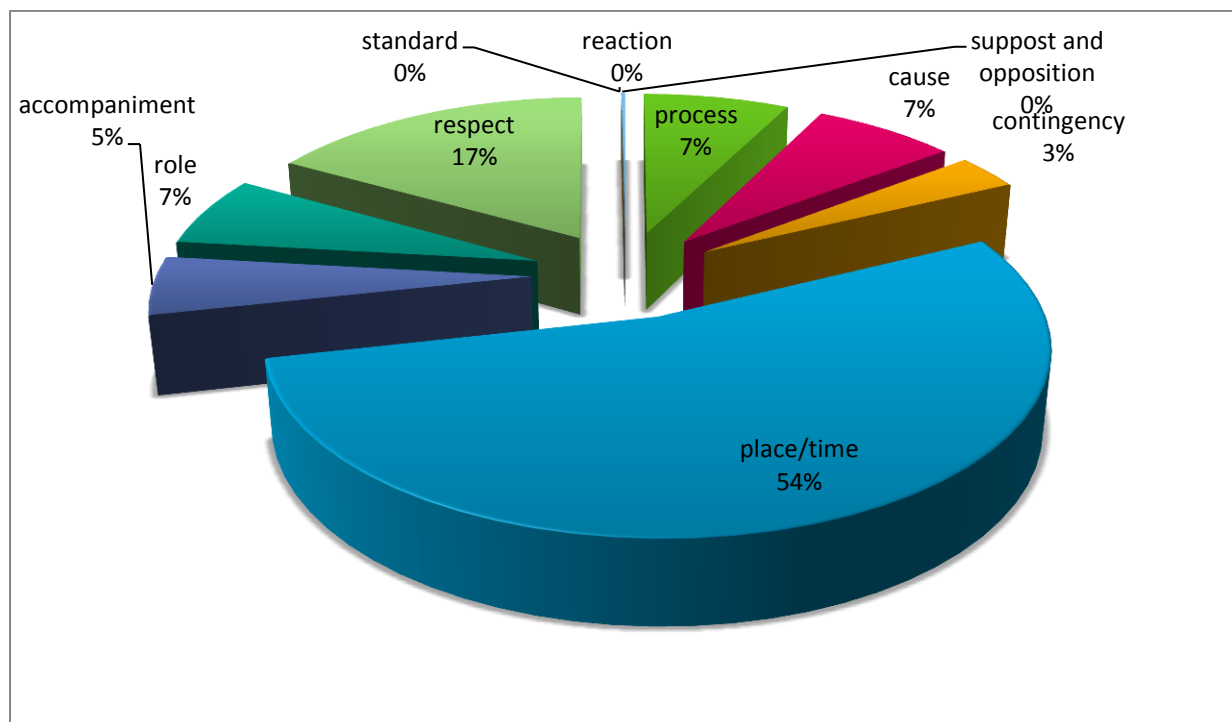


Figure 6.3 shows that among the PPs expressing experiential meanings, 54 percent are annotated as place/time, a result similar to that of textual references. Respect adjuncts are less frequent than place/time, as they account for 17 percent of the experiential PPs. The least frequent group of meanings includes accompaniment, role, process, cause and contingency. The figure reveals also that certain meanings like standard, reaction, and support and opposition are not present in the sample. Some of these meanings have different distribution across the two registers, as shown in the following table:

Table 6. 6 Experiential meanings in the Medical and Social sciences

	<i>Medical</i>	<i>Social</i>	<i>Chi-square</i>
Process	17	22	0.889
Cause	21	17	0.319
Contingency	7	10	0.658
Place/time	157	126	5.227
Accompaniment	15	13	0.087
Role	19	15	0.368
Respect	31	56	9.660

Table 6.6 shows that almost all the meanings are distributed equally across the two registers, except for place/time and respect. This result is further stressed by the Chi-square test which shows a high significance for these two lines. Thus, the distribution of these two meanings is not even and the choice of one meaning over the other is associated with the type of register. The meanings of place/time are associated with the Medical register, while that of respect is rather associated with the Social Sciences. For further analysis of these quantitative results, the following sub-sections will deal with these meanings separately.

6.3.3.1. Place/time

Place and time have been joined together in the analysis due to their similarities stated in section [2.6.1. Space and Time]. According to the system in figure 4.11, these PPs need to be annotated according to two systems; place versus time, and location versus extent. Spatial references are then classified into concrete and abstract. The results of the corpus annotation have revealed that spatial PPs are more frequent than those which are temporal, as revealed in the following table.

Table 6. 7 Spatial and temporal PPs

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Space	115 (73.25%)	98 (77.78%)	213
Time	42 (26.42%)	28 (22.05%)	70

Table 6.7 shows that the number of spatial references exceeds that of temporal references which means that descriptions of space seem to be more prominent than temporal ones. Besides, more temporal references are made in the Medical Sciences (26 percent) than in the Social Sciences (22 percent), thus revealing a slight difference in the conception of time across the two disciplines. For further analysis, the following sub-sections will deal with the concrete versus abstract spatial references, the location versus extent and rest versus motion distinctions.

6.3.3.1.1. Concrete and Abstract Spatial PPs

Spatial references can be either concrete or abstract. The results reveal that this distinction seems to be influenced by the context, as its distribution differs with respect to the Medical and Social Sciences, as revealed in the following table.

Table 6. 8 Concrete and abstract spatial references

	<i>Medical</i>	<i>Social</i>	<i>Chi-square</i>
Concrete	66	22	26.645
Abstract	49	76	26.645

Table 6.8 shows that most concrete references are made in the Medical Sciences, while in the Social Sciences, most references are abstract. The chi-square test shows a high significance for this result, which is further stressed by the correlation coefficient Q, which is in this case beyond the rejection interval:

$$Q = A - B / (A + B) = 0.644$$

This correlation implies that a systematic relation exists between the type of reference (abstract or concrete) and the register. Not all the prepositions express this spatial meaning, the following table summarises the distribution of these PPs.

Table 6. 9 PPs expressing concrete and abstract places

	<i>for</i>	<i>to</i>	<i>of</i>	<i>in</i>	<i>between</i>	<i>on</i>	<i>from</i>	<i>at</i>
Concrete	0	6	1	56	4	2	13	6
Abstract	2	23	0	42	27	1	17	13

Table 6.9 shows that not all the prepositions express the meaning of space, although it is thought to be the most basic of all the meanings. This shows that the central meaning of prepositions is not necessarily spatial, as claimed in section [2.5.1.2. Polysemous Prepositions], it is rather conceptual. Each preposition is linked to a mental concept which is translated into a particular meaning whenever used in context. The direct linguistic context plays an important role in defining the meaning of the preposition.

Prepositions such as ‘*as, with, by* and *about*’ do not express spatial meanings in the studied sample, while other prepositions, such as ‘*for, of, and on*’, do not convey this meaning frequently, according to table 6.8. This can be related to the degree of specificity of these prepositions [2.5.1.1. Construals]. For instance, the prepositions ‘*with*’ and ‘*by*’ express a conceptual meaning of closeness and proximity, which is not specific compared to other meanings of path (*to*), position (*at*), origin (*from*), etc. Spatial prepositions are those which have a more specific conceptual meaning.

In addition to these results, table 6.9 shows that the prepositions ‘*to, in, between, from* and *at*’ express most of the spatial meanings, and that ‘*to*’ and ‘*between*’ are rather associated with abstract meanings. The meanings of the PPs are classified into concrete or abstract based on the type of complements they have:

- **MA MET 11.** In brief, one round of amplification was performed, RNA samples were labeled with Cy3 or Cy5 dyes, and samples were hybridized to the Mouse Operon oligo set 4.0 Chip. (Concrete)
- **MA RES 28.** Consistent with the previous data, the Ile161Met mutation did not markedly impact on the interaction between CD94-NKG2C and HLA-E. (Concrete)
- **SD RES 11.** In addition, letters from Adams Electric to the State Prison seemed to reflect a sense of frustration in not knowing the status of the prison's intent for execution equipment. (Concrete)
- **SD INT 12.** I posited that each aspect of CSR would explain unique variance in job applicants' attraction to organizations. (abstract)
- **MA DIS 11.** In such cases, one reliable indicator of disease is that the pain is out of proportion to the physical examination or the cutaneous findings [13]. (abstract)
- **SA MET 27.** Frame analysis is particularly applicable to the media due to its appreciation of the link between the production and consumption of the news story. (abstract)

These examples show that the PP can have abstract or concrete meanings based on what is referred to. The difference between the places is attributed to the focus of each discipline, for while Medical Science deal with cells in the human body, solutions, examinations, etc., Social Sciences link the person to his/her social environment, which in these cases, the prison, organizations, etc. However, whether concrete or abstract, most of these PPs have metaphorical meanings, as the places denoted are not real.

The preposition 'to' originally expresses a movement to a precise point. Metaphorically, the meaning of this preposition can extend and cover any movement with a target, or transition:

- **SD INT 11.** If today's veterans can see how Vietnam veterans succeeded, this information will assist in their transition to post war life.

These meanings seem to emerge as part of the grammatical functions of this preposition. In fact, as shown in table 5.8, these PPs function as complements or postmodifiers, since only few cases have been annotated as adverbials, which means that they are semantically and grammatically, linked to others constituents. The analysis in section [5.4.3. Complements] has revealed that 'to' complements certain verbs thus indicating the direction of their movements. This is also the case for the function of postmodifier, since most of the nouns are nominalised verbs. Conceptually, 'to' expresses the positive meaning of a movement to "the endpoint of a path" (Lindstromberg, 2010, p. 30), and this meaning seems to be shaped not only by the prepositional complement, but mainly by the preceding verb or noun. The PP, therefore, expresses a metaphorical meaning of direction, convergence,

pointing, etc. More precisely, it shows the direction of the effect of the preceding verb or noun.

This is also the case for the preposition ‘*between*’ which can be linked to abstract locations, according to table 6.9. This preposition functions as postmodifier to other nouns. The use of this preposition seems to emerge in the process of nominalization. Most of the cases are ditransitive verbs which require two objects, or monotransitive relational verbs:

- **SA MET 27.** Frame analysis is particularly applicable to the media due to its appreciation of the link *between the production and consumption of the news story*.
- **MD DIS 28.** The aim of this chapter was to identify individual residues of core protein required for the interaction *between core and DDX3*.

These NPs are nominalizations of:

- We *link* the production of the news story *to* the consumption of the news story.
- Core interacts with DDX3

The preposition ‘*between*’ with its meaning of centrality links different constituents of the clause in the nominalization process. The meaning of centrality reflects the centrality of the verb to its arguments, whether subject and objects, or two objects.

Furthermore, table 6.9 shows that spatial meanings, whether abstract or concrete, are expressed by the prepositions ‘*in*’, ‘*from*’ and ‘*at*’. The first preposition expresses containment in space, while the second has the meaning of negative source, and the third expresses the meaning of a positive position. Containment can be in real or abstract places:

- **MA MET 9.** The nitrocellulose membrane was blocked for 1 h with 5% skimmed milk (Oxoid, UK) at 37 °C, incubated with the hyperimmune serum diluted *in phosphate buffered saline (PBS)* for 1 h and washed with PBS-0.1% Tween-20 (PBST).
- **SA DIS 2.** Differentiating between employees in terms of their bargaining power *in the employment relationship* has also been a well-known theme *in labor market sociology*
- **MA MET 23.** Values were obtained by phlebotomy if not available *from clinical records* within 4 months of the interview.
- **SD MET 23.** Phenomenological methodology employs the in-depth interview to gain a contextual understanding of the phenomenon *from the participant’s personal point of view*
- **SA INT 25.** Even Crothers (2002), a critic of Putnam, advocates “street-level” civic revitalization *at the neighborhood and community levels*.

Whether concrete or abstract, the meaning of containment of the preposition *in* seems to be expressed in the same way, and this is also the case for the meanings of origin and position. The difference between the references can be related to the register, as the Medical Sciences which study the human body refer to concrete parts of the body, solutions, etc. while

in the Social Sciences most references are abstract as the former studies abstract notions (relationships, labor market sociology, etc.).

Concrete and abstract spatial references seem to be register-related, as far as the prepositions *in*, *from* and *at* are concerned. However, certain prepositions, *to* and *between*, are associated with abstract rather than concrete PPs because of the grammatical function they have; they complement verbs and nouns, and this shapes their meanings to drive it away from pure concrete references. The degree of specificity of a preposition seems to be in a way responsible for its meaning and its function in the clause. More specific prepositions seem to have more concrete spatial meanings, while those which are less specific are rather used to express abstract meaning as they are associated with other grammatical categories (N, V, etc). Less specific prepositions allow the creation of new and abstract meanings from the interaction with those lexical categories that they complement. In addition to this distinction, the meanings of place and time are classified as location or extent in the corpus.

6.3.3.1.2. Extent versus Location

Spatial and temporal references are distinguished according to the meaning they express. They can refer to a particular point in place or time, called location, or to a whole interval, that is a distance or period of time, called extent. In the studied sample, the semantic distribution of PPs shows that space and time are not equally distributed, as revealed in the following table.

Table 6. 10 Extent and location

	<i>Place</i>	<i>Time</i>	<i>Chi-square</i>
Location	214	62	25.166
Extent	0	8	25.166

Table 6.10 shows that most of the space/time references are categorised as locations, rather than extent, and that while most locations are made in space, all the extents are temporal. This result is highlighted by the chi-square test, which is highly significant thus proving that the distribution is not even. This implies that the places referred to in the sample are only precise locations, and not distances, which can be explained by the type of the discourse, where such measures are not supposed to be part of the research. However, spans of time can be among the research variables.

Extents of time can be either definite or indefinite. The analysis has revealed that among the 8 temporal durations, 7 are definite, while 1 case is not.

- **SA INT 13.** One prior study indicates that wage differentials across industries had been growing *for several decades* and continued to increase through the mid 1980s (Bell and Freeman, 1991).

This temporal extent is classified as indefinite because of the prepositional complement ‘several decades’. The use of ‘several’ is not precise while ‘decades’ are large periods of time, and this makes the reference imprecise. Providing a precise period might be judged unnecessary by the author. This can be linked to the genre of RAs, which is a focused piece of research, where only one specific problem is addressed.

The other durations are classified as definite, and they are expressed by four prepositions:

- **MA MET 14.** B cells from five wild-type and five miR-155-deficient mice were cultured with LPS and IL-4 *for 24 hr* as described above, and RNA was extracted with TRIzol.
- **MD MET 14.** Reactions were incubated *for 2 hours* at 37 °C.
- **SD RES 14.** The electrocution of Walter Morrison was the only one conducted in North Carolina *for the year 1910*.
- **MA RES 10.** Hypotension (defined as systolic blood pressure less than 90 mm of mercury), present in two individuals when IV ribavirin was initiated, was managed with fluids and vasopressors, and resolved *within 24 h*.
- **SA MET 8.** However, due to the exclusion from the analysis of people who were unhealthy *in the base year*, the results presented in the study should be viewed as ‘conditional’ (upon being healthy in the base year) and may not be generalized to the entire older population.
- **MA MET 28.** Twelve patients treated *between 1991 and 2002* at our hospital for primary cancers of the external auditory canal were included.

These prepositions are used for spatial references, and in these examples their meaning has extended to cover time. The preposition ‘*for*’ conceptually expresses the meaning of path rather than a particular point. The conceptual meaning of path when applied on places would result in references to distances. The extension of this meaning to time leads to the emergence of periods, which means that the meaning of the preposition is responsible for shaping the meaning of the whole PP. The preposition seems to provide the perspective to look at the prepositional complement. However, whether this period of time is definite or not depends on the prepositional complement.

Besides, the prepositions ‘*in*’ and ‘*within*’ denote a meaning of containment. This conceptual containment is shaped by the prepositional complement, which is, in these cases, a period of time (24 h, the base year). The resulting meaning, therefore, is that of containment within a period of time. Although both prepositions, ‘*within*’ and ‘*for*’, convey this meaning, a slight difference between the two PPs exists (*for 24 hr*, *within 24 h*). In fact, the use of ‘*for*’

and ‘24 h’ gives a general meaning of period, while the use of ‘*within*’ and ‘24h’ gives a more exact interpretation, as the action of resolving is fully contained in that period and therefore should not exceed it.

Similarly, the preposition ‘*between*’, which originally expresses the meaning of centrality, refers to the central part between two dates, thus, taking a temporal interpretation.

Although the distribution of the temporal extents is similar across the disciplines, the meanings expressed in each register seem to be different. In Medical Sciences, the durations tend to be measured by hours, while in Social Sciences durations are expressed in terms of decades and years, and this shows the scope of each discipline. In Medical Sciences, the researcher is based on experiments in laboratories or case studies in the hospital where time is very limited. In Social Sciences, however, changes in society are measured by years or even decades (SA INT 13).

Besides, these temporal references are associated with the two main sections: the Methods and the Results, and mainly those in the MSSC. In the Methods section, researchers need to present their data, and how they are going to deal with it. Certain procedures may involve the measures of durations, which are also considered important while producing the results of the research, as durations may be among the research variables.

Unlike the meaning of extent, which is, in this sample, only temporal, locations are both spatial and temporal. They can be either definite or indefinite, as shown in the following table.

Table 6. 11 Definite and indefinite spatial and temporal locations

	<i>Place</i>	<i>Time</i>	<i>Chi-square</i>
definite	214	60	6.954
indefinite	0	2	6.954

Table 6.11 shows that most locations are definite, which confirms the claim for specificity as far as the choice of the prepositions is concerned. In fact, most of the PPs have been annotated as definite since indefinite references are most of the time conveyed via adverbs. The only indefinite locations are temporal, they are:

- **MD RES 20.** Among these, 106 patients developed complete seizure freedom (87%) *by the end of study* while 16 did not.
- **SD RES 19.** *By 1939*, that figure had climbed to almost 1.5 billion dollars, a fifteen-fold increase (ibid.).

These two PPs have been classified as indefinite because of the prepositional meaning. In fact, the complements ‘*the end of the study*’ and ‘*1939*’ are not that vague, yet it is the conceptual meaning of proximity that the preposition ‘*by*’ has contributed to the meaning of the whole PP. The use of the preposition shows that the authors make references to temporal locations which are near points in time, thus revealing some fluidity with respect to the interpretation of the references. This fluidity is meant to be an indication to the reader that the temporal location at hand is not of paramount importance, thus allowing other, more important references to have much of the attention.

It is important to note that the preposition ‘*by*’ is annotated as space/time only in these two cases, which means that in this register, it is not relied on for spatial and temporal references, and this can be linked to its conceptual meaning of ‘proximity’. In fact, according to the chi-square test in table 6.11 all the spatial references are definite, and these definite locations can be either rest or motion. This distinction will be the focus of the following subsection.

6.3.3.1.3. Rest versus Motion

Definite prepositions can be either rest or motion. The result of the annotation of this system is presented in the following table.

Table 6. 12 Rest and motion definite spatial and temporal locations

	<i>Place</i>	<i>Time</i>	<i>Chi-square</i>
Rest	150	59	20.653
Motion	64	1	20.653

Table 6.12 shows that most definite locations describe rest positions. Based on the chi-square test which shows a high significance for the distribution of rest and motion locations with respect to time and place, it is possible to claim that this distribution is not even, and that while temporal locations are associated with rest positions, spatial ones can be both rest and motion. The difference between the two categories seems to follow from the preposition itself, as these two meanings differ with respect to the prepositions that introduce them. For further insights, the following table summarises the distribution of prepositions (with P referring to place, and T referring to time).

Table 6. 13 Prepositions expressing rest and motion

	<i>to</i>	<i>in</i>	<i>between</i>		<i>on</i>		<i>from</i>	<i>after</i>		<i>at</i>	
Rest	0	109	31		7		0	32		29	
		P	T	P	T	P	T	P	T	P	T
		96	13	31	0	3	4	0	32	19	10
Motion	29	2		0		0		31		0	
	P	T						P	T		
	29	0						30	1		

Table 6.13 shows that certain prepositions like ‘*in*, *between*, *on*, *after* and *at*’ are associated with rest locations, other prepositions such as ‘*to*, and *from*’ are linked to motion. As for the preposition ‘*in*’, although associated with rest positions, two occurrences express motion, these are:

- **MA INT 8.** The flow of information through the amygdala starts with cortical and thalamic input *into the lateral and basolateral nuclei*, then proceeds from there through efferent projections to the central nucleus of the amygdala, bed nucleus of the stria terminalis, and the nucleus accumbens (De Olmos et al., 1985).
- **MD MET 9.** The beta coefficient estimate and standard error for each study were entered *into the analysis*, which produced a global (i.e. average) OR and associated 95% confidence interval.

These two examples have been classified as motion because the meaning of ‘*into*’ is different from ‘*in*’, as the preposition ‘*to*’ adds to the complex preposition the meaning of path. This shows how complex prepositions depart from the original meanings expressed by their prepositions [section 5.2.1. Two-word prepositions].

Table 6.13 also shows that certain prepositions express exclusively place (*to*, *between*, and *from*), or time (*after*), while others express both meanings (*in*, *on* and *at*). ‘*In*, *on* and *at*’ are three prepositions denoting a position of rest. The meaning of these prepositions can extend from space to time:

- **SD RES 5.** In order to describe how he adjusted to civilian life back *in his hometown*, Leroy talked about people he was hanging out with and what his plans were for the future.
- **MA MET 8.** The aerial parts of H. cordata were collected at Gyeongsangnam-do Agricultural Research & Extension Services, Korea, *in August 2004*.
- **SD INT 3.** Notably, anti-war sentiment and protests have continually increased since the beginning of the war *in March 2003*.

The containment expressed by the preposition extends from the spatial and congruent meaning to the temporal sense. However, whether spatial or temporal, this preposition denotes

a trajector contained in a landmark, which varies from real places, to abstract ones, to spans of time. In these cases, whole actions are seen as totally included within this landmark.

This is also the case for the preposition ‘*on*’, which expresses the conceptual meaning of support. The spatial meaning is that of a surface supporting a trajector:

- **SA DIS 22.** Much in line with previous research, aural mode respondents tend to give more extreme responses *on the positive ends of the scale* compared to visual mode respondents, even when controlling for demographics.

In this example, the surface is ‘*the positive ends of the scale*’; it supports the trajector ‘more extreme responses’. This abstract use of spatial ‘*on*’ is extended to convey time:

- **SD MET 21.** In addition to the surveys, I conducted informal participant observation at church services and church events, most typically at one or more services prior to the administration of the survey and then again *on the day of the survey*.

This sentence exemplifies the use of ‘*on*’ as a temporal preposition. In this case, the landmark is ‘*the day of the survey*’, which supports the action of ‘*conducting informal participant observation*’.

As for the preposition ‘*at*’, the meaning of place is exemplified in:

- **MD DIS 25.** A densely packed heterochromatin structure is proposed to result from the tight association of the proteins residing *at the sites of methylated DNA* and methylated histones of the adjacent nucleosomes, according to the model reviewed elsewhere (Brenner & Fuks, 2007).

This preposition denotes the landmark as a point, and the trajector being positioned at that point in space. This meaning extends to express temporal positions:

- **SA MET 26.** The generic model to be estimated is, where y_{it} refers to health status *at time t*, taking value 1 if healthy or 0 if unhealthy; W_{i0} is reported wealth in the base year; X_i is a vector of other covariates; ϵ_i is a random error term.

The preposition ‘*at*’ is used to refer to a precise point on the axis of time (*time t*). The spatial meaning of positive position seems to extend to convey a temporal location. These three prepositions (*in*, *on*, *at*) show some similarities between the concepts of place and time, as far as the way they are expressed is concerned.

However, certain differences between the prepositions exist. In English, months are introduced by ‘*in*’ (*in March 2003*), days are used with the preposition ‘*on*’ (*on the day of the survey*), and hours, parts of the day, etc. (*at time t*) are rather introduced by ‘*at*’. These three prepositions have been classified by Quirk et al. (2005) as expressing positive position at three different dimensions (Table 2.1). ‘*At*’ is situated at the level of dimension-type 0, ‘*on*’ at

dimension-type 1 and 2 (line or surface) and ‘*in*’ at dimension-type 2 or 3 (area or volume). Spatially, these prepositions vary in terms of the surface they conceptualise. However, when extended to cover time, the notion of surface metaphorically extends to denote the span of time, which explains why smaller periods are introduced by ‘*at*’, days, which are larger, are seen as surfaces, while months are large enough to be introduced as containers. The choice of one preposition instead of another reveals the way time is construed after place as far as the English language is concerned, for ‘large’ events would be classified as containers.

In addition to ‘*in*, *on* and *at*’, which express both spatial and temporal meanings, other prepositions express exclusively either place (*to*, *between*, and *from*) or time (*after*), according to table 6.13. ‘*To*’ and ‘*between*’ have been associated with abstract positions due to their grammatical functions as complements and postmodifiers. On the other hand, the preposition ‘*from*’ expresses place, except for:

- **MD RES 23.** According to the data presented in Figure 3.3, successful ATRX depletion in HF-ShATR_X cells was observed *from day 2* after applying lentiviral stocks, with subsequent reduction of ATRX to virtually undetectable levels by day 7.

In this example, ‘*from*’ is used to signal the starting point of ‘*ATR_X depletion*’. This PP seems to be reduced from a clausal realisation ‘*starting from day 2*’, as the meaning can be guessed from the context of medical experiments. However, to express the same relation of departing from a past event, ‘*since*’ is rather used in temporal interpretations, and this can be linked to the vague sense of *from*. This shows that although certain similarities between space and time do exist, as far as the distribution of *in*, *on* and *at*, are concerned, some differences reveal that metaphorical extensions are rather partial.

This temporal use of the preposition is contrasted to the spatial meanings expressed by *from*:

- **SA RES 24.** Consider the two quotes below *from The Age and The Daily Telegraph*.
- **MD MET 24.** Media was removed *from the cells* so that a small amount of media was left to form a meniscus in the dish when tilted.

The preposition conveys the meaning of departing from a destination, or source. This meaning is stressed by the verb ‘remove’, as in the following cases:

- **MA INT 23.** FGF10 transcripts have been detected in stroma derived *from benign human prostatic hyperplasia specimens*.
- **SD MET 24.** All data used in this study were collected *from written surveys*.

In these examples, the PPs function as complements, which shows that their meaning is linked to the verb, in a way similar to the preposition ‘*to*’ [6.3.3.1.1. Concrete and Abstract

Spatial PPs]. However, unlike ‘*from*’, which expresses a general meaning of source that is specified by the verbs or nouns they complement, the preposition ‘*after*’ functions as an independent adverbial, and expresses exclusively time (table 6.13). Conceptually, it conveys a meaning of relative position behind a landmark, and temporally, it denotes a location in time, or “in the time following”¹⁴.

- **MA MET 30.** *After completion of this interval*, pups were returned to their respective holding cages where they remained for 10 min.
- **MA DIS 29.** As mentioned, adult heterogeneous rats do not typically show increased locomotion *after being administered with ethanol*.
- **SD MET 29.** *After each church survey*, I prepared a report for the pastor or other church leader.
- **SD RES 30.** Five years prior to the “Act”, a black inmate housed in the Wake County Prison Camp was released from his cell for special yard privileges, and subsequently had his toes amputated *after suffering from frostbite (ibid.)*.

These examples show that ‘*after*’ is used to link events or actions to each other, which explains why it is followed by clausal complements, or nominalised actions, as mentioned in section[5.3.1. Prepositional complements]. The meaning of the preposition ‘*after*’ seems to develop from its grammatical status as a subordinator. In fact, subordinators link clauses, which seems to be also the case for the preposition since even the phrasal complements (completion and survey) denote actions. Linking actions with the conceptual meaning of a relative position behind a landmark means that these actions will be ranked one behind the other, and this results in the temporal succession of events.

To Conclude, certain prepositions are considered, in terms of their conceptual meaning, as more specific than others, and are the ones used for spatial references. These prepositions have the ability to extend their conceptual meaning. On the other hand, prepositions which are considered to be less specific express more abstract meanings, or exclusively just one meaning, because they are rather linked to other words, which makes them more grammatically-bound, and less lexically-extendable. The prepositions analysed in this sub-section do not represent all those in the sample as certain ones do not express the place/time relations (table 6.9). In fact, certain prepositions express the meaning of respect.

6.3.3.2. Respect

According to figure 6.3, the second most important meaning expressed by the studied PPs is that of respect. However, based on the results presented in table 6.6, these PPs, unlike those expressing place/time, are rather associated with Social Sciences. These PPs present the

¹⁴ <http://oxforddictionaries.com/definition/english/after?q=after>

subject matter being dealt with or the angle from which the situation is construed. The result of the analysis is presented in the following table.

Table 6. 14 PPs expressing respect

	<i>Medical</i>	<i>Social</i>
Matter	31	55
Angle	0	1

Table 6.14 shows that almost all the respect PPs introduce subject matter, as only one case in the SSSC introduces the angle of speaking:

- **SA DIS 24.** *From the standpoint of promoting political participation*, for instance, scholars have identified two key means by which individuals come to take political action: when they develop politically relevant civic skills and when they are mobilized to participate by others (Rosenstone & Hansen, 1993; [Verba et al., 1995a] and [Verba et al., 1995b]).

This PP is used in the SSSC to present the angle from which the speaker is construing the whole sentence. The prepositional meaning of negative departure extends to convey a meaning of angle by picturing the complement ‘*the standpoint of promoting political participation*’ as the source, or place used to start the procedure of producing the sentence. However, such meanings are not commonly used in this register, as Biber et al. (2007) claim that while “in news, prepositional phrases are often used to convey the source of information, especially with the preposition *according to*... Academic prose often uses prepositional phrases to qualify claims” such ‘*as in general, or on the whole*’ (Biber et al., 2007, p. 863/864). In fact, conveying the ‘source of information’ in academic writing is peculiar to this register, as researchers need to cite their references in a very precise way, which explains the scarcity of such references.

On the other hand, the meaning of matter is quantitatively qualified as important. Three main prepositions introduce this meaning: *in*, *on* and *about*, as shown in the following figure.

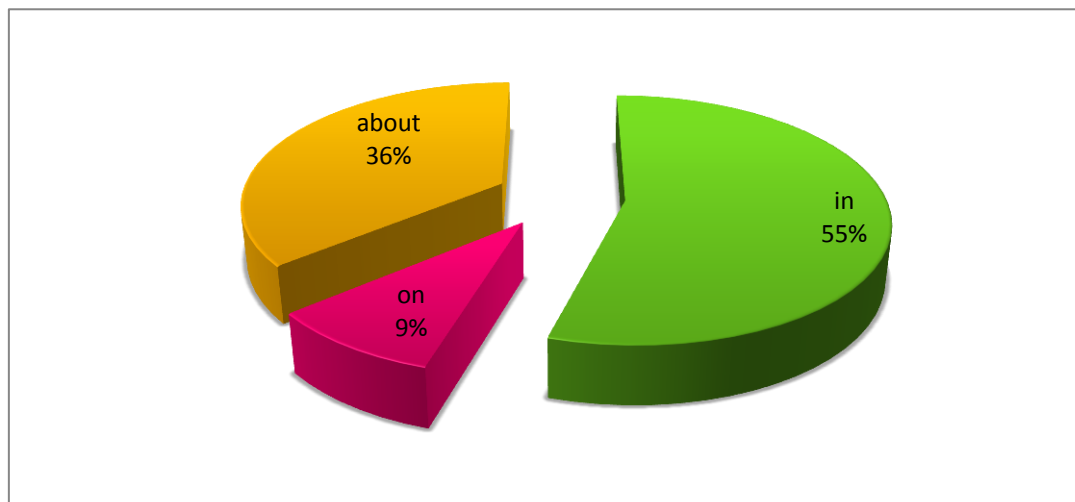
Figure 6. 4 Prepositions expressing matter

Figure 6.4. presents the prepositions expressing matter, together with their relative percentages. ‘*In*’ is the most frequent, followed by ‘*about*’, while ‘*on*’ accounts only for certain cases. Conveying the subject matter can be done by depicting a metaphorical containment of certain actions:

- **MA INT 7.** Alcohol has multiple effects on metabolism, including changes *in energy intake* (Armellini et al., 1993).
- **MA MET 10.** The Mann–Whitney test (two-tailed) was performed to analyze the differences *in mean virus titers and serum ALT levels.*
- **SA RES 8.** The markers on the middle lines represent race group mean differences *in log popularity* after controlling for individual and school characteristics.
- **SA DIS 2.** Differentiating between employees *in terms of their bargaining power* in the employment relationship has also been a well-known theme in labor market sociology.

The examples show that the meaning of matter can be expressed either by the preposition ‘*in*’ or ‘*in terms of*’. The analysis has revealed that most respect PPs headed by ‘*in*’ function as postmodifiers of nouns such as ‘changes, differences, increase, etc.’, while those headed by ‘*in terms of*, *in the case of*, and *in regard to*’ are adverbials. The complex preposition ‘*in terms of*’ seems to convey the meaning of matter clearly. It is used in case the PP functions as adverbial because an adverbial can be freely inserted in any position in the clause. However, using the preposition ‘*in*’ can be seen as a reduced form of the complex preposition ‘*in terms of*’, this use is restricted to cases where the PP follows immediately the described subject, which is the case of postmodification.

The preposition ‘*in*’ expresses the containment of the head noun in a particular landmark, that is, the matter. These cases are nominalizations of other verbal forms:

- **MA DIS 2.** We also observed *an increase in the expression of several Wnt axis members*
- We also observed that *the expression of several Wnt axis members* has increased

The introduction of the preposition ‘*in*’ in the nominalised form reveals that the action verb has been contained in the subject. Thus the containment stresses the idea that the subject, conceptualised as a container, has been affected by that action of increase.

The scope of the PP is on the head it modifies, however, adverbials modify whole clauses, which means that the use of the same preposition ‘*in*’, would result in a lexical ambiguity:

- **MA RES 8.** *In terms of risk categories*, 28% of participants would be reclassified into a different risk set using arterial age in place of observed age.
- *In risk categories*, 28% of participants would be reclassified into a different risk set using arterial age in place of observed age.

The meaning of the PP ‘in risk categories’ does not convey the same meaning as ‘in terms of risk categories’, as the former bears different interpretations. This shows that the choice of one preposition instead of the other reveals the correlation between meaning and function.

Hyland (2008) maintains that ‘*in terms of*’ is the second most frequent bundle in academic writing (Hyland, 2008, p. 7). This complex preposition is thought to be a ‘framing signal’ as it situates “arguments by specifying limiting conditions” (Hyland, 2008, p. 14). This bundle is used in the Results and mainly in the Discussion sections, which are the sections where the researcher announces his/her results and findings, and, therefore, needs to highlight them for more attention and precision.

In addition to the preposition ‘*in*’, figure 6.4 shows that the preposition ‘*about*’ expresses only this meaning of matter:

- **MA INT 31.** However, beyond the gene sequences, little is known *about the structure and function of MHC class I molecules outside of mammals*.
- **SA INT 31.** While the processes that generate fear of crime are clearly complex, one factor that plays a salient role in understanding anxiety *about crime* is race and ethnicity.

These PPs are used to convey the meaning of subject matter, which is thought to be influenced by the spatial meaning of ‘*about*’. In fact, this preposition denotes the meaning of ‘approximate position’ (Lindstromberg, 2010), and it is used to bring the subject matter of an issue, that is, its approximate focus. Conceptually, the figure is seen in an approximate position from the landmark.

In the sample, ‘*about*’ has been coded as expressing respect only. The absence of the spatial meaning could be linked to its vagueness compared to the other spatial prepositions (*at*, *in*, and *on*). According to Quirk et al. (2005), this preposition has “a vaguer meaning of ‘in the area of’ or ‘in various positions in’” (Quirk et al., 2005, p. 681). This relative vagueness of meaning has influenced the grammatical functioning of the whole PP, as it has not been assigned the function of adverbial in the sample. The studied examples are either postmodifiers or complements, and this stresses the link between the semantic and grammatical functions of PPs.

The last preposition that conveys this meaning of respect is ‘*on*’, which is exclusively used in the SSSC:

- **SA MET 21.** It should be pointed out that none of the friend-influence environments in Table 1 corresponds to the idealized alcohol-free environment discussed in the section *on research design*.
- **SD INT 22.** Research *on modeling human judgment* has suggested that information is often integrated by using complicated configural cue processing involving multiplicative interactions (e.g., Hitt & Barr, 1989).

The preposition ‘*on*’ conveys the meaning of support, which means that a trajector is higher in position than, and positing on, a landmark. The choice of ‘*on*’ over ‘*about*’, which expresses proximity, can be linked to the type of trajector. In fact, ‘*about*’ complements verbs or postmodifies different types of nouns, while ‘*on*’, functioning only as part of a postmodifier, modifies heads such as: ‘studies, survey, section, research, report and literature’. The use of this preposition shows that the author wants to visualise his/her piece of research as built on, and based on a particular point or field. These PPs are mainly found in Social Sciences because of the need to show the focus and the merits of one’s research with respect to others’.

PPs headed by ‘*in*, *about*, and *on*’ express the meaning of respect, thus identifying the subject matter of one word, or a whole clause. This meaning gains its importance in the register of scientific writing for its ability to specify the topic dealt with. However, other meanings, such as that of process, may serve other purposes in this register.

6.3.3.3. Process

PPs describing the process in the clause may be annotated as: manner, means, degree or stimulus. Those expressing degree are not found in the sample, while only two cases express the meaning of stimulus. Most of the process PPs are either manner or means, as revealed in the following table.

Table 6. 15 Process PPs in the Medical and Social sciences

	<i>Medical</i>	<i>Social</i>	<i>Chi-square</i>
Manner	5	13	3.399
Means	11	8	3.083

Table 6.15 shows that PPs expressing manner are more frequent in the SSSC, while those expressing means are mainly common in the Medical Sciences. This result is relatively maintained by the chi-square test, which shows a weak significance for this distribution thus revealing that it is not even. This is further proved by Yule's Coefficient:

$$Q = \frac{A-B}{A+B} = \frac{40 - 143}{40+143} = -0.52$$

This result is beyond the rejection interval, thus showing a negative correlation between manner PPs and Social Sciences on the one hand, and means PPs and Medical Sciences, on the other.

Circumstantials of manner are divided into two main meanings: manner proper, comparison and rate. Their distribution is presented in the following table.

Table 6. 16 Manner PPs in the Medical and Social Sciences

	<i>Medical</i>	<i>Social</i>
Manner proper	2	9
Comparison	2	4
Rate	1	0

Table 6.16 shows that PPs expressing manner proper are more frequent in the sample and that they are associated with the SSSC. Most of these PPs are introduced by the preposition 'in':

- **SA RES 9.** This is clearly evident in media reports where the attack is interpreted in relation to Australia's 'exceptional' self-identity as the 'lucky country'. (M)
- **SD MET 7.** In the German data, tenure is measured in years, in the US data it is measured in months. (M)
- **MA MET 3.** The obtained cell suspension was continued in the same culture condition. (Comparison)
- **SD RES 7.** This difference by church size suggests that although smaller churches may serve Chinese peoples' interests in a way similar to hometown societies (tong-xiang hui), Christianity clearly represents a different form of institution. (Comparison)

These examples show that the same preposition 'in' expresses the two meanings of manner: manner proper and comparison. These PPs have in common the fact they answer

questions with ‘how’, however, the difference between manner-proper and comparison emerges from the complement, rather than the preposition. Those expressing comparison contain signs in the complement (*same, similar*).

What distinguishes these PPs from others having the same form is the fact that, although not functioning as complements, they have a semantic link to the verb. For instance, the PPs ‘in years’ and ‘in months’ express a containment in a period of time, which means that they may have a temporal interpretation. However, this is not the case seeing that the verb ‘measured’ helps identify the meaning of the PP. The trajector in this case is the verb, and the prepositional meaning seems to be affected by both the landmark, and the trajector. The landmark is a circumstance where the trajector, that is the verb, is contained.

In addition to manner, process circumstantials can express means. Two main prepositions express this relation: ‘with’ and ‘by’. The first is mostly used in the MSSC:

- **MA INT 15.** Heterogeneous genetic instability in the glandular epithelium due to telomerase shortening or infection with viruses such as BK, JC, and a recently described retroviral isolate are two mechanisms by which multifocal disease can occur.
- **MA RES 15.** UGSM was infected with either control vector (GFP) or FGF10-GFP retrovirus.
- **MD MET 15.** Media from confluent cell cultures are aspirated and the cell layer was briefly rinsed with PBS solution.

The choice of the preposition ‘with’ in the Medical Sciences seems to be linked to the type of actions performed in this field: *infect* and *rinse*. This preposition expressing the conceptual meaning of proximity conveys the means, or the tool used while performing the action. The conceptual proximity is explored in this case to highlight the proximity, or dependence, of the action on a particular tool or instrument.

This meaning of indefinite proximity is also expressed by the preposition ‘by’, which expresses the meaning of means:

- **MA MET 19.** B cells were purified by negative selection with the MACS system (Miltenyi Biotech) and stimulated with 10 µg/ml LPS (Sigma) and 20 ng/ml IL-4 (Peprotech) for 3 days.
- **MA MET 20.** Briefly, the CLDC were prepared by the sequential addition of nuclease-free water (NFW), DOTIM, and plasmid DNA.
- **SD DIS 20.** That is to say, ritual shapes affinities between people by providing ritualized means of expressing benevolence, or at least some sort of higher order meaning, that establishes the boundaries of group membership.
- **SA MET 20.** In order to evaluate response rate effects across survey modes, it was necessary to obtain a common sample frame that would allow people to be contacted either by mail or telephone.

Similarly to ‘with’, the preposition ‘by’ expresses a general conceptual meaning of proximity, which in this context, conveys the meaning of means. The difference between the two prepositions emerges from their different complements, as ‘with’ is complemented by things, while most occurrences of ‘by’ are rather complemented by procedures or actions. In fact, while ‘with’ does not have any clausal complements, those associated with ‘by’ convey the meaning of means. In this case, the conceptual proximity is not seen in relation to a thing, but rather to an action, which explains why ‘with’ is rather associated with the MSSC, as tools and real things can be used in experiments.

Another difference with respect to the choice of ‘with’ or ‘by’ to introduce the means of an action is the use of ‘by’ to introduce the agentive in passive constructions [6.2. Participants]. This preposition is thought to express a conceptual proximity between the verb and the oblique participant, which bears a similarity to the meaning of means, as it is seen as one of elements to help fulfil the action of the verb. The means presented by the preposition ‘by’ seems to take more prominence than those presented by ‘with’, as every preposition seems to be affected by all the meaning it expresses, for while ‘by’ presents the agentive, ‘with’ introduces the accompaniment of the process. However, both prepositions reveal a link to the verb, although grammatically independent, which explains their classification as ‘process’ circumstantials.

The distribution of these circumstantials seems to vary not only with respect to the discipline, but also according to genre, as revealed in the following table.

Table 6. 17 Distribution of process PPs by genres and disciplines

	<i>Medical</i>	<i>Social</i>	<i>Chi-square</i>
PhD theses	6	14	3.083
RAs	11	8	3.083

Table 6.17 shows that the frequency of process PPs is fairly high in SDSC and MASC. This result is relatively maintained by the Chi-square test, which shows a weak significance for this distribution, thus showing that it is not even. Yule’s Coefficient is computed for further statistical evidence:

$$Q = A-B / (A+B) = 0.52$$

This result is beyond the rejection interval, thus a correlation can be claimed between Phd theses and Social Sciences on the one hand, and Medical Sciences and RAs, on the other, as far as the distribution of process PPs is concerned. The analysis has also revealed that all the process PPs in the MDSC are phrasal, while clausal complements of by-phrases are

located in the PhD Theses. This result is to be interpreted in light of the distribution by section, presented in the following figure.

Figure 6. 5 Distribution of process PPs by section

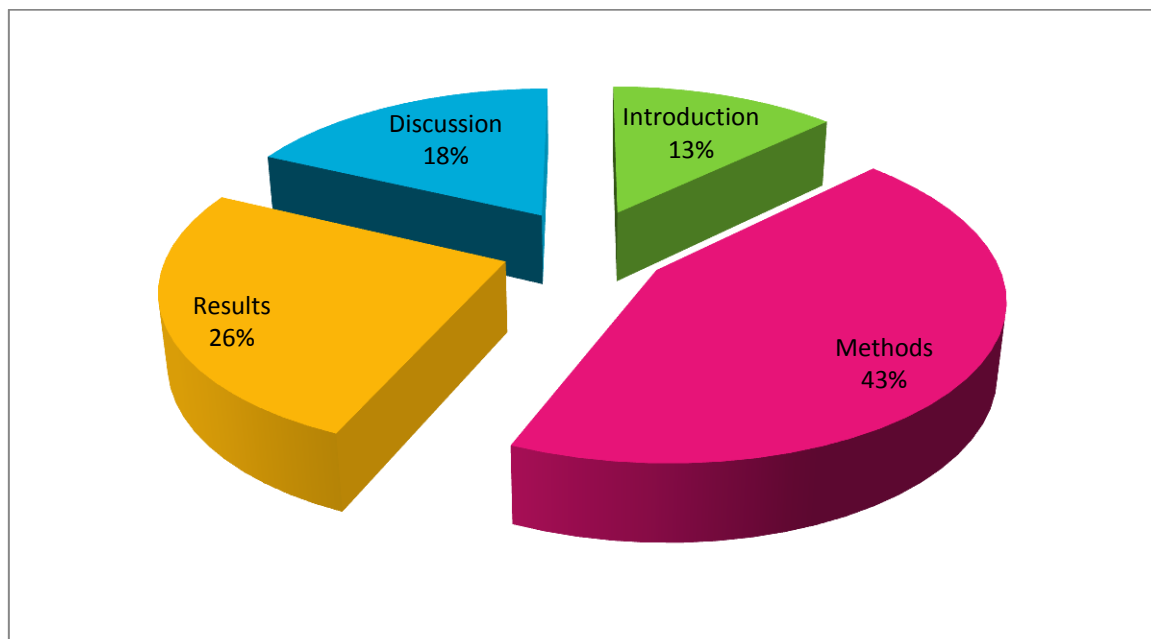


Figure 6.5 shows that most process, and particularly manner PPs, are associated with the methods section. Based on the results in table 6.17 and figure 6.5, the condensation of these adjuncts in Methods of PhD Theses in Social Sciences can be linked to the elaborated Methods section of this genre. This is further justified by the clausal complements adopted in this genre, where students do not have constraints on space.

Almost sharing the same distribution as process PPs are those expressing cause.

6.3.3.4. Cause

The meaning of cause represents almost 7 percent of all the PPs studied in the sample, as revealed in figure 6.3. The meaning of cause is classified into: pure-cause, reason, result, motive, behalf, purpose, and target. The analysis has revealed that not all the meanings are present in the sample. This can be explained by the focus of this type of writing, where certain relations are expressed. In fact, only three meanings are present in the sample, as shown in the following table.

Table 6.18 Cause PPs in the Medical and Social Sciences

	<i>Medical</i>	<i>Social</i>
Reason	1	1
Purpose	10	9
Target	10	7

Table 6.18 shows that purpose and target are the most frequent meaning of cause, while those of reason are rare. These meanings are expressed by two main prepositions: *on* and *for*. The preposition ‘*on*’ expresses target, while ‘*for*’ conveys meanings of purpose and reason. Conceptually, ‘*on*’ expresses the meaning of support, which extends through metaphor to cover the meaning of target.

- **MD MET 22.** Based *on initial association analysis* results SNPs were sorted by p-value for statistical significance from lowest to highest (i.e. most to least significant).
- **MA MET 22.** The *effect* of heparin *on the clearance of PAPP-A* was examined by the coinjection of heparin 1 mg with PAPP-A.
- **SA RES 21.** First, a *focus* *on the loss of Australian footballers in the attack* worked to place grief within a patriotic context, reminding the public of the strength of national character at a time when it was perceived to be under threat.
- **SD DIS 21.** As suggested by Greening and Turban (2000), given that job choice decisions are value-laden and ethics-laden, it is important to assess the *impact* of P-O fit in terms of ethics *on applicant attraction* to organizations.

In these examples, PPs headed by the preposition ‘*on*’ express the meaning of target. The trajectors ‘effect, focus and impact’ are seen as being in a higher position towards the landmarks. What clarifies the meaning of target is actually the trajector. This preposition expresses the meaning of target when associated with certain nouns and verbs. Indeed, the grammatical analysis has revealed that target PPs function either as postmodifiers or complements. This preposition carries a more precise meaning than ‘*to*’, as it clearly specifies the target.

On the other hand, the preposition ‘*for*’ introduce two main meanings: purpose and reason. In comparison to the different possible meaning within this spectrum, the preposition ‘*for*’ expresses mostly a meaning of purpose. ‘Purpose, target and motive’ have some resemblance in meaning as they express the meaning of a goal to attain. However, there are differences between the three meanings. ‘Purpose’ is the general term, while a ‘target’ is usually specific and ‘motive’ is rather psychological. The preposition ‘*for*’ establishes the meaning of purpose in general, as shown in the following examples.

- **MA INT 14.** In the past few years, new options *for antiviral therapy* have become available.
- **MD RES 14.** Both ICP4 and UL42 proteins are essential *for HSV-1 replication*.
- **SA DIS 13.** We argue that the “class has greater importance than race conclusion” is only valid when family background has the same effect *for both whites and blacks*.
- **SD INT 14.** Several positive and useful implications *for this study* are clear.

This preposition expresses a conceptual meaning of ‘intended destination’, which extends metaphorically to convey a meaning of purpose. In addition to purposes, this preposition is also used for reason.

- **SD RES 13.** Further, consistent with Hypothesis 3a, utilitarianism was not significantly associated with variance in the within-subjects slope *for either of the attraction outcomes in the equation of legal responsibility*.
- **MD MET 13.** *For reasons of computational power* the analyses reported here were performed on a remote server via the open-source Telnet/SSH client PuTTY.

The meanings of cause and reason do not seem to be commonly expressed by the preposition ‘*for*’. The first case, which is ambiguous, is thought to be expressing cause because of the negated verb, whereas the second one is annotated as expressing reason, because of the use of the word ‘reason’ after the preposition. These meanings of cause and reason do not seem to be emanating directly from the preposition ‘*for*’, the way the meaning of ‘purpose’ is. Rather, it is implied from other linguistic devices.

The distribution of the meanings of cause reveals certain differences among the sections, this distribution is to be contrasted to those expressing process, as shown in the following figure.

Figure 6. 6 Cause and process PPs across the sections

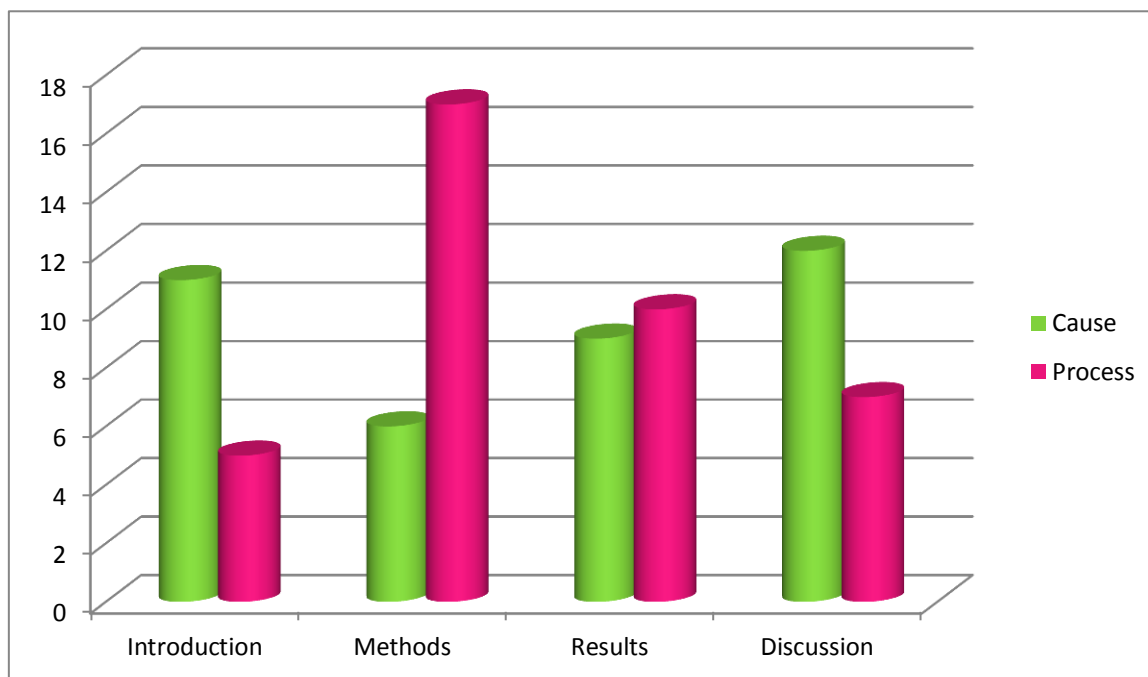


Figure 6.5 shows that while PPs expressing cause are more frequent in the sections of Introduction and Discussion, those expressing process are rather found in the Methods and Results sections. Each section is built around a number of moves or communicative purposes that seem to determine the meanings expressed. Expressing links of causality helps establish the claims brought by the research, and these claims are first expressed in the Introduction, and then justified in the Discussion. PPs expressing process are rather associated with the Methods and Results sections because they describe the way the claims have been proved.

In addition to process and cause, certain PPs express the meaning of role.

6.3.3.5. Role

This meaning expresses the role assigned to a participant. It can be either guise or product. The results of the analysis are presented in the following table.

Table 6. 19 Role PPs in the Medical and Social sciences

	<i>Medical</i>	<i>Social</i>
Guise	15	13
Product	4	2

Table 6.19 shows that PPs expressing product are less frequent than those expressing guise. The analysis has also revealed that product PPs are introduced by the preposition ‘in’, but those expressing guise are rather introduced by ‘as’. Examples of product PPs are:

- **MA RES 6.** Incubation of TGFBI-KD cells in serum-free media conditioned with rTGFBI also resulted *in a significant reversal of paclitaxel resistance*
- **MD INT 8.** It has been found that the M-current in the neurons is subserved by KCNQ2 and KCNQ3 potassium channel subunits (Wang et al., 1998) and consequently, dysfunction of these subunits results *in epileptic disorders.*
- **SA RES 2.** When breaking down the organizational variables *into the effects of unionization, casualization, globalization, and downsizing,* Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).
- **SD INT 5.** Axinn and Yabiku (2001) identify a crucial association between attitudes and transitions *into marriage* at the neighborhood level.

These examples illustrate the use of product PPs. They can be introduced by the preposition ‘in’ or ‘into’, but what determines the meaning is not only the preposition, but also the verb or noun introducing it. In fact, the analysis has revealed that these PPs can be either postmodifiers to other nouns or complements of verbs.

The other meaning of role is that of guise, it is realised by the preposition ‘as’, as shown in the following examples.

- **MA MET 18.** BaF3 cells were maintained in RPMI-1640 supplemented with 10% fetal calf serum and 10% WEHI-conditioned medium *as a source of IL-3.*
- **MD INT 18.** Importantly, interactions between CD4+ T cells and B cells are recognised *as a crucial step in the anti-viral immune response,* since the B cells act as antigen presenting cells in this case.
- **SA RES 18.** If the dependent variable is considered to consist of two groups’ earnings, determinants of earnings for each group can be added *as control variables* in the regression model. Specifically, education has traditionally been a strong predictor of earnings.
- **SD RES 18.** This dissertation has argued that methods of execution serve *as vehicles for the administration of state-sanctioned institutionalized violence.*

These roles are used with verbs such as ‘act, maintain, annotate, implicate, recognize, consider, use, and act’ in the Medical sample and ‘interpret, add, take, refer, detail, serve and cite’, in the Social Sciences sample. The verbs in the Medical sample can be categorised into two main types: those denoting actions (act, annotate, use) and other mental verbs (recognize and consider). On the other hand, most of the verbs in the Social Sciences sample are actions like ‘add, take, refer, and detail’, while only one verb is mental (interpret). The action verbs in Medical Sciences reflect those performed in experiments, while those in the Social Sciences

are done on written data, which shows that, in addition to the different methodologies, the data worked on in the disciplines are different. The mental verbs seem to be different too, as the mental actions done as they are directly linked to the material ones. In fact, verbs such ‘recognize’ can be classified as cognitive and perceptive (Halliday and Matthiessen, 2004, p. 210), while ‘interpret’ is cognitive. Seeing the difference in the type of data, concrete data would require actions as well as verbs of perception, written, oral or numerical data would require interpretation. Therefore, identifications expressed by the preposition ‘as’ are discipline-specific for while in Medical Science they follow from experiments, in Social Sciences they are reflections on qualitative and quantitative data.

6.3.3.6. Accompaniment

According to the classification adopted in the analysis of the corpus, the meaning of accompaniment is divided into: comitative, having, material-ingredient, exception and addition. The meaning of material ingredient does not exist in the sample, while the distribution of the other meanings is summarised in the following table.

Table 6. 20 Accompaniment PPs in the Medical and Social Sciences

	<i>Medical</i>	<i>Social</i>	<i>Total</i>
Comitative	6	9	15
Having	6	2	8
Exception and addition	3	2	5

Table 6.20 shows that the comitative meaning is the most frequent, followed by the meanings of having and exception and addition. In the Social Sciences, the comitative meaning is more frequent than the other meanings. Although comitative and having PPs are introduced via the preposition ‘with’, their distribution across the disciplines are different. Medical Sciences make use of both meanings, while Social Sciences rely on the comitative meaning.

Applying Yule’s Coefficient on the first two lines of the table gives the following result:

$$Q = A \cdot B / (A + B) \text{ with } A = 6 \cdot 2 = 12 \text{ and } B = 6 \cdot 9 = 54$$

$$Q = 12 \cdot 54 / (12 + 54) = -0.64$$

The result is beyond the rejection interval thus revealing a correlation between Social Sciences and the comitative meaning on the one hand, and Medical Sciences and meanings of

having on the other hand. The comitative meaning seems to emanate from the spatial meaning of proximity and extends to cover the meaning of relational proximity. Examples of this meaning are:

- **MA INT 16.** Seoul virus is generally associated with a less severe form of disease, with a mortality rate of less than 1%.
- **MA MET 16.** Similarly, when the dNTP concentration was kept constant at saturating levels and the inhibition at various TP concentrations was analyzed, RT was present either as a free enzyme or in the ternary complex *with TP and dNTP*, as shown in the right part of Fig. 2.
- **SD INT 16.** Gatewood et al. (1993) found that both overall corporate image and recruitment image were related to applicants' intentions to pursue employment *with a company*, the latter more strongly than the former.
- **SD DIS 16.** Consistent *with gender roles and stereotypes*, work values literature has found that males value money, promotions, leadership and power more whereas females value interpersonal relationships, helping others, and intrinsic job aspects (e.g., growth opportunities, task enjoyment) more than males (Konrad, Ritchie, Lieb, & Corrigan, 2000).

The meaning of the preposition seems to be largely influenced by verbs and adjectives such as '*associate, comparable and consistent*'. These verbs and adjectives imply the presence of two or more parties coming into metaphorical proximity (in company with). The analysis has revealed that this comitative meaning is associated with the Introduction and Discussion sections. In the Introduction, a researcher is expected to 'establish a niche', that is identify the focus of the research through "indicating a gap" or "adding to what is known" (Swales, 2004, p. 230). Using the comitative type of PPs shows that the researcher is paving the way for certain relations that have not been explored before. The use of these PPs in the Discussion is seen as mirroring the effect made in the Introduction as the writer is expected to revisit the major claims defended.

In addition to this meaning, the preposition '*with*' can express the meaning of 'having'.

- **MA MET 15.** This study included 349 adult patients *with AML*, de novo or secondary after treatment for a primary malignancy or following myelodysplasia, as defined by French-American-British Cooperative Group criteria or the World Health Organization classification.
- **MA DIS 15.** Since hematopoietic stem cells (HSCs) are endowed *with self-renewal*, it has been argued that transformation of HSCs provides a simple means to generate leukemic cells.
- **SA RES 15.** Establishments *with a higher proportion of newly hired employees* had a greater degree of earnings dispersion within the organization, supporting Hypothesis 3.

The meaning of proximity in these cases is extended further as the metaphorical proximity is between a figure and a thing but with the figure owning the other. The owners in

these examples are ‘patients, hematopoietic stem cells and establishments’ being characterised with ‘AML, self-renewal and a higher proportion of newly hired employees’. Relational meanings seem to be associated with Social Sciences, while those which are more concrete are rather linked to Medical Sciences.

Meanings of exception and addition are expressed via complex prepositions such as:

- **MD DIS8.** *Instead of the three levels of cut off points of the recommended daily defined doses of AEDs*, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).
- **MA RES 2.** In type 1 EN tumors, the K5+ basal/myoepithelial cells, *in addition to the K8+ luminal cells*, are part of the tumor epithelial cell population.
- **MA RES 8.** In terms of risk categories (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified into a different risk set using arterial age *in place of observed age* (16% would go to a lower risk stratum and 12% to a higher risk stratum).

These meanings are expressed via complex prepositions, thus expressing complex relations. The meaning of addition could have been expressed by simpler coordination conjunctions, however, the use of ‘in addition to’, for instance, draws the attention of the reader to an important piece of information. These tools are associated with the section of Results, where the researcher needs to state his/her results. These results can be either consistent, in which case they need to be coordinated, or contradictory, in which case relations of exception are to be expressed. The use of a complex preposition is a stylistic device to draw the attention of the reader to the enumeration of the results, while relations of exceptions are there to highlight the unexpectedness of certain results. In addition to these, the least frequent meaning to be covered in the analysis is that of contingency.

6.3.3.7. Contingency

The meaning of contingency is expressed whenever a trajector is dependent on a particular landmark. The classification adopted in the analysis of the corpus shows that the sub-meanings can be: condition, concession, default, contrast, and recurrent contingency. The meaning of default is not conveyed in the studied sample, while the distribution of the other meanings is summarised in the following table.

Table 6. 21 Contingency PPs in the Medical and Social sciences

	<i>Medical</i>	<i>Social</i>
Condition	3	1
Concession	0	1
Contrast	0	1
Recurrent contingency	4	7

Table 6.21 shows that the most frequent of these meanings is that of recurrent contingency. Condition is also present in the corpus, mainly in the Medical Sciences, while concession and contrast are rare. These meanings are mainly expressed by the preposition ‘*in*’, as shown in the following examples.

- **MA DIS 8.** Importantly, GDNF was highly effective ***in reducing heavy drinking*** after a short period of deprivation.
- **MD INT 3.** The mechanism of RA ***in inducing neural commitment*** from stem cells in vitro was investigated by Berg and McBurney, where they revealed RA can be present for as short as 2-4 hours and still be effective ***in inducing the irreversible neuronal differentiation of P19 EC cells*** (Berg and McBurney, 1990).
- **SA INT 1.** While the racial (or minority) threat thesis has been conceptualized as multidimensional (Eitle et al., 2003), one conceptualization emphasizes the criminal threat of Blacks and other minorities ***in understanding the actions of the state*** against minorities (Liska and Chamlin, 1984).
- **SD RES 4.** ***In evaluating Hudson’s position***, it becomes clear that his opposition to lethal injection hinged on the distancing between the State and the condemned.

Most of the PPs expressing recurrent contingency have clausal complements, which means that the preposition plays the role of a link between two clauses, thus showing how dependent they are. This relation is ambiguous, in the sense that it expresses a meaning that can be interpreted differently. This meaning is mainly expressed in PhD Theses, as shown in the following table:

Table 6. 22 Recurrent contingency and condition across the genres

	<i>PhD Theses</i>	<i>RAs</i>	<i>Chi-square</i>
Condition	0	4	5.885
Recurrent Contingency	9	2	10.432

Table 6.22 shows that the distribution of the two most important meanings expressing contingency. The chi-square test for this distribution reveals a high significance thus proving,

statistically speaking, that the choice of one meaning over the other can be genre-related. PPs expressing recurrent contingency are associated with PhD Theses, while those expressing condition are rather found in RAs.

PPs expressing recurrent contingency have clausal complements introduced by the preposition ‘*in*’. The use of this preposition to link clauses shows that the researcher does not state the relation between the clauses overtly. One possible explanation for this is that doctoral students do not perceive of these relations, as they are still in the first attempts of conducting research. Another possibility can be the lack of confidence that a doctoral student may feel towards his/her work, and therefore, s/he does not really know where to intervene and express his/her point of view overtly. Students are not willing to take risks. On the other hand, authors of RAs tend to express meanings of condition, as shown in the examples below:

- **MA INT 1.** Several lines of evidence indicate that altered expression of the FGF/FGFR signaling axis may be important *in prostate pathology*.
- **MA INT 5.** Diabetes mellitus (DM) and chronic kidney disease (CKD) are common co-morbidities *in heart failure* (HF) and are known to be associated with poor outcomes
- **MA DIS 1.** For instance, since MaSCs can give rise to both luminal and myoepithelial cells, one would expect to see mixed cell types *in breast cancer* if MaSCs represent the predominant cellular origin, yet most human breast tumors exhibit phenotypes of luminal epithelial cells (Sorlie et al., 2001).
- **SA INT 7.** By contrast, theories of authoritarianism predict that, *in the face of threat*, authoritarian sentiment should grow (Adorno et al., 1950).

These PPs are introduced by ‘*in*’, which expresses containment. They have been annotated as expressing condition for their hypothetical meanings. The containment is not real as it did not take place, rather these are reductions of ‘*in case(s) of*’. All the occurrences are found in RAs, thus showing that only in this genre do authors dare such ambiguous reductions. In fact, writing specialised RAs with the constraints of space lead the author to minimise the number of words to the maximum even at the expense of clarity. Consequently, writers rely on the shared background knowledge of their readers to decipher certain ambiguities, which are neutralised within their research communities.

6.4. Concluding Remarks

This chapter has tried to present the semantic analysis of PPs. Based on the system designed in chapter two on the semantic approach to PPs, the present one has been divided into three main sections: functional PPs, PPs introducing participants and metafunctional PPs.

Functional PPs are mainly of-phrases functioning as postmodifiers. They have been annotated as such because they do not seem to carry a clear meaning; rather they are markers of a grammatical structure. However, the choice of this preposition to fulfil this function seems to be linked to its conceptual meaning of source applied between the head of the NP and the prepositional complement.

The second section deals with those PPs used to introduce participants that are called oblique. By-phrases are thought to introduce the agentive in the clause because of the relative 'proximity' expressed conceptually by the preposition 'by', and which applies in such cases on the proximity of the agentive to the main verb of the clause, and to its original position. Such a role is explored by authors to highlight the agentivity of certain entities mainly in the Introduction section in order to construe their arguments. Other less frequent roles in the sample include recipients and benefactives. These roles are recognised based not only on the verbs that introduce them into the clause, but also on the prepositions, thus showing the similarity between verbs and prepositions in selecting the arguments of the clause.

The third section presents the metafunctional meanings expressed by the PPs. Most of these meanings are experiential, while only 4 percent are textual and 1 percent is interpersonal. The scarcity of interpersonal PPs has been associated with the focus on content to the exclusion of contextual features, as defined by Tannen (1985). Despite being rare, interpersonal adjuncts play double roles in the sample, they are used by PhD students to hedge their claims, and by authors of RAs to claim factuality for their findings.

Textual references are mainly linkers used to achieve cohesion in the text. Their use in the sample has revealed differences across the registers for while Social Sciences opt for a variety of linkers with different meanings, the relations in Medical Sciences are mainly additive or spatio-temporal. The methodologies adopted in each discipline can be in a way responsible for the difference as researchers in Social Sciences need to express their interpretation clearly as they are claims that need to be supported. However, in Medical Sciences, authors rely on the common background knowledge shared by the research communities to understand the relations between the actions, as claims are often raised to the level of truth.

Experiential PPs construe the circumstances around the clause. The studied sample has revealed that most of the references are spatio-temporal, while meanings of respect, process and cause are considerably important. More specific prepositions are used for concrete spatial references, while those which express vaguer meanings are explored either abstractly or metaphorically. Statistical measures have proved the presence of a correlation between

concrete places and Medical Sciences on the one hand, and abstract places and Social Sciences on the other hand, thus revealing differences among topics. Abstract places are related to vaguer prepositions, and are also grammatically-bound since they need other constituents for their interpretation.

Temporal references seem to rely for their expression on the same prepositions expressing space, thus revealing how a conceptual meaning can gain new meanings in new contexts. The prepositional complement seems to play an important role in defining the meaning of the whole PP, yet, in cases where the PP functions as a complement, the head intervenes in the process of meaning making. Shades of temporal meanings are expressed by different prepositions, thus revealing how different conceptual meanings yield different prepositional meanings.

Meanings of respect, which are associated with the Social Sciences, are expressed via different prepositions. The analysis has revealed a correlation between the choice of the preposition and its function in the clause. Adverbials, which can be inserted in different positions in the clause, tend to have more precise prepositions (e.g. *in terms of*), while the more reduced possibilities are rather postmodifiers that are closely associated to their heads.

Meanings of Process also reveal differences among the registers. In fact, while Medical Sciences tend to express the means of the experiments, Social Sciences rather describe the manner. The distribution of these meanings seems to contradict that of Cause, as purpose and target PPs are mainly grouped in the Introduction and Discussion sections, thus mirroring the communicative purpose(s) of each section.

Other meanings reveal differences among the genres and the statuses of their writers. Certain complex prepositions are used with the aim of stressing the meaning of adding in the Results section of RAs, thus showing the strategy to enumerate one's findings. Similarly, meanings of contingency are explored differently by the writers' of each genre, for while PhD students opt for the vaguer meaning of recurrent contingency, authors of RAs express more direct conditions.

General Conclusion

The present thesis has tried to study PPs from syntactic and semantic perspectives. To conclude, this chapter will review the major findings, and then state the limitations and the implications of the research.

7.1. Major Findings

The syntactic and semantic analyses have led to the emergence of certain findings that defend the claims made in the introduction of this thesis.

✦ First, the study of PPs has revealed the existence of certain global and local probabilities in the quantitative analysis. Since the corpus has been collected based on the variables of genres and disciplines, these probabilities can be linked to the differences between these variables. This additional evidence shows the role of probability from an SFL perspective, as the notion of choice; choosing one structure or meaning from other possibilities, makes sense when each option is associated with a particular probability within a particular context.

✦ Second, the probabilities resulting from the quantification of the text have revealed that they are subject to different parameters, which means that the notion of context is not homogeneous, rather contexts are 'hybrid' (Sellami-Baklouti, forthcoming), and that it is the genre as well as the register that intervene in the choices studied in this research.

✦ Third, in conformity with the major claim followed in this thesis; that context activates semantic choices, which in turn activate lexico-grammatical choices, the forms of the studied prepositions are found to be semantically-motivated. Simple prepositions convey simpler meanings while complex prepositions have more complex meanings. Those prepositions which have fused, that is turned morphologically into one word, have gained the status of simpler prepositions, and express therefore simple, but new, meanings.

✦ Correlations and statistical measures have also proved that choices of structure are semantically-motivated. In fact, the study of the prepositional complements has revealed that clausal complements are used in response to the need to highlight actions, whereas phrasal complements seem to emanate from the need to have a condensed type of writing. Furthermore, patterns of nominalization have indicated differences among the registers as they yield grammatically complex structures in Social Sciences and lexically dense constructions in Medical Sciences.

* Additionally, the analysis has also shown that certain correlations exist between the functions of PPs and the preposition used to introduce the phrase. Most of-phrases are postmodifiers because of the peculiar status of the preposition ‘*of*’, which although classified as functional, seems to be chosen based on its conceptual meaning of source. Besides, prepositions with more specific meanings have been selected for less dependent functions like that of adverbial, and for more concrete meanings, like space. Conversely, those prepositions with vaguer meanings are explored metaphorically, and tend to complement other words. The relation between the preposition in this case and the element introducing it is dialogical, as the preposition complements the head grammatically, while that head helps construe the meaning of the preposition.

* Moreover, semantic choices seem to reflect global and local probabilities, for the general semantic distribution reveals that the whole register shades from interpersonal meanings, thus explaining one general feature of the language of science as being content-based. Local probabilities contrast the disciplines, genres and sections studied. In fact, the disciplines seem to divert with respect to the meanings chosen, as Medical Sciences rely mostly on spatio-temporal relations, while Social Sciences are rather associated with meanings of respect. Still, within the spatial category, Medical Sciences opt for more concrete choices, while Social Sciences select abstract places. Such differences have been explained with reference to the focus of each science. However, the distribution of process adjuncts reveals differences with respect to the methodology followed in each discipline. Medical Sciences opt for means adjunct, as it involves the performance of experiments, while Social Sciences rely on manner adjuncts to talk about how studies have been undertaken. The disciplines seem to differ also as far as the cohesion of their texts is concerned. Social Sciences tend to use more varied textual linkers to achieve persuasion, while Medical Sciences rely on the shared knowledge and the general truths in that science.

* The local probabilities have also contrasted the genres studied. RAs and PhD theses have different requirements that can be traced in the structural choices made in the corpus. For instance, clausal complements are associated with PhD theses because little constraints are made on the length of this document, while RAs opt for more phrasal constructions because of their compactness. These two genres differ also because of their different writers, and this can be seen in the nominalizations used. Such patterns are more precise and less ambiguous in RAs, and this can be linked to the status of the writer as an expert researcher. The voice of such researcher is clearer than that of the PhD students, and this can be depicted from certain vague semantic relations. In fact, PhD theses are associated with recurrent

contingency, which is rather vague, while RAs make use of conditions, as far as the meanings of contingency are concerned.

* Certain differences in statistical measures reflect the differences among the sections of each genre. For instance, roles of agentive are more numerous in the Introduction section, as they allow the writer to draw the attention of his/her reader to one reading of the situation. Process PPs are associated with the Methods and Results section as they are the section where the researcher needs to present the means of his/her research, or the manner with which s/he could attain certain results. On the other hand, causality is rather expressed in the Introduction and Discussion sections, as writers need to define or refer to the purpose of their research. Also, certain interpersonal meanings of limitations are used in the Discussion to hedge one's claims.

These findings follow from the syntactic and semantic study of PPs, which, like any piece of research, has certain limitations.

7.2. Limitations of the Study

This study has gone through certain choices that have influenced its methodology and findings, and have resulted in the presence of certain limitations.

As it is primarily syntactic and semantic, the present study has opted for the grammatical structure of PPs as a unit of analysis, which means that it is limited to only one structure, while other constructions could have been studied. Seeing that grammar can only be described in a text, the study has opted for perspectives that take structure and also meaning into consideration, and hence the reliance on SFL.

In order to study the syntax and semantics of PPs, the present thesis has opted for the language of science seeing the importance and the intricacy of this discourse. Other types of discourse could have been studied, such as the legal discourse, the language of Social media, etc.

The corpus has been selected from academic discourse to the exclusion of other types, and the focus on RAs and PhD theses has excluded other genres in academic writing. Moreover, only two disciplines have been chosen for the corpus, whereas other disciplines would have had other findings. Besides, the selection of the corpus was based on availability.

Furthermore, only a sample has been analysed in this research seeing the large number of prepositions in the corpus. At first the aim of the research was to study all the prepositions in the corpus, but after a pilot study was performed on paragraphs from the corpus, it seemed impossible to finish such work.

In order to link the syntactic and semantic analyses to the studied discourse, the present thesis has opted for ‘a text-driven procedure for genre analysis’ (Swales, 2004, p. 72:3), while ‘a situation-driven procedure’ is also possible, but would result in different methodology and implications. Moreover, the purpose from conducting such research is to have a deep understanding of PPs, and to test their distribution in different contexts, so that an understanding of the language of science is attained. However, such studies could be helpful to students and provide suggestions for teachers of English for Specific Purposes.

7.3. Implications of the Study

This thesis paves the way for other future research. In fact, other grammatical categories can be studied such as: adjectives, adverbs, verbs, etc. Verbs in academic writing seem to be very telling about how events are construed, how results are provided, how choices are accounted for, etc. The use of verbs can be compared across the different sections of RAs in order to investigate how the moves affect the use of verbs.

Other studies can deal with the way complex prepositions are formed, and particularly about how specific they are, and about the roles they may have in their contexts. For this purpose a longitudinal study could be undertaken to study the progress of these expressions. Otherwise, a comparison between a specialised type of discourse with everyday language use could reveal the specificity of such constructions.

A future piece of research can focus on nominalization, and select more than two disciplines to show how it is reflective of the situation where it was invented. Or, different genres can be compared to study the acculturation process that students go through. Such genres can range from students’ reports to papers, on the one hand, and RAs or textbooks on the other.

Within the language of science, spoken language has not received much attention. In fact, the analysis of the language of lectures, conferences and defences can be compared to their written counterparts mainly that the language of science is known for being primarily written. Other genres in academic writing are not studied, as far as I know, these are mainly manuscripts. Such an investigation would require a semiotic analysis as well, as they are not expected to be fully written paragraphs.

Certain topics in science are addressed by more than one discipline at a time. For instance, a linguistic analysis and a literary critic of the same novel would be different although dealing with the same topic. An analysis of their language would reveal the epistemology of each discipline.

Other types of discourse can be the focus of a linguistic analysis: legal discourse, journalistic discourse, etc. and other dimensions such as gender differences, Social class, etc. can be explored. Newly emerging genres such as instant messaging, and computer or telephone mediated communications can reveal how language is developing.

This study, where a grammatical construction is studied in academic writing, can be explored for teaching purposes. The way PPs are used across the disciplines can inform researchers in ESP, and therefore, design curricula in accordance with the needs of specialised students.

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Appendices

Appendix A: The Corpus

Medical Theses:

1. THE ROLES OF ND10 PROTEINS ATRX AND HDAXX IN THE REGULATION OF HERPESVIRUS INFECTION. (75590)
2. 1.CHROMATIN-BINDING HMGN PROTEINS AND THE NEURONAL DIFFERENTIATION OF ENBRYONAL CARCINOMA CELLS IN VITRO. (51594)
3. IDENTIFICATION OF HEPATITIS C VIRUS CORE PROTEIN RESIDUES CRITICAL FOR THE INTERACTION with the Cellular DEAD-box Helicase DDX3 and their Functional Relevance (76188)
4. THE SYNERGISTIC EFFECT OF ANTI-ANDROGENS AND SIGNAL TRANSDUCTION INHIBITORS IN PROSTATE CANCER PROGRESSION
5. HEART FAILURE PATIENTS UTILIZING AN ELECTRIC HOME MONITOR: WHAT EFFECTS DOES HEART FAILURE HAVE ON THEIR QUALITY OF LIFE?
6. CHARACTERISATION OF RESPONSE TO ANTIEPILEPTIC DRUGS
7. DISCOVERING COMMON GENETIC VARIANTS FOR HYPERTENSION USING AN EXTREME CASE-CONTROL STRATEGY
8. HIF PROLYL HYDROXYLASE-3 REGULATES ACTIN POLYMERISATION AND HYPOXIA-INDUCED MOTILITY AND INVASION

Medical Research Articles:

1. Acquisition of a Functional T Cell Receptor during T Lymphocyte Development Is Enforced by HEB and E2A Transcription Factors. 'Immunity', Volume 27, issue 6, 21 December 2007, Pages 860–870
2. Enhanced Paracrine FGF10 Expression Promotes Formation of Multifocal Prostate Adenocarcinoma and an Increase in Epithelial Androgen Receptor.' Cancer Cell', Volume 12, Issue 6, 6 December 2007, Pages 572–585
3. ETV6-NTRK3 Fusion Oncogene Initiates Breast Cancer from Committed Mammary Progenitors via Activation of AP1 Complex. 'Cancer Cell', Volume 12, Issue 6, 6 December 2007, Pages 542–558.
4. Identification of Driver and Passenger Mutations of FLT3 by High-Throughput DNA Sequence Analysis and Functional Assessment of Candidate Alleles. 'Cancer Cell', Volume 12, Issue 6, 6 December 2007, Pages 501–513
5. Inducible FGFR-1 Activation Leads to Irreversible Prostate Adenocarcinoma and an Epithelial-to-Mesenchymal Transition. 'Cancer Cell', Volume 12, Issue 6, 6 December 2007, Pages 559–571.
6. Loss of β -Catenin Impairs the Renewal of Normal and CML Stem Cells In Vivo. 'Cancer Cell' Volume 12, Issue 6, 6 December 2007, Pages 528–541.
7. microRNA-155 Regulates the Generation of Immunoglobulin Class-Switched Plasma Cells. 'Immunity' Volume 27, Issue 6, 21 December 2007, Pages 847–859.
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9. Structures of an MHC Class I Molecule from B21 Chickens Illustrate Promiscuous Peptide Binding. 'Immunity' Volume 27, Issue 6, 21 December 2007, Pages 885–899
10. The Extracellular Matrix Protein TGFBI Induces Microtubule Stabilization and Sensitizes Ovarian Cancers to Paclitaxel. 'Cancer Cell', Volume 12, Issue 6, 6 December 2007, Pages 514–527
11. The Heterodimeric Assembly of the CD94-NKG2 Receptor Family and Implications for Human Leukocyte Antigen-E Recognition. 'Immunity', Volume 27, Issue 6, 21 December 2007, Pages 900–911.
12. A gelatin-thrombin matrix for hemostasis after endoscopic sinus surgery. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 49–53.
13. Treatments and outcomes of malignant tumors of external auditory canal. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 44–48.
14. Survival outcomes of squamous cell carcinoma arising from sinonasal inverted papilloma: report of 6 cases with systematic review and pooled analysis. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 38–43.
15. Melkersson-Rosenthal syndrome revisited as a misdiagnosed disease. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 33–37.
16. Gene expression profiles of nasal polyps associated with allergic rhinitis. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 24–32.
17. Craniocervical necrotizing fasciitis with and without thoracic extension: management strategies and outcome. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 17–23.
18. Study on neural stem cell transplantation into natural rat cochlea via round window. American Journal of Otolaryngology, Volume 30, Issue 1, January–February 2009, Pages 8–16.
19. Implication of QRS Prolongation and Its Relation to Mechanical Dyssynchrony in Idiopathic Dilated Cardiomyopathy in Childhood. The American Journal of Cardiology, Volume 103, Issue 1, 1 January 2009, Pages 103–109.
20. Medium Term Effects of Different Dosage of Diuretic, Sodium, and Fluid Administration on Neurohormonal and Clinical Outcome in Patients With Recently Compensated Heart Failure. The American Journal of Cardiology, Volume 103, Issue 1, 1 January 2009, Pages 93–102.
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of Having Coronary Heart Disease. *The American Journal of Cardiology*, Volume 103, Issue 1, 1 January 2009, Pages 50–58.

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27. Prognostic Value of a Multimarker Approach for Patients Presenting to Hospital With Acute Chest Pain. *The American Journal of Cardiology*, Volume 103, Issue 1, 1 January 2009, Pages 22–28.

28. Tailored Clopidogrel Loading Dose According to Platelet Reactivity Monitoring to Prevent Acute and Subacute Stent Thrombosis. *The American Journal of Cardiology*, Volume 103, Issue 1, 1 January 2009, Pages 5–10.

29. Using demand analysis and system status management for predicting ED attendances and rostering. *The American Journal of Emergency Medicine*, Volume 27, Issue 1, January 2009, Pages 16–22.

30. An observational, prospective study comparing tibial and humeral intraosseous access using the EZ-IO . *The American Journal of Emergency Medicine*, Volume 27, Issue 1, January 2009, Pages 8–15.

31. The CAREFALL Triage instrument identifying risk factors for recurrent falls in elderly patients. *The American Journal of Emergency Medicine*, Volume 27, Issue 1, January 2009, Pages 23–36.

32. Frequency of Intensive Statin Therapy in Patients With Acute Coronary Syndrome Admitted to a Tertiary Care Center. *The American Journal of Cardiology*, Volume 109, Issue 1, Pages 1-5.

33. Usefulness of the Admission Electrocardiogram to Predict Long-Term Outcomes After Non-ST-Elevation Acute Coronary Syndrome (from the FRISC II, ICTUS, and RITA-3 [FIR] Trials). *The American Journal of Cardiology*, Volume 109, Issue 1, 1 January 2012, Pages 6–12.

34. Relation Between Red Blood Cell Omega-3 Fatty Acid Index and Bleeding During Acute Myocardial Infarction. *The American Journal of Cardiology*, Volume 109, Issue 1, 1 January 2012, Pages 13–18.

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36. Alcohol consumption and lipodystrophy in HIV-infected adults with alcohol problems. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 65–71.

37. Effect of exercise training on ethanol-induced oxidative damage in aged rats. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 59–64.

38. Chronic ethanol consumption resulting in the downregulation of insulin receptor- β subunit, insulin receptor substrate-1, and glucose transporter 4 expression in rat cardiac muscles. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 51–58.

39. Ethanol disrupts NMDA receptor and astroglial EAAT2 modulation of Kv2.1 potassium channels in hippocampus. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 45–50.

40. Excessive alcohol consumption is blocked by glial cell line-derived neurotrophic factor. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 35–43.

41. Chronic ethanol and withdrawal effects on kainate receptor-mediated excitatory neurotransmission in the rat basolateral amygdala. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 25–33.

42. Ethanol induces locomotor activating effects in preweanling Sprague-Dawley rats. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 13–23.
43. Conditioned preferences and aversions in infant rats mediated through ethanol inhalation. *Alcohol*, Volume 43, Issue 1, February 2009, Pages 1–12.
44. Antiviral activity of quercetin 7-rhamnoside against porcine epidemic diarrhea virus. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 77–81.
45. Experience with intravenous ribavirin in the treatment of hemorrhagic fever with renal syndrome in Korea. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 68–76.
46. New pleconaril and [(biphenyloxy)propyl]isoxazole derivatives with substitutions in the central ring exhibit antiviral activity against pleconaril-resistant coxsackievirus B3. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 56–63.
47. Rapid determination of antiviral drug susceptibility of human cytomegalovirus by real-time PCR. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 64–67.
48. Biochemical and structural characterization of RHDV capsid protein variants produced in *Pichia pastoris*: Advantages for immunization strategies and vaccine implementation. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 25–36.
49. Non-nucleoside HIV-1 reverse transcriptase inhibitors di-halo-indolyl aryl sulfones achieve tight binding to drug-resistant mutants by targeting the enzyme–substrate complex. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 47–55.
50. Prophylaxis with cationic liposome–DNA complexes protects hamsters from phleboviral disease. *Antiviral Research*, Volume 81, Issue 1, January 2009, Pages 37–46.

Social Theses:

1. THE TRANSITION OF METHODS OF EXECUTION IN NORTH CAROLINA: A DESCRIPTIVE SOCIAL HISTORY OF TWO TIME PERIODS, 1935 & 1983.
2. IN RETROSPECT: AFTER THEIR MILITARY DISCHARGE, WHAT FACTORS ENABLED COMBAT VIETNAM VETERANS TO OBTAIN A COLLEGE DEGREE AND LIVE A SUCCESSFUL LIFE, AS DEFINED BY THEM?
3. THE MARRIAGE ECONOMY: EXAMINING THE ECONOMIC IMPACT AND THE CONTEXT OF MARRIAGE IN COMPARATIVE PERSPECTIVE
4. “IT’S THE PEOPLE HERE”: A STUDY OF RITUAL, CONVERSION, AND CONGREGATIONAL LIFE AMONG CHINESE CHRISTIANS.
5. CORPORATE SOCIAL RESPONSIBILITY, APPLICANTS’ ETHICAL PREDISPOSITIONS, AND ORGANIZATIONAL ATTRACTION: A PERSON – ORGANIZATION FIT PERSPECTIVE.

Social Research Articles:

1. A cross-national study of the association between per capita carbon dioxide emissions and exports to the United States. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 239–250.
2. Are Hispanics the new ‘Threat’? Minority group threat and fear of crime in Miami-Dade County. *Social Science Research*, Volume 37, Issue 4, December 2008, Pages 1102–1115.

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4. Declining inter-industry wage dispersion in the US. *Social Science Research*, Volume 37, Issue 4, December 2008, Pages 1081–1101.
5. Earnings inequality within organizations. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 225–238.
6. From War on Drugs to War against Terrorism: Modeling the evolution of Colombia's counter-insurgency. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 146–154.
7. Gendered racial exclusion among white internet daters. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 39–54.
8. Gene–environment interactions: Peers' alcohol use moderates genetic contribution to adolescent drinking behavior. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 213–224.
9. Intergenerational transmission of kinship norms? Evidence from siblings in a multi-actor survey. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 188–200.
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13. Race and space in the 1990s: Changes in the geographic scale of racial residential segregation, 1990–2000. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 55–70.
14. Race of the interviewer and the black–white test score gap. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 29–38.
15. Religion and marital quality among low-income couples. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 168–187.
16. The shifting and diverging White working class in U.S. presidential elections, 1972–2004. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 118–133.
17. When faith divides family: Religious discord and adolescent reports of parent–child relations. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 155–167.
18. Who trusts? Race, gender, and the September 11 rally effect among young adults. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 134–145.
19. Women's employment and fertility: A welfare regime paradox. *Social Science Research*, Volume 38, Issue 1, March 2009, Pages 103–117.
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23. Religion and attitudes concerning euthanasia: Australia in the 1990s. *Journal of Sociology*, March 2009; vol. 45, 1: pp. 31-54.
24. The social exclusion of rural and remote young people. *Journal of Sociology*, March 2009; vol. 45, 1: pp. 89-107.
25. The friendship networks of multiracial adolescents. *Social Science Research*, Volume 38, Issue 2, June 2009, Pages 279–295.
26. Bushrangers: Ned Kelly and Australian identity. *Journal of Sociology* December 2008 vol. 44 no. 4 373-390.
27. Framing ideology in the niche media: The Koori Mail's construction of the Redfern riots The Redfern riots in the print media. *Journal of Sociology* December 2008 vol. 44 no. 4 355-371.
28. Collective memory and crisis. *Journal of Sociology* December 2008 44: 337-353.
29. Debating group structure: How local, translocal, and national voluntary organizations promote democracy. *The Social Science Journal*, Volume 46, Issue 1, March 2009, Pages 47–69.
30. Theorizing therapeutic culture: Past influences, future directions. *Journal of Sociology* December 2008 vol. 44 no. 4 321-336

Appendix B: Distribution of Prepositions in the Corpus

Table 1: Most Frequent Prepositions in Medical Articles

Medical Articles Introduction		Medical Articles Method		Medical Articles Results		Medical Articles Discussion		Total
of	982	of	1527	of	3217	of	2198	7924
in	669	in	833	in	2350	in	1778	5630
to	286	to	443	to	927	to	622	2278
with	243	with	643	with	1018	with	677	2581
for	164	for	573	for	706	for	423	1866
by	114	by	396	by	524	by	311	1345
as	136	as	349	as	438	as	307	1230
from	76	from	297	from	490	from	193	1056
on	99	on	166	on	280	on	191	736
at	46	at	394	at	335	at	171	946
after	37	after	145	after	216	after	84	482
between	29	between	63	between	172	between	102	366
during	50	during	59	during	91	during	89	289
because	25	because	15	because	47	because	88	
into	26	into	84	into	69	into	70	
		up	49	up	72	up	39	
within	21	within	38	within	82	within	60	
through	20	through	22	through	17	through	41	
against	14	against	12	against	44	against	42	
		among	15	among	40	among	23	
		without	26	without	55	without	31	
including	29	including	24	including	35	including	34	
		before	48			before	17	
		out	20	out	34			
		until	12			until	10	
		across	13	across	26	across	15	
		according	59	according	27	according	11	
		about	10	about	13	about	14	
		via	15	via	12	via	17	
		following	59	following	48	following	12	
		under	30	under	22	under	15	
		prior	17	prior	17	prior	11	
		per	35	per	26			
				since	17	since	17	
		over	16	over	26			
		above	10	above	27			
				despite	12			
along	10			along	14			

				below	11			
				except	10			
				upon	32	upon	14	
				versus	31			
Total	2618		6426		12074		8277	

Table2: Most Frequent Prepositions in Medical dissertations

Medical Dissertation Introduction		Medical Dissertations Method		Medical Dissertations Results		Medical Dissertations Discussion		Total
of	3331	of	1013	of	2380	of	2155	8879
in	1831	in	585	in	1687	in	1347	5450
to	842	to	307	to	648	to	603	2400
with	866	with	336	with	762	with	717	2681
for	689	for	360	for	594	for	458	2101
as	545	as	213	as	523	as	396	1677
by	502	by	209	by	340	by	248	1299
on	435	on	169	on	426	on	276	1306
at	213	at	189	at	190	at	114	706
from	203	from	141	from	190	from	122	656
between	159	between	57	between	212	between	139	567
		about	17	about	203	about	77	297
into	79	into	43	into	68	into	49	239
after	75	after	44	after	90	after	46	255
among	53	among	15	among	80	among	80	228
within	51	within	31	within	44	within	17	143
because	44	because	14	because	51	because	41	150
over	56	over	17	over	60	over	36	169
since	49	since	25	since	17	since	18	109
including	70	including	14	including	37	including	18	
out	10	out	19	out	60	out	16	
according	31	according	15			according	11	
following	31			following	49			
up	31	up	41	up	43	up	62	
under	29	under	11	under	165	under	28	
through	81	through	27	through	44	through	27	
before	15	before	26	before	33	before	14	
		during	20			during	21	
		regarding	19	regarding	19	regarding	15	
until	10			until	16			
prior	20	prior	21	prior	11	prior	11	
above	16			above	14			
via	12			away	10			
against	33			throughout	10			

per	28	per	12	per	35			
around	17	onto	13	towards	22			
across	28					across	21	
without	23					without	26	
upon	18			down	45	despite	13	
Total	11499		4372		9967		7868	

Table 3: Most Frequent Prepositions in Social Research Articles

Social Articles Introduction		Social Articles Methods		Social Articles Results		Social Articles Discussion		Total
of	2799	of	1848	of	2243	of	1243	8133
in	1912	in	1197	in	1616	in	583	583
to	834	to	566	to	630	to	388	2418
for	633	for	646	for	838	for	317	2434
as	561	as	343	as	413	as	234	1551
on	534	on	358	on	364	on	190	1446
with	417	with	311	with	438	with	230	
by	377	by	272	by	325	by	184	
from	267	from	260	from	232	from	113	
between	203	between	118	between	156	between	103	
at	166	at	144	at	153	at	78	
among	144	among	55	among	119	among	53	
about	117	about	76	about	65	about	67	325
because	111	because	72	across	66	because	34	
over	103	over	63	over	83	over	39	
into	59	into	36	into	52	into	36	183
within	93	within	53	within	49	within	16	
after	62	after	28	after	47	after	25	162
since	41	since	46	since	30	since	27	
during	45	during	19	during	35			
out	28	out	32	out	32	out	21	
prior	35	prior	18	prior	19	prior	15	
through	38	through	25	through	24	through	28	
including	48	including	40	including	25	including	14	
up	23	up	18	up	35	up	10	
under	21	under	16	under	12	under	12	
following	31	following	35					
across	42	across	37			across	23	
according	30	according	18					
		per	34	per	23			
against	22					against	14	
beyond	12			beyond	11	beyond	10	
toward	21			toward	13	toward	16	
below	20	below	17	below	21			

without	20	without	10	without	16			
				versus	10	versus	11	
upon	14	upon	11					
around	13							
before	13			before	19			
throughout	13							
until	13							
above	12	above	17	above	28			
				except	15			
per	11							
towards	10					towards	13	
despite	22							
regarding	16							
Total	10771		7397		8861		4531	

Table 4: Most Frequent Prepositions in Social Dissertations

Social Dissertation Introduction		Social Dissertation Methods		Social Dissertation Results		Social Dissertation Discussion		Total
of	1904	of	1014	of	4885	of	1493	9296
to	630	to	280	to	1644	to	521	
in	1040	in	618	in	3685	in	954	
as	440	for	253	for	1303	as	370	
for	371	as	104	as	1242	for	351	
on	315	on	149	on	773	on	196	
with	251	with	145	with	815	with	206	
by	250	by	111	by	696	by	158	
at	152	at	113	at	683	at	138	
from	154	from	143	from	506	from	137	
between	92	between	36	between	240	between	90	
because	60	because	40	because	185	because	42	
after	33	after	22	after	221	after	55	331
into	54	into	28	into	204	into	48	313
about	47	about	41	about	269	about	56	413
out	33	out	23	out	196	out	43	
during	22	during	16	during	173	during	24	
over	44	over	29	over	152	over	32	
among	50	among	11	among	138	among	55	
upon	33	upon	11	upon	48	upon	22	
through	34	through	14	through	131	through	26	
within	25	within	28	within	87	within	28	
before	13	before	10	before	101	before	20	
under	11	under	16	under	47	under	15	
regarding	14	regarding	23	regarding	47	regarding	11	
since	28	since	21	since	83			

across	19	across	16	across	58			
up	16			up	143	up	14	
against	19			against	53			
following	16	following	11					
		prior	12	prior	51			
including	18	including	10					
towards	10	per	12	until	56			
according	21	instead	10					
despite	13							
				down	53			
				following	75			
				without	39			
				above	35			
				toward	33	toward	15	
				including	32			
				despite	28			
				throughout	28			
				beyond	25	beyond	14	
				away	24			
				except	24			
				per	22			
				below	11			
				via	10			
	6874		3695		21616		5515	

Appendix C: Of-Phrases

MD INT1. Prevalence of HSV-1 infection is substantially higher than that of HSV-2 but the figures vary largely between geographic regions and amongst different age groups.

MD INT2. Linking with the multiplicity-dependence of ICP0-null HSV-1, the second distinguished property of this mutant strain is the probability of establishing lytic infection, or what is often referred to as the 'probability phenotype' (Everett, 2000).

MD INT3. Several key extracellular signalling pathways have been identified to be crucial in maintenance of pluripotency and self-renewal of ES cells.

MD INT4. This project was commenced with an aim to study the role of HMGN1-3 in stem cells and neural differentiation.

MD INT 5. However, until the recent discovery of the infectious cell culture system, the exact function, if any, of these receptors in the HCV life cycle has been difficult to confirm.

MD INT6. *Saccharomyces cerevisiae* protein POP2, a component of the multi-subunit transcriptional regulator complex Ccr4p, has been shown to physically interact with the putative RNA helicase DHH1 (Hata et al., 1998).

MD INT7. Gioeli et al. analyzed 60 primary PCa specimens and found that 19 had high levels of activated MAPK (p-MAPK), 31 had low levels and 10 had no detectable levels of p-MAPK (147).

MD INT8. This is a patient filled questionnaire composed of 16 questions distributed into two categories; the first category is composed of 10 questions related to ictal and post- ictal phenomena, while the second category is composed of 6 questions concerned with the predictability of seizures.

MD INT9. Therefore, if we are to take advantages of this unprecedented expansion in the pharmacological armamentarium and genuinely seek the most appropriate drug or combination of drugs for any given patient, then comparative long-term efficacy and tolerability studies are essential.

MD INT10. Additional evidence against the CDCV hypothesis is taken from observations of the allelic diversity of late-onset disorders with Mendelian inheritance patterns 90.

MD MET1. The cells used throughout this study and the purpose of their use are detailed below (in the order of relevance).

MD MET2. For deletion of hDaxx ATRX-interaction domain PAH1, mutagenesis by the gene splicing approach described in (Heckman & Pease, 2007) was performed.

MD MET3. In order to infect the cells seeded into appropriate volume, firstly the required amount of virus to be used was determined according to the required multiplicity of infection (MOI), based on the number of cells seeded into the dish on the day prior to infection procedures.

MD MET4. Equal concentrations of samples were then subjected to denaturing Polyacrylamide Gel Electrophoresis (SDS-PAGE), and the gel was stained with colloidal coomassie brilliant blue (Fisher) using the methods described below (section 2.5.3).

MD MET5. Immunofluorescence (IF) analysis in this project was carried out to study the distribution of HMGN proteins and the expression of neural and glia markers.

MD MET6. Bacterial cultures were mixed with glycerol to a final concentration of 15 % and stored at -70° C.

MD MET7. Demographic data: name, folder number, gender, date of birth, intellectual status, date of referral and date of last clinic visit.

MD MET8. The MDC was established as a resource to examine the relationship between diet and the subsequent development of cancer 145.

MD MET9. A flowchart of the cohorts included and their sample sizes is shown in Figure 2.5.

MD MET 10. Cells were grown in heavy and light medium until 100% incorporation of labelled amino acids was achieved.

MD RES1. . The appearance of the two bands corresponding to major ATRX isoforms of approximately 280 kDa and ATRXt (a truncated ATRX isoform) was consistent with previously published work (Berube et al, 2000; Garrick et al, 2004).

MD RES2. A general hypothesis underlying the research described in this thesis is that the recruitment of the ND10 components (and other proteins) to the sites closely associated with the incoming HSV-1 genomes and sites of IE transcription represents a cellular response to virus infection that may lead to viral genome repression.

MD RES3. P19 EC cells can be maintained in their undifferentiated state *in vitro* and induced to achieve directed differentiation of all three germ layers (Martin, 1980).

MD RES4. The intra-nuclear organisation of HMGN proteins in P19 EC cells has not been studied.

MD RES5. Bacterial expression vector pKK223-3 (Amersham Pharmacia Biotech, Sweden), containing the B domain of Staphylococcus aureus protein A (SpAb) fused to GFP, was kindly donated by Takashi Aoki (Department of Biochemistry, Health Sciences University of Hokkaido, Japan) (Aoki et al., 2002).

MD RES6. It is possible however that the interaction is required for either the production of progeny particles or their ability to infect naïve cells.

MD RES7. Several studies have shown the involvement of growth factor pathways in the progression to and proliferation of HRPC (12-14, 37).

MD RES8. As expected, expression of all signaling pathway proteins increased throughout the experiment.

MD RES9. Patients with failure of two treatment regimens due to lack of efficacy had a response rate of 13% in comparison to 39% response rate in case of patients with failure of two schedules due to poor tolerability.

MD RES10. L-lactate dehydrogenase and fructose-bisphosphate aldolase were identified as potential binding partners of PHD2 in the SILAC screen, but all three enzymes were tested for their ability to bind either PHD2 or PHD3.

MD DIS1. As discussed in Chapter 1 and in Section 3.1 of the present Chapter, ND10 components constitute a part of cellular intrinsic defence mechanism against both HCMV and HSV-1.

MD DIS2. Because hDaxx is the targeting component of the ATRX/hDaxx complex, this causes displacement of the entire complex away from the viral genomes (marked in red) and relieves cellular repressive mechanism.

MD DIS3. HMGN1 and/or HMGN2 knockdowns altered the expression of many of the neural lineage genes in day 3 of neural differentiation but not in undifferentiated cells.

MD DIS4. To confirm that a mutation near residue 33 of core was responsible for the production of infectious particles, infection studies were carried out on JFH-1 RNA containing the original mutation G33A and a mutation at residue 34 (V34A), shown to be present in infectious JFH-1 G33A RNA.

MD DIS5. The aging of the population in the United States and the prevalence of HF dictate the need for strategies to improve self-care management and decrease costly health care expenditures.

MD DIS6. The study was also implemented in a real world setting, at the time of an initial specialty consult visit, and highlights the strengths and limitations of using this type of setting to disseminate CAPtDA tools into practice.

MD DIS7. Remission rate of elderly patients with focal epilepsy on sodium channels blocking AEDs was 89% compared to 90% in those on AEDs working mainly by potentiation of GABA inhibitory effect with insignificant difference noticed (p-value = 0.8).

MD DIS8. Instead of the three levels of cut off points of the recommended daily defined doses of AEDs, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).

MD DIS9. In summary, the results presented validate the extreme case-control phenotyping method for the study of hypertension as a qualitative trait.

MD DIS10. Family studies may have a better chance of detecting rare variants, and any association between them and common diseases, than population studies.

MA INT 1. The primary determinant of progression through T cell development is the expression of a functional T cell receptor.

MA INT 2. Until lately, the contribution of chromosomal rearrangements to epithelial cancers has been viewed as minor.

MA INT 3. In addition to its importance in normal development, dysregulation of the Wnt pathway can have potent oncogenic effects.

MA INT 4. Structural analyses have revealed that the side chains of these anchor residues (along with secondary anchors) interact with polymorphic residues that define the binding specificities of a series of pockets (B through F) along the peptide-binding groove.

MA INT 5. Melkersson-Rosenthal syndrome (MRS) is a rare, noncaseating granulomatous disease that is characterized by a triad of facial paralysis, orofacial edema, and lingua plicata (scrotal tongue, or fissured or furrowed tongue).

MA INT 6. The concept of vascular or arterial age has been proposed in several previous studies.

MA INT 7. Elderly patients who may benefit from a multifactor intervention are difficult to identify because many are unaware of their increased risk of falling and do not report those issues to their physicians.

MA INT 8. Insulin plays a key role in the regulation of various aspects of cardiac muscle metabolism and function.

MA INT 9. In the present study, we examined sensitivity to ethanol's locomotor activating effects in a genetically heterogeneous rat strain (Sprague-Dawley) during the second postnatal week of life.

MA INT 10. Experiment 2 suggests that vapor ethanol exposure could exert differential hedonic effects depending on the schedule of administration.

MA MET 1. In brief, one round of amplification was performed, RNA samples were labeled with Cy3 or Cy5 dyes, and samples were hybridized to the Mouse Operon oligo set 4.0 Chip.

MA MET 2. Stable cell lines with bicistronic expression of bcl-2 and GFP or GFP alone were kindly provided by D. Wang (Wen et al., 2003).

MA MET 3. NP tissues were from 6 patients (3 men and 3 women) with AR associated NP, who ranged in age from 27 to 65 years with a mean of 49 years.

MA MET 4. The design, primary end points, and results of the ESCAPE trial have been previously published.

MA MET 5. The study protocol was in accordance with the Declaration of Helsinki and approved by the local ethics committee of our institutions.

MA MET 6.). The two genes are separated by approximately 30 Kb. We selected SNPs to tag haplotypes in the most diverse HapMap population (African) and to tag all haplotypes with a frequency of at least 0.5% using a double classification tree search algorithm (Zhang et al., 2004).

MA MET 7. Locations of cannulae were verified in 60- μ m coronal sections of paraformaldehyde-fixed tissue stained with thionin.

MA MET 8. . Pups representative of both pre-exposure conditions (ethanol or air) were assigned to one of two conditioning groups (SAND+ or SAND?, see Fig. 3).

MA MET 9. E. coli XL-1 Blue (Bullock et al., 1987) was used for propagation of the expression vectors.

MA MET 10. Hamsters were weighed prior to the start of experiments and sorted into groups of five hamsters per cage so that mean cage weights across the entire experiment varied by less than 5 g.

MA RES 1. After getting the result of severe axonal degeneration on EMG, facial nerve decompression via transmastoid approach was performed.

MA RES 2. We had previously observed a 4-fold increase in the expression of AR comparing FGF10 to control grafts (Figure 4A).

MA RES 3. The signaling properties of the R834Q substitution were compared to those of the most frequent AL mutation, D835Y.

MA RES 4. Mice transplanted with BCR-ABL-infected β -catenin $^{\Delta/\Delta}$ cells displayed a markedly different course of disease.

MA RES 5. To further explore a potential role for E47 in the modulation of V β chromatin accessibility, we assessed histone H3 acetylation throughout the TCR β locus by chromatin immunoprecipitation (ChIP), and then real-time PCR, by using primers located in the V β , D β , and J β regions, as well as the TCR β enhancer (E β).

MA RES 6. To examine the effect of loss of TGFBI expression on paclitaxel sensitivity, stable transfected cell lines expressing short interfering RNAs (siRNA) against TGFBI were generated from the parental SKOV-3 line.

MA RES 7. Twenty-nine patients achieved hemostasis within 10 minutes of product application (96.7% success rate; 1-sided 95% CI, 85.1%–100%).

MA RES 8. In Figure 2, we illustrate the difference between arterial age and observed age, across increasing CAC values. As expected, for large CAC values, arterial age tends to be higher than observed age, and for low values of CAC, arterial age is lower than observed age.

MA RES 9. Ethanol has been shown to decrease the mRNA levels of insulin-signaling molecules of IR- β and IRS-1 in a dose-dependent manner.

MA RES 10. All 38 subjects had fevers of ≥ 100.5 °F and an abnormal laboratory finding of either thrombocytopenia, proteinuria, or an elevated serum creatinine.

MA DIS 1. It appears that E proteins are regulating, perhaps directly, two sets of genes.

MA DIS 2. The activating mutations identified in our study conferred varying degrees of sensitivity to the small-molecule TK inhibitor PKC412.

MA DIS 3. Our results suggest that the ECM protein TGFBI modulates paclitaxel response via regulation of microtubule stability.

MA DIS 4. Chemokine CCL20 is a group of cytokines that have chemotactic effects on various white blood cell subtypes such as neutrophils, monophils, and lymphocytes. According to the number and arrangement of conservative cysteine of chemokine N β , they are classified as 4 subtypes: CXC, CC, C, and CX3C.

MA DIS 5. In agreement, groups D and H, receiving more conventional diuretic doses, showed reductions in diuresis associated with higher neurohormonal values and a higher incidence of readmissions.

MA DIS 6. Future studies are needed to evaluate whether the observations in the present animal studies can be translated into humans. If heparin is confirmed to play a confounding role on PAPP-A levels, the prognostic role of PAPP-A in patients with AMIs must be reevaluated. In this case, previous investigations of the value of PAPP-A in patients with AMIs must be interpreted cautiously because heparin treatment has not been considered as a possible confounder. [

MA DIS 7. Our findings suggest that genetic variation within HTR3B may influence vulnerability to develop AUD with comorbid ASPD. Consistent with this idea, the 5-HTR3R antagonist ondansetron appears to be effective in the treatment of early onset alcoholics who frequently have ASPD.

MA DIS 8. Importantly, we found that GDNF acts as a potent inhibitor of excessive ethanol drinking.

MA DIS 9. This profile is different from that of Experiment 2, where DS pups given ethanol-sandpaper pairings preferred the CS compared to their specific controls.

MA DIS 10. The real-time PCR assay can overcome the shortcomings of PRA. The test is not affected by variation in virus loads.

SA INT 1. A number of studies focus on cross-national variations in chemical emissions and natural resource consumption (e.g., [Burns et al., 2006], [Jorgenson, 2003], [Jorgenson, 2004], [Jorgenson, 2005], [Jorgenson and Rice, 2005], [Rudel, 1989] and [Wheeler, 2001]) and the role international trade plays in shaping the global environmental landscape ([Clapp and Dauvergne, 2005], [Jorgenson and Rice, 2005] and [Rice, 2007]).

SA INT 2. Experiments have shown that respondents to surveys are more likely to offer socially desirable answers and to demonstrate acquiescence in the presence of an interviewer than in the self-administered situation ([de Leeuw, 1992], [de Leeuw, 2005] and [Schuman and Presser, 1981]).

SA INT 3. Hypothesis 3: Establishments with a greater proportion of recently hired workers have greater earnings inequality within the organization.

SA INT 4. In addition to contributing to work that focuses on genetic influences, sociologists may also be interested in incorporating the advances in molecular genetics into sociological thinking. Genes may be an important component of outcomes relevant to sociologists.

SA INT 5. The outcome we study is not trivial. State legislatures decide many important redistributive policies including decisions about the presence of Right-to-Work laws that weaken unions, the generosity of welfare policies, and the distributive effects of state tax codes (Lenz, 2004).

SA INT 6. Davis and Silver (2003) reported a gap of 1.07 items between black and white respondents who were tested by white interviewers (as perceived by the respondents).

SA INT 7. Religion is also multidimensional. Group affiliation, beliefs, and practices are all religious dimensions along which individuals vary widely. Individuals also vary as to the importance of religion in their lives, a concept usually called religious salience.

SA INT 8. In 1996, 23 out of 64 countries with below-replacement fertility had policies to raise fertility ([Tsuji, 2001] and [Caldwell et al., 2002]).

SA INT 9. There exist, of course, a multitude of theoretical perspectives on globalization, ranging from Ritzer's (1993) unstructured 'McDonaldization' to Robertson's (1995) semi-structured 'glocalization' to Castells' (1996) highly structured 'network society.'

SA INT 10. Few topics in social science have seen as rapid a growth in research and writing in recent years as multiraciality. The resulting literature is diverse and crosses multiple disciplines, but most of this work can be categorized as engaging one of three major topics: racial identity and identification, psychological well-being, and racial stratification.

SA MET 1. We were able to collect an average of 13.29 years of overlapping trade and CO2 data for each nation.

SA MET 2. A total of 728 households (36%) reported accessing the web within the previous 30 days, or subscription access to American Online (AOL), CompuServe, or Prodigy. These respondents were asked,

SA MET 3. Indices 1–4 represent an assessment of government policy on the insurgency and Index 5 characterizes the influence of the insurgents on the overall system.

SA MET 4. Our sample starts with 1247 pairs of sibling pairs that includes all MZ twin pairs, DZ twin pairs and full sibling pairs.

SA MET 5. The effects of such changes in national politics are removed by including year-specific dummies.

SA MET 6. The Huber/White sandwich estimator was used to correct variance estimates for the clustering of multiple respondent observations within interviewers (Stata Corporation, 2001, pp. 254–258).

SA MET 7. Later in the survey, respondents were presented with a series of statements about their relationships with their parents.

SA MET 8. Because data for child care services have only been gathered recently, the effect of child care on older women may be overestimated in the sample.

SA MET 9. One way to address the possibility of endogeneity is to study inequality change, rather than inequality itself.

SA MET 10. To form respondent racial categories from the parents' races, we first created categories of race for each parent from the home survey similar to the self-identified categories for adolescents, discussed above.

SA RES 1. Before examining the results of the multivariate analyses, we first present Table 2, which has the descriptive statistics for each of the four ethnic and racial subgroups represented in our sample.

SA RES 2. Panel A of Fig. 1 shows the variance in the mean log-wage across the 42 two-digit industries.

SA RES 3. System Dynamics combines the theory, methods, and philosophy needed to analyze the behavior of systems in management, environmental change, politics, economic behavior, medicine, engineering, and other fields.

SA RES 4. Again, the model fit is good according to the RMSEA. We first see a strong and significant effect of the parents' norms.

SA RES 5. Table 3 presents estimates from three regression models for each of the three racial contrasts (Black-white, Hispanic-white, and Asian-white).

SA RES 6. In Table 4, we display this same set of analyses for the restricted working class schema.

SA RES 7. The chi-square statistic is significant and both the IFI and TLI are near the acceptable range of 0.90.

SA RES 8. Overall the combined influence of religiosity is substantial.

SA RES 9. To this point, we have not controlled for other factors that may be related to popularity of students.

SA RES 10. Indeed, a pivotal part of the Koori Mail's social injustice frame was the definition of the group who were suffering the injustice.

SA DIS 1. Clearly, these data indicated that U.S. consumption practices have important implications for world production of CO₂.

SA DIS 2. Limitations of this study need to be recognized.

SA DIS 3. This could only be overcome by a linkage of organization-level data to individual-level data.

SA DIS 4. The question of where kinship norms come from is an important yet underanalyzed issue in the growing research on family solidarity.

SA DIS 5. These results and the other studies that detected historically contingent relationships with interactive specifications suggest that scholars who have criticized statistical methods because they ignore the contingent nature of historical change may have been guilty of overstatements.

SA DIS 6. One disadvantage of this study is having a small sample size, especially in the number of black respondents interviewed by blacks and the number of white respondents interviewed by blacks, but the results presented in this study are not novel.

SA DIS 7. While affiliation discord was less important as a predictor, we did find that affiliation is an important moderator of other religious associations with parent-child relational quality.

SA DIS 8. Our second longitudinal theory highlights the importance of political climate.

SA DIS 9. While our results indicate that multiracial individuals are not less popular than their single-race peers, we also note that this does not necessarily imply that there are no social adjustment problems resulting from a multiracial background, or that multiracial individuals may not face occasional social rejection from members of single-race groups.

SA DIS 10. Why do translocal organizations excel at political mobilization? Skocpol (2003, p. 256) asserts that translocal groups historically “expressed broadly shared identities and values, engaged in raucous conflict with one another, and linked local people to state, regional, and national centers of power.

SD INT 1. Within criminological conflict theory is the conflict model of lawmaking.

SD INT 2. . The elite also likely saw these crowds as a potential threat to social order and to state power, both of which were called into question by the rowdy behavior of spectators, though never really compromised...

SD INT 3. Some critics of the current war have compared it to the Vietnam conflict, which ultimately had little popular support, and confirmed Sherman’s conclusion that “war is hell” (Hutcheson, 2003; Odom, 2006).

SD INT 4. Follow-up studies examining the results of NVVRS also indicate other key risk factors contributing to PTSD in this study group.

SD INT 5. They suggest it is not only individuals’ own attitudes that play a role in marriage decisions, but also the views of those surrounding the couple.

SD INT 6. States have a number of policy tools at their disposal.

SD INT 7. This entails a recursive social process of the sort envisioned by symbolic interactionists.

SD INT 8. The findings from these studies are rich and varied, especially in regard to institutional responses to changing social and structural conditions, the changing nature of denominational affiliation, the different fates of mainstream and evangelical churches, and the extent of local churches’ provision of social services.

SD INT 9. Following from the previous studies, I used a policy capturing design to examine how job applicants form their employer attractiveness perceptions and job acceptance intentions based upon different configurations of multiple aspects of CSR, focusing on economic, legal, and ethical social responsibility.

SD INT 10. In summary, prior research has suggested that a wide variety of organizational, recruiter, and job attributes may influence organizational attraction.

SD MET 1. In selecting newspapers for examination, consideration was given to their political orientations. Justification for this lay in the possibility that differences in how execution methods were literally constructed may depend upon the liberal or conservative slant of the media organization.

SD MET 2. Aside from providing hints at locating government documents and reports, early newspaper accounts reveal names of persons involved in important social issues.

SD MET 3. Examination of the Senate Judiciary Committee III file revealed statements from physicians who had read eyewitness accounts of execution by lethal gas.

SD MET 4. Psychological resilience has been characterized by the ability to bounce back from negative emotional experiences and by flexible adaptation to the changing demands of stressful experiences.

SD MET 5. The interview is not used as a question/answer agenda but as a “dialogical reflection” of the researcher and participant working together (Langenbach, Vaughn, & Aagaard, 1994).

SD MET 6. . For the United States, I use data from the Panel Study of Income Dynamics (PSID).

SD MET 7. In this macro level analysis, I am interested in various aspects of policy context.

SD MET 8. In a second step, I also account for changes in the individual and labor market characteristics, to obtain the net effect of entering marriage on earnings, including the measures for the German and US data described above.

SD MET 9. . Individual congregants were the key unit of analysis.

SD MET 10. At the Cantonese congregations, although my Cantonese is very limited, I made a point of speaking a few sentences in Cantonese.

SD RES 1. Prior to discussing North Carolina's distinct execution history, it is pertinent that a brief history of execution method shifts in the United States be provided.

SD RES 2. Espousing humanitarian concerns, reformists were able to have a somewhat productive impact on the treatment of prisoners and the conditions within penitentiaries and correctional facilities across the country (Bohm, 1999; Link, 1992; Walker, 1998).

SD RES 3. The News & Observer has historically contained a small informational column entitled "Under The Dome", which attends to business of the State's Legislature which is housed in a domed building downtown.

SD RES 4. In a style reminiscent of the 1935 transition, Maddrey urged, "North Carolina has a tradition of progressiveness, of looking forward, of maintaining as high ideals as possible..." (ibid.).

SD RES 5. To summarize this important point, the construction of the lethal gas chamber in the 1935 legislature relied solely on the use of scientific language and terminology.

SD RES 6. Although James plays down the significance of medals he said he also did not do anything that he considered immoral.

SD RES 7. He focuses on the positive aspects of his life experiences.

SD RES 8. None of the economic factors reaches statistical significance.

SD RES 9. This study discusses rituals at varying levels of complexity.

SD RES 10. However, this study finds that ABC congregations are more conservative than Chinese congregants in rejecting the equality of religions, but less likely to select the most literal choice of the hermeneutics question (see Table 5-4).

SD DIS 1. While functionalism is a viable theoretical perspective in examining the meaning of execution ritual, interactionism and dramaturgy were considered more suitable perspectives for this study, and thus will remain the primary features of this discussion.

SD DIS 2. The social constructivist paradigm carries with it a unique set of criteria by which to evaluate the quality and integrity of qualitative sociological research.

SD DIS 3. Wardell was the most highly decorated soldier of the six participants studied and seemed almost embarrassed by the awards.

SD DIS 4. This dissertation explored the context and consequences of marriage through an examination of marriage earnings differences for men and women in crosssectional and longitudinal perspective, and the analysis of marriage formation and timing at the aggregate level.

SD DIS 5. It is from this social context and predisposing conditions that most contemporary Chinese recruits in New England enter Chinese Christian churches. There, they encounter the ideology of the church and its members' behavior, mostly in the form of interaction rituals.

SD DIS 6. Those who were not attracted by the “loving” qualities of other congregants tended to either drop out or to convert more slowly.

SD DIS 7. It is more profitable to consider how strictness in this or that regard shapes the interactional routines of the congregants.

SD DIS 8. Whatever Agape is or could be, this study assumes that it is intuited by congregants in the context of interaction rituals.

SD DIS 9. . Church activities increase members’ awareness of the cares and concerns of other members, recent converts, and recruits.

SD DIS 10. Considering the similarity of the decision task between Einhorn’s and my study, it is possible that job applicants use a conjunctive model rather than a multiplicative model in their organizational attraction decision making process.

Appendix D: Sample of 'in'

MA INT 1. Several lines of evidence indicate that altered expression of the FGF/FGFR signaling axis may be important in prostate pathology.

MA INT 2. The development of genetically engineered mouse (GEM) PCa models can help dissect the role of the FGF axis in disease progression in a physiological setting.

MA INT 3. In the present study, we demonstrated that TCR γ gene rearrangement in fetal thymocytes was perturbed by the E47 deficiency in a dosage-sensitive fashion.

MA INT 4. In combination with Thrombin-JMI (distributed by Jones Pharma Inc, Bristol, VA, a wholly owned subsidiary of King Pharmaceuticals, Briston, TN), this mixture allows intimate tissue contact and conformation to an irregular wound bed, such as an abraded sinonasal mucosal surface after sinus surgery.

MA INT 5. Diabetes mellitus (DM) and chronic kidney disease (CKD) are common co-morbidities in heart failure (HF) and are known to be associated with poor outcomes

MA INT 6. We aimed to describe the time demand patterns at our local ED during a 3-year period. This will allow us to prepare a demand analysis and, in subsequent phases, to apply SSM to tailor ED manpower to demand.

MA INT 7. Alcohol has multiple effects on metabolism, including changes in energy intake (Armellini et al., 1993).

MA INT 8. The flow of information through the amygdala starts with cortical and thalamic input into the lateral and basolateral nuclei, then proceeds from there through efferent projections to the central nucleus of the amygdala, bed nucleus of the stria terminalis, and the nucleus accumbens (De Olmos et al., 1985).

MA INT 9. Pre-exposure to ethanol facilitates the expression of first-order ethanol-mediated conditioned preferences, as observed in adults (20 days or more of prior exposure: [Bienkowski et al., 1995] and [Reid et al., 1985]) and infant rats (Pautassi et al., 2007).

MA INT 10. For example, the prototype strain CVB3 Nancy often used in antiviral studies as well as CVB3 Nancy variants are naturally pleconaril-resistant ([Pevear et al., 1999] and [Schmidtke et al., 2005]).

MA MET 1. BaF3 cells were maintained in RPMI-1640 supplemented with 10% fetal calf serum and 10% WEHI-conditioned medium as a source of IL-3.

MA MET 2. The structures of the two copies of BF2*2101-10-mer in the crystallographic asymmetric unit were essentially identical, as was the BF2*2101-11-mer (Table 1).

MA MET 3. The obtained cell suspension was continued in the same culture condition.

MA MET 4. Angina was classified, except in the setting of myocardial infarction, as definite, probable, or absent.

MA MET 5. The ratio, $100 \times (\text{mean fluorescence intensity of PGE1} - \text{mean fluorescence intensity of ADP} + \text{PGE1}) / \text{mean fluorescence intensity of PGE1}$, is expressed in this study as a VASP index corresponding to a ratio of the VASP phosphorylation of activated platelets versus at-rest platelets and expressed as a percentage of platelet reactivity.

MA MET 6. To evaluate the potential impact of ethnic substructure on our association results, ethnic factor scores were compared between cases and controls in the Finnish population using the χ^2 test.

MA MET 7. These neurons represent 90–95% of the neurons in the BLA (McDonald, 1982).

MA MET 8. The aerial parts of *H. cordata* were collected at Gyeongsangnam-do Agricultural Research & Extension Services, Korea, in August 2004.

MA MET 9. The nitrocellulose membrane was blocked for 1 h with 5% skimmed milk (Oxoid, UK) at 37 °C, incubated with the hyperimmune serum diluted in phosphate buffered saline (PBS) for 1 h and washed with PBS-0.1% Tween-20 (PBST).

MA MET 10. . The Mann–Whitney test (two-tailed) was performed to analyze the differences in mean virus titers and serum ALT levels.

MA RES 1. Altered expression of *Gfi1*, *Mad111*, and *Foxo1* in *Tcf12f/fTcfe2af/fCD4Cre+* DP thymocytes was also confirmed by quantitative RT-PCR (Figure 5B).

MA RES 2. In type 1 EN tumors, the K5+ basal/myoepithelial cells, in addition to the K8+ luminal cells, are part of the tumor epithelial cell population.

MA RES 3. Therefore, extended iFGFR1 activity leads to the development of sarcomatoid carcinoma-like tumors, suggestive of a role of FGFR1 in an epithelial-to-mesenchymal transition in transformed epithelial cells or, alternatively, an increase in mesenchymal cell proliferation.

MA RES 4. On the other hand, the titers of primary IgG1 antibodies in miR-155 deficient mice were reduced to 20% of WT controls when NP17-BSA was used as the capture antigen (Figure 1B, middle).

MA RES 5. Crystals of BF2*2101-11-mer and BF2*2101-10-mer grew in the space groups P212121 with one molecule per crystallographic asymmetric unit and in P21 with two molecules in the asymmetric unit, respectively.

MA RES 6. Incubation of TGFBI-KD cells in serum-free media conditioned with rTGFBI also resulted in a significant reversal of paclitaxel resistance

MA RES 7. The histologic diagnoses were SCC in 10 patients (83%) and ACC in 2 patients (17%).

MA RES 8. In terms of risk categories (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified into a different risk set using arterial age in place of observed age (16% would go to a lower risk stratum and 12% to a higher risk stratum).

MA RES 9. However, there were no statistic differences in group L (10.3%, $P > .05$).

MA RES 10. Hypotension (defined as systolic blood pressure less than 90 mm of mercury), present in two individuals when IV ribavirin was initiated, was managed with fluids and vasopressors, and resolved within 24 h.

MA DIS 1. For instance, since MaSCs can give rise to both luminal and myoepithelial cells, one would expect to see mixed cell types in breast cancer if MaSCs represent the predominant cellular origin, yet most human breast tumors exhibit phenotypes of luminal epithelial cells (Sorlie et al., 2001).

MA DIS 2. We also observed an increase in the expression of several Wnt axis members after iFGFR1 activation, including *Fzd4*, capable of inducing β -catenin (Xu et al., 2004).

MA DIS 3. The observation that HLA-E bound to peptides with Ala, Tyr, or Lys at P8 interacts with CD94-NKG2A with low affinity suggests a role for this residue in governing the specificity of the interaction.

MA DIS 4. Our findings of 20 CCNF patients with 10 presenting with thoracic extension are an alarming reminder for physicians who practice in such locations to consider not only common presentations of rare diseases but rapid deterioration of serious conditions.

MA DIS 5. As in all observational studies, we cannot rule out bias due to imbalance in an unmeasured covariate.

MA DIS 6. The present study suggests that a tailored clopidogrel LD according to platelet reactivity monitoring decreases the rate of stent thrombosis in patients undergoing PCI.

MA DIS 7. In the present study, alcohol use was prospectively examined at 6-month intervals using a comprehensive, validated instrument.

MA DIS 8. Importantly, GDNF was highly effective in reducing heavy drinking after a short period of deprivation.

MA DIS 9. IV Ribavirin was demonstrated to decrease severity of disease from HFVS in animals, where disease severity has correlated with viral burden ([Kanerva et al., 1998], [Zhang et al., 1987] and [Zhang et al., 1993]).

MA DIS 10. Such possible failure in cross-reactivity has been already described (Schirmer et al., 1999).

MD INT 1. The tegument of a herpesvirus virion is defined as the space between the inner surface of the envelope and the outer surface of the capsid in a mature particle.

MD INT 2. In contrast, methylation of histone H3 residues K9 and K27 and of histone H4K20 is associated with repressed chromatin.

MD INT 3. The mechanism of RA in inducing neural commitment from stem cells in vitro was investigated by Berg and McBurney, where they revealed RA can be present for as short as 2-4 hours and still be effective in inducing the irreversible neuronal differentiation of P19 EC cells (Berg and McBurney, 1990).

MD INT 4. Agents have been discovered which inhibit specific processes in the virus life cycle including inhibitors of HCV enzymes as well as nucleic acid based molecules that interfere with the viral RNA.

MD INT 5. The only animal capable of being infected with HCV is the chimpanzee. HCV was shown to be transmissible to chimpanzees many years before the discovery of the virus in 1989.

MD INT 6. PSA was first discovered in 1970 by Ablin et. al (13) and later purified and characterized in 1979 (14) and finally detected in serum in 1980 (15).

MD INT 7. Patients were identified in the hospital and approached for consent to participate in the study.

MD INT 8. It has been found that the M-current in the neurons is subserved by KCNQ2 and KCNQ3 potassium channel subunits (Wang et al., 1998) and consequently, dysfunction of these subunits results in epileptic disorders.

MD INT 9. In the graph on right side of figure, unbroken line indicates theoretical blood pressure (BP) of the population that is not affected by factors that increase BP; the shaded area indicates SBP in the hypertensive range.

MD INT 10. An imbalance in the stoichiometry of protein complex subunits as well as improper folding of proteins lead to activation of the heat shock response in tumours which is evidence of proteotoxic stress.

MD MET 1. Cells were maintained either in DMEM or WME media (as specified).

- MD MET 2. For deletion of hDaxx ATRX-interaction domain PAH1, mutagenesis by the gene splicing approach described in (Heckman & Pease, 2007) was performed.
- MD MET 3. The following method for infection of the cells seeded into appropriate tissue culture dishes was used throughout the experiments, unless otherwise specified for particular HCMV infection assays.
- MD MET 4. The cell pellet in PBS was centrifuged at 300g for 5 minutes, washed in PBS, counted and centrifuge as before.
- MD MET 5. Immunofluorescence (IF) analysis in this project was carried out to study the distribution of HMGN proteins and the expression of neural and glia markers.
- MD MET 6.). The aqueous (top) layer was placed in a fresh centrifuge tube and 0.1 volumes 5 M NHOAc added along with 3 4 volumes 100% ethanol.
- MD MET 7. In addition, data obtained from patients' records were recorded and stored in adherence with the Data Protection Act 1998.
- MD MET 8. High quality DNA was extracted in Glasgow for all participants on an Autopure LS DNA extraction system from Qiagen.
- MD MET 9. The beta coefficient estimate and standard error for each study were entered into the analysis, which produced a global (i.e. average) OR and associated 95% confidence interval.
- MD MET 10. Treated or untreated cells were washed twice with cold PBS (on ice) and lysed in RIPA or TNN buffer containing protease inhibitors (Sigma).
- MD RES 1. Confocal immunofluorescence analysis of the ATRX-depleted cell lines was performed in order to confirm the efficiency of a knock-down and to analyse localisation of other ND10 proteins, such as the major ND10 component PML and the ATRX-interacting protein hDaxx.
- MD RES 2. HD-ED cells were infected with dl 1403 strain at MOI 1.2, infection was allowed to proceed overnight and the cells were processed for FRAP analysis, as described in Materials and Methods (Chapter 2, Section 2.5.2.5).
- MD RES 3. The rate of neuronal differentiation in P19 EC cells is RA dosage- dependent (Edwards and McBurney, 1983).
- MD RES 4. These results raise several questions about the role HMGN3 in P19 EC cells and whether it acts through a different mechanism compared to HMGN1 and HMGN2.
- MD RES 5. Most GST-DDX3C remained bound to the beads but sufficient protein was eluted for use in ELISA.
- MD RES 6. To confirm the presence of virus and cellular localisation of DDX3, passaged cells were grown for 72 hrs before being washed with PBS and fixed in methanol.
- MD RES 7. However, previous studies in our lab have shown that VN/124-1 may provide inhibitory effects in resistant cells.
- MD RES 8. For statistical analysis animals in the control group were observed over 29 days, in the VN/124-1 and bicalutamide groups - for 37 days, and three groups with everolimus administration were on the study for 43 days.
- MD RES 9. SNP data were screened within BeadStudio using a two step procedure.

MD RES 10. The results shown in Figure 4.4 confirmed the previous results obtained HCT116 cells.

MD DIS 1. Within the three different cell lines generated in this part of the study, namely cell lines depleted of hDaxx, or expressing hDaxx PAH1 or hDaxxMSIM, ATRX had a dispersed localisation pattern.

MD DIS 2. These results however neither provide evidence for the mechanism of action of the ATRX/hDaxx complex, nor suggest that the ATRX/hDaxx complex may be directly involved in the assembly of repressed chromatin structures on viral genomes.

MD DIS 3. Thus, HMGN1 and HMGN2 appear to have some redundant functions, particularly in the regulation of pluripotency-related genes, but they also have isoform-specific roles in the regulation of some neuronal lineage genes.

MD DIS 4. Leptomycin B mediated blockage of the CRM1 export pathway causes a build-up of DDX3 in the nucleus.

MD DIS 5. Adequate self-care requires skill in performing routine self-care maintenance behaviors.

MD DIS 6. In addition, differences in decisional conflict between consult groups also could not have been found.

MD DIS 7. Lamotrigine is better tolerated in terms of withdrawal due to side effects compared with gabapentin and carbamazepine without significant difference in rates of seizure freedom during the first 12 months of treatment (Rowan et al., 2005).

MD DIS 8. The hope for achieving a state of complete seizure control is always there although small as in the work of Sillanpaa who demonstrated that remission of seizures can be achieved after a period of as long as 30 - 35 years after the diagnosis (Sillanpaa, 1993).

MD DIS 9. However they differ in SNP selection strategy.

MD DIS 10. For complex traits it is likely that whole exome sequencing will be performed in a subset of participants and then followed up with validation sequencing of regions of interest in a larger sample.

SA INT 1. While the racial (or minority) threat thesis has been conceptualized as multidimensional (Eitle et al., 2003), one conceptualization emphasizes the criminal threat of Blacks and other minorities in understanding the actions of the state against minorities (Liska and Chamlin, 1984).

SA INT 2. Freeman (1988) argues that an important source of the decline of unionization in the US is the anti-labor tactics of management.

SA INT 3. The changes executed by Uribe in 2002 were realized in full between 2003 and 2006.

SA INT 4. The data we use come from a recently collected large multi-actor survey among respondents in the Netherlands.

SA INT 5. Moreover, the scale at which segregation is measured will determine the extent of segregation observed—a measure of the variation in racial composition among street blocks will not reveal the extent to which racial composition varies among regions of the country; likewise, a measure of the variation in racial composition among regions will not reveal the extent to which the average block differs from the next.

SA INT 6. Although Frank presents an engaging account, his book is not based on systematic evidence to substantiate his claim that a large scale shift in electoral behavior has truly occurred.

SA INT 7. By contrast, theories of authoritarianism predict that, in the face of threat, authoritarian sentiment should grow (Adorno et al., 1950).

SA INT 8. Beyond those women who decided to run for public office, women in general were also more likely to see the political under-representation of women as a problem.

SA INT 9. Yet this prediction alone cannot serve as the basis for formulating hypotheses about systematic differences in attitudes, as definitions of patients' best interests may heavily depend on specific circumstances of each particular case.

SA INT 10. In Australia, outlaws are known as 'bushrangers'.

SA MET 1. They argued that Cubans (in Miami) have been advantaged relative to Mexicans (in cities such as San Diego) because of the differences in resources that the initial Cuban immigrants possessed, the differences in federal government assistance for Cuban immigrants, and the resulting social capital differences derived from such advantages (Martinez et al., 2004, p. 153)

SA MET 2. Differentiated rates of change in wages across industries over time are represented by the random slope for TIME and its variance, ψ_{22} .

SA MET 3. They find that individuals who do not state racial preferences in their profiles nevertheless tend to discriminate against members of different racial groups (Hitsch et al., 2006).

SA MET 4. To test the hypotheses about direct norm transmission, we include the kinship norms of the parent, which were measured in exactly the same way as they were measured for the two siblings.

SA MET 5. In this paper, we describe patterns of change in segregation for the 100 most populous metropolitan areas (as of the 2000 census) in the U.S.

SA MET 6. Husband and wife differences in religious beliefs are measured using three dummy variables:

SA MET 7. We adapt a predictive modeling strategy to the problem of identifying increases in trust in government following the 9/11 attacks.

SA MET 8. However, due to the exclusion from the analysis of people who were unhealthy in the base year, the results presented in the study should be viewed as 'conditional' (upon being healthy in the base year) and may not be generalized to the entire older population.

SA MET 9. Two studies undertaken by the writers in 2001 and 2005 examined employment and education access for rural and remote young people.

SA MET 10. Members of local organizations should be most involved in their group, followed by members of translocal and then national organizations.

SA RES 1. In addition to the analyses reported, we also consider the possibility that predictors of the fear of specific crimes may have differential effects, consistent with recent research (e.g., [Ferraro, 1995] and [Rountree, 1998]).

SA RES 2. When breaking down the organizational variables into the effects of unionization, casualization, globalization, and downsizing, Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).

SA RES 3. The number of MZ-twin pairs is small in part because we are able to include a twin pair in the analysis only if information is available for both members of a twin pairs as well as for the friends of both members of the twin pair.

SA RES 4. The increases in segregation that we observe are slightly larger, on average, than those reported by other studies.

SA RES 5. In Table 2, we present the effects of the broad and restricted White working class variables with no controls.

SA RES 6. We begin our analysis of women in state legislatures by testing the null hypothesis that women's political participation increased linearly over time.

SA RES 7. Although formal education did not affect these attitudes directly, the educational upgrading taking place in Australia did have implications for views concerning voluntary euthanasia.

SA RES 8. The markers on the middle lines represent race group mean differences in log popularity after controlling for individual and school characteristics.

SA RES 9. . This is clearly evident in media reports where the attack is interpreted in relation to Australia's 'exceptional' self-identity as the 'lucky country'

SA RES 10. The data from the General Social Survey reveal the declining inequality in educational attainment among blacks and whites, a decline that could be attributed to a virtuous cycle.

SA DIS 1. There may, in fact, be other relevant variables that are not included in the models presented in Table 1 and Table 2.

SA DIS 2. Differentiating between employees in terms of their bargaining power in the employment relationship has also been a well known theme in labor market sociology ([Kalleberg et al., 1981], [Sørensen and Kalleberg, 1981], [Sørensen, 1994], [Halaby and Weakliem, 1993] and [Sakamoto and Chen, 1991]).

SA DIS 3. In contrast to the varied positions Asians and blacks encounter in white men and women's racial hierarchies, Latinos are the most included out-group for both white men and women.

SA DIS 4. In this study we examined the consequences of marital dissolution on psychological well-being over the five-year period between the two waves of the National Survey of Families and Households.

SA DIS 5. The increases in Hispanic-white and Asian-white segregation are driven primarily by increases in macro-scale segregation.

SA DIS 6. Finally, public policy initiatives—including secular programs that aim to strengthen marriage or relationships—presumably can learn from the strong role that religion apparently plays in the marital lives of some low-income couples (see [Lambert and Dollahite, 2006] and [Brown et al., 2008]).

SA DIS 7. In general, our initial model reflects the available literature on individual citizens' trust in government.

SA DIS 8. Results may thus be interpreted as causal when they are, in fact, panel-specific or period-specific.

SA DIS 9. Like Kelly, Hall and Ward enjoyed sympathetic support from the locals in the areas in which they ranged

SA DIS 10. The 20th century began with dramatic gaps in educational attainment (Myrdal, 1944) and in the southern US rising inequalities in school funding.

SD INT 1. When speaking specifically to legislative shifts in execution methods, there is little or no evidence within the literature which indicates that modes of punishment were designed or adopted to be exclusively used against one particular group or race of individuals, particularly in the post-industrial United States.

SD INT 2. These were disgusting spectacles to the social elite, in no small measure because the crowds drawn to them came for the crass carnival atmosphere rather than any serious moral or civic purpose.

SD INT 3. Notably, anti-war sentiment and protests have continually increased since the beginning of the war in March 2003.

SD INT 4. Even though many veterans showed signs of PTSD and had difficulty adapting to their post war life, what was discovered in over 100 life adjustment indices was that a majority of Vietnam Veterans successfully reentered civilian life and were not having severe negative psychological effects because of their military service.

SD INT 5. Axinn and Yabiku (2001) identify a crucial association between attitudes and transitions into marriage at the neighborhood level.

SD INT 6. . The male breadwinner model, which is prevalent in many conservative countries, assumes or encourages the notion that the husband supports the family and the wife focuses on domestic responsibilities.

SD INT 7. The identity concerns he addresses are not mere fancy; they have real consequences in shaping a community and the behavior relevant to that community.

SD INT 8. The findings from these studies are rich and varied, especially in regard to institutional responses to changing social and structural conditions, the changing nature of denominational affiliation, the different fates of mainstream and evangelical churches, and the extent of local churches' provision of social services.

SD INT 9. I posited that each aspect of CSR would explain unique variance in job applicants' attraction to organizations.

SD INT 10. Bretz and Judge (1994) manipulated two job attributes (pay level and promotional opportunities) and four human resource system variables (reward system, mobility system, justice system and work-family system) in a policy-capturing study.

SD MET 1. Thus, the mention of organizations, persons, offices, and institutions can serve as a logical plan of inquiry in collecting and perusing historical primary data.

SD MET 2. This document was located in Ehringhaus' correspondence with the Highway and Public Works Commission, Prison Department.

SD MET 3. With the advent of a new method of execution in 1983, it was likely that the seated Governor made some type of reference to capital punishment in his speeches or addresses to the North Carolina General Assembly, or to other agencies during his term.

SD MET 4. Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress--such as family and relationship problems, serious health problems, or workplace and financial stressors.

SD MET 5. However, to participate in this research project, all participants must have earned a minimum of a four-year college degree and must identify themselves as successful.

SD MET 6. I examine the economic implications of marriage using individual level comparative data in Chapters 3 and 5.

SD MET 7. In the German data, tenure is measured in years, in the US data it is measured in months.

SD MET 8. This is not to suggest that the Chinese are especially polite in all respects; for instance, the tight relationship between manners and social hierarchy may at times offend the sensibilities of many Americans.

SD MET 9. In each of these cases only a handful of individuals were involved, although these other respondents could number as high as one fifth of a small church's congregants.

SD MET 10. . Fortunately, because only six envelopes were returned in this manner (out of the 286 total respondents for that congregation), the overall effect on the data is negligible.

SD RES 1. The suggested change was twofold – first, condemned prisoners were being allowed to choose the manner in which they died, which at times appeared to cause confusion and last minute changes of heart (Kruckman, 1921).

SD RES 2. However, a latent effect of this hyper-reporting, complete with vivid adjectives concerning the nature of the executions, was in all likelihood the main catalyst for an increase in negative public sentiment which was soon to follow.

SD RES 3. With indignant press reports, and scores of letters and telegrams opposing the method of execution, the State was placed in a defensive position insofar as preserving its justification for adopting lethal gas.

SD RES 4. In evaluating Hudson’s position, it becomes clear that his opposition to lethal injection hinged on the distancing between the State and the condemned.

SD RES 5. In order to describe how he adjusted to civilian life back in his hometown, Leroy talked about people he was hanging out with and what his plans were for the future.

SD RES 6. Marriage remains a central family institution, despite dramatic changes in the past few decades.

SD RES 7. This difference by church size suggests that although smaller churches may serve Chinese peoples’ interests in a way similar to hometown societies (tong-xiang hui), Christianity clearly represents a different form of institution.

SD RES 8. I found this to be true in my previous research, where I was able to observe great constancy in prayer meeting practice over several years.

SD RES 9. The results are expected to be loosely connected to the respondents’ point of view in making their initial decision, but more in the way of emphasis than strict conformity.

SD RES 10. I estimated an intercepts-and slopes-as-outcomes model in order to assess the impact of individual ethical predispositions on the intercepts and slopes obtained in the within-subjects analyses.

SD DIS 1. While this model is useful in sociological explanations of white-collar crime, organized mob activity, or political misconduct, it is somewhat insufficient in accounting for or addressing institutional acts which have no apparent malicious agency, such as the case presented in this study.

SD DIS 2. In constructivist-based qualitative research, this is referred to as transferability.

SD DIS 3. While in the hospital, he became addicted to morphine.

SD DIS 4. Since selection seems to be such a powerful factor in explaining marriage earnings differences at the individual level for both men and women, I want to investigate the extent to which cultural and economic conditions affect marriage crossnationally in my analysis of marriage formation and timing drawing on aggregate data over the past four decades.

SD DIS 5. In the case of Chinese Christians, the generally high degree of religiosity I have observed among congregants signals deep acceptance of the Christian social and moral order.

SD DIS 6. Incidentally, in the case of respondents who previously participated in traditional Chinese religious practices, such as worshipping ancestors or propitiating the Earth or Kitchen gods, a pattern emerges of greater previous participation among lower income respondents, as well as those with less education (see Table 7-4).

SD DIS 7. As we have seen throughout this dissertation, such activities are a central concern in the congregational life at almost any church.

SD DIS 8. Nonetheless, if church participants are bringing their selves into relation to each other vis-à-vis an agreed upon ideal, then rituals can be said to align divergent individuals with each other and with an ideology of some sort.

SD DIS 9. Further, the cost of a false positive in this situation would be expected to be high, i.e., choosing a job that turns out poorly would involve a high cost to the decision maker.

SD DIS 10. While this literature has been expanding (Turban & Greening, 1996; Greening & Turban, 2000), the present study offers the first comprehensive examination of the distinct aspects of CSR as they affect organizational attraction in a single study.

Appendix E: Sample Prepositions

TO

MA INT 11. It is during the DP stage when thymocytes undergo TCR α rearrangement to produce a mature α TCR. DP cells expressing a functional TCR, capable of recognition of antigen in the context of major histocompatibility complex (MHC) molecules, will receive a positive-selection signal and differentiate to the CD4⁺ or CD8⁺ single-positive (SP) stage.

MA INT 12. Special attention was given to the possibility that schedule of exposure to ethanol vapor would modulate ethanol-mediated motivational learning.

MA MET 11. In brief, one round of amplification was performed, RNA samples were labeled with Cy3 or Cy5 dyes, and samples were hybridized to the Mouse Operon oligo set 4.0 Chip.

MA MET 12. Nonidet P-40 detergent (NP-40) was added to a final concentration of 1% before PNGase F addition.

MA RES 11. We then quantitated DN c-Jun expression levels and compared these to virally transduced cells before transplantation (i.e., input).

MA RES 12. The pattern obtained pointed as well to the homogeneity of the self-assembled multimers.

MA DIS 11. In such cases, one reliable indicator of disease is that the pain is out of proportion to the physical examination or the cutaneous findings [13].

MA DIS 12. In this work, we showed that the di-halo-IAS RS2723, RS2913, RS2917 and RS1914 interact dynamically with the viral RT and selectively bind to the enzyme in complex with its template/primer and substrate.

MD INT 11. The model presented on this diagram, which applies to HCMV lytic infection, is consistent with the envelopment-development model of virion assembly.

MD INT 12. This is because phenytoin binds preferentially to the sodium channels in an inactivated state (Rogawski and Loscher, 2004).

MD MET 11. Pellets were resuspended in 20 ml of STET and transferred to 50 ml beakers.

MD MET 12. This does not reflect very extreme low blood pressure (unlike the cases who have very extreme high blood pressure) because in the adult population the blood pressure distribution curve is skewed to the right.

MD RES 11. The RNA sample used to study the expression these genes was similar to that use for Oct4 analysis (section 3.6.1).

MD RES 12. Cluster plots of the 119 SNPs with a GC adjusted P value $\leq 1 \times 10^{-4}$ were visually inspected, leading to the exclusion of 39 poorly clustered SNPs.

MD DIS 11. ATRX itself, on the contrary, is not required for hDaxx localisation to ND10, suggesting that hDaxx serves as the ND10-targeting component within the ATRX/hDaxx complex.

MD DIS 12. These findings are similar to those of Kwan and Brodie who observed a decline in the rate of developing complete seizure control following failure of the first treatment regimen (Figure 30) (Kwan and Brodie, 2000b).

SA INT 11. This investigation begins with a brief discussion of the history of scientific thought about CO₂ emissions and the global response to those emissions.

SA INT 12. Within Australia, access to production technologies such as video cameras, printers, home computers and community television stations has resulted in an explosion of Indigenous media products which can now be found in the domains of television, radio and print (Cottle, 2000; Meadows, 1998; Rose, 1996).

SA MET11. In theory, this variable should be negatively related to carbon production; that is, countries that ratify Kyoto should institute policies that slow or reduce their per capita CO₂ emissions.

SA MET 12. The SIDD3 includes methodologically standardized Gini coefficients for up to 141 countries for the period 1960–99.

SA RES 11. This methodology necessitated a revision to the basic model that can be found in Fig. 4.

SA RES 12. Responses to the four bushranger questions were summed to establish the 10 best-known bushrangers in Table 1.

SA DIS 11. These findings also indicate that policies designed to reduce U.S. contributions to CO₂ pollution are, perhaps, more important than might ordinarily be expected.

SA DIS 12. Seal (2002: 131) claims there is little mention of the armour in oral tradition, and attributes the ‘fascination’ to ‘books, films, poems, plays, even Nolan’s paintings’.

SD INT 11. If today’s veterans can see how Vietnam veterans succeeded, this information will assist in their transition to post war life.

SD INT 12. I posited that each aspect of CSR would explain unique variance in job applicants’ attraction to organizations.

SD MET 11. Using bound finding aids in the North Carolina State Archives, Governor Hunt’s entry was examined for any references to the death penalty.

SD MET 12. Although, the wording employed in the Chinese translation strongly implies conversion to Christianity (jue zhi), respondents to the English language survey may have included converts to other religions.

SD RES 11. In addition, letters from Adams Electric to the State Prison seemed to reflect a sense of frustration in not knowing the status of the prison’s intent for execution equipment.

SD RES 12. Chinese Christians do not openly criticize each other and then attempt reintegration of individuals who demonstrate adequate allegiance to church ideology.

SD DIS 11. I find do not find clear evidence that there is a ubiquitous marriage penalty for women that is directly comparable to the motherhood penalty that has been documented extensively.

SD DIS 12. The majority of the chapter is devoted to the interpretation of the findings reported in Chapter 4.

For

MA INT 13. TCR expression and selection are obligatory events for the development of SP cells that will then emigrate from the thymus to establish the peripheral CD4 helper and CD8 cytotoxic T cell compartments.

MA INT 14. In the past few years, new options for antiviral therapy have become available.

MA MET 13. For rate-zonal sucrose density gradients, five hundred microliters of samples containing VP60 from *P. pastoris* PVP12 strain were applied to a linear 10–30% (w/v) sucrose density gradient and centrifuged at 30,000 rpm for 90 min.

MA MET 14. B cells from five wild-type and five miR-155-deficient mice were cultured with LPS and IL-4 for 24 hr as described above, and RNA was extracted with TRIzol.

MA RES 13. After centrifugation, the sucrose gradient was fractionated and the individual fractions were assayed by immunodot for the detection of VP60, which was quantified by ELISA.

MA RES 14. Thus, genetic marking suggests that activation of EN by Cre rescues an otherwise transient subpopulation of MECs and maintains them and their progeny for subsequent steps in progression to frank malignancy.

MA DIS 13. The reduced binding and/or faster dissociation relative to the mutated forms, especially Tyr181Ile, which was observed for those inhibitors with bulkier substituents at that position with respect to RS1914, might be due to steric clashes which obstruct the entrance of the inhibitor into the NNBS pocket and/or reduce the stability of the complex formed.

MA DIS 14. These data provide genetic evidence for the importance of Y572 in maintaining the autoinhibited conformation of FLT3 and suggest that any mutation that interferes with the stability of the JM domain in this conformation is likely to be transforming.

MD INT 13. These forms of the disease are characterised by their severity and early onset, but their rarity means that they account for less than 1% of human hypertension.

MD INT 14. Yet another group did not detect an interaction between the C-terminal part of hDaxx and pp71, and mapped the pp71-interacting region of hDaxx to aa 142-290 (Ishov et al, 2002), indicating that this may be the region responsible for the N-terminal interaction detected by Hofmann et al (2002).

MD MET 13. For reasons of computational power the analyses reported here were performed on a remote server via the open-source Telnet/SSH client PuTTY

MD MET 14. Reactions were incubated for 2 hours at 37 °C.

MD RES 13. The association results for each cohort and the combined summary measure are presented, as well as measures to assess heterogeneity between component studies.

MD RES 14. Both ICP4 and UL42 proteins are essential for HSV-1 replication.

MD DIS 13. Functional information will help narrow the regions and variants of interest, as will association and linkage evidence for candidate variants.

MD DIS 14. Therefore, one of the aspects for future work should be aimed at identifying novel components involved in the formation of such chromatin complexes.

SA INT 13. One prior study indicates that wage differentials across industries had been growing for several decades and continued to increase through the mid 1980s (Bell and Freeman, 1991).

SA INT 14. Yet this prediction alone cannot serve as the basis for formulating hypotheses about systematic differences in attitudes, as definitions of patients' best interests may heavily depend on specific circumstances of each particular case.

SA MET 13. To account for missing data we use multiple imputation (Allison, 2002).

SA MET 14. Names on the sample frame list were randomly divided into four groups for completion of mail, telephone, IVR, and web modes.

SA RES 13. On the first anniversary of the attack, for example, Australian survivors, families of the dead and government leaders participated in a commemorative service held in Bali with their Indonesian equivalents (Fischer, 2006).

SA RES 14. The frequency distributions for the first and last scale category demonstrate that IVR respondents choose the extreme positive category more often than mail respondents.

SA DIS 13. We argue that the “class has greater importance than race conclusion” is only valid when family background has the same effect for both whites and blacks.

SA DIS 14. The small number of available MZ and DZ twin pairs make it difficult to produce credible test results for group differences in heritability estimates.

SD INT 13. In their study, college student subjects reviewed simulated application blanks for a fictitious company.

SD INT 14. Several positive and useful implications for this study are clear.

SD MET 13. Guest (2003) speaks of performing many favors for members of the Chinese churches he sampled, presumably as a means to build trust or a sense of mutual obligation.

SD MET 14. In essence, early newspaper reporting was, for all intents and purposes, the only manner in which society could define and validate itself.

SD RES 13. Further, consistent with Hypothesis 3a, utilitarianism was not significantly associated with variance in the within-subjects slope for either of the attraction outcomes in the equation of legal responsibility.

SD RES 14. The electrocution of Walter Morrison was the only one conducted in North Carolina for the year 1910.

SD DIS 13. The results of this research also have practical implications for organizations and job applicants.

SD DIS 14. Several agencies and organizations have already voiced the need for a detailed, well-researched work that addresses the topic matter presented within these pages.

With

MA INT 15. Heterogeneous genetic instability in the glandular epithelium due to telomerase shortening or infection with viruses such as BK, JC, and a recently described retroviral isolate are two mechanisms by which multifocal disease can occur.

MA INT 16. Seoul virus is generally associated with a less severe form of disease, with a mortality rate of less than 1%.

MA MET 15. This study included 349 adult patients with AML, de novo or secondary after treatment for a primary malignancy or following myelodysplasia, as defined by French-American-British Cooperative Group criteria or the World Health Organization classification.

MA MET 16. Similarly, when the dNTP concentration was kept constant at saturating levels and the inhibition at various TP concentrations was analyzed, RT was present either as a free enzyme or in the ternary complex with TP and dNTP, as shown in the right part of Fig. 2.

MA RES 15. UGSM was infected with either control vector (GFP) or FGF10-GFP retrovirus.

MA RES 16. In addition, flavonols Q7R possessed one rhamnoside at position 7 with a 3?,4?-dihydroxyl group was also found to have an antiviral activity than higher that of the 3?,4?-dihydroxylated flavonoids.

MA DIS 15. Since hematopoietic stem cells (HSCs) are endowed with self-renewal, it has been argued that transformation of HSCs provides a simple means to generate leukemic cells.

MA DIS 16. Mild hyperuricemia has been associated with ribavirin, possibly reflecting metabolism of ribavirin to urates (Investigator Brochure, 2004).

MD INT 15. Studies conducted in the chick model show that Wnt inactivation together with FGF signalling is required for neuroectoderm induction (Wilson and Edlund, 2001; Wilson et al., 2001).

MD INT 16. . In this case the assumption is that certain variants are more likely to be associated with complex traits than others.

MD MET 15. Media from confluent cell cultures are aspirated and the cell layer was briefly rinsed with PBS solution.

MD MET 16. The null hypothesis is homogeneity and under it the Q statistic follows a chi-square distribution with $k - 1$ degrees of freedom, where k is the number of studies.

MD RES 15. During the infection with ICP0-null mutant virus, however, averages of a 4-fold increase in HF-ShATRX cells and a 6-fold increase in HAA cells in plaque forming efficiencies were observed when compared to control HF-ShGFP or HALL cells, respectively (Figure 5.7, G and H).

MD RES 16. Among individual AEDs, agents with the highest prescription rate were identified and their efficacy calculated.

MD DIS 15. Comparisons with Published Studies on Usage of Interactive Cancer Decision Aids Only two published studies described or analyzed actual usage patterns of a CAPtDA.

MD DIS 16. It is thought that most of the unexplained heritability for many complex traits is likely to lie in the middle region of the graph, i.e. low-frequency variants with intermediate effect.

SA INT 15. Rountree (1998) posited that multilevel explorations of the factors associated with fear of crime can be derived from a general opportunity or routine activities framework (Felson, 1998; see also Miethe and Meier, 1990).

SA INT 16. One of the major problems with these Australian studies is that they do not address the direction of causal-ity; rather, they just show that a statistical correlation between poverty and health exists (Saunders, 1998).

SA MET 15. With these numeric values in place the research moved to a third stage: creating the Colombian model using System Dynamics.

SA MET 16. The response rate of 42 percent is comparable with the other major Australian attitudinal survey, the Australian Election Study (2004, see Bean et al., 2005).

SA RES 15. Establishments with a higher proportion of newly hired employees had a greater degree of earnings dispersion within the organization, supporting Hypothesis 3.

SA RES 16. As expected, Ned Kelly is by far the most frequently named bushranger, with 1538 of the 1914 respondents, or 80.4 percent naming him as one of the four responses.

SA DIS 15. For example, whether or not race-matching effects are dialect-matching effect can be addressed by presenting respondents with two tests; one requires extensive conversation between the respondent and the interviewer and the other that does not require any conversation.

SA DIS 16. Traditional models of bargaining practices between unions and management have usually assumed that workers believe that firms should share their higher profits or productivity gains with workers in the form of higher wages or benefits ([Reynolds, 1978] and [Kahneman et al., 1986]).

SD INT 15. With the advent of modernity, reflexivity takes on a different character.

SD INT 16. Gatewood et al. (1993) found that both overall corporate image and recruitment image were related to applicants' intentions to pursue employment with a company, the latter more strongly than the former.

SD MET 15. Using both electronic and non-electronic archival finding aids, this organization was traced with no success.

SD MET 16. These different patterns of response resulted in problems with data coding.

SD RES 15. In prior electrocutions, witnesses had been in the room along with the condemned, separated only by a red rope.

SD RES 16. That reference, with its implication of Jewish practices, would have been out of context in Chinese Protestant churches, where the term "Sunday School" is standard.

SD DIS 15. However, this type of discrimination or employer favoritism cannot be tested with the type of data that is widely available.

SD DIS 16. Consistent with gender roles and stereotypes, work values literature has found that males value money, promotions, leadership and power more whereas females value interpersonal relationships, helping others, and intrinsic job aspects (e.g., growth opportunities, task enjoyment) more than males (Konrad, Ritchie, Lieb, & Corrigan, 2000).

As

MA INT 17. For leukemias and childhood sarcomas, chromosomal translocations leading to the production of chimeric proteins serve as initiating genetic events.

MA INT 18. . In 2003, enfuvirtide, a 36-amino-acid residue peptide acting as a viral entry inhibitor, has been licensed for the treatment of HIV infection ([Blasko, 2003], [Jenny-Avital, 2003], [Menzo et al., 2004] and [Oishi et al., 2008], Tomaras and Greenberg, 2001).

MA MET 17. This plasmid was purified in the same manner as pMB75.

MA MET 18. BaF3 cells were maintained in RPMI-1640 supplemented with 10% fetal calf serum and 10% WEHI-conditioned medium as a source of IL-3.

MA RES 17. After 2 days, inhibition was evaluated by SRB method and expressed as the inhibition rate.

MA RES 18. Of the remaining 12 sequence alterations, 9 were predicted to change the amino acid sequence of FLT3 (nonsynonymous substitutions; Table 1 and Figure S1), whereas 3 were annotated as synonymous substitutions, resulting in a ratio of nonsynonymous to synonymous mutations of 3.

MA DIS 17. After calculation of correlation coefficients for pleconaril and compounds Va–d, both volume and lipophilicity were identified as important determinants of anti-CVB3 activity in the present study.

MA DIS 18. However, a number of studies have suggested that the MHC-determined resistance to Marek's disease is due at least in part to the action of CTLs and NK cells ([Garcia-Camacho et al., 2003], [Markowski-Grimrud and Schat, 2003], [Omar and Schat, 1996] and [Omar and Schat, 1997]), both of which implicate an MHC class I molecule as a target.

MD INT 17. . Because of this some investigators have studied blood pressure as a quantitative trait 58, 59.

MD INT 18. Importantly, interactions between CD4+ T cells and B cells are recognised as a crucial step in the anti-viral immune response, since the B cells act as antigen presenting cells in this case.

MD MET 17. The bacterial stock expressing pLKO-shATRX90 was delivered as transformed bacterial cells, which were plated out on agar plates supplied with 100 µg/ml ampicillin.

MD MET 18. In this study, both regular release and sustained release forms are considered as the original regular form since this project is mainly concerned with the pharmacodynamics of AEDs (the mechanisms by which these agents act) rather than their pharmacokinetics properties (the ways by which body systems handle the drug).

MD RES 17. Swedish samples are represented as open lilac circles.

MD RES 18. Samples were prepared for analysis at 2 hours post infection and tested for the presence of pp65, an abundant tegument protein that is normally expressed at late times and therefore at early times can be used as a measure of the quantity of input virus particles.

MD DIS 17. Rather, their analysis serves as an exemplar study on the meaning of the entire spectrum of genome-wide data.

MD DIS 18. GFP is stable in the presence of urea (Ward, 1998) and therefore can act as a chemical label attached to the fused protein.

SA INT 17. When income, occupational status, and family structure are considered as additional indicators of family background, the improvements in the family background of blacks over the 20th century are more modest.

SA INT 18. This conclusion might appear to be unexpected if one interprets the prior literature as suggesting that inter-industry wage dispersion had contributed to (i.e., was positively correlated with) wage inequality.

SA MET 17. Therefore, our results may not be generalizable to the population as a whole, or even the population of internet users, who tend to be younger and less educated than our sample.

SA MET 18. Trade as a proportion of GDP is by far the most commonly used measure of economic globalization in the empirical literature (Babones, 2007).

SA RES 17. As a result we encountered a number of young people, many of them Indigenous, with little or no access to financial resources.

SA RES 18. If the dependent variable is considered to consist of two groups' earnings, determinants of earnings for each group can be added as control variables in the regression model. Specifically, education has traditionally been a strong predictor of earnings.

SA DIS 17. Classic (Durkheim, 1897/1951) and contemporary ([Allen and Wilder, 1977] and [Festinger, 1954]; [Akers, 1973] and [Akers, 1997]; [Sutherland and Cressey, 1984] and [Haynie and Osgood, 2005]) social theories have always viewed peer influence as vitally important in the development of deviant behavior.

SA DIS 18. These might be taken as a starting point for analysing the diffusion of policies that foster inequality, or even of inequality itself, across national boundaries.

SD INT 17. Turban and Greening's (1996) was the first empirical study to explicitly investigate the link between CSR and organizational attractiveness as employers.

SD INT 18.). Madow (1995) refers to this media/public detachment as 'epistemological relocation', whereby the violent execution is moved "...from the domain of firsthand, everyday experience and sense perception to the sphere of 'abstract consciousness'" (p. 478).

SD MET 17. As an incentive, participants could enter in a drawing for gift certificates. Also, light refreshment was provided to all participating classes.

SD MET 18. This report, issued by the Public Information Office, details such information as execution protocol for lethal injection procedures, itemizations of equipment costs, detailed descriptions of death row and death watch areas, and criteria for witness selection.

SD RES 17. However, despite the high correlation between the two variables, they are viewed as distinct constructs and found to be predicted by different organizational and job factors (Aiman-Smith et al., 2001).

SD RES 18. This dissertation has argued that methods of execution serve as vehicles for the administration of state-sanctioned institutionalized violence.

SD DIS 17. Although prior studies have investigated the role that CSR plays in job applicants' attraction to organizations, they have only assessed a limited number of social programs and policies as indicators of CSR (e.g., Turban & Greening, 1996; Bauer & Aiman-Smith, 1996).

SD DIS 18. This approach has been cited as a useful research method to make meaning out of the exploration of lived experience (van Manen, 1990).

By

MA INT 19. The transition from DP to SP stage, directed by TCR-mediated positive selection, involves the activity of E protein transcription factors HEB and E2A encoded by the genes Tcf12 and Tcf2a, respectively.

MA INT 20. IST after ACS, compared to either placebo or low-dose statin therapy, has been shown to decrease cardiovascular events, myocardial infarction, and all-cause mortality by 11% to 16%, 17%, and 25% respectively.

MA MET 19. B cells were purified by negative selection with the MACS system (Miltenyi Biotech) and stimulated with 10 μ g/ml LPS (Sigma) and 20 ng/ml IL-4 (Peprotech) for 3 days.

MA MET 20. Briefly, the CLDC were prepared by the sequential addition of nuclease-free water (NFW), DOTIM, and plasmid DNA.

MA RES 19. Consistent with this, we also detected EN protein in tumor tissues by western blot (Figure 2D).

MA RES 20. The location of the injector tips is represented by gray circles

MA DIS 19. This can be best explained by the existence of an epithelial cell hierarchy in EN tumors.

MA DIS 20. The antiviral activity of this compound appeared to be strongly influenced by the strain of the coronavirus tested.

MD INT 19. While IE gene expression does not require *de novo* protein synthesis and is activated by viral and host cell transcriptional factors, Early and Late gene regulation is highly dependent on the synthesis of IE gene products (Honest & Roizman, 1974).

MD INT 20. These forms of the disease are characterised by their severity and early onset, but their rarity means that they account for less than 1% of human hypertension.

MD MET 19. The BRIGHT data were analysed in Glasgow, and the GRECO and HERCULES data analysed by their respective investigators.

MD MET 20. Enrichment of cells expressing EYFP fusion proteins after transduction with lentiviruses derived from plasmids of the pLNGY- series was achieved by fluorescence activated cell sorting (FACS).

MD RES 19. This was achieved by infecting HF-ShLuci and HF-ShATRX cells on coverslips with 0.2 infectious units per cell of ADSubUL82 and processing for immunofluorescence with anti-IE1 and anti-ATRX antibodies at 12 hours post infection.

MD RES 20. Among these, 106 patients developed complete seizure freedom (87%) by the end of study while 16 did not.

MD DIS 19. Although the presence of HDAC within the ATRX/hDaxx-containing complex is speculative, it can explain the mechanism of regulation of transcriptional repression by ATRX and hDaxx.

MD DIS 20. This is because the SNP tagging strategy employed by Illumina provides better coverage of the common variants identified through HapMap, than other genotyping platform strategies.

SA INT 19. While racial threat theory has been proffered by a number of studies as a macro-level explanation for understanding fear of crime, arguably the most often utilized theoretical framework for explaining fear of crime/perceived risk is social disorganization theory (Shaw and McKay, 1942).

SA INT 20. We know also that there is a growing sense of alienation in rural areas recognized by the then Deputy Prime Minister and National Party leader, John Anderson, in a speech to the National Press Club and suggesting that not only have rapid changes destabilized rural people as much as their communities, but also that a perceived lack of support has undermined the confidence of rural Australians (Anderson, 1999).

SA MET 19. Berry points out, however, that the advocacy explosion was led by groups wishing to influence public policy (1989).

SA MET 20. In order to evaluate response rate effects across survey modes, it was necessary to obtain a common sample frame that would allow people to be contacted either by mail or telephone.

SA RES 19. The first four models are baseline models evaluating Wave 1 parent-child relations, followed by a model employing the Wave 2 dependent-variable and finally a lagged dependent-variable model.

SA RES 20. The loss of Australians in Bali, however, was alternatively rationalized by references to national heroic narratives and mythologies.

SA DIS 19. The sample frame was further limited by our need for information on sample frame demographics.

SA DIS 20. However, current government policy seems to have been going in the opposite direction by shifting health care financing to the private sector and household incomes through user-fees such as copayments.

SD INT 19. Nancy Ammerman's (2005) research employed the sample collected by Chaves, but focused more particularly on the institutions that congregations rely upon, such as denominational presses, purveyors of priestly garments, producers of communion wafers, and the like.

SD INT 20. This dissertation considers these issues by examining two time periods in a particular state rather than one incident or act at a single moment in time (see Gusfield & Michalowicz, 1984).

SD MET 19. At times, a letter to the Governor regarding the death penalty would be accompanied by a newspaper article containing information pertinent to the citizen's concern.

SD MET 20. I obtain earnings propensity scores by estimating probit models with employment as the dependent variable and region (Germany), age, education, disability status and the previous year's household post government household income.

SD RES 19. By 1939, that figure had climbed to almost 1.5 billion dollars, a fifteen-fold increase (ibid.)

SD RES 20. The ubiquity of reference to Agape at all the Chinese churches I have observed suggests that it is a core value – presumably the single most important value held by Chinese Protestants.

SD DIS 19. First, rituals provide a means to “reify” an ideology by providing concrete enactments of abstract concepts.

SD DIS 20. That is to say, ritual shapes affinities between people by providing ritualized means of expressing benevolence, or at least some sort of higher order meaning, that establishes the boundaries of group membership.

On

MA INT 21. . In vitro data suggest that FGF10 has mitogenic actions on prostate epithelium and not stroma. FGF10 binds preferentially to the IIIb isoform of FGFR1 and FGFR2.

MA INT 22. During extensive structure-activity relationship studies on sulfone NNRTIs, we identified potent pyrrol and indolyl aryl sulfones (IASs) ([Silvestri and Artico, 2005] and [Silvestri et al., 2004]).

MA MET 21. Five animals from each treatment group were sacrificed on day 4 of infection to measure viral loads (assessed by viremia and liver virus) and serum alanine aminotransferase (ALT) activity.

MA MET 22. The effect of heparin on the clearance of PAPP-A was examined by the coinjection of heparin 1 mg with PAPP-A.

MA RES 21. The initial titers were obtained on mean day 4 of illness (range days 1–7 of fever; range days 1–10 of illness).

MA RES 22. Cells were then harvested and counted, and 5000 cells were replated for a second, third, and fourth time, and colonies were counted on days 8–10 after each replating.

MA DIS 21. To elucidate the action of Q7R on PEDV multiplication in more detail, we investigated the effect of Q7R on single steps during the infection cycle of PEDV.

MA DIS 22. Further focus on this transcriptional complex as a target in human breast cancer is warranted.

MD INT 21. Changes between modes of invasion rely on the specifics of the microenvironment.

MD INT 22. Reactivation of HCMV from latency does not require viral transactivators and therefore may be dependent on certain cellular stimuli.

MD MET 21. A fraction of each sample was run on a polyacrylamide gel followed by coomassie staining.

MD MET 22. Based on initial association analysis results SNPs were sorted by p-value for statistical significance from lowest to highest (i.e. most to least significant).

MD RES 21. Hypoxia was linked to an increase in cell migration and tumour invasion however signalling pathways involved as well as the impact on the actin cytoskeleton under these conditions are mostly unknown [88, 91].

MD RES 22. Whether this displacement occurs as a result of ICP0-mediated PML degradation or through a more direct effect on ATRX causing its displacement from the newly formed foci is unclear from this experiment, but this issue is considered later in this chapter.

MD DIS 21. Our combined results suggest that UMOD may have a role in regulating blood pressure, possibly through an effect on sodium homeostasis.

MD DIS 22. One of the hypotheses driving the current line of research states that the factors implicated in repressed chromatin assembly and maintenance of the cellular heterochromatin may also be involved to some extent in repressed chromatin assembly on viral genomes.

SA INT 21. In our discussion of the impacts on young people in rural and remote areas, we begin by providing a brief summary of recent changes in such areas.

SA INT 22. In sum, it was expected that answers to the critical measurement questions in this survey on long distance survey satisfaction might be more positive among telephone respondents and, to a lesser extent, IVR respondents than for other modes, but that primacy or recency was unlikely to account for those differences.

SA MET 21. It should be pointed out that none of the friend-influence environments in Table 1 corresponds to the idealized alcohol-free environment discussed in the section on research design.

SA MET 22. Although in principle health transitions in both directions (i.e. from healthy to unhealthy and vice versa) can be analysed, this study focuses on transitions from healthy to unhealthy, because the large majority of the population examined were healthy in the base year.

SA RES 21. First, a focus on the loss of Australian footballers in the attack worked to place grief within a patriotic context, reminding the public of the strength of national character at a time when it was perceived to be under threat.

SA RES 22. While education preferences have no effect on white women's exclusion, white men with an education preference are nearly five times as likely to exclude black women as dates as those who do not have an education preference.

SA DIS 21. In a series of books and articles, Skocpol accuses social capitalists and communitarians of ignoring the merits of translocal organizations and focusing excessively on local ties and groups.

SA DIS 22. Much in line with previous research, aural mode respondents tend to give more extreme responses on the positive ends of the scale compared to visual mode respondents, even when controlling for demographics.

SD INT 21. Most sociological research which focuses on deviant labeling concerns itself with more individualistic forms of deviant behavior.

SD INT 22. Research on modeling human judgment has suggested that information is often integrated by using complicated configural cue processing involving multiplicative interactions (e.g., Hitt & Barr, 1989).

SD MET 21. In addition to the surveys, I conducted informal participant observation at church services and church events, most typically at one or more services prior to the administration of the survey and then again on the day of the survey.

SD MET 22. A search of using electronic archival finding aids also generated a 1929 report on capital punishment in North Carolina, albeit this report was not produced by the Highway and Public Works Commission nor the Prison Department.

SD RES 21. In my previous research on a single church, I gradually became aware of how sermons are used to smooth out the rough edges of theological differences, circle the congregation's wagons against heterodoxy, or to bring theological justification to bear on church controversies.

SD RES 22. According to Shipman (1996), the media's strategy in reporting on execution methods is mainly contingent upon the public's acceptance or rejection of capital punishment.

SD DIS 21. As suggested by Greening and Turban (2000), given that job choice decisions are value-laden and ethics-laden, it is important to assess the impact of P-O fit in terms of ethics on applicant attraction to organizations.

SD DIS 22. Although the existing literature on Chinese conversion to Christianity tends to highlight sudden and dramatic conversion experiences (Yang 2005), it is nonetheless a striking feature of this study's survey results that very few Chinese consider their own conversions to have occurred at a single point in time; they more commonly see their own conversions as having occurred gradually over a long period of time (see Table 7-5).

From

MA INT 23. FGF10 transcripts have been detected in stroma derived from benign human prostatic hyperplasia specimens.

MA INT 24. In a previous paper (Cancio et al., 2005), we have shown that IASs are highly flexible molecules, whose mode of interaction, and hence the mechanism of RT inhibition, can be modulated by the nature of the different substituents, so that from compounds endowed with a classical fully non-competitive mechanism, a series of inhibitors showing mixed-non-competitive and even partially competitive mechanism of action can be derived.

MA MET 23. Values were obtained by phlebotomy if not available from clinical records within 4 months of the interview.

MA MET 24. The CD94-NKG2A protein was secreted into the media by the Hi5 cells, and separation of the secreted protein from whole cells was achieved via centrifugation at $500 \times g$ followed by centrifugation at $5000 \times g$ in a SLC-6000 Beckman rotor for further purification.

MA RES 23. Moreover, MGs from mature nulliparous WCEN females contained a greater number of CD24+Sca-1+ cells than WT controls even before they developed tumors (Figure 3F).

MA RES 24. In summary, results from the present experiment indicate that during the second postnatal week of life pups are highly sensitive to the ethanol's stimulating effects, and also that there may be age-related differences in sensitivity to ethanol's motor effects across age.

MA DIS 23. To identify genetic changes with a role in tumorigenesis, statistical models have been developed that incorporate mutational frequency and distribution, and it has been inferred from such approaches that nonsynonymous passenger mutations are present at a higher frequency than previously anticipated ([Greenman et al., 2007], [Sjoblom et al., 2006] and [Wood et al., 2007]).

MA DIS 24. The overall increase in neurophysiological responses during CIE and WD indicates that this occlusion results from a CIE/WD-dependent recruitment of the cellular mechanisms that govern the expression of synaptic plasticity within the BLA.

MD INT 23. Cells from APL patients are characterised by a gene fusion between PML and retinoic acid receptor α (RAR α) loci as a result of a specific chromosomal translocation t(15;17).

MD INT 24. Sp100 was the first marker of ND10 to be identified as the antigen recognised by sera extracted from patients with primary billiary cirrhosis (Ascoli & Maul, 1991; Fusconi et al, 1991).

MD MET 23. Funnel plots were created, also using Stata version 10, and assessed for evidence of bias resulting from overestimation of effect size in smaller studies of poor methodological quality.

MD MET 24. Media was removed from the cells so that a small amount of media was left to form a meniscus in the dish when tilted.

MD RES 23. According to the data presented in Figure 3.3, successful ATRX depletion in HF-ShATRX cells was observed from day 2 after applying lentiviral stocks, with subsequent reduction of ATRX to virtually undetectable levels by day 7.

MD RES 24. Many resistant cell lines have been derived from the parental LNCaP cell line both in vitro and in vivo.

MD DIS 23. This proves the importance of validating the results from a proteomic screen to rule out false positives.

MD DIS 24. . Analysis of 52 core protein amino acid sequences from different genotypes showed that HCV core has a highly conserved amino acid sequence across all genotypes with 85.3% -100% conservation observed (Bukh et al. , 1994).

SA INT 23. There are (at least) two dimensions of interest that have emerged from this research perspective: (a) the perceived criminal threat posed by Blacks and/or other ethnic minority groups for individuals and (b) differences in the fear of crime experienced by white individuals vs. Blacks and other ethnic minorities.

SA INT 24. A common concern resulting from racial segregation in friendship relations is that multiracial persons will be socially marginalized by single-race persons because they fail to fit in with any single-race crowd.

SA MET 23. Translocal groups are likely to mobilize least effectively, since appeals from group leaders may seem less personal in the translocal context.

SA MET 24. We collected data from internet dating profiles posted on Yahoo Personals, the most popular national online dating website (Madden and Lenhart, 2006), between September 2004 and May 2005.

SA RES 23. The effect of cohabitation on fertility is not significantly different from single status in any country sampled.

SA RES 24. Consider the two quotes below from *The Age* and *The Daily Telegraph*.

SA DIS 23. Significant improvements were achieved by reverting from IVR and web back to the completion of telephone interviews.

SA DIS 24. From the standpoint of promoting political participation, for instance, scholars have identified two key means by which individuals come to take political action: when they develop politically relevant civic skills and when they are mobilized to participate by others (Rosenstone & Hansen, 1993; [Verba et al., 1995a] and [Verba et al., 1995b]).

SD INT 23. This dimension is concerned with the degree of social responsiveness of managerial processes, which can range from reaction and defense to accommodation and proaction.

SD INT 24. The removal of executions from public view became one of many strategies in dramaturgically concealing state sanctioned death, thus the meaning and construction of the act were transformed.

SD MET 23. Phenomenological methodology employs the in-depth interview to gain a contextual understanding of the phenomenon from the participant's personal point of view (Bogdan & Taylor, 1975; Yow, 1994).

SD MET 24. All data used in this study were collected from written surveys.

SD RES 23. These duties were assigned to women in hopes of bolstering morality, and preventing a further fall from womanhood and femininity (Craven, 1987).

SD RES 24. The quality of the food offered ranges from very simple snacks to elaborate meals with Chinese dishes that are hard to come by in the United States, such as pork with bitter melon, pickled vegetables, winter melon soup, or Taiwan style hot pot.

SD DIS 23. This study recognizes job applicants, the potential employees, as an important stakeholder group, and shows that firms' investments in CSR can yield secondary benefits from attracting quality employees.

SD DIS 24. The results from my dissertation are not to prove that marriage is not a beneficial societal institution.

At

MA INT 25. Currently, there are four selective FLT3 inhibitors at various stages of clinical development, including PKC412 (midostaurin), CEP-701 (lestaurtinib), MLN518 (tandutinib), and SU11248 (sunitinib) (Knapper, 2007).

MA INT 26. At present, the disease remains as an important cause involved in the decline of wild rabbit populations throughout certain regions of Europe and Asia ([Calvete, 2006], [van de Bildt et al., 2006] and [Yang et al., 2008]).

MA MET 25. Leukemic cells at diagnosis and a matched remission sample were analyzed in one case with a presumptive leukemogenic mutation in the FLT3 kinase domain, M737I.

MA MET 26. One Unit of DNA polymerase activity corresponds to the incorporation of 1 nmol of dNMP into acid-precipitable material in 60 min at 37 °C.

MA RES 25. Both mAbs 6H6 and 6G2 reacted against the recombinant protein in immunodot or ELISA when assayed immediately after drying or three years later, in which case the powder was maintained at 4 °C.

MA RES 26. This variant was present at diagnosis but not in the remission sample, demonstrating that it was somatically acquired (Figure S1).

MA DIS 25. Except for RS1914 which is a primary carboxamide, the other three compounds bear different side chains at the 2-carboxamide function, as illustrated in Fig. 1.

MA DIS 26. Based on this approach, we observed that OPN, known to contribute to several biological processes, including proliferation and migration ([Tuck et al., 1999] and [Thalmann et al., 1999]), is expressed at later PCa stages, while OPN receptor, CD44, was rapidly induced by iFGFR1.

MD INT 25. A unique phenomenon, so far reported only for HSV-1, is the asymmetric re-distribution of ND10 proteins into novel ND10-like foci associated with the incoming viral genomes in cells at the edge of developing plaques (Everett & Murray, 2005).

MD INT 26. Many aspects of metastasis are not fully understood, especially when and how cells move away from the primary tumour and how efficient these cells can proliferate at distant sites.

MD MET 25. The samples were then incubated with corresponding Alexa Fluor (Invitrogen) secondary antibodies that were prepared at a dilution of 1:1000 in blocking solution.

MD MET 26. In the current study all plots were created at the same time using the batch mode facility.

MD RES 25. However, expression of PHD3 was upregulated at an earlier timepoint than expression of PHD2.

MD RES 26. Overall the results described in the current section provide evidence that ATRX is displaced from ND10 at the very early stages of HCMV infection by pp71, and not by other viral tegument components.

MD DIS 25. A densely packed heterochromatin structure is proposed to result from the tight association of the proteins residing at the sites of methylated DNA and methylated histones of the adjacent nucleosomes, according to the model reviewed elsewhere (Brenner & Fuks, 2007).

MD DIS 26. This is exemplified by the Global BPgen study, which in Stage 1 analysis identified eight loci associated with SBP and/or DBP at the level of genome-wide significance 58.

SA INT 25. Even Crothers (2002), a critic of Putnam, advocates “street-level” civic revitalization at the neighborhood and community levels.

SA INT 26. Most studies of earnings determination and the earnings gap focus on accounting for the level of individual employees’ earnings, rather than explaining the distribution of employees’ earnings at an organization.

SA MET 25. When the twin sample was first collected at Wave I, the classification of the twins into monozygotic and dizygotic pairs was based on self-reported confusability of appearance.

SA MET 26. The generic model to be estimated is, where y_{it} refers to health status at time t , taking value 1 if healthy or 0 if unhealthy; W_{i0} is reported wealth in the base year; X_i is a vector of other covariates; ϵ_i is a random error term.

SA RES 25. At the opposite end of the spectrum, members of local groups are most likely to feel “a lot of control” over their organization (15 percent), versus 10 percent for translocal group members and 6 percent for national group members.

SA RES 26. Both of these variances are statistically significant at any conventional level implying that both the intercepts and the slopes randomly vary across industries.

SA DIS 25. Second, we were unable to provide official crime rate data at the census tract level, primarily because of the number of different law enforcement jurisdictions that exist in Miami-Dade County, including two large urban police departments.

SA DIS 26. As in 1992, women’s under-representation at all levels of government might leap to the forefront of national attention.

SD INT 25. At the time of the study it was estimated that 830,000 male and female Vietnam theater veterans (26%) had symptoms of PTSD (Price, 2006; Schlenger et al., Weiss et al. 1992).

SD INT 26. They found that organizations’ personality traits were related to overall organizational attractiveness, employer reputation and the likelihood of pursuing a job at the organization.

SD MET 25. At the end of each scenario, they were asked to answer a series of questions about their attraction to the organization as an employer.

SD MET 26. A search was first conducted at the Legislative Library in both the House and Senate Journals for the 1935 Legislative Session.

SD RES 25. Specifically, I plotted the HLM within-subjects equation at conditional values of individual ethical predispositions (1 SD above the mean, the mean, and 1 SD below the mean).

SD RES 26. This “breadwinner pressure” may be associated with increased productivity at work.

SD DIS 25. The circle at the top of Figure 1 represents the social context – or “predisposing conditions,” in Loftand & Stark’s (1965) terminology, from which Chinese converts to Protestantism are drawn.

SD DIS 26. In addition, political motives are heavily influenced by cultural philosophies at any given moment in time.

Between

MA INT 27. In the prostate, homeostasis can be maintained, at least partly, by paracrine signaling between stromal cells, which produce FGF7 and FGF10 and proximal epithelial cells, expressing their cognate FGFR isoform, FGFR2iib (Ornitz et al., 1996).

MA INT 28. Several previous studies have found no relation between omega-3 supplementation and bleeding in patients with cardiovascular disease, yet most of these studies focused on long-term bleeding risk, and few studied patients with acute myocardial infarction (AMI).

MA MET 27. The v_t/v_0 ratio, representing the normalized difference between the amount of dTTP incorporated at the zero time point and at different time points, was then plotted against time.

MA MET 28. Twelve patients treated between 1991 and 2002 at our hospital for primary cancers of the external auditory canal were included.

MA RES 27. The remaining two mutations (Y572C and V592G) had conflicting results between the SIFT and PMut algorithms.

MA RES 28. Consistent with the previous data, the Ile161Met mutation did not markedly impact on the interaction between CD94-NKG2C and HLA-E.

MA DIS 27. There has been no study reporting a definite correlation between CCL20 expression and occurrence of NP.

MA DIS 28. These results show a clear dissociation between ethanol's effects on stimulation and motor impairment during the preweaning period, suggesting that different mechanisms underlie these effects of ethanol.

MD INT 27. Some cell types can use both modes of invasiveness and undergo transitions between them.

MD INT 28. Association between viral DNA and ND10 have sparked substantial interest in their roles as domains with anti-viral properties in an attempt to explain the mechanism, reasons and consequences of this association.

MD MET 27. Statistical significance of differences between the means was determined by Mann-Whitney test analysis using GraphPad Prism 5.

MD MET 28. Depending on the cell type and the confluency of the cells required, cell lines were split at a range of ratios between 1/3 to 1/10.

MD RES 27. Because of the known relationships between hDaxx and pp71, hDaxx expression was also analysed in these infected cells.

MD RES 28. This correlation value indicates a moderately strong, positive association between the two variables.

MD DIS 27. Family studies may have a better chance of detecting rare variants, and any association between them and common diseases, than population studies.

MD DIS 28. The aim of this chapter was to identify individual residues of core protein required for the interaction between core and DDX3.

SA INT 27. Rossi and Rossi (1990) make a further distinction between 'filial norms' (normative obligations toward parents), 'parental norms' (normative obligations toward children) and general kinship norms (normative obligations toward family in general).

SA INT 28. Most studies find that multiracial persons have socioeconomic status that is intermediate between the groups composing their monoracial identities (Kao, 1999; Hill, 2000; Harris and Thomas, 2002; Campbell, 2004).

SA MET 27. Frame analysis is particularly applicable to the media due to its appreciation of the link between the production and consumption of the news story.

SA MET 28. This measure reflected the degree of earnings dispersion between five occupations within an establishment.

SA RES 27. ". The sharp differences between the analysis of observed friend's drinking pattern and the analysis of randomly assigned friend drinking pattern provide an independent piece of evidence that the level of heritability for adolescent drinking may depend on friend drinking behavior.

SA RES 28. Some literature on multiracialism suggests that a positive aspect of a multiracial background is the ability to see both sides of racial issues and to act as liaisons between persons of different racial backgrounds.

SA DIS 27. The actual effect of these re-framings on ideological beliefs in society and the amount of exchange between the main readership of the Koori Mail and of the two mainstream papers is beyond the scope of this article.

SA DIS 28. Instead, the link between productivity and wages is mediated by employment relationships that are embedded in the organizational practices of firms which are in turn influenced by complex patterns of workplace power relations.

SD INT 27. Their findings were replicated by Albinger and Freeman (2000) who reported that the positive relationship between CSR and employer attractiveness was even stronger for job applicants with more employment opportunities than those with less.

SD INT 28. As previously discussed, the public execution provided no barrier between what was occurring and those viewing it.

SD MET 27. The sample is limited to employed men and women between the ages of 25 and 55, excluding those currently in the military, unemployed, and students.

SD MET 28. In the present study, when comparisons are made between Chinese Protestants and non-Chinese U.S. congregations, I employ a sample of over 400 American congregations from the CLS study.

SD RES 27. In evaluating Hudson's position, it becomes clear that his opposition to lethal injection hinged on the distancing between the State and the condemned.

SD RES 28. Axinn and Yabiku (2001) document a crucial association between attitudes and transitions into marriage at the neighborhood level, suggesting that not only individuals' attitudes play a role in their marriage decisions, but also the views of those surrounding the couple.

SD DIS 27. This study recognizes the differentiation of values and social norms between and within regions of the same country.

SD DIS 28. Just as demographers employ the "balancing equation" to model the changing relationship between births, deaths, immigrants, and emigrants, Church growth and decline can be conceived of in terms of converts, apostates, and church/denominational "switchers."

After

MA INT 29. We found that after 42 weeks of CID treatment, JOCK1 mice consistently (100%) developed prostate adenocarcinoma, which were largely sensitive to androgen ablation.

MA INT 30. Limited reports have described the use and tolerability of IST in patients after ACS in a "real world" setting; therefore, the objective of the present study was to describe the practice patterns of IST use in an ACS population.

MA MET 29. Our review included patients both before and after the acquisition of HBO equipment at our institution (1998).

MA MET 30. After completion of this interval, pups were returned to their respective holding cages where they remained for 10 min.

MA RES 29. After discontinuation of the ribavirin (received 18 doses and 10 doses, respectively), the bradycardia resolved in both individuals within 24–36 h. The "possible" temporal relationship of the bradyarrhythmias with IV ribavirin raised a concern of potentiation of bradyarrhythmias from IV ribavirin.

MA RES 30. Unfortunately, use of MMTV-Cre led to a lethal myeloproliferative disease within several weeks after birth, apparently due to expression of MMTV-Cre in the hematopoietic system (data not shown).

MA DIS 29. As mentioned, adult heterogeneous rats do not typically show increased locomotion after being administered with ethanol.

MA DIS 30. We also observed an increase in the expression of several Wnt axis members after iFGFR1 activation, including Fzd4, capable of inducing β -catenin (Xu et al., 2004).

MD INT 29. For example, in HSV-1 infected mice, antibodies produced by B cells play important roles in suppression of lesions formed after primary infection by HSV-1 (Deshpande et al, 2000).

MD INT 30. DNMT1 $-/-$ ES cells divide and maintain pluripotency in culture but failed to survive after being induced to differentiate, possibly due to the lack of repression of pluripotent genes such as Oct4 and Nanog through methylation (Jackson et al., 2004).

MD MET 29. After removing the fix solution and washing the coverslips twice in PBS, 0.5 ml of permeabilisation solution [10% (w/v) sucrose, 0.5% (v/v) NP40, in PBS] was added and the cells were incubated at room temperature for 10 min.

MD MET 30. Newly diagnosed patients who were started on AEDs at the unit before July 1982 or after 5th April 2006 were not included in the study.

MD RES 29. Patients with symptomatic epilepsy had the lowest rate of developing complete seizure freedom after treatment with AEDs (63%).

MD RES 30. After culturing electroporated cells for 10 passages, it was noted that culture medium from mutant G33A culture could infect naïve Huh7 cells.

MD DIS 29. After cultivation of cells with replicating viral RNA, infectious particles were produced.

MD DIS 30. Additionally, in G-allele carriers the rise in extracellular fluid volume is greater after increased salt intake.

SA INT 29. Sudman et al. (1996) after a detailed review of such order effects concluded, "...response order effects may go in different directions...and may cancel one another in heterogeneous samples" (p. 169).

SA INT 30. Other supportive findings indicate that white Republican registration was especially likely to increase in southern counties after a growth in African American populations (Giles and Hertz, 1994).

SA MET 29. After a pause of one month in the data collection effort, nonrespondents to the telephone survey were asked to complete a mail questionnaire, while nonrespondents to the other modes (mail, web and IVR) were contacted by telephone and asked to complete a telephone interview.

SA MET 30. We attempt to address these questions after briefly discussing our research strategy.

SA RES 29. These results obtain even after controlling for demographics, resources, social connectedness, and overall number of memberships and active memberships.

SA RES 30. Table 2 also shows that the covariance between the intercepts and the slopes is substantially reduced in the Full Model after adding the substantive covariates, although this covariance is still significant at the .05 level.

SA DIS 29. As long as students of social movements and political sociologists focus on the short-lived political coalitions between the dispossessed in exceptional periods such as the 1930s or the early 1960s and largely ignore the political effects of racial divisions, the dominance of conservatism after the 1960s is likely to remain incomprehensible.

SA DIS 30. In contrast, desegregation and affirmative action occurred primarily after the periods of major convergence in educational attainment.

SD INT 29. He made this statement several years after the Civil War when he voiced it to graduating military cadets at the Michigan Military Institute on June 19, 1879.

SD INT 30. Korenman and Neumark (1991) find that men's wages increase faster after marriage and they receive more frequent promotions and better performance evaluations (see also Gray 1997).

SD MET 29. After each church survey, I prepared a report for the pastor or other church leader.

SD MET 30. Furthermore, any public or political dissent regarding the method change would likely come after its adoption and use.

SD RES 29. In this way, a first time attendee can form several friendships during a short period of interaction after a typical service.

SD RES 30. Five years prior to the “Act..”, a black inmate housed in the Wake County Prison Camp was released from his cell for special yard privileges, and subsequently had his toes amputated after suffering from frostbite (ibid.).

SD DIS 29. At least I can say that after years of attending Chinese churches around the country, I myself have never been pressed to meet obligations nor have I faced any threat of ostracism for having been only moderately helpful.

SD DIS 30. These and possible other differences not mentioned here should be considered, but research should continue to focus on the vulnerability and resilience of combat soldiers to improve their transition to life after war.

About

MA INT 31. However, beyond the gene sequences, little is known about the structure and function of MHC class I molecules outside of mammals.

MA INT 32. This early capability to learn about ethanol could account for the apparent long-lasting effects of early exposure to the drug. Fourteen-day-old rats exhibit ethanol-mediated conditioned taste aversions ([*Hunt et al.*, 1991] and [*Pautassi et al.*, 2002]) as well as ethanol-mediated conditioned texture preferences ([*Molina et al.*, 2006] and [*Molina et al.*, 2007]).

MA MET 31. Details about EMSAs, western blot, immunoprecipitation studies, and soft agar assays are provided in the Supplemental Experimental Procedures.

MA MET 32. The resulting final 44-item CTI contained 3 questions concerning the frequency of falling, 3 questions about the circumstances of the current fall, 5 questions concerning the fall history, and 33 questions regarding modifiable risk factors (Appendix B).

MA RES 31. We used interpulse intervals of 25, 50, and 250 ms to determine the ratio of the second synaptic response to the first across times that yield information about release probability (25 and 50 ms; [*Andreasen and Hablitz*, 1994] and [*Katz et al.*, 1993]) as well as autoreceptor-mediated decreases in presynaptic function (250 ms; [*Brucato et al.*, 1992]).

MA DIS 31. However, we could not draw conclusions about the effect of intra-LV dyssynchrony on clinical outcomes from our study.

MA DIS 32. Prasad and Janecka [6] had reviewed 26 publications containing information of 144 patients with temporal bone SCC and they derived some conclusions about outcomes as follows.

MD INT 31. As more is known about the properties of p7 it is becoming clear that this is an important factor in the virus life cycle, presumably at a post-replication stage.

MD INT 32. Much of what we understand about the effectiveness of any given antiepileptic agent is actually gained through clinical experience in the post-marketing period.

MD MET 31. The GeneCards database integrates information about human genes, proteins and diseases, extracted from over 80 databases including both OMIM and Entrez Gene.

MDMET 32. The amount of information available varies depending on how much is known about a gene.

- MD RES 31. These results raise several questions about the role HMG3 in P19 EC cells and whether it acts through a different mechanism compared to HMG1 and HMG2.
- MD RES 32. However not much is known about the influence of hypoxia on the actin cytoskeleton.
- MD DIS 31. To understand more about this interaction in terms of a fully infectious replication system, these alanine substitutions were introduced individually into the JFH-1 background and their effects on the JFH-1 life cycle studied in cell culture.
- MD DIS 32. The relevant literature on CAPtDA for early stage prostate cancer, about both the impact and usage of these tools, is very sparse.
- SA INT 31. While the processes that generate fear of crime are clearly complex, one factor that plays a salient role in understanding anxiety about crime is race and ethnicity.
- SA INT 32. Some important developments in the U.S. labor market, and the academic discussion about them, demonstrate why it is important to look at work organizations when studying inequality.
- SA MET 31. How well informed the respondent feels about the group is measured on a scale of 1 (not well informed) to 3 (very well informed).
- SA MET 32. This procedure allows us to examine the average association between a country's exports to the U.S. and estimated per capita CO2 emissions in order to determine if there something unique about exports to the U.S.
- SA RES 31. What is unique about the industries that show the greatest impact on carbon emissions is industries is their "carbon intensity".
- SA RES 32. A further expansion of the analysis to Model 4 suggests that denomination itself entails little information about attitudinal differences, once church attendance and trust in scientific cosmology have been taken into consideration.
- SA DIS 31. If this idea about environmental performance is true, then the poor countries should eventually show a decrease in their CO2 output.
- SA DIS 32. Thus, among whites, racial/ethnic preferences, as well as ideas about different racial/ethnic groups, are strongly gendered.
- SD INT 31. In this study, I use these two terms interchangeably to refer to the total impression based on a loose combination of knowledge, beliefs and feelings about an organization (Tom, 1971).
- SD INT 32. Two schools of thought emerged about the adjustment of returning Vietnam veterans: stress evaporation and residual stress (Figley, 1978).
- SD MET 31. Aside from the personal letters from citizens, one piece of memoranda was located which was probably intended to inform the Governor about the logistics of the electric chair and death cell at Central Prison.
- SD MET 32. First, the historic nature of the CLS survey, the size of the study, and the fact that information about the study is widely available, allowed me to present this research as an important academic research project.
- SD RES 31. There is nothing against the system at all and the fact is there has been a great deal of senseless, sensational talk about the execution...
- SD RES 32. If participation in decision making and feelings about the church's leader are most closely related to Emotional Energy, then power may be more of a factor than Collins allows.

SD DIS 31. My study is not informative with respect to how often information about CSR is available to job seekers, or whether CSR information actually is salient to the individual.

SD DIS 32. While the sociological literature does allude to societal disfavor as the primary impetus for changing execution methods, little is mentioned about the specific social agents or influences that have a voice or role in the process of reconstructing or redefining meaning.

Appendix F: Complex Prepositions

Two-word Prepositions

- **MD DIS8.** Instead of the three levels of cut off points of the recommended daily defined doses of AEDs, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).
- **SA INT 8.** In 1996, 23 out of 64 countries with below-replacement fertility had policies to raise fertility ([Tsui, 2001] and [Caldwell et al., 2002]).
- **MA INT 8.** The flow of information through the amygdala starts with cortical and thalamic input into the lateral and basolateral nuclei, then proceeds from there through efferent projections to the central nucleus of the amygdala, bed nucleus of the stria terminalis, and the nucleus accumbens (De Olmos et al., 1985).
- **MA RES 8.** In terms of risk categories (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified into a different risk set using arterial age in place of observed age (16% would go to a lower risk stratum and 12% to a higher risk stratum).
- **MD MET 3.** The following method for infection of the cells seeded into appropriate tissue culture dishes was used throughout the experiments, unless otherwise specified for particular HCMV infection assays.
- **MD MET 9.** The beta coefficient estimate and standard error for each study were entered into the analysis, which produced a global (i.e. average) OR and associated 95% confidence interval.
- **MA RES 10.** Hypotension (defined as systolic blood pressure less than 90 mm of mercury), present in two individuals when IV ribavirin was initiated, was managed with fluids and vasopressors, and resolved within 24 h.
- **MD RES 9.** SNP data were screened within BeadStudio using a two-step procedure.
- **MD DIS 1.** Within the three different cell lines generated in this part of the study, namely cell lines depleted of hDaxx, or expressing hDaxx PAH1 or hDaxxMSIM, ATRX had a dispersed localisation pattern.
- **SA RES 2.** When breaking down the organizational variables into the effects of unionization, casualization, globalization, and downsizing, Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).
- **SD INT 1.** When speaking specifically to legislative shifts in execution methods, there is little or no evidence within the literature which indicates that modes of punishment were designed or adopted to be exclusively used against one particular group or race of individuals, particularly in the post-industrial United States.
- **SD INT 5.** Axinn and Yabiku (2001) identify a crucial association between attitudes and transitions into marriage at the neighborhood level.
- **SD DIS 8.** Nonetheless, if church participants are bringing their selves into relation to each other vis-à-vis an agreed upon ideal, then rituals can be said to align divergent individuals with each other and with an ideology of some sort.

Three-word Prepositions

- MA MET 17. This plasmid was purified in the same manner as pMB75.
- MA INT 4. In combination with Thrombin-JMI (distributed by Jones Pharma Inc, Bristol, VA, a wholly owned subsidiary of King Pharmaceuticals, Briston, TN), this mixture allows intimate tissue contact and conformation to an irregular wound bed, such as an abraded sinonasal mucosal surface after sinus surgery.
- MA RES 2. In type 1 EN tumors, the K5+ basal/myoepithelial cells, in addition to the K8+ luminal cells, are part of the tumor epithelial cell population.
- MA RES 8. In terms of risk categories (>10%, 10% to 20%, and <20% estimated 10-year CHD risk), 28% of participants would be reclassified into a different risk set using arterial age in place of observed age (16% would go to a lower risk stratum and 12% to a higher risk stratum).
- MD MET 7. In addition, data obtained from patients' records were recorded and stored in adherence with the Data Protection Act 1998.
- MD DIS 7. Lamotrigine is better tolerated in terms of withdrawal due to side effects compared with gabapentin and carbamazepine without significant difference in rates of seizure freedom during the first 12 months of treatment (Rowan et al., 2005).
- SA RES 1. In addition to the analyses reported, we also consider the possibility that predictors of the fear of specific crimes may have differential effects, consistent with recent research (e.g., [Ferraro, 1995] and [Rountree, 1998]).
- SA RES 2. When breaking down the organizational variables into the effects of unionization, casualization, globalization, and downsizing, Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).
- SA RES 9. This is clearly evident in media reports where the attack is interpreted in relation to Australia's 'exceptional' self-identity as the 'lucky country'.
- SA DIS 2. Differentiating between employees in terms of their bargaining power in the employment relationship has also been a well known theme in labor market sociology ([Kalleberg et al., 1981], [Sørensen and Kalleberg, 1981], [Sørensen, 1994], [Halaby and Weaklien, 1993] and [Sakamoto and Chen, 1991]).
- SA DIS 3. In contrast to the varied positions Asians and blacks encounter in white men and women's racial hierarchies, Latinos are the most included out-group for both white men and women.
- SD INT 8. The findings from these studies are rich and varied, especially in regard to institutional responses to changing social and structural conditions, the changing nature of denominational affiliation, the different fates of mainstream and evangelical churches, and the extent of local churches' provision of social services.
- SD MET 4. Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats, or even significant sources of stress--such as family and relationship problems, serious health problems, or workplace and financial stressors.
- SD DIS 5. In the case of Chinese Christians, the generally high degree of religiosity I have observed among congregants signals deep acceptance of the Christian social and moral order.
- SD DIS 6. Incidentally, in the case of respondents who previously participated in traditional Chinese religious practices, such as worshiping ancestors or propitiating the Earth or Kitchen gods, a pattern emerges of greater previous participation among lower income respondents, as well as those with less education (see Table 7-4).
- SD INT 25. At the time of the study it was estimated that 830,000 male and female Vietnam theater veterans (26%) had symptoms of PTSD (Price, 2006; Schlenger et al., Weiss et al. 1992).
- SD MET 25. At the end of each scenario, they were asked to answer a series of questions about their attraction to the organization as an employer.
- SD DIS 25. The circle at the top of Figure 1 represents the social context – or “predisposing conditions,” in Loftand & Stark's (1965) terminology, from which Chinese converts to Protestantism are drawn.

Appendix E: Clausal Complements

- **MA INT 17.** For leukemias and childhood sarcomas, chromosomal translocations leading to the production of chimeric proteins serve as initiating genetic events.
- **SA INT 18.** This conclusion might appear to be unexpected if one interprets the prior literature as suggesting that inter-industry wage dispersion had contributed to (i.e., was positively correlated with) wage inequality.
- **SA INT 14.** Yet this prediction alone cannot serve as the basis for formulating hypotheses about systematic differences in attitudes, as definitions of patients' best interests may heavily depend on specific circumstances of each particular case.
- **MD DIS10.** Family studies may have a better chance of detecting rare variants, and any association between them and common diseases, than population studies.
- **SD MET 8.** In a second step, I also account for changes in the individual and labor market characteristics, to obtain the net effect of entering marriage on earnings, including the measures for the German and US data described above
- **SD MET 10.** At the Cantonese congregations, although my Cantonese is very limited, I made a point of speaking a few sentences in Cantonese.
- **SD RES 4.** In a style reminiscent of the 1935 transition, Maddrey urged, "North Carolina has a tradition of progressiveness, of looking forward, of maintaining as high ideals as possible..." (ibid.).
- **MA DIS 3.** The observation that HLA-E bound to peptides with Ala, Tyr, or Lys at P8 interacts with CD94-NKG2A with low affinity suggests a role for this residue in governing the specificity of the interaction.
- **MA DIS 8.** Importantly, GDNF was highly effective in reducing heavy drinking after a short period of deprivation.
- **MD INT 3.** The mechanism of RA in inducing neural commitment from stem cells in vitro was investigated by Berg and McBurney, where they revealed RA can be present for as short as 2-4 hours and still be effective in inducing the irreversible neuronal differentiation of P19 EC cells (Berg and McBurney, 1990).
- **MD DIS 5.** Adequate self-care requires skill in performing routine self-care maintenance behaviors.
- **SA INT 1.** While the racial (or minority) threat thesis has been conceptualized as multidimensional (Eitle et al., 2003), one conceptualization emphasizes the criminal threat of Blacks and other minorities in understanding the actions of the state against minorities (Liska and Chamlin, 1984).
- **SA RES 2.** When breaking down the organizational variables into the effects of unionization, casualization, globalization, and downsizing, Table 5 shows that the impact of unionization is similar across both genders in terms of increasing the explained variance of the slopes (i.e., see the estimates for Model 6).
- **SD INT 7.** The identity concerns the addresses are not mere fancy; they have real consequences in shaping a community and the behavior relevant to that community.
- **SD MET 1.** Thus, the mention of organizations, persons, offices, and institutions can serve as a logical plan of inquiry in collecting and perusing historical primary data.
- **SD RES 4.** In evaluating Hudson's position, it becomes clear that his opposition to lethal injection hinged on the distancing between the State and the condemned.
- **SD RES 9.** The results are expected to be loosely connected to the respondents' point of view in making their initial decision, but more in the way of emphasis than strict conformity.
- **SD DIS 1.** While this model is useful in sociological explanations of white-collar crime, organized mob activity, or political misconduct, it is somewhat insufficient in accounting for or addressing institutional acts which have no apparent malicious agency, such as the case presented in this study.
- **SD DIS 4.** Since selection seems to be such a powerful factor in explaining marriage earnings differences at the individual level for both men and women, I want to investigate the extent to which cultural and economic conditions affect marriage crossnationally in my analysis of marriage formation and timing drawing on aggregate data over the past four decades.

- **MD RES 19.** This was achieved by infecting HF-ShLuci and HF-ShATRX cells on coverslips with 0.2 infectious units per cell of ADSubUL82 and processing for immunofluorescence with anti-IE1 and anti-ATRX antibodies at 12 hours post infection.
- **SA DIS 20.** However, current government policy seems to have been going in the opposite direction by shifting health care financing to the private sector and household incomes through user-fees such as copayments.
- **SD INT 20.** This dissertation considers these issues by examining two time periods in a particular state rather than one incident or act at a single moment in time (see Gusfield & Michalowicz, 1984).
- **SD MET 20.** I obtain earnings propensity scores by estimating probit models with employment as the dependent variable and region (Germany), age, education, disability status and the previous year's household post government household income.
- **SD DIS 19.** First, rituals provide a means to "reify" an ideology by providing concrete enactments of abstract concepts.
- **SD DIS 20.** That is to say, ritual shapes affinities between people by providing ritualized means of expressing benevolence, or at least some sort of higher order meaning, that establishes the boundaries of group membership.
- **SD DIS 23.** This study recognizes job applicants, the potential employees, as an important stakeholder group, and shows that firms' investments in CSR can yield secondary benefits from attracting quality employees.
- **MA DIS 29.** As mentioned, adult heterogeneous rats do not typically show increased locomotion after being administered with ethanol.
- **MD INT 30.** DNMT1 -/- ES cells divide and maintain pluripotency in culture but failed to survive after being induced to differentiate, possibly due to the lack of repression of pluripotent genes such as Oct4 and Nanog through methylation (Jackson et al., 2004).
- **MD MET 29.** After removing the fix solution and washing the coverslips twice in PBS, 0.5 ml of permeabilisation solution [10% (w/v) sucrose, 0.5% (v/v) NP40, in PBS] was added and the cells were incubated at room temperature for 10 min.
- **MD RES 30.** After culturing electroporated cells for 10 passages, it was noted that culture medium from mutant G33A culture could infect naïve Huh7 cells.
- **SA MET 30.** We attempt to address these questions after briefly discussing our research strategy.
- **SA RES 29.** These results obtain even after controlling for demographics, resources, social connectedness, and overall number of memberships and active memberships.
- **SA RES 30.** Table 2 also shows that the covariance between the intercepts and the slopes is substantially reduced in the Full Model after adding the substantive covariates, although this covariance is still significant at the .05 level.
- **SD RES 30.** Five years prior to the "Act..", a black inmate housed in the Wake County Prison Camp was released from his cell for special yard privileges, and subsequently had his toes amputated after suffering from frostbite (ibid.).

Appendix F: Phrasal Complements

- **MD INT1.** Prevalence of HSV-1 infection is substantially higher than that of HSV-2 but the figures vary largely between geographic regions and amongst different age groups.
- **MD MET1.** The cells used throughout this study and the purpose of their use are detailed below (in the order of relevance).
- **MD RES1.** The appearance of the two bands corresponding to major ATRX isoforms of approximately 280 kDa and ATRXt (a truncated ATRX isoform) was consistent with previously published work (Berube et al, 2000; Garrick et al, 2004).
- **MA INT 1.** The primary determinant of progression through ?? T cell development is the expression of a functional T cell receptor .
- **MA MET 1.** In brief, one round of amplification was performed, RNA samples were labeled with Cy3 or Cy5 dyes, and samples were hybridized to the Mouse Operon oligo set 4.0 Chip.
- **MA RES 1.** After getting the result of severe axonal degeneration on EMG, facial nerve decompression via transmastoid approach was performed.
- **MA DIS 1.** It appears that E proteins are regulating, perhaps directly, two sets of genes.
- **SA MET 1.** We were able to collect an average of 13.29 years of overlapping trade and CO2 data for each nation.
- **SA DIS 1.** Clearly, these data indicated that U.S. consumption practices have important implications for world production of CO2.
- **SD INT 1.** Within criminological conflict theory is the conflict model of lawmaking.
- **SD MET 1.** In selecting newspapers for examination, consideration was given to their political orientations. Justification for this lay in the possibility that differences in how execution methods were literally constructed may depend upon the liberal or conservative slant of the media organization.
- **SD RES 1.** Prior to discussing North Carolina's distinct execution history, it is pertinent that a brief history of execution method shifts in the United States be provided.
- **MA INT 7.** Alcohol has multiple effects on metabolism, including changes in energy intake (Armellini et al., 1993).
- **MA MET 7.** These neurons represent 90–95% of the neurons in the BLA (McDonald, 1982).
- **MA RES 7.** The histologic diagnoses were SCC in 10 patients (83%) and ACC in 2 patients (17%).
- **MD INT 7.** Patients were identified in the hospital and approached for consent to participate in the study.
- **MD MET 7.** In addition, data obtained from patients' records were recorded and stored in adherence with the Data Protection Act 1998.
- **MD RES 7.** However, previous studies in our lab have shown that VN/124-1 may provide inhibitory effects in resistant cells.
- **MD DIS 7.** Lamotrigine is better tolerated in terms of withdrawal due to side effects compared with gabapentin and carbamazepine without significant difference in rates of seizure freedom during the first 12 months of treatment (Rowan et al., 2005).
- **SA INT 7.** By contrast, theories of authoritarianism predict that, in the face of threat, authoritarian sentiment should grow (Adorno et al., 1950).
- **SA MET 7.** We adapt a predictive modeling strategy to the problem of identifying increases in trust in government following the 9/11 attacks.
- **SA RES 7.** Although formal education did not affect these attitudes directly, the educational upgrading taking place in Australia did have implications for views concerning voluntary euthanasia.
- **SA DIS 7.** In general, our initial model reflects the available literature on individual citizens' trust in government.
- **SD MET 7.** In the German data, tenure is measured in years, in the US data it is measured in months.

- **SD RES 7.** This difference by church size suggests that although smaller churches may serve Chinese peoples' interests in a way similar to hometown societies (tong-xiang hui), Christianity clearly represents a different form of institution.
- **SD DIS 7.** As we have seen throughout this dissertation, such activities are a central concern in the congregational life at almost any church.
- **MA INT 31.** However, beyond the gene sequences, little is known about the structure and function of MHC class I molecules outside of mammals.
- **MA MET 29.** Our review included patients both before and after the acquisition of HBO equipment at our institution (1998).
- **MA RES 17.** After 2 days, inhibition was evaluated by SRB method and expressed as the inhibition rate.
- **MA DIS 25.** Except for RS1914 which is a primary carboxamide, the other three compounds bear different side chains at the 2-carboxamide function, as illustrated in Fig. 1.
- **MD INT 27.** Some cell types can use both modes of invasiveness and undergo transitions between them.
- **MD MET 19.** The BRIGHT data were analysed in Glasgow, and the GRECO and HERCULES data analysed by their respective investigators.
- **SA INT 21.** In our discussion of the impacts on young people in rural and remote areas, we begin by providing a brief summary of recent changes in such areas.
- **SA MET11.** In theory, this variable should be negatively related to carbon production; that is, countries that ratify Kyoto should institute policies that slow or reduce their per capita CO2 emissions.
- **SA DIS 15.** For example, whether or not race-matching effects are dialect-matching effect can be addressed by presenting respondents with two tests; one requires extensive conversation between the respondent and the interviewer and the other that does not require any conversation.
- **SA RES 31.** What is unique about the industries that show the greatest impact on carbon emissions is industries is their "carbon intensity".
- **SD RES 14.** The electrocution of Walter Morrison was the only one conducted in North Carolina for the year 1910.

Appendix G: Appositives

- **MA INT 6.** The concept *of vascular or arterial age* has been proposed in several previous studies.
- **MA INT 7.** Elderly patients who may benefit from a multifactor intervention are difficult to identify because many are unaware of their increased risk *of falling* and do not report those issues to their physicians.
- **SA DIS 4.** The question *of where kinship norms come from* is an important yet underanalyzed issue in the growing research on family solidarity.
- **MA MET 32.** The resulting final 44-item CTI contained 3 questions concerning the frequency of falling, 3 questions *about the circumstances of the current fall*, 5 questions concerning the fall history, and 33 questions regarding modifiable risk factors (Appendix B).
- **MA RES 31.** We used interpulse intervals of 25, 50, and 250 ms to determine the ratio of the second synaptic response to the first across times that yield information *about release probability* (25 and 50 ms; [Andreasen and Hablitz, 1994] and [Katz et al., 1993]) as well as autoreceptor-mediated decreases in presynaptic function (250 ms; Brucato et al., 1992).
- **MA DIS 31.** However, we could not draw conclusions *about the effect of intra-LV dyssynchrony on clinical outcomes* from our study.
- **MA DIS 32.** Prasad and Janecka [6] had reviewed 26 publications containing information of 144 patients with temporal bone SCC and they derived some conclusions *about outcomes* as follows.
- **MD MET 31.** The GeneCards database integrates information *about human genes, proteins and diseases*, extracted from over 80 databases including both OMIM and Entrez Gene.
- **MD RES 31.** These results raise several questions *about the role HMG3 in P19 EC cells* and whether it acts through a different mechanism compared to HMG1 and HMG2.
- **MD DIS 32.** The relevant literature on CAPtDA for early stage prostate cancer, *about both the impact and usage of these tools*, is very sparse.
- **SA RES 32.** A further expansion of the analysis to Model 4 suggests that denomination itself entails little information *about attitudinal differences*, once church attendance and trust in scientific cosmology have been taken into consideration.
- **SA DIS 31.** If this idea *about environmental performance* is true, then the poor countries should eventually show a decrease in their CO2 output.
- **SA DIS 32.** Thus, among whites, racial/ethnic preferences, as well as ideas *about different racial/ethnic groups*, are strongly gendered.
- **SD MET 32.** First, the historic nature of the CLS survey, the size of the study, and the fact that information *about the study* is widely available, allowed me to present this research as an important academic research project.
- **SD RES 31.** There is nothing against the system at all and the fact is there has been a great deal of senseless, sensational talk *about the execution*...
- **SD DIS 31.** My study is not informative with respect to how often information *about CSR* is available to job seekers, or whether CSR information actually is salient to the individual.

Appendix H: Of-phrases complementing simple nouns

MD INT4. This project was commenced with an aim to study the role of HMGN1-3 in stem cells and neural differentiation.

MD INT6. *Saccaromyces cerevisiae* protein POP2, a component of the multi-subunit transcriptional regulator complex Ccr4p, has been shown to physically interact with the putative RNA helicase DHH1 (Hata et al., 1998).

MD INT7. Gioeli et al. analyzed 60 primary PCa specimens and found that 19 had high levels of activated MAPK (p-MAPK), 31 had low levels and 10 had no detectable levels of p-MAPK (147).

MD INT9. Therefore, if we are to take advantages of this unprecedented expansion in the pharmacological armamentarium and genuinely seek the most appropriate drug or combination of drugs for any given patient, then comparative long-term efficacy and tolerability studies are essential.

MD MET1. The cells used throughout this study and the purpose of their use are detailed below (in the order of relevance).

MD MET7. Demographic data: name, folder number, gender, date of birth, intellectual status, date of referral and date of last clinic visit.

MD MET9. A flowchart of the cohorts included and their sample sizes is shown in Figure 2.5.

MD RES1. . The appearance of the two bands corresponding to major ATRX isoforms of approximately 280 kDa and ATRXt (a truncated ATRX isoform) was consistent with previously published work (Berube et al, 2000; Garrick et al, 2004).

MD RES2. A general hypothesis underlying the research described in this thesis is that the recruitment of the ND10 components (and other proteins) to the sites closely associated with the incoming HSV-1 genomes and sites of IE transcription represents a cellular response to virus infection that may lead to viral genome repression.

MD RES5. Bacterial expression vector pKK223-3 (Amersham Pharmacia Biotech, Sweden), containing the B domain of *Staphylococcus aureus* protein A (SpAb) fused to GFP, was kindly donated by Takashi Aoki (Department of Biochemistry, Health Sciences University of Hokkaido, Japan) (Aoki et al., 2002).

MD RES9. Patients with failure of two treatment regimens due to lack of efficacy had a response rate of 13% in comparison to 39% response rate in case of patients with failure of two schedules due to poor tolerability.

MD RES10. L-lactate dehydrogenase and fructose-bisphosphate aldolase were identified as potential binding partners of PHD2 in the SILAC screen, but all three enzymes were tested for their ability to bind either PHD2 or PHD3.

MD DIS1. As discussed in Chapter 1 and in Section 3.1 of the present Chapter, ND10 components constitute a part of cellular intrinsic defence mechanism against both HCMV and HSV-1.

MD DIS2. Because hDaxx is the targeting component of the ATRX/hDaxx complex, this causes displacement of the entire complex away from the viral genomes (marked in red) and relieves cellular repressive mechanism.

MD DIS3. HMGN1 and/or HMGN2 knockdowns altered the expression of many of the neural lineage genes in day 3 of neural differentiation but not in undifferentiated cells.

MD DIS7. Remission rate of elderly patients with focal epilepsy on sodium channels blocking AEDs was 89% compared to 90% in those on AEDs working mainly by potentiation of GABA inhibitory effect with insignificant difference noticed (p-value = 0.8).

MD DIS8. Instead of the three levels of cut off points of the recommended daily defined doses of AEDs, using simple calculations of patients who failed treatment with the first schedule due to ongoing seizures (regardless of the dosing) or withdrawal of treatment due to side effects, the remission rate on subsequent schedules was 10% (n = 109).

MA INT 4. Structural analyses have revealed that the side chains of these anchor residues (along with secondary anchors) interact with polymorphic residues that define the binding specificities of a series of pockets (B through F) along the peptide-binding groove.

MA INT 6. The concept of vascular or arterial age has been proposed in several previous studies.

MA INT 7. Elderly patients who may benefit from a multifactor intervention are difficult to identify because many are unaware of their increased risk of falling and do not report those issues to their physicians.

MA INT 8. Insulin plays a key role in the regulation of various aspects of cardiac muscle metabolism and function.

MA INT 9. In the present study, we examined sensitivity to ethanol's locomotor activating effects in a genetically heterogeneous rat strain (Sprague-Dawley) during the second postnatal week of life.

MA INT 10. Experiment 2 suggests that vapor ethanol exposure could exert differential hedonic effects depending on the schedule of administration.

MA MET 3. NP tissues were from 6 patients (3 men and 3 women) with AR associated NP, who ranged in age from 27 to 65 years with a mean of 49 years.

MA MET 4. The design, primary end points, and results of the ESCAPE trial have been previously published.

MA RES 7. Twenty-nine patients achieved hemostasis within 10 minutes of product application (96.7% success rate; 1-sided 95% CI, 85.1%–100%).

MA RES 9. Ethanol has been shown to decrease the mRNA levels of insulin-signaling molecules of IR-? and IRS-1 in a dose-dependent manner.

MA RES 10. All 38 subjects had fevers of ≥ 100.5 °F and an abnormal laboratory finding of either thrombocytopenia, proteinuria, or an elevated serum creatinine.

MA DIS 2. The activating mutations identified in our study conferred varying degrees of sensitivity to the small-molecule TK inhibitor PKC412.

MA DIS 5. In agreement, groups D and H, receiving more conventional diuretic doses, showed reductions in diuresis associated with higher neurohormonal values and a higher incidence of readmissions.

MA DIS 6. Future studies are needed to evaluate whether the observations in the present animal studies can be translated into humans. If heparin is confirmed to play a confounding role on PAPP-A levels, the prognostic role of PAPP-A in patients with AMIs must be reevaluated. In this case, previous investigations of the value of PAPP-A in patients with AMIs must be interpreted cautiously because heparin treatment has not been considered as a possible confounder.

MA DIS 9. This profile is different from that of Experiment 2, where DS pups given ethanol-sandpaper pairings preferred the CS compared to their specific controls.

MA DIS 10. The real-time PCR assay can overcome the shortcomings of PRA. The test is not affected by variation in virus loads.

SA INT 4. In addition to contributing to work that focuses on genetic influences, sociologists may also be interested in incorporating the advances in molecular genetics into sociological thinking. Genes may be an important component of outcomes relevant to sociologists.

SA INT 6. Davis and Silver (2003) reported a gap of 1.07 items between black and white respondents who were tested by white interviewers (as perceived by the respondents).

SA MET 1. We were able to collect an average of 13.29 years of overlapping trade and CO2 data for each nation.

SA MET 10. To form respondent racial categories from the parents' races, we first created categories of race for each parent from the home survey similar to the self-identified categories for adolescents, discussed above.

SA RES 1. Before examining the results of the multivariate analyses, we first present Table 2, which has the descriptive statistics for each of the four ethnic and racial subgroups represented in our sample.

SA RES 2. Panel A of Fig. 1 shows the variance in the mean log-wage across the 42 two-digit industries.

SA RES 7. The chi-square statistic is significant and both the IFI and TLI are near the acceptable range of 0.90.

SA RES 10. Indeed, a pivotal part of the Koori Mail's social injustice frame was the definition of the group who were suffering the injustice.

SA DIS 4. The question of where kinship norms come from is an important yet underanalyzed issue in the growing research on family solidarity.

SA DIS 5. These results and the other studies that detected historically contingent relationships with interactive specifications suggest that scholars who have criticized statistical methods because they ignore the contingent nature of historical change may have been guilty of overstatements.

SA DIS 6. One disadvantage of this study is having a small sample size, especially in the number of black respondents interviewed by blacks and the number of white respondents interviewed by blacks, but the results presented in this study are not novel.

SA DIS 9. While our results indicate that multiracial individuals are not less popular than their single-race peers, we also note that this does not necessarily imply that there are no social adjustment problems resulting from a

multiracial background, or that multiracial individuals may not face occasional social rejection from members of single-race groups.

SA DIS 10. Why do translocal organizations excel at political mobilization? Skocpol (2003, p. 256) asserts that translocal groups historically “expressed broadly shared identities and values, engaged in raucous conflict with one another, and linked local people to state, regional, and national centers of power.

SD INT 1. Within criminological conflict theory is the conflict model of lawmaking.

SD INT 3. Some critics of the current war have compared it to the Vietnam conflict, which ultimately had little popular support, and confirmed Sherman’s conclusion that “war is hell” (Hutcheson, 2003; Odom, 2006).

SD INT 4. Follow-up studies examining the results of NVVRS also indicate other key risk factors contributing to PTSD in this study group.

SD INT 5. They suggest it is not only individuals’ own attitudes that play a role in marriage decisions, but also the views of those surrounding the couple.

SD INT 8. The findings from these studies are rich and varied, especially in regard to institutional responses to changing social and structural conditions, the changing nature of denominational affiliation, the different fates of mainstream and evangelical churches, and the extent of local churches’ provision of social services.

SD MET 1. In selecting newspapers for examination, consideration was given to their political orientations. Justification for this lay in the possibility that differences in how execution methods were literally constructed may depend upon the liberal or conservative slant of the media organization.

SD MET 2. Aside from providing hints at locating government documents and reports, early newspaper accounts reveal names of persons involved in important social issues.

SD MET 4. Psychological resilience has been characterized by the ability to bounce back from negative emotional experiences and by flexible adaptation to the changing demands of stressful experiences.

SD MET 6. . For the United States, I use data from the Panel Study of Income Dynamics (PSID).

SD MET 7. In this macro level analysis, I am interested in various aspects of policy context.

SD MET 9. Individual congregants were the key unit of analysis.

SD MET 10. At the Cantonese congregations, although my Cantonese is very limited, I made a point of speaking a few sentences in Cantonese.

SD RES 1. Prior to discussing North Carolina’s distinct execution history, it is pertinent that a brief history of execution method shifts in the United States be provided.

SD RES 3. The News & Observer has historically contained a small informational column entitled “Under The Dome”, which attends to business of the State’s Legislature which is housed in a domed building downtown.

SD RES 9. This study discusses rituals at varying levels of complexity.

SD DIS 2. The social constructivist paradigm carries with it a unique set of criteria by which to evaluate the quality and integrity of qualitative sociological research.

SD DIS 4. This dissertation explored the context and consequences of marriage through an examination of marriage earnings differences for men and women in crosssectional and longitudinal perspective, and the analysis of marriage formation and timing at the aggregate level.

SD DIS 5. It is from this social context and predisposing conditions that most contemporary Chinese recruits in New England enter Chinese Christian churches. There, they encounter the ideology of the church and its members’ behavior, mostly in the form of interaction rituals.

SD DIS 6. Those who were not attracted by the “loving” qualities of other congregants tended to either drop out or to convert more slowly.

SD DIS 7. It is more profitable to consider how strictness in this or that regard shapes the interactional routines of the congregants.

SD DIS 8. Whatever Agape is or could be, this study assumes that it is intuited by congregants in the context of interaction rituals.