On conditionality: A corpus-based study of conditional structures in Late Modern English scientific texts

Autor: Luis Puente-Castelo

Tese de doutoramento UDC / 2017

Directora: Begoña Crespo García

Titora: Begoña Crespo García

Programa Oficial de Doutoramento en Estudos Ingleses Avanzados: Lingüística, Literatura e Cultura

UNIVERSIDADE DA CORUÑA

Dona Begoña Crespo García, en calidade de directora da tese de doutoramento *On conditionality: A corpus-based study of conditional structures in Late Modern English scientific texts* escrita polo doutorando Luis Miguel Puente Castelo

ACREDITO

Que a devandita tese de doutoramento reúne os requisitos formais e técnicos necesarios para a súa lectura e defensa pública, e que cumple tamén cos requisitos para optar á mención internacional.

Na Coruña, a 9 de xaneiro de 2017

Asdo: Begoña Crespo García.

"*Turpe autem nobis sit, si globi materiati tractus, terrarum videlicet et marium, nostris temporibus in iramensum aperti et illustrati sint: globi autem intellectualis fines, inter veterum inventa et angustias steterint.*"

[It would be something that we should be ashamed of, if, now that the ample spaces of the material universe, the lands, and the oceans have been discovered and explored; the frontiers of the intellectual universe were fixed by the exiguous discoveries of the Ancient.]

Bacon, Francis. 1608. *Redargiutio Philosophiarum.* In Spedding, James; Robert L. Ellis & Douglas D. Heath (eds.) *1857-1859. The Works of Francis Bacon*. Cambridge: Riverside Press. Volume VII, 93.

"It [the conditional] is not a creature of constant hue, but chameleon-like, takes on the colour of its surroundings: its meaning is determined to some extent by the very propositions it connects."

Wason, Peter Cathcart & Philip N Johnson-Laird. 1972. *Psychology of Reasoning, Structure and Content*. Cambridge, MA: Harvard University Press. 72.

Acknowledgments

I have had the pleasure of being helped, one way or another, by an enormous number of people during the process which led to the production of this dissertation, and I cannot and would not forget thanking them.

First, I would like to thank my supervisor, Dr. Begoña Crespo, for her support during the process of writing, discussing, correcting and proofreading this dissertation. Her mentoring has been second to none, and I can now say that her meticulous corrections, which my past self would have considered a nuisance, had definitely a point (or two).

I would also like to thank the Department of English Philology and the Faculty of Philology of the Universidade da Coruña as a whole, and their faculty and staff in particular, for allowing me to grow into a researcher under their guidance and help. I would like to thank in particular the staff at our library for their continuous help over the years since I first crossed its doors, and the staff at the Departments Administrative Unit (UADI) for their help whenever I panicked over paperwork.

I am also immensely grateful to everyone at the Department of English Language and Applied Linguistics and at the Centre for Advanced Research in English of the University of Birmingham during my three, shorter-than-I-would-have-liked, stays there. I am deeply grateful to Dr. Suganthi John and Prof. Susan Hunston for their academic guidance and for providing a fresh point of view on my dissertation, and, most particularly, to CARE administrator Michelle Devereux, as the most helpful, caring person one would like to find after arriving at a foreign city and new university.

My stay in Birmingham could not have been the same without the comfortable environment of the Wesley International Hall, and I would like to thank all the staff and fellow residents for making it a real home away from home. I would also like to thank my fellow visiting researchers at CARE, with whom more than a coffee was shared, and, particularly, Dr. Isabel Herrando-Rodrigo, for her good ideas and friendly chat over coffee, lunch, drinks or Full English breakfasts somewhere in Bristol Road.

I could not forget my colleagues, and now friends, in our research group: Gonzalo Camiña, Inés Lareo, María José Esteve, Iria Bello, Estefanía Sánchez, Paula Lojo, Emma Lezcano, and Isabel Moskowich. In some manner or other, from compiling our corpus to providing good advice, this is also yours. A special place among them is reserved to my colleague and fellow sufferer Maria Monaco, for her advice, help, and proofreading, and for her psychological support whenever I had one of my (admittedly fairly frequent) crises. I must also extend this gratitude to my fellow PhD students in the faculty, and particularly to Sonia Rico for all these years of office-sharing in our beloved (but ultimately cold) “catacombs”.

Since I have started thanking colleagues who now are friends, I must also thank all my friends for supporting me during these years of writing, during which I have perhaps not been as readily available

as they would have wanted. This includes the large number of friends with whom I have shared library hours and coffee breaks (leading to the coining of the verb *bibliotequear*), and who have played a crucial role in the happy ending of this process. Although I want this paragraph to include everyone who have helped me in any way (and therefore naming names would be somewhat of a risk), I have to highlight the role of my best friend, Iago Varela, who has always been ready to help, support, and give courage, and without whom this would not have been possible.

I would also like to thank my family, Mum, Iris, Brais, Miguel, for bringing me up in a loving and caring environment as a responsible individual, conscious of my place in the world, and ever thankful of the work of my parents, and for loving me a lot. This extends to my partner, best friend, and flatmate, Sandra, for her love and her patience. Particularly for her patience. I owe you a lot.

Finally, I would like to thank the state-funded education system. Without the extensive net of support in the form of grants and scholarships in the state-funded education system for which our parents and grandparents fought, and from which my generation have benefitted, it would have been impossible for the son of a working-class family as myself to make it to the end of a university degree, let alone a doctoral dissertation. Now that this system seems more at risk than ever, it is precisely the moment when it must be most appreciated (and fought for). Thank you.

A Coruña, May 21, 2016.

Resumo

Sobre a condicionalidade: Un estudo baseado en corpus das estruturas condicionais en textos científicos de Inglés Moderno Tardío.

Os séculos XVIII e XIX representan o período principal de desenvolvemento do rexistro científico en inglés. Este rexistro, porén, non debe entenderse coma un ente monolítico, senón, ao contrario, coma unha entidade con múltiples facetas que presenta importantes variacións en función dunha serie de parámetros, como a disciplina e o xénero dos textos ou a orixe xeográfica e o sexo dos autores, ademais da evidente variación ao longo do tempo.

Unha das características principais do rexistro científico durante o período estudado é a súa evolución cara a un modelo no cal os autores teñen que persuadirse uns a outros da veracidade das súas afirmacións, o que fan mediante o uso de certas estratexias lingüísticas determinadas. As condicionais son unha destas estratexias. As condicionais presentan unha moi importante variabilidade tanto formal coma funcional, realizando os máis diversos roles no discurso, entre eles o de modular afirmacións dun autor de cara a obter unha mellor recepción da audiencia.

O obxectivo principal desta tese é analizar os usos das condicionais nos textos científicos dos ss. XVIII e XIX, analizando a variabilidade tanto formal como funcional das condicionais e os seus usos como estratexias discursivas de cara a conseguir unha mellor recepción do discurso. Para facer isto, analizarase o uso das condicionais en tres subcorpus do *Coruña Corpus of English Scientific Writing*, prestando atención tanto á forma das condicionais (partícula, orde dos constituíntes, combinacións de verbos), como á súa función, e analizando os datos en función dos diversos parámetros de variabilidade do rexistro científico (diacronía, disciplina, xénero, orixe e sexo), de cara a observar posibles diferencias nos usos das condicionais nos diferentes tipos de rexistro científico.

Resumen

Sobre la condicionalidad: Un estudio basado en corpus de las estructuras condicionales en textos científicos del Inglés Moderno Tardío.

Los siglos XVIII y XIX representan el periodo principal de desarrollo del registro científico en inglés. Este registro, sin embargo, no debe entenderse como un ente monolítico, sino, al contrario, como una entidad con múltiples facetas que presenta importantes variaciones en función de una serie de parámetros, como la disciplina y el género de los textos o el origen geográfico y el sexo de los autores, además de la evidente variación a lo largo del tiempo.

Una de las características principales del registro científico durante el periodo estudiado es su evolución hacia un modelo en el cual los autores tienen que persuadirse mutuamente de la veracidad de sus afirmaciones, lo que conseguían mediante el uso de algunas estrategias lingüísticas determinadas. Las estructuras condicionales son una de estas estrategias. Las condicionales presentan una variabilidad muy importante, tanto formal como funcionalmente, llevando a cabo diversos roles en el discurso, entre ellos el de modular las afirmaciones de un autor para obtener una mejor recepción por parte de la audiencia.

El objetivo principal de esta tesis es analizar los usos de las condicionales en textos científicos de los siglos XVIII y XIX, analizando la variabilidad, tanto formal como funcional, de las condicionales, así como sus usos como estrategias discursivas para conseguir una mejor recepción del discurso. Para haces esto, se analizará el uso de las condicionales en tres subcorpus del *Coruña Corpus of English Scientific Writing*, prestando atención tanto a la forma de las condicionales (partícula, orden de los constituyentes, combinaciones de verbos) como a su función, y analizando los datos en función de diversos parámetros de variabilidad en el registro científico (diacronía, disciplina, género, origen y sexo), con el objetivo de observar posibles diferencias en los usos de las condicionales en los diferentes tipos de registro científico.

Abstract

The eighteenth and nineteenth centuries represent the main period of development of English scientific register. This register must not be considered as a monolithic entity, but, rather, as a multifaceted entity with important variation depending on several parameters, such as the discipline and genre of the text or the sex and geographical origin of the authors, besides the evident diachronic variation.

One of the characteristics of scientific register during this period is its evolutions towards a model in which authors have to persuade one another of the veracity of their claims, by means of using particular linguistic strategies. Conditionals are one of these strategies, as they present a very noticeable variability, both formal and functional, performing diverse roles in discourse, including that of modulating an author's claims so as to obtain a better reception by the audience.

The main aim of this dissertation is to analyse the uses of conditionals in eighteenth and nineteenth century scientific texts, analysing the formal and functional variability of conditionals and their uses as discursive strategies to obtain a better reception for a discourse. To do this, three subcorpora of the *Coruña Corpus* will be analysed for the use of conditionals, paying attention both to their form (particles, constituent order, verb form combinations) and to their function. I will also analyse the data in relation with several parameters for variability in scientific register (diachrony, discipline, genre, origin and sex) in order to observe possible differences in the use of conditionals in the different types of scientific discourse.

Table of contents

Index of tables

Index of figures

Introduction

Introduction

The aim of this study is to describe the use and functions of conditionals in English scientific writing during the eighteenth and nineteenth centuries with the help of the *Coruña Corpus of English Scientific Writing* (*Coruña Corpus* or *CC*). This introduction aims at providing a general overview of the contents in this dissertation. It will be divided in two main sections: the first one will present a general description of the study, whilst the second will focus on the relevance of the study in relation with the existing literature on the topic.

1. Description of the study.

This dissertation stems from the tradition of studies on register, and, more particularly, on scientific register. The study of scientific discourse (and, particularly, scientific writing[1]) has been developing as a focal point for linguistic studies during the past few decades, configuring an exuberant area of research.

[1] Even though oral transmission of knowledge was essential for the continuing exercise of science in the Medieval Era, the use of the written (rather than the oral) medium for the transmission of knowledge has been a defining feature of Institutionalised Science at least since Socrates' dialogues were put into writing by Plato. This institutionalisation was the result of a series of factors, in which the natural longer permanence of the written form combined with the "sacredness" sometimes associated to the Bible (and, by extension, to all written material) in medieval times. However, nowadays the prevalence of writing is also explained by the fact that scientific writing materials (articles, essays…) are, in Bazerman's words, "the primary product of most disciplines, and a secondary product of all…" (1994: 104), to the point that these pieces of writing "are taken to constitute the knowledge of the disciplines".

This surge of interest have manifested principally in two main approaches: one is related with the teaching processes of academic writing as a subject taught both to native and non-native English speakers: the emergence of English for Academic Purposes as a discipline led to the necessity of having insightful descriptions of disciplinary discourse with which to inform its teaching processes. The other approach studies scientific discourse as an example of register variation, using the main product of the scientific endeavour, the scientific text, as evidence to analyse the practices and culture of the different disciplines, movements, paradigms, or schools. In Gray's words, "describing and understanding patterns of language use in academic prose allows us to understand the disciplinary cultures and practices that they embody" (2011: 1).

This study is ingrained in this latter tradition, as it tries to contribute to the description of a given type of scientific discourse (English scientific writing in the eighteenth and nineteenth centuries) and to identify the differences between different subtypes of this discourse, whilst at the same time relating these results to the reality of the different communities of scientists developing at the time, using the linguistic data as evidence to forward these analyses[2].

In what follows, the study will be described in full, with subsections focusing on its methodology, objectives, and contents. However, and before starting with these issues, it is necessary to clarify a crucial terminological issue.

1.1. *Register, discourse, genre, text type, style. A short overview*:

The reader may have noticed that the concepts *scientific discourse* or *scientific writing* have been used interchangeably in the previous paragraphs, referring to similar (or nearly similar) realities. It has also been common in the literature to refer to these same realities as *genres*, as did Biber (1988), distinguishing *spoken* and *written genres;* or Bhatia (1993, 1996, 2002), writing about *academic* or *research genres*. Thus, *register* and *genre* are two concepts that have been frequently used by different authors to refer to a similar reality, that of "varieties associated with particular situations of use and particular communicative purposes" (Biber & Conrad 2009: 21). Regretfully, these concepts are not perfectly synonymous, and are often defined with differing, sometimes opposite, criteria. Thus, it is necessary to delimit the meaning of these and some other related concepts (*discourse, text type, style*) in this dissertation.

One example of author providing a distinction between these concepts is Johnstone. She (2002: 158) understands *register* as "a variety of language" which is used in a particular situation (i.e. scientific

[2] However, and despite the tendency in some of these studies, theoretical frameworks have not been followed, but only taken as a reference, considering the general approach of the dissertation as *eclectic*.

discourse, testamentary language), whilst *genre* would be a "recurrent verbal form" adopted by the given variety of language (i.e. a research article, a will)[3]. Both concepts do not purport a biunivocal relation: a single register may use different genres (scientific discourse can appear in the shape of a research article, but also as a conference presentation), whilst a single genre may "cut across registers" (Bhatia 1996: 45), as do text-books, which, irrespectively of the different disciplines they could be dealing with (this is, irrespectively of the particular register in each of them) present comparable communicative purposes. Taavitsainen (2001: 140) however, considers genres as a "mental frame in people's minds which gets realised in texts for a certain purpose in a certain cultural context", whilst the linguistic realisation of these mental frames would be a *text-type*.

Biber (1988) in a first stage distinguishes between *genres* and *text types*. Genres would be categories of texts on account of rhetorical and non-linguistic criteria, most particularly the purpose of the author, whilst text-types are categories of texts which are grouped "on the basis of similarities in linguistic form, irrespective of genre classifications" (1988: 206). This is, the classification of text-types would initially ignore any extra-linguistic information, and would only interpret possible functional similarities after the linguistic-based groupings are made.

Biber later evolved his stance on this terminological problem, readdressing it several times and changing the labels used to name the concepts, sometimes together with Finegan and Conrad. In Biber & Conrad (2009), the concepts whose distinctions are described are those of *register*, *genre* and *style*. *Register* is "a variety associated with a particular situation of use (including particular communicative purposes)" and it is described on account of "three major components: the situational context, the linguistic features, and the functional relationships between the first two components" (Biber & Conrad 2009: 6). *Genres*, on the contrary, are characterised by their rhetorical organisation, with their defining characteristics presenting a structural function in the text which is frequently the result of conventional constraints. Thus, scientific register would be characterised by particular linguistic features which are typical of the register and which have a function in it, whilst the research article as a genre would be characterised by its structural properties, such as the conventional structure Introduction-Method-Result-Discussion (IMRD), as well as the presence of an abstract and a conclusion. This difference implies that whilst registers can be analysed with the help of corpora, genres need complete texts, thus putting genre analysis beyond the scope of corpus linguistics and

[3] This is, *register* (assimilated by Johnstone to the concept of *style*) would be characterised by the situation which raises the necessity of using the register and its particular linguistic characteristics, whilst *genre* (assimilated to *text type*) would be characterised by its communicative purposes and by how these purposes (as a result of the various influences of its practitioners over time) give way to different conventions around the way knowledge and information is transmitted and organised and how this is reflected in the formal nature of the texts.

into the realm of rhetorical analysis. Finally, Biber and Conrad conceive *styles*, much like registers, as being characterised by their linguistic features, but, in this case, with features which are not the result of situational constraints, but which are, on the contrary, "associated with aesthetic preferences, influenced by the attitudes of the speaker/writer about language" (Biber & Conrad 2009: 18). Thus, the particular way of writing of an author or a group of authors would be an example of style.

1.1.1. *Use of* register *in this dissertation.*

This dissertation will follow Biber & Conrad's (2009) definition of *register* as a situational variety of language which presents particular communicative purposes and particular linguistic uses with a definite function in it. The concepts *scientific discourse* and *scientific writing* will be used interchangeably with *scientific register*. The latter concept is, admittedly, not perfectly synonymous (scientific register includes both oral and written texts), but, given that this dissertation will only study written texts, the three concepts will be used interchangeably, taken to mean "(written) scientific register".

An important characteristic of Biber & Conrad's concept of register is that it is scalable, this is, it can be "defined at varying levels of specificity" (Gray 2011: 3), since linguistic productions are affected by several situational factors at once and, consequently, they allow different analyses focusing on the influence of any of these situational factors on a single linguistic variety. For instance, scientific register as a whole presents a series of particular situational characteristics, which can be the object of analysis by themselves or in contrast with other types of registers; but this is also the case with, for example, the different disciplines of scientific register, which constitute different disciplinary registers that can also be analysed by themselves or contrasting with one another.

The aim of this study is to analyse the scientific register in English as a whole, examining a corpus of texts which are taken to be representative of the general uses of the register, but it will also focus on several parameters at a higher level of specificity, such as the discipline to which the texts belong, the moment in time they were written, or the sex of the author, among others. However, in this dissertation, the term *register* will be reserved to refer to the lowest level of specificity only, this is, to scientific register *as a whole.* Consequently, analyses at a higher level of specificity will be said to study "scientific register on account of the parameter X". There are five such parameters: the year of publication of the text, denoting the diachronic evolution of the language, the sex of the author, their geographic origin, the discipline of the text and its genre[4].

[4] *Genre* as the name of this parameter is not to be understood in Biber & Conrad's sense, but rather in Johnstone's (2002), as a recurrent formal structure on which information could be transmitted, being an

1.2. *Methodology: Uses of corpora in register variation.*

Since the 1960s and 1970s, the emergence of large electronic corpora has opened the way for large scale studies of register variation, allowing comparison of different registers, in different languages, and from a diachronic or synchronic point of view, among an enormous range of other different parameters. However, as far as the design of corpus research is concerned, any corpus study on register variation can be described on account of two criteria, defined by Gray (2011: 18ff): the comprehensiveness of the linguistic features being investigated and the way the information is obtained from the corpus.

In what concerns the first of the criteria, Gray distinguishes three different possibilities for the scope of the research. The first is studying a single linguistic feature in detail (be it a word, a grammatical structure or "a set of related items") and focusing on its different variants. An example of this type of study is, for instance, a study on the prefixes and suffixes of nouns in astronomy and philosophy texts (Camiña 2012), or a study of deverbal nominalizations in astronomy texts (Bello 2014). The second type examines a series of related features which share a common communicative purpose, such as extenders in scientific discourse (Sánchez Barreiro, forthcoming). Finally, the third type focuses on a large set of non-necessarily-related linguistic features which help describing a language or linguistic variety. An example of such a study could be a Multidimensional Analysis (Biber 1988) on the scientific register in the eighteenth and nineteenth century (Monaco, forthcoming). These three categories are somewhat in a continuum, with certain studies presenting traces of both the first and second or the second and third types (Gray 2011: 20). This criterion was also defined by Biber (1988), who distinguished between macroscopic and microscopic studies: a microscopic study of textual variation "provides a detailed description of the communicative functions of particular linguistic features", while a macroscopic one "attempts to define the overall dimensions of variation in language" (Biber 1988: 61)

The second criterion focuses on how the information is extracted from the corpus. If the researcher approaches the corpus with a set of preconfigured search elements (mainly lexical items, or grammatical tags in tagged corpora), the research is considered to be corpus-based. Contrarily, if the researcher approaches the corpus as a whole, looking at general results in the whole corpus without a preconfigured set of searches, (for instance, keywords or frequently repeated patterns of words) the

expression of conventional discourse practices inside the scientific community. The use of this denomination has been decided by compilers of the *Coruña Corpus* after a lengthy consideration, which goes beyond the scope of this dissertation (although a very brief summary is provided in Chapter 4). It will be maintained for the sake of terminological unity in works using the *Coruña Corpus*.

research is considered to be corpus-driven. There is, again, a cline between corpus-based and corpus-driven studies, presenting a plethora of intermediate approaches showing varying levels of hybridity between the two. Multidimensional analyses, with their guided selection of a set of features to be searched but entirely automatised factor analyses grouping these features together, are good examples of this hybrid approach.

This study will focus on a single grammatical structure, conditionals, which will be described comprehensively, studying its different formal and structural variations as well as its functions. The quantitative information to perform the analysis will be obtained from the *Coruña Corpus* by means of searching for a series of particles, which will be predefined after a review of the literature (in Chapter 2). Consequently, this study would be classified as a Type 1 (microscopic), corpus-based study.

As noted by Gray (echoing Reppen, Fitzmaurice & Biber (2002)), type 1 studies "often incorporate a register perspective by comparing the frequency and variants across registers" (2011: 21). This comparative approach is adopted here by comparing the distribution of the different types of conditionals and its functions across the different subsets of texts. This is done by means of selecting a series of parameters, both linguistic and extra-linguistic, whose interaction is then studied.

There are four linguistic parameters, defined in Chapters 2 and 3: the formal type of conditional (this is, the conditional particle in use), the order of the constituents of the conditional structure, its combination of verb forms, and its function in discourse. The extra-linguistic parameters, further explained in Chapter 4, are five: the sex and origin of the author, the discipline and the genre of the texts, and the date of publication of the sample, which helps analyse the diachronic evolution of the language.

The analysis of the results according to these different parameters makes it possible to provide a complete analysis of the use of conditionals as examples of the variation in scientific register as a whole, presenting a high number of different nuances which both enrich and deepen the study.

1.3. *Objectives of the dissertation*

The main goal of this study is to describe the use and functions of conditionals in English scientific writing during the eighteenth and nineteenth centuries, trying to ascertain whether and how the use of conditionals reflects the general evolution of the scientific register during the period.

As explained above, according to Biber & Conrad, there are three major components to describe a register: "the situational context, the linguistic features, and the functional relationships between the first two components" (2009: 6). Following this model, this dissertation presents three main

intermediate objectives. The first objective is to present a description of the context in which the register is used, analysing the different social and historical circumstances relevant to the shaping of the register. This objective occupies Chapter 1.

The second objective is to describe the linguistic information obtained during the study. After this objective is fulfilled, there will be "[b]aseline data on what types of conditional occur and how they relate to their discourse contexts", data which "are essential if we hope to explain how conditionals are used rather than how we *think* they are used" (Ford & Thompson 1986: 354).

In order to achieve this second aim, it is necessary to fulfil a number of intermediate objectives. First, it is necessary to identify the scope of the structure under analysis, in order to delimit the different linguistic productions which are going to be analysed. This is examined in Chapter 2. Second, it is necessary to identify the parameters used to analyse the structure. These parameters are divided into two groups: linguistic parameters, which are analysed in Chapters 2 and 3, and extra-linguistic parameters, which are the object of analysis in Chapter 4. Third, it is necessary to describe the corpus from which the data has been extracted, also the object of Chapter 4. Finally, it is necessary to provide the actual quantitative data in relation with the different parameters and their interactions, providing the aforementioned "baseline data". This is the objective of Chapter 5.

Finally, as in order to define a register it is not sufficient to present quantitative data, the last objective is to bring together the previous two steps and to analyse the associations (functional, conventional or otherwise) between the context and the linguistic features of the register, in order to explain the distribution of the results and the possible ways in which they may (or may not) be representative of the general nature of the register. This is the objective of Chapter 6 and the conclusions.

1.4. *Contents of the dissertation*

This dissertation is, then, organised as follows:

Chapter 1 will present the context of the register, analysing the period under study (the eighteenth and nineteenth centuries) and the development of scientific register occurring at that moment.

Chapter 2 will focus on conditional structures, providing a definition of what is understood as such and determining their scope, as well as the parameters having to do with their formal variability.

Chapter 3 will present, after an extensive examination of the literature, a new typology to classify conditionals according to their function in discourse.

Chapter 4 will describe the corpus from which the data has been obtained, the *Coruña Corpus*, and will also explain the methodology which has been followed as well as the extra-linguistic parameters which have been used to classify conditionals.

Chapter 5 will present the actual results of the analysis of data, according to the different linguistic and extra-linguistic parameters defined above.

Chapter 6 will relate the linguistic and the contextual data in order to explain how the results reflect the nature of the register under study.

And finally, the Conclusions will provide a summary of the dissertation and a reflection of the main findings in it.

2. Contextualisation of the study

This second section consists of a review of part of the literature about conditionals, mapping the field and placing this dissertation in context. At the same time, by showing that this is the first corpus-based study of the uses and functions of conditionals on Late Modern English scientific writing, it also contributes to make the case for the relevance of the dissertation.

Conditionals have been an important object of study for different disciplines, namely logic, philosophy of language, psychology, and linguistics in its different subareas, developing different questions and approaches which have sustained a continuous interest in the field and, consequently, a sizable number of works.

Among the most relevant monographs and edited volumes on conditionals, either analysing them from a holistic point of view or providing collections of analyses from different approaches, it is worth mentioning Harper, Stalnaker & Pearce's *Ifs, conditionals, belief, decision, chance and time* (1981), Traugott *et al.*'s *On Conditionals* (1986), and its sequel Athanasiadu & Dirven's *On Conditionals Again* (1997), Dancygier's *Conditionals and Prediction: Time, knowledge and causation in conditional constructions* (1998), Declerck & Reed's *Conditionals: A Comprehensive Empirical Analysis* (2001), Dancygier & Sweetser's *Mental spaces in grammar: conditional constructions* (2005) and Gabrielatos' dissertation *A corpus-based examination of English if-conditionals through the lens of modality: Nature and types* (2010).

Apart from these, there have been a series of works focusing on particular elements of conditionals, such as their nature (Dancygier & Mioduszewska 1984, Sweetser 1990, and Athanasiadou & Dirven 1996), or the phenomenon of Conditional Perfection, further explained in Chapter 2, (Geis & Zwicky 1971, van der Auwera 1997, Horn 2000, and Van-Canegem Ardijns & Van Belle 2008).

Another important topic of interest has been the limitations of the typology of conditionals commonly presented in ESL manuals, studied by Hwang (1979), Maule (1988), Fulcher (1991), and Jones & Waller (2011), among many others. It is also interesting to note a series of works focusing on the particular formal types of conditionals, such as Closs Traugott (1997) on *unless*, or Iatridou & Embick (1994), Jong Bok (2011), and Biezma (2011) on inversion conditionals.

2.1. *Studies on conditionals in scientific discourse*

However, these studies analyse conditionals in general discourse, and this study aims at describing conditionals in scientific discourse. The particular uses of conditionals in scientific discourse have been analysed in the literature in a series of works which are of special interest to this dissertation, particularly since most of them also use corpus or data-based approaches. These are briefly summarised in here.

Horsella & Sindermann (1992) studied the argumentative use of conditionals in four samples of texts from physics, medicine and economics, taken from a non-described "larger corpus", in order to test the validity of a model of analysis of argumentation with conditionals in scientific texts.

Facchinetti (2001) analysed the uses of conditionals in legal texts from 1500 to 1800, using the Helsinki and Archer corpora. She concentrated on analysing the verbal forms of the conditionals, as well as their different uses, in two types of legal texts: statutes and legal cases[5].

Ferguson (2001) analysed conditionals in three types of medical writing: research articles, journal editorials and doctor-patient consultations, using a 100,594-word corpus. He classified conditionals according to a typology by Athanasiadou & Dirven (1997), finding interesting differences in their distribution among genres, as well as a concentration of particular types of conditionals in particular sections of the text.

Carter-Thomas & Rowley-Jolivet (2008) analysed the uses of conditionals in academic discourse, compiling a corpus of three genres of medical discourse (30 articles, 15 conference presentations and 74 journal editorials), totalling *c*. 250,000 words. They defined an ad-hoc typology "based on the regularity found in the data" (2008: 193), and aiming at reflecting their focus on argumentative uses of conditionals, as they defend that the view of ESL manuals is incorrect and that the classification of conditionals should not ignore "discipline-specific forms of argumentation" (2008: 192).

[5] For the purposes of this dissertation, "science" is understood in its broadest sense, and thus texts on law would be included. However, it could be reasonably argued that the nature of the texts analysed in Facchinetti's study are instances of disciplinary discourse, rather than scientific texts.

Warchal (2010) presented a corpus-based analysis of the functions of conditionals in a corpus of research articles on linguistics. She created a new typology, influenced by Sweetser (1990) and Quirk *et al.* (1985), in which she distinguishes eight different functions. Her study presents two stages, first making a pilot study in a 200-article corpus from five different journals, totalling 2.4 million words; and later providing an in-detail study in 40 of those articles totalling 430,000 words.

Finally, Hesabi, Dehaghi & Shahnazari (2013) compared the frequency of use and functions according to Sweetser's (2010) methodology, in research articles on Applied Linguistics & Chemistry. However, they never reveal the number of words in their corpus, and as they only provide actual (not normalised) figures, it is impossible to know the relative frequencies of the uses they analyse. A summary of the main characteristics of all these studies can be seen in Table 1 below.

Work	**Methodology**	**Corpus used / Size**	**Variety of Language**
Carter-Thomas & Rowley-Jolivet (2008)	Corpus based	30 articles, 15 conference presentations, 74 editorials c.250,000 words.	Scientific register: Medicine
Facchinetti (2001)	Corpus based	Archer, Helsinki. 82,455 words.	Disciplinary discourse: Law
Ferguson (2001)	Corpus based	18 articles, 40 editorials, 34 consultations: 100,594 words in total.	Scientific register: Medicine
Hesabi, Dehaghi & Shahnazari (2013)	Corpus based, but faulty	Twenty-one articles on linguistics, twenty-nine articles on chemistry.	Scientific register: Applied linguistics and chemistry.
Horsella & Sindermann (1992)	Data derived	Analysis of four passages "from a larger corpus", which is never described.	Scientific register: Physics, economics, medicine
Warchal (2010)	Corpus based	Pilot: 200 articles, 2.4 million words. In-detail: 40 articles: 430,000 words.	Scientific register: Linguistics

Table 1: Studies analysing conditionals in scientific or disciplinary discourse, with their basic characteristics.

As shown in Table 1 above, there is a moderately important number of studies analysing the uses of conditionals in scientific register using a corpus-based methodology, which join all the studies on conditionals in general language referenced above.

However, and despite their valuable insights, none of these studies presents a comprehensive corpus-based analysis of the use of conditionals in eighteenth and nineteenth century scientific register. They present three main problems. First, as it is obvious, all these studies are based on Present-Day English, rather than on eighteenth and nineteenth-century English.

Second, most of these studies are single-discipline analysis. Among them only Hesabi, Dehaghi & Shahnazari's (2013) and Horsella & Sindermann's (1992) compare the uses of more than one discipline. The rest, being single-discipline analyses and despite their intrinsic value as a description of a particular disciplinary register, make it impossible to discriminate whether the results found are attributable to their particular characteristics as a discipline or to their general nature as scientific texts.

Finally, only Warchal's (2010) and Carter-Thomas & Rowley-Jolivet's (2008) use medium-sized corpora, while the other studies either do not use corpus methodologies (Horsella & Sindermann 1992), do not provide data about their corpus (Hesabi, Dehaghi & Shahnazari 2013), or use small corpora (Ferguson 2001, Facchinetti 2001), which are not large enough to avoid the potential bias of an excessive influence of particular authorial idiosyncrasies in the results.

This dissertation aims at presenting a corpus-based study of the uses of conditionals in scientific register, comparing three disciplines (astronomy, philosophy, life sciences) in order to be able to infer conclusions applicable to scientific register as a whole (as well as the valuable particular descriptions of their disciplinary characteristics), and using a sufficiently large corpus (*c*. 1,200,000 words) so as to avoid potential biases. However, perhaps the most interesting characteristic of this dissertation is that it is the first study focusing on the uses and functions of conditionals in eighteenth and nineteenth-century scientific register, allowing to investigate how conditionals were used during a period of incredible effervescence in the intellectual circles, and whether and how these uses reflect this context, as shown in what follows.

CHAPTER 1:

Science and scientific discourse in the eighteenth and nineteenth centuries

Introduction

The first step in any dissertation studying a particular register must necessarily be a close examination of the register under study. Thus, in this dissertation, which studies the uses of conditionals in eighteenth and nineteenth century scientific register, this first step has to consist in examining how science, and scientific writing, were at the period.

The period of study (the eighteenth and nineteenth centuries) is not arbitrary, but rather, conforms a well-delimited stage within the history of science, with two important facts acting as bookends. The start of the eighteenth century marks the culmination of the process of change in science which started in the seventeenth century and caused the dramatic transformation of the old scientific paradigms. This coincides with the dissemination of Newton's ideas about gravity, changing the basis of physics completely and influencing a good proportion of scientific research during the following two centuries. The turn of the twentieth century coincides with another major breakthrough, Einstein's 1905 paper on the Special Theory of Relativity (still considered a foundation for research in a plethora of disciplines), as well as with the discovery of the electron by J.J. Thompson in 1896, the crisis in the grounding of mechanical physics announced by Mach, Kirchhoff, or Bolzmann in 1896, and Planck's announcement of quantum mechanics in 1900, among other discoveries (Moskowich 2012: 48).

As "changes in scientific thought imply changes in the way in which knowledge is conveyed" (Moskowich & Parapar 2008), these changes in science had a correlation at the linguistic level: this is the period referred to as Late Modern English. Although there have been several suggestions for the starting point of this period[6], it is here considered to start in 1700 and to end in 1900, with the turn of the twentieth century being considered the start of Present Day English.

These two centuries witness comparably little change in phonetics, morphology, or syntax of the English language, but coincide with several events of a supra-linguistic nature which influence the development of a distinct scientific discourse. On the one hand, the expansion of science led to the development of a new genre, scientific prose, as shown in Section 2 below. On the other hand, there is a general preoccupation for the good use of language and particularly of scientific discourse, as shown in the publication of grammars, which also prompted the loss of dialect, especially in scientific discourse (Freeborn 1992: 180, Moskowich 2001: 625). This preoccupation for the language was manifest in the preference for the coinage of new words with morphological processes (Camiña 2012) rather than for borrowing foreign words (Beal 2012), after the developments in science caused a necessity of new, clear terminology. The end of the period is also marked by linguistic change, as the turn of the twentieth century witnessed several arguments for a new scientific style, such as Thomas Huxley's at the 1897 International Congress of Mathematics. (Moskowich 2012: 48).

This chapter is divided in two sections. Section 1 deals with the history of science and scientific communities during the period studied. Section 2 examines the development of the scientific register. Finally, a summary of the most important findings in the chapter will also be provided.

The two sections present a parallel structure: they study, from their respective points of view, the precedents of the new scientific paradigm in order to understand its emergence, adopting an approach in which the social nature of science is emphasised. They also devote respective subsections to the role and linguistic uses of women in science and to the particularities of the development of scientific practice and discourse in the three disciplines under study in this dissertation: astronomy, philosophy, and life sciences.

1. How science became what it is. The emergence of New Science.

The period around the eighteenth and nineteenth centuries is a period of change, it redefined what was understood as science. However, processes of change do not stick to arbitrary limits such as those

[6] Among others 1660, 1725, 1776 or 1800 (see Moskowich 2012: 47-48).

of centuries, and their description in such compartmentalised terms would lead to oversimplification. This is why, for contextualisation, the period object of description in these sections will surpass the thresholds of the two centuries, using instead the concepts of the long 18th and long 19th centuries. These, following Beal (2012: 2), stretch from the Restoration in the 1660s to the fall of Napoleon in the 1815 and from the French Revolution in 1789 to the end of World War I in 1918, respectively[7]. At the same time, in order to fully explain the situation of any given topic at a moment in time, one needs to look back into the past. Thus, in order to explain the development of science from the final decades of the seventeenth century, it is necessary to make an excursion into the paradigm that was being substituted, scholasticism.

Thus, Section 1.1 below presents the precedents of science in the period under examination, studying scholasticism, the medieval paradigm of knowledge. Section 1.2 deals with the characteristics of New Science, focusing on the aspects defining science as a social activity and specifically on the groups of power and the elements of control over knowledge, whilst Section 1.3 focuses on the role of women in science at this time, and Section 1.4 briefly explains the evolution of astronomy, philosophy and life sciences during the period.

In relation with the approach selected in this section, it is important to state that processes of change are not conceived here as changes en masse, but as a complex set of factors which interrelate and influence each other in an incremental way, in order to change a set of elements from a given state of events to another, different, state. In this sense, the approach taken in this section follows Burke's (2000) *Social History of Knowledge* in two aspects. The first one has to do with this multifactorial conception of how scientific paradigms change. Burke's model follows Kuhn's (1962) model of *Scientific Revolutions* in that the discomfort with orthodox, established thought evolves into a new paradigm which later becomes established itself. However, Burke conceives changes as being multifactorial (this is, influenced by different factors acting on different features at different speeds and rates) rather than recursive and straightforward, as Kuhn did. The second aspect is that the changes in scientific paradigms are conceived of as being the consequence of the very *social nature of science*, this is, of the nature of science as an exchange of knowledge between individuals in a society, and not as the result of the influence of ideas or events devoid of their incardination in these social communities of scientists, or on a mere relation of new discoveries and theories.

[7] This however, does not imply the extension of the period of the data analysed in the dissertation, which sticks to the two centuries, from 1700 to 1900.

1.1. *A controlled science: Scholasticism*

Even though science was never completely abandoned after the fall of the classical world, the period between the fifth and the eleventh centuries is commonly depicted as a Dark Age in which little knowledge is created[8]. It is from the end of the eleventh century and the twelfth century that a series of events would coalesce into the emergence of the Lower Middle Ages' paradigm of knowledge: Scholasticism.

1.1.1. *Origins of scholasticism*

Scholasticism is considered to have been greatly influenced in its development from the end of the eleventh centuries by two main elements:

First, contacts with the Muslim world allowed for the recovery of part of the previously lost or inaccessible classical tradition and, specifically, Aristotelian thought. Aristotle's works had been lost in Western Europe since the fall of the Roman Empire, but they had been preserved in Muslim Territories, where they helped develop a Muslim philosophical school which produced scholars such as Ibn Sina and Ibn Rusd. Access to Muslim knowledge, which also included inventions such as the astrolabe (Pearsall 1999: 218), was possible because of the cohabitation of Christians and Muslims in the Iberian Peninsula. The availability of these texts would improve after the conquest of Toledo in 1085, giving Christian scholars physical access to them and prompting the foundation of a school of translators, who made Latin versions of these classical works. These new texts transferred Aristotelian ideas through Europe, influencing authors such as Albertus Magnus and St. Thomas Aquinas, who integrated Aristotelian philosophy and Christian thought and whose work would serve as the basis of the institutionalised worldview of the period in Western Europe.

Second, the foundation of medieval universities expanded and amplified this new knowledge. These new institutions were founded as a consequence of the good economic situation of the period, in which agricultural innovations and the development of cities and commerce helped raising money for other onerous quests such as the Crusades or the building of cathedrals. The first universities, in Paris, Bologna, Oxford, or Salamanca evolved from cathedral schools at the middle of the twelfth century, and continued their development during the following centuries under the control of the Church.

[8] This is, admittedly, a Eurocentric view. It is true that the fall of the Roman Empire caused the physical loss of an important number of documents, but, at the same time, science was being cultivated in the Middle East and, especially, in China. Even though caution has been taken to refer in the text to the fact that the object of the narration is European science, any claims in which this is not explicitly stated or denied must be also understood as referring to the European reality, or, after the development of North American Science, to the *Western* reality.

1.1.2. *The paradigm: scholasticism*

Scholasticism was the result of the expansion of the rediscovered Aristotelian thought in the context of medieval universities. Universities taught the seven liberal arts, which were divided in two groups of subjects: the trivium (grammar, logic and rhetoric) and the quadrivium (arithmetic, geometry, music and astronomy). They offered postgraduate or specialization courses on medicine, law and theology as well. Scholasticism was used in these universities both as a didactic system and as a methodology to obtain knowledge.

Scholastic knowledge was based on already existing texts[9] on science and philosophy, the most important of which were the Bible, classical philosophers, such as Plato and, especially, Aristotle; and the medieval philosophers who adapted Plato's and Aristotle's works to Christian teachings, as the already mentioned Albertus Magnus and St. Thomas Aquinas. These authors were considered "authorities" (Taavitsainen 2000; Crespo 2004) whose teachings were trusted and considered indisputable, as they were "handed down from above" (Taavitsainen & Pahta 1998: 176). Any new knowledge stemmed from the teachings in these authoritative sources (Atkinson 1996: 335) whose premises would then either be applied to particular cases or combined with other theoretical statements to obtain a new, derivative point, in both cases by means of applying the rules of classical deductive and inferential logic introspectively (Taavitsainen & Pahta 1998, Crespo 2004).

Scholastic knowledge mainly reapplied the then-considered irrefutable contents of classical sources, producing sterile and petty discussions (Burke 2000: 53-54) and largely ignoring experimentation or even the observation of the world. Thus, knowledge generated within this framework was rigid and fruitless, and consequently inapplicable to the real world. It was instead artisan knowledge, linked to commerce and largely ignored –if not rejected[10]– by scholastic philosophers, which provided the technologies which produced real improvements in society. It was the work of artisans rather than scholars that developed such discoveries as the application of hydraulic force to produce saws or bellows, new knowledge of structural forces and building techniques, or the invention of the helm and the compass; which helped develop cast iron, Gothic architecture, and navigation and commerce, respectively. Moreover, it was through commerce that Western Europe had access to new materials such as gunpowder or paper (c.1150) and technologies such as the precedents of the print and the clocks.

[9] It has been characterised as "logocentric" (Taavitsainen & Pahta 1998: 167), this is, based on the power of the written word.

[10] During the Late Middle Ages the social habit among higher classes of disregarding manual, useful knowledge was in full fledge (Burke 2000: 115).

Scholastic knowledge was not easily accessible either. Only the members of a wealthy educated minority were capable of affording medieval learning, with members of the clergy and non-inheriting sons of the nobility filling the ranks of the universities. Moreover, the "divine" consideration of knowledge led to the exclusion of vernacular languages, which were considered corrupt. This meant that scientific matters were mainly discussed in Latin, which constituted another hindrance to its accessibility, as it implied the necessity of having a deep knowledge of this language just to be able to follow these discussions.

Finally, scholastic knowledge was deeply and tightly controlled by the Church. First, most teachers and students were members of the clergy, "bearers of knowledge and purveyors of the written and spoken word" (Jacob 1998: 11), and were ready to uphold the perspective of the Church and to denounce any departure from it. This control was reinforced by the fact that universities were granted independence and had a monopoly over higher education in their area of influence, thus being free from the influence of the nobility and from any competition, privileges which had the side-effect of strengthening the control of the Church over knowledge.

This ecclesiastical control manifested in two main aspects. First, it affected the object of study of science, as the Church controlled what could and could not be taught, denouncing departures from orthodoxy and exerting their force over dissenters such as Galileo Galilei or Miguel Servet. Second, it also affected the access to knowledge, as apart from the obvious pecuniary obstacles to access University, there were explicit vetoes in admissions to the universities for certain groups, such as illegitimate offspring, women, or followers of other faiths[11]. Consequently, the official Church had a near monopoly[12] on both contents and admission to academic knowledge in Western Europe during this period (Burke 2000: 54) and imposed their limited view of the world.

1.1.3. *First departures from scholasticism.*

Scholasticism received its first criticism as early as the thirteenth century, when Roger Bacon (c.1214-1294) criticised those who based their opinions on fallible authorities or the weight of habit and asked for a true knowledge based on the real world. However, it would not be until the Renaissance that serious criticism started to affect this paradigm of knowledge.

[11] This veto was suffered, among others, by Leonardo da Vinci, who was not allowed into university as he was an illegitimate son.

[12] The only alternative to universities, monasteries, were still part of the Church, even though they had some higher degrees of freedom.

A major factor in the emergence of these first criticisms was the start of the encounter between the artisan and cult traditions[13]. Artisan knowledge started to evolve towards a more refined state, as specialist artisans advanced their knowledge by devoting their time to read classical texts. At the same time, they also started to write about their practical knowledge to hand it down to future generations, thus inadvertently both connecting the practical and the cult traditions and starting the process of vernacularisation of science[14]. It was also during this period that guilds and their regulatory powers appeared.

Concurrently, the cult tradition witnessed the emergence of a new generation of thinkers who considered that science should pay more attention to the real world and to the artisan tradition. These scholars, including figures such as Erasmus or Leonardo da Vinci, conformed a new movement, Humanism, characterised by the approximation of artisan and cult traditions and a return to classical ideas.

Humanists proposed a new curriculum inspired in classical times, in which a man of science would have to know a little about every subject (hence the idea of the *Renaissance man*). The main beneficiaries were subjects which were considered as the most interesting in the real world, especially what would later be called humanities and, among these, rhetoric. At the same time, they also vindicated classical figures who applied scientific knowledge to change reality, such as Archimedes, and promoted activities that combined artisan and scientific knowledge, such as engineering, which was cultivated by the philosopher-engineers of the time, of which the best example is Leonardo da Vinci.

At the same time, humanists also contributed to debilitate scholasticism by reducing the influence of the Church on science. This manifested in two different aspects: Humanists tried to escape from church-controlled universities, where their ideas were received with hostility, creating new places of learning. They founded both new humanist universities with regal patronage, such as Wittenberg or Leiden (Burke 2000: 57-58), and the first associations and academies, especially in Florence and Venice, under the sponsorship of cultivated nobility. At the same time they also started to undermine logocentrism, the position of authority of the texts, by studying translations and discovering forgeries, thus debilitating the influence of religion over the subject matter of science.

[13] In fact, Burke (2000: 28*ff*) argues that all of the Revolutions in science are nothing more than the popularisation of a type or other of artisan knowledge after being legitimised by academia.

[14] The first examples of scientific texts in English are texts on medicine from the fourteenth century. Medicine started the process of vernacularisation as the most immediately useful science.

During this period, some other factors played a role in the development of science. Among these, perhaps the most important is the development of printing, which contributed to the expansion and popularisation of knowledge, since it transmitted both artisan and erudite knowledge; and to undermine the Church's control over science, as it allowed for a more independent learning.

Another important aspect was the emergence of Protestantism, which featured Luther's requirement that lay people had the right to read and understand Scripture by themselves as one of its foundational traits (Burke 2000: 114). Thus, Latin was identified as a hindrance to access knowledge and translation to vernacular languages (firstly of religious texts, and then of all other types) was boosted, contributing to make science more accessible. At the same time, Protestant churches were also more open for new ideas, contrarily to the restriction of Catholic areas, and served as refuge for scholars being prosecuted for their ideas in other areas[15].

1.2. *A new science: The emergence of a new paradigm*

Scholasticism remained dominant until the seventeenth century, the period during which the demise of the paradigm started. From the end of the sixteenth century, Francis Bacon (later joined in the seventeenth century by Robert Boyle) criticised the cornerstones of the scholastic methodology: its lack of interest in making new discoveries, its contemplative nature, its inapplicability, its reliance on logical deduction, and the authority and unquestionability of classical sources. At the same time, Bacon also criticised artisan knowledge, and specifically artisan medicine, as it did not study the real causes of diseases, but just concentrated on the recovery of patients (Burke 2000: 30).

Both Bacon and Boyle laid the foundations for a new form of knowledge based on evidence and induction (Taavitsainen and Pahta 1998: 162). Bacon, in *The Advancement of Learning* (1605), argued that "an empiricist approach to facts based on experimental data was more reliable than a recursive reinterpretation of reality using Aristotelian syllogism and metaphysics." (Camiña 2012: 94), whilst in *Novum Organum* (1620) he asked for a new way of creating knowledge, a third way between scholasticism and empiric, artisan traditions, which started with sensorial information and advanced towards general conclusions.

Bacon's proposals would become a reality with the emergence of empiricism, a new system of knowledge which was the definitive factor in the process of weakening of scholasticism. Empiricism

[15] This does not mean that there were no opposition to new ideas in protestant countries, but, rather, that it was much milder. For instance, Giordano Bruno's ideas about the nature of the Universe were not accepted in Lutheran or Calvinist areas either, but it was back in Italy that these ideas caused his condemnation to be burnt at the stake.

finished the process, started by humanists, of undermining the concept of textual authority, totally rejecting the introspective efforts made by scholastics. Instead, empiricism proposed a new type of knowledge focusing on the observation of the physical world, which is systematised and expressed as mathematical data[16] (Atkinson 1996: 335-336; Taavitsainen & Pahta 1998: 162; Crespo 2012: 17), and which would later evolve to experimentation after the development of the scientific method.

The pivotal role given to knowledge about the physical world in new scientific paradigms, combined with the increase in the exchanges between academic and artisan traditions, put the basis for the major breakthrough[17] in scientific results at the period, changing medieval knowledge to make it become science as we understand it nowadays. However, scholasticism did not disappear completely, and continued to influence some works, authors, and disciplines (especially philosophy) for a longer time[18].

1.2.1. *Characteristics of the new paradigm*

The emergence of empiricism prompted the demotion of texts from their authoritative role, shifting the focus of science towards the physical world and artisan knowledge. This new approach made knowledge much more useful for society. Whilst scholastic scientific production had little utility for society as a whole, this new approach focused on realities which affected the lives of all people in a much more immediate way. For instance, the combination of the study of astronomy, geography and magnetism, together with artisan advances in shipbuilding, allowed for a much more efficient transatlantic navigation, with all its well-known consequences. Moreover, the Scientific Revolution was the germ of the consequent development of the Industrial Revolution (Moskowich 2012), as can be noted in the importance given in the new paradigm to new disciplines such as the mechanical sciences, perhaps the most cultivated in this period, with astronomy in second place (Camiña 2012: 93).

[16] For instance, empiricist astronomers systematised the observation and annotation of the positions of the celestial bodies and, by applying calculus and trigonometry (with the help of the continuously improving new telescopes), they were able to discover the laws of planetary motion.

[17] This breakthrough is a process which comprises several stages and phenomena, referred to by different names (*Enlightenment, New Science, English Enlightenment* (Beal 2012: 2), *Scientific Revolution*...) which are not always used consistently to refer to the same realities. In this sense, care has been taken to use more aseptic constructions such as "emergence of a new scientific paradigm" or "development of a new system of knowledge", which help refer to the general, long process taking place, and avoid other, potentially misleading concepts. However, readers must be warned that *Scientific Revolution*, when used, will refer to its traditional rather than its Kuhnian sense.

[18] As explained above, processes of change are not considered (in this dissertation) to be complete and radical from one day to the following, but gradual and multifactorial. A good example of this is the presence of scholastic influences in different disciplines, most notably philosophy, well into the nineteenth century, which shows how remnants of the previous situation can still appear long after a change.

A consequence of these efforts to make science more useful is the process of specialization of science: Scholastic universities only taught (apart from Trivium and Quadrivium) Philosophy, Law, Medicine and Theology as subjects. From the sixteenth century new disciplines start to appear (Burke 2000: 132-137), with certain universities creating the first chairs on history, botanic, geography, chemistry, politics or economics (these latter two as recently as 1727). From the eighteenth century, these new disciplines tended to specialise even more, with newer disciplines such as astrophysics appearing at the turn of the twentieth century.

A further characteristic of this new approach is that it brought knowledge closer to general audiences. Contrarily to scholastic texts, which were both physically and content-wise only accessible to a wealthy educated minority, the physical world was an object of study easily accessible to everyone. Simultaneously, from the end of the seventeenth century academic science followed artisan knowledge and started to be written in vernacular languages (Bailey 1985; Crespo 2004; Beal 2004, 2012) instead of Latin. Although this was a slow process, it radically contributed to make science more accessible to those who could not afford to learn Latin, as well as more useful[19].

1.2.2. *A new system of power and control over knowledge.*

Empiricist ideas, with their new focus on nature, were received with hostility[20] in universities, raising strong opposition among the scholastic clergy (Burke 2000: 60). In Camiña's words, clergymen "made use of their ascendancy in lecture halls to neutralise, restrict or plainly deny the latest discoveries [...] bringing to bear the authority of the Holy Scriptures and Aristotelian logic dating back almost two thousand years" (2012: 93). They even raised prosecutions against any dissenters, leading to their being processed, jailed, and, in some cases, executed.

This resistance led to the foundation of new, lay, scientific institutions, which acted as alternatives to scholastic centres of learning and allowed scientists escape from the control of the Church and avoid

[19] The process of vernacularisation was slow, as shown for instance with Newton, who wrote his *Principia* in Latin, but *Opticks* in English (Beal 2012: 2). However, in the most useful disciplines the process was much more advanced: 207 out of the 238 medical works published between 1640 and 1660 were written in English. (Webster 1975: 267, apud Taavitsainen & Pahta 1998: 157). This is in keeping with the idea that after the Enlightenment science is a matter of economic benefit (Jardine 1999), as there is a market for application of scientific thought (Moskowich 2012: 47). This principle applies here in both ways: science in vernacular is more accessible and useful, and consequently, disciplines whose necessity is most immediately felt are the ones that start to use vernacular first.

[20] Some contemporary authors have questioned whether the claims of across-the-board hostility are in fact exaggerations on the part of empiricists, being used to justify the creation (and funding by patrons) of new centres of learning. However, and despite the fact that the degree of hostility has perhaps been exaggerated, scholastic authors did indeed confront empiricists.

the vetoes imposed by the clergy over both access to knowledge and topics of study[21]. One of these new institutions was the Royal Society of London, founded in 1660 with an agenda towards the reform of scientific research, based on the improvement of both scientific research itself and its transmission. According to Camiña (2013: 46), this agenda had three lines of action: methodology, promoting scientific methods (following Bacon's proposals as explained in Section 1.2.1 above); language, with the establishment of a scientific register; and the vehicle to disseminate the results, with the creation of a new genre, the experimental essay.

These new institutions were formed largely by genteel amateurs, members of the nobility who "represented a moral and social model to be followed" (Crespo 2012: 20), who were free from influences from higher powers and could act freely (Burke 2000: 43-44)[22]. These members met at the new centres of learning to describe their observations and present their hypothesis (or, later, to experiment) before other members of the society, exposing their discoveries to the criticism of their peers. They formed a close-knit epistemological community in which every member knew each other and followed a given social etiquette, with activities such as visiting one another and exchanging information through letters and books. It is from this period that science starts to be understood as a social endeavour, constituting a *socially-construed science* (Bazerman 1988; Hyland 1996, 1998, 2000; Myers 1989; Swales 1990), in which the role of discussion with one's peers was paramount for its development.

However, and despite the fact that the debilitation of the control of the church and the use of vernacular languages made science more accessible, the improvements in accessibility applied to some audiences only: most communities of scientists were still conformed almost exclusively by high-class male members. This is in part the consequence of an economic system which implied that lower classes had almost no free time and no access to regulated formation, let alone scientific knowledge. Moreover, science was considered to be a gentlemanly activity, and lower and middle classes were forbidden to access places of knowledge, such as scientific institutions, on the grounds of gentility, being thus effectively secluded from scientific knowledge.

Nevertheless, new institutions gained prestige quickly, displacing universities as the forum for the most advanced scientific developments. In fact, during this period universities produced very little scientific knowledge (perhaps with the exception of the advances in medicine made in Leiden) and the

[21] It must be taken into account that the debilitation of the control of the Church over science has not been absolute: there have been (and still are) examples of religious condemnations of scientific research. A good example of this is the hostile reception to Darwin's ideas about evolution among more religious colleagues.

[22] The Royal Society achieved the status of Public Corporation and consequently, to a certain extent, became institutionalised, although this also helped it protect its own independence (Hunter 1989: 1-2).

new institutions of science became institutionalised (Burke 2000: 71-72), with the Royal Society exercising "a near-total monopoly over British and American science lasting into the 1800s" (Atkinson 1996: 334). Most scientists following the new system of science aspired to obtain membership and present their discoveries there.

The situation continued until the nineteenth century. Universities slowly adapted to the times, creating new facilities such as observatories, botanic gardens or laboratories, and slowly reclaiming their relevance during this century[23]. At the same time, the necessity of useful, applicable knowledge and the shift in the focus of science towards method and evidence, in keeping with a general drive towards universals "transcending the particulars of an investigation" (Bazerman 1988: 78), slowly eroded the position of social gentility in science. This was the start of a process of professionalization, materialised in the substitution of the Word of member gentlemen as the source of truthfulness, with sound methodology and evidence occupying its place. This process would continue, with the foundation of professional institutions, towards its present-day state.

However, and in spite of the disappearance of the requirements of gentility, access to knowledge was even more difficult for the lower classes in the nineteenth century, as the expansion of industrial capitalism created a new type of lower class composed of industrial workers with even less free time and rights. The situation would not change until after the first manifestations of the labour movement and the introduction of universal programmes of alphabetisation, first, and universal educative systems, later[24]. This would eventually allow for the most gifted among the lower classes to be trained in science and access scientific circles, in an initial example of the potential of scientific training for social mobility.

Simultaneously to the process of institutionalization of the new institutions of science and the resurgence of old universities, a new phenomenon starts to appear. Scientific communities divided themselves in different ranks according to each member's position in the epistemic community, echoing social classes elsewhere: Science became socially stratified.

1.3. *The role of women in a developing science*.

Despite the fact that women have been taking a part in the development of scientific knowledge from its very onset (Solsona 1997, Mourón 2011), they have been generally left out of institutionalised

[23] Oxford and Cambridge, for instance, were not reformed until the second half of the nineteenth century, when research was finally incorporated as one of the duties of these universities, which already excelled in teaching.

[24] For instance, in the United Kingdom, universal compulsory elementary education was not introduced until the Education Act 1870.

scientific training. Previously to empiricism, most women did not have any sort of schooling but for that which they could receive in convents and guilds (Schiebinger 1987), preparing them to act as carers, healers and midwifes as well as helping the oral, women-to-women transmission of all this knowledge (Cabre 2011).

This situation did not improve with the debilitation of scholasticism, as the co-occurring closure of convents and the resurface of the Aristotelian concept of women as "incomplete" beings influenced the ideas about the role of women in society[25] and had a prejudicial effect on their already paltry possibilities for accessing formal education. Thus, but for some notable exceptions[26], women were not able to devote their time to science.

1.3.1. *Women in science during the 18th and 19th centuries.*

The popularisation of the new scientific paradigm improved accessibility to science for the general public, but this was not the case with women: In this period, the obstacles women had to face to access scientific knowledge improved, rather than diminished. The role of women was conceived of only in a family context, and, although the education of women was then finally seen as profitable, it had to focus first and foremost on preparing them to fulfil the role of good wife. Any knowledge beyond this very limited view of femininity (including, obviously, scientific knowledge) was looked upon with suspicion.

These ideas would expand even further during the Victorian Era in the United Kingdom, when any woman not conforming to these limited roles would see her morality being put into question: for instance, female astronomers were criticised because it was seen as indecorous for a woman to be out at night to observe the sky (Herrero 2007: 82).

Women continued to have few alternatives to obtain scientific training: women were not allowed into universities[27] (Abir-Am & Outram 1987) until the second half of the nineteenth century, nor into the

[25] Women humanists, such as Isotta Nogarola or Cassandra Fedele, were discriminated, In fact, Nogarola decided to become a nun after her attempts to pursue scholarly work caused her to be ridiculed and vilified (Burke 2000: 36).

[26] These are the so-called Scientific Ladies, noblewomen without systematised instruction but with important contributions to science. Among these, perhaps the most important are Lady Ranelagh (1615-1691), Robert Boyle's sister, with whom she shared experimentation duties in their laboratory, and Anne Conway (1631-1679), who shared correspondence with her brother's tutor, Henry More, and wrote *The Principles of the Most Ancient and Modern Philosophy*. Special mention is deserved by Margaret Cavendish, Duchess of Newcastle, (1623-1673), an autodidact scientist working on the observation of the physical world following empiricist principles, and the writer of *Observations on Experimental Philosophy*, who was also the first women accepted into the Royal Society.

[27] But for two exceptions in Italy, Elena Cornaro Piscopia (1646-1684) and Laura Bassi (1711-1778), who even obtained a professorship.

Royal Society until the twentieth[28]. One of these alternatives was receiving training within their family circles, where some women (of the higher classes) were able to access scientific knowledge by sharing their brother's instruction, normally with private tutors at their homes (Crespo 2015)

Another alternative for women was working with their husbands, brothers or fathers (Schiebinger 1989, 2003). According to the male-authored narratives of the time, men would be scientists, whilst women would be assistants, collectors of specimens or painters/illustrators, thus hinting a specialization of scientific roles. Although these women's work was recognised in the private sphere, it would not easily transcend into public knowledge, as male relatives frequently published their work without the female's signature. This discrimination in academia continued into the twentieth century, when even reputed women scientists had to face an uneven playfield[29].

In any case, very few women could actually publish their work, and, when they did, many of them continued to hide behind anonymyty[30], a pseudonym, or a male relative's name in order to avoid social censure (Herrero 2007: 75). Women who actually published scientific works with their names faced a more important scrutiny compared to their male counterparts, as well as initial distrust. This led to their use of certain linguistic and pragmatic strategies to obtain a good reception for their texts, as will be explained in Section 2.3 below.

1.4. *Disciplinary advances in the eighteenth and nineteenth centuries: astronomy, philosophy and life sciences*.

The process of specialization of science promoted the apparition of new disciplines, which would then further specialise and divide into subdisciplines, evolving towards their present state. During much of the previous period, much of what is now considered science was named *natural philosophy*, a "superscience" (Camiña 2013: 39) including such different disciplines as astronomy, cosmology, geology, biology… but also metaphysical philosophy in what has to do with the nature of Creation. However, in the eighteenth and nineteenth century the process of specialization can be considered to be quite advanced.

[28] After Margaret Cavendish, admitted in the seventeenth century, there were no more women being granted membership to the Royal Society until Kathleen Lonsdale and Marjory Stephenson in 1945. However, some of the institutions of learning founded during the second half of the eighteenth century and the start of the nineteenth century did indeed admit women from their initial stages (Crespo 2012: 24).

[29] For instance, Lisa Meitner was part of the group working in the discovery of nuclear fission, but she was not awarded the Nobel Prize, which was given instead to her colleague Otto Hahn.

[30] During the seventeenth century a group of German female astronomers published a Catalogue of Stars, which was left unsigned.

For instance, the development of astronomy as a discipline, "the first exact science to make decisive advances" (Pledge 1959: 31), was by the start of the eighteenth century well under-way: Copernicus had already presented his heliocentric theory, Kepler had enunciated the laws of planetary motion and Galileo had perfected the telescope to the point of discovering mountains in the moon and satellites in Jupiter, with which he questioned the long-held Aristotelian idea of the perfection of Heavens, triggering an Inquisitorial process against him. At the same time, these discoveries helped to definitely distinguish astronomy apart from astrology, with which it was frequently confounded during the Middle Ages. Astronomy during the eighteenth and nineteenth centuries would be influenced by two main elements. One is the publication in 1687 of Isaac Newton's *Philosophiae Naturalis Principia Mathematica*, in which he published his laws of motion and universal gravitation. This work would influence authors throughout the period, as most of them would put themselves to work to calculate the degree to which planetary orbits conformed to physical laws as defined by Newton. The other is the ever-improving fabrication of telescopes, which would lead to more and more discoveries, first of comparably nearby celestial bodies, such as comets, or Uranus, discovered by William Herschel in 1781, and later, as telescopes evolved to be able to analyse starlight, of farther bodies, such as other stars and galaxies. This situation would continue until the dissemination of Einstein's *Special Theory of Relativity*, which emerged from 1905 as a new basis on which to build scientific practice.

Philosophy from the eighteenth century was considered a study "of rational thought, as an opposition to reveal knowledge and religion" (Moskowich 2016: 2). The philosophy of the period was dominated by the discussion between two approaches: Hume's and Locke's empiricism, which defended the knowledge of the real world acquired by means of the senses as the source of human knowledge, and Descartes' rationalism, which defended that it is the very process of reasoning (as the manifestation of God's work through an immortal soul) that originates knowledge, as explained in his famous sentence "cogito ergo sum". This situation would not change until Kant was able to reunite both approaches during the final decades of the eighteenth century. In parallel to these disputes, another philosophical current studying society and its political and economic organisation also flourished, with the Encyclopédistes (such as Diderot and Rousseau) and Karl Marx as perhaps the most notable examples.

Life Sciences were perhaps the disciplines that improved the most as a result of the interest in real life promoted since the Renaissance: the first dissections greatly improved anatomy and medicine, whilst the invention of the microscope led to the discovery of bacteria and spermatozoa by Leeuwenhoek. During the eighteenth century, the three main subdivisions of life sciences focused on different

elements: botanists worked on the elaboration of taxonomies, with those by Linnaeus and Jussieu as primary examples of the trend; geologists focused on the evidence of old events in the sediments and the study of fossils, and biologists started to develop the first ideas of Evolution, with Lamarck. These advances would continue with Mendel's discovery of the laws of inheritance and the publication of Charles Darwin's *On the Origin of the Species*, which would constitute a defining element of the discipline comparable to Newton's and Einstein's works in physics and astronomy. Both these authors (together with the improving functionalities of microscopes) would lead to a renewed interest in cellular biology, which would lead to the study of the processes of cell division and the discovery of chromosomes as the carriers of genetic information, a line of study which still continues at present.

2. A new language for a new science: the emergence of scientific register

Just as science changed during the eighteenth and nineteenth centuries, so did the language used by scientists to convey their discoveries. As explained in the previous section, the developments taking place ever since the turn of the seventeenth century, but especially from the eighteenth century onwards, transformed medieval knowledge into science as we understand it nowadays. Similarly, the language used by scientists in their reports started a process of evolution towards contemporary scientific register in the 1600s. The conventional practices which are still used in scientific language to expound scientific results and secure support for them date from this period. (Hyland 1998: 18)

This process of change, rather than spontaneous, has been in many ways a conscious effort of regularisation: as explained by Crespo, "[s]cience and the language of scientific concerns is a social product in which authors and their audience participate" (2012: 15). Bearing in mind that "if scientific knowledge is not written in many ways it simply does not exist" (Moskowich 2012: 35), one can imagine the interest of such regularisation efforts.

The object of this section is to analyse the changes in scientific discourse prompted by the emergence of the new paradigm of science from the seventeenth century onwards. Section 2.1 will focus on the situation prior to the demise of the scholastic paradigm, as well as on the proposals of improvement of scientific discourse made by several authors (many of them were members of the Royal Society) as examples of a concerted effort to regularise scientific discourse. Section 2.2 will study the evolution of the actual uses of scientific discourse from the eighteenth century until the end of the nineteenth century, whilst Section 2.3 will deal with some particular uses of scientific writing, analysing the linguistic uses of women scientists during the period, as well as some discipline-related particular uses.

2.1. *An organised effort: Scholastic discourse and proposals of change before 1700*

As explained in Section 1.1 above, scholastic knowledge stemmed from the analysis of older texts which were considered authoritative, and this conception of knowledge thoroughly informed scholastic discourse. For scholastics, the correct argumentative construction of texts was of special importance. This manifests in the importance they gave to analysing their authoritative sources in search for useful premises, "establishing the correct definition of things" (Taavitsainen & Pahta 1998: 167), as well as in the emphasis of the elements conforming the logical framework of discourse (Taavitsainen 1999: 249). Both these elements were of special importance, as scholastic discourse often relied on intricate argumentation with long, elaborate sentences and metaphors, which would otherwise render a very difficult reading.

The influence of the paradigm also manifests in the frequent presence of quotations and references from the authoritative works used (Taavitsainen & Pahta 1998: 167-175), especially in the scholastics' preferred genre, the commentary of older texts[31]. These references play a "crucial argumentative role" (Atkinson 1996: 335)[32], as any proposition had to be attested in an authoritative text in order to be worthy of consideration.

In what has to do with their linguistic uses, scholastics (apart from their use of long sentences and an elaborate style, full of images and metaphors) are characterised by their use of prescriptive phrases, such as "it is known". These phrases, according to Taavitsainen & Pahta, contribute to presenting "knowledge as a fact and emphasise the reliability of the statements, and as such reflect the trust in knowledge handed down from above." (1998: 176).

2.1.1. *First proposals of change: Early seventeenth century criticism.*

The new focus on real world events promoted by empiricism (see Section 1.2 above) entailed, at the discourse level, the ascension of narratives of observations and experiments to a preponderant place. It also caused the first shows of preoccupation about scientific discourse, which from the start of the seventeenth century was considered a field ripe for regularisation, and prompted several authors to ask for the establishment of discursive rules (Moskowich 2012: 35).

Among these, Francis Bacon was one of the earliest and most important. Among several criticisms, he explicitly suggested in his *Novum Organum* (1620) the necessity a new model of scientific report,

[31] Even though the commentary of texts was the most prolific genre during the scholastic period, other genres were used, most notably, dialogues.

[32] They are also the immediate precedent to present day referencing in scientific texts.

which considered observation and experiment as the only reliable sources, thus disregarding the authority of classical sources. He also promoted a new type of discourse, which would have to be "plain and unadorned" (Montgomery 1996: 72) in order to convey reality as straightforwardly as possible.

Bacon's proposals were not ignored and, after the foundation of the Royal Society in 1660, some of them were included as part of its members' agenda towards the reform of scientific research. Apart from methodological proposals already analysed in Section 1.2 above, the Royal Society proposed two other courses of action (Camiña 2013: 46): linguistic change, with the establishment of a scientific register; and the creation of a new genre, the experimental essay. Each of these aspects is devoted a subsection in what follows:

2.1.2. *Scientific discourse reform as part of the agenda of the Royal Society: Linguistic change*

Members of the Royal Society aimed at improving both scientific research and its transmission, to "reach a larger audience outside the confines of traditional learning, both to promote a natural philosophy and to lend dignity to the practical arts" (Coulston-Gillispie 1976: 363). Consequently, linguistic reform was a priority for them. Science could not be successfully transmitted without a more effective type of language. Members of the Royal Society considered Latin, still the primary language of science, as a hindrance towards the transmission of scientific knowledge, but vernaculars were still seen as insufficiently clear to convey science. Thus, they argued for a new type of scientific language, embracing Bacon's claims of simplicity and transparency, in order to use a "non-ornamental style devoid of those figures of speech which could eschew the scientific message" (Moskowich & Crespo 2012b: 9).

During a first phase, members of the society tried to create a universal scientific language, an effort commanded by John Wilkins. In 1668 he published his *Essay towards a Real Character and a Philosophical Language*, in which he claimed that in order to develop a new language it was necessary to classify all the knowledge developed until that period (Subbiondo 2001: 273). He continued doing so, providing "an extensive classification of the scientific knowledge in English" (Camiña 2012: 94) but failing to create the universal 'philosophical' language.

After this failure, the efforts of the Royal Society focused instead on reforming English, in order to make it as adequate to represent scientific knowledge as Latin, under the principles of clarity, simplicity, objectivity, and precision: in Sprat's words, "a close, naked, natural way of speaking", preferring the language of "Artizans, Country-Men and Merchants, before that of Wits or Scholars" (1667: 113). Among other proposals (some echoing Bacon's), Wilkins and Sprat wanted to achieve

univocity between concepts and words, condemning metaphor and polysemy (Gotti 2001: 231) and introducing new terms when needed or new meanings to already-existing terms. They also asked for the disappearance of the author from the text and the elimination of rhetorical moves (Bazerman 1984: 163), reiterating the necessity of presenting physical evidence to support claims. A good example of these uses is the language used by Newton, who displays an objective, unadorned style, with a frequent use of passives and of mathematical notation to define positions and results.

2.1.3. *Scientific discourse reform as part of the agenda of the Royal Society: Generic change*

The Royal Society also thought necessary to develop a new vehicle for the dissemination of scientific knowledge, "a new expository genre to suit the new epistemic approach of 17th century "natural philosophers"" (Gotti 2001: 221). This new vehicle would be the experimental essay, developed by Robert Boyle in his 1661 *Proemial Essay… with Some Considerations Touching Experimental Essays in General*.

In his work, Boyle proposed, in contrast with the intricate scholastic texts, to separate the exposition of hypotheses from that of proven facts (Allen, Qin and Lancaster 1994, Gotti 1996), but he argued to maintain citations of authorities to "ensure the validity of scientific claims" (Moskowich & Crespo, 2012b: 10). He also proposed to introduce images in texts to facilitate understanding. Regarding writing itself, he proposed five basic characteristics: brevity, lack of assertiveness, perspicuity, simplicity of form, and objectivity (Gotti 2001, 2003, 2005). These characteristics conformed the framework of what would later become a new scientific genre.

2.2. *Scientific discourse in the eighteenth and nineteenth centuries*

Wilkins', Sprat's and Boyle's proposals (as Bacon's), although becoming a reference to the ideal format of scientific discourse for years to come, were not immediately embraced by all writers, and were still far from being an actual achievement during their lifetimes (Montgomery 1996). In fact, Boyle, even though calling for precision over ornament, used polysemy and figurative devices in his terminology (Gotti 1996: 39, 2001: 232), and he even sometimes apologised for his being too verbose, although this verbosity could be explained by the necessity of providing detailed accounts in order "to give the impression of verisimilitude" (Shapin 1984: 493) and to avoid the possible difficulties in understanding caused by an excessive brevity (Gotti 2001).

2.2.1. *Author-centered approches*

The main difference between the proposals of the Royal Society and actual uses in scientific discourse at the time was the preservation of the authorial presence in the text. During scholasticism, the

authority of the sources was the main factor for considering a claim legitimate and truthful. After these sources were demoted, it was the detailed narratives of concrete physical events (whether accounts of findings in the real world or experiments in the laboratory) that became the bases for trust and legitimacy, promoting what Boyle called "rhetoric of immediate experience". (Atkinson 1996: 335)

This developed a particular narrative style, the "author-centered approach" (Atkinson 1996), which dominated scientific writing from the end of the seventeenth century to the period between the eighteenth and nineteenth centuries. It was characterised by an extensive authorial presence, manifest at the linguistic level in the use of first person pronouns, active voice and narrative verbs, as well as in frequent mentions to the psychological state of authors[33]. Four further characteristics of this style are defined by Atkinson (1996: 339): *witnessing*, consisting in the naming of the witnesses present during the event reported; examples of *elaborate politeness*, such as the use of dedications and encomia; a *tendency towards miscellany*, with frequent digressions; and the use of *indexes of modesty and humility*[34].

2.2.2. *Object-centered approaches*

It was not until the end of the eighteenth century that scientific discourse finally started to fulfil Bacon's and Wilkin's proposals, evolving towards present day scientific register. Simultaneously with the shift in focus of science towards method and evidence, scientific discourse adopted the "object-centered approach" (Atkinson 1996: 339-340), in which it is the subject matter of the investigation, rather than the researcher themselves, that is on focus (Bailey 1999, Görlach 1999, Kytö, Rudanko & Smitterberg 2000). It first appeared in sections on methodology and the description of experiments, evolving to general use later on.

Linguistically, this narrative style is characterised by the progressive decrease of the presence of the author in the texts. This correlates with the expansion of certain features, some of them already existing and transforming their functions (Halliday 1988), such as objectification, nominalisation, specific terminology, and use of the passive voice, especially agentless passives. This however did not cause the total elimination of authorial presence in scientific texts, as during much of the nineteenth century personal asides are common to express author's uncertainties (Atkinson 1996: 340). This

[33] In his study of the linguistic uses of the articles in the *Philosophical Transactions*, Atkinson expounds the case of an author who apart from mentioning his doubts and expectations, "describes himself as suffering a "misfortune" which "discouraged" him from reformulating a "troublesom" compound." (Atkinson 1996: 339).

[34] These indexes include, among others, possibility modals such as *might*, adjectives and adverbs expressing probability such as *perhaps*, or "distancing verbs" such as *suggest* or *seem* (Biber &Finegan 1988, where these are categorised as stance markers).

feature does not disappear until the twentieth century, when the author is more effaced and self-references, if present, tend to use formulae such as "the author". Moreover, during this century the references needed to sustain a researcher's claims also change from putting the emphasis in classical authors to referencing works by their contemporaries or even making reference to standard methods (Atkinson 1996: 349), showing an evolution towards Present-Day, more standardised, scientific writing.

2.2.3. Scientific discourse as a dialogic exercise.

In any case, the change which most definitely informed present-day scientific writing was triggered by the expansion of scientific communities, a process which developed simultaneously and exerted influence on the gradual decrease of authorial presence.

At the beginning of the empiricist period, whilst science was still a gentlemanly activity and scientific circles were small, the Word of Gentleman of a given researcher, together with the level of detail of the actual account, sufficiently guaranteed the truthfulness of their accounts. However, as scientific communities increased their size and their members stopped being acquainted with one another, the power of a scientist's Word decreased and audiences started judging researchers on the validity of their work.

At a first stage, scientists reacted by emphasising the use of the rhetorical devices characteristic of the author-centered approach, especially the indexes of modesty and humility, whilst at the same time increasing the weight given in their texts to the production of evidence and the description of methods. This paved the way for the emergence of the object-centered approach.

These changes contributed to the development of the rhetorical profile of present-day scientific writing[35]. Science, rather than a set of objective and impersonal information, is considered as a dynamic space in which scientists and audience (specifically, the other members of the epistemic community) exchange information (Bazerman 1988; Myers 1989; Swales 1990; Hyland 1996, 1998, 2000). Thus, as members of the community, researchers wanting to communicate their findings have to find a balance between two forces in permanent tension: on the one hand, scientists have to carve a research space for their claims, "posing a potential challenge to the existing paradigm through academic criticism" (Warchal 2010: 140), and thus emphasising their individual contributions as worthy of recognition by the community. On the other hand, they also need to move their audience

[35] This does not mean that scientific writing from the period under study featured this rhetorical profile, but rather that it was taking steps to this direction, explaining the presence of a number of characteristics which surface in some of the texts.

towards consensus, emphasising commonality (this is, shared knowledge and values) to vindicate their status as members of the scientific community.

As a result of the tension between these two necessities, scientific writing becomes an interpersonal exercise of negotiation of meaning, in which claims have to be asserted and mitigated at the same time in order to emphasise the possibilities of agreement. Thus, the author has to practice an effective type of writing, not only to *persuade* the audience of the truthfulness of their findings (Allen, Qin and Lancaster 1994, Atkinson 1996, 1999) but also predisposing them towards agreeing to their claims. Quoting Bazerman, as a result of this process, "empiricism, which for Bacon was a mode of investigation, became a mode of persuasion" (Bazerman 1988: 140).

Thus, even though the main aim of scientists continues to be the reporting of their findings, they must also use a series of strategies to achieve the best reception for their writing, establishing links of cooperation and not confrontation and seeking agreement and consensus (Hyland 1996, 1998, 2000). Thus, authors avoid the use of categorical claims, reject the use of a confrontational tone, and convey modesty, humility, respect, and politeness in their writings. At the same time, they also establish cooperative links which emphasise the common membership of the scientific community of authors and readers by making shared knowledge explicit, recognising the work of one's peers and differing points of view from one's own.

At the linguistic level, these strategies correlate with the use of a series of devices, such as modal verbs, verbs of cognition in the first person, expressions of probability, evaluation and attribution, or conditional structures, among others. These linguistic devices play a mediating role in the relationship between the authors and their peers (Hyland 1994, 1998, 1998b; Warchal 2010: 141-142), either by reducing the assertiveness of a proposition, avoiding the commitment of an author towards a statement, conveying subjectivity or giving way to more than one point of view. The characterisation of this type of structures is further dealt with in Section 1.3 in Chapter 3.

2.2.4. *Changing the vehicle for the dissemination of science: the expansion of the scientific article.*

This period also witnessed the realisation of Boyle's suggestions about the new vehicle for the dissemination of scientific knowledge with the consolidation of a new scientific genre, the scientific article.

During the seventeenth and eighteenth centuries, books were the preferred medium for scientific dissemination (Allen, Qin & Lancaster 1994: 293, Crespo 2012). However, publishing a book was a lengthy task, and sometimes immediacy was required. The alternative to books used at the period was transmitting scientific knowledge in the format of letter. Letters reporting scientific events had an

established form, with introductions and elaborate dedications before the actual scientific report was written. Linguistically, they were characterised by the constant use of a second person address, as well as a tendency towards digression (Atkinson 1996: 341-343).

Letters would be replaced by journal articles during the nineteenth century, and disappear almost completely at the end of that century (Crespo 2012). The structure of articles stems directly from that of letters, eliminating the dedications and increasing the level of formality, although during their development they would show an important amount of variation, as the methods and the results section gained weight as time progresses, while the space devoted to the details of experimental proof also increased (Bazerman 1988: 78). Only from the first decades of the twentieth century would articles show the nowadays established IMRD (Introduction, Methods, Results, Discussion) structure (Atkinson 1996: 343-347).

2.3. *Particular uses of scientific writing.*

2.3.1. *Women's scientific register*.

As explained in Section 1.3 above, most women were not admitted into the scientific community at the period. Women scientists did not only have to face social pressure towards their conforming to the role of good wife, leaving no place for scientific endeavours; but were also discouraged from publishing their discoveries, thus avoiding their recognition outside from their innermost circles and their ability to become full members of scientific communities.

The few women who were actually able to publish their works had to face the reservations of their male counterparts. At a time when the narration of observations was of utmost importance, the genteel and close-knit nature of scientific communities meant that women's narrations (as those by members of the lower classes) were not considered as truthful: the Gentlemen's Word was the pillar for the validity of scientific accounts, the Ladies' Word did not deserve the same consideration.

The expansion of scientific communities and the shift in the focus of veracity from one's Word to the power of persuasion and evidence allowed women certain room for their publications. However, in a new scenario in which the scientific community had to be persuaded to accept any scientific report as truthful, more, even exceptionally, convincing arguments would be needed in order to recognise a female-authored work. This state of affairs influenced female-authored scientific writing, provoking the emergence of a series of characteristics (Crespo 2011), related to the extreme care in the use of scientific language, which make women's scientific writing both peculiar and especially relevant as evidence of the persuasive nature of the scientific register.

Among other characteristics, women authors put extreme care in the recognition of other scientists' work, in the use of politeness and courtesy forms and in the avoidance of categorical statements. Moreover, some authors (Crespo 2011) have found that women authors used a larger proportion of persuasive strategies, and especially the most blatant ones, such as conditional structures and suasive verbs (such as *agree*, *ask*, *order* or *prefer*), which transmit a higher degree of involvement in the text, whilst men preferred the use of modals.

Another important characteristic is that a high proportion of female-authored scientific writings had a didactic nature, sometimes presenting a direct address to readers to this sense in their prefaces. (Crespo 2014)

2.3.2. *Particular disciplinary-related uses of scientific discourse*.

A final point that must be taken into consideration is that, in spite of the increasing standardization in scientific writing, disciplines maintain some characteristic uses, which are normally determined both by the disciplinary practices and the objects of study of each discipline:

Astronomy in the period combined a theoretical and an observational nature, being influenced both by the improvement of telescopes and Newton's physical laws. This was reflected on the language used, which shows an important use of description, but also of mathematical analysis and its more sober style (Atkinson 1996). Life sciences, despite being also observational, put a greater emphasis on classification and experimentation, creating taxonomies and analysing similitudes and differences, and thus showing a more discursive nature. Finally, philosophy was more speculative, and relied on the logical development of discourse stemming from given premises, instead of observation and description. It was also influenced by scholasticism for longer (Moskowich 2016: 3), thus being the discipline that deviated the most from the recommendations of the Royal Society, but also the one that shows the most clear persuasive profile (Crespo & Moskowich 2015).

Summary of the chapter

This period provided for a great expansion of knowledge and changed science making it more useful and accessible to audiences. However, these changes did not cause a real democratisation. Access to knowledge continued to be restricted on the basis of social status and, even though science was liberated from the control of the Church, New Science also became institutionalised quickly, with new groups of control producing norms and developing a socially stratified science in which there were different ranks or *classes*. The situation did not stay static, however. Initially, discrimination against middle and lower classes and, particularly, women, was even more acute than in previous centuries, but the situation improved during the nineteenth century, when the ongoing professionalization and the introduction of universal education allowed for a higher accessibility to scientific knowledge.

At the same time, a parallel process of specialization was taking place: knowledge started to be considered in terms of disciplines, and during the seventeenth and eighteenth centuries many new disciplines, such as history or chemistry, appeared in universities. During the period, astronomy focused on the discovery of celestial bodies as a result of the improvement of telescopes and applied Newton's discoveries to the study of the physical interactions between these bodies. Life sciences focused on the study of the fossils and geological evidence, on the one hand, and the relationships between living beings, on the other. This latter trend led to the production of taxonomies and the discovery of the laws of inheritance, and, later, to Darwin's discovery of Evolution. Philosophy focused on the dispute about the source of knowledge, and whether it stemmed from reasoning, as defended by rationalists, or from the senses, as defended by empiricists.

During this period science became more dependent on its social context, as well. From the emergence of empiricism, submitting one's findings to criticism from peers was both unavoidable and desirable. This prompted the emergence of a series of strategies which authors followed to achieve a better reception for their accounts. Among other elements, these strategies consisted in avoiding categorical claims and confrontation, recognising different points of view and others' work, and using mitigating elements, such as conditional structures, modal verbs, *verba dicendi*, "distancing verbs" such as *suggest* or *seem*, or probability adverbs such as *perhaps*. These coexisted with the linguistic results of the shift of science towards methods and evidence, such as an increased use of objectification, nominalisation, specific terminology, and passive voice; and a decrease in the use of personal references. These uses, evidence of the persuasive nature of scientific writing, were especially fruitful among women authors. At the same time, disciplinary differences showed as well in language, as philosophy texts appeared to be more speculative in nature, whilst life sciences texts, with their focus in classifications, were descriptive, and astronomy texts combined a descriptive and a theoretical side.

CHAPTER 2:

Conditionals: definition, scope and formal variability

Introduction

In order to describe the characteristics of conditional sentences in scientific writing it is necessary to consider two main aspects: first, it is necessary to provide a definition of *conditional* and delimit its scope by determining the criteria which characterise the conditionality of a given structure, and, second, it is necessary to examine the variability in the structure, describing the different kinds of conditional structures in terms of their formal types, their functions in scientific discourse, and their main structural and grammatical features.

The initial aim of this chapter is to focus on the first of these issues, defining what conditional structures are and determining their scope. However, during the examination of this issue it was found that the definition of conditionals is determined by the presence of a conditional particle, and, given that the different conditional particles are one of the most characteristic parameters of formal variation, all formal variability will also be studied in this chapter.

By doing this, this chapter also contributes to the design of the study: the factors accounted for here will help determine three of the parameters to be used in the study of the uses of conditionals in eighteenth and nineteenth-century scientific writing in Chapter 5 below. At the same time, the definition of conditional provided here will frame the whole dissertation, establishing some of the limits of the study.

The chapter is divided into three sections: Section 1 addresses the question of the very definition of *conditional structure.* The definition will be provided by means of analysing the characteristics of conditional structures in contrast to the logical notion of implication and noting their particularities. Section 2 is focused on determining the scope of conditional structures, analysing the different particles which have been deemed conditional markers in the literature, and studying whether they are to be considered as such. Section 3 analyses the remaining aspects which play a role in conforming the variability of conditionals and are therefore relevant for their grammatical description. It starts with the analysis of non-prototypical conditional structures, paying attention to both apodosis-less conditionals and non-single clauses protases and apodoses. Then, the focus is put on the possible orders of the protasis and the apodosis and on the verb-form combinations in conditionals, devoting special attention to modals and also examining verbless conditionals. Finally, a short summary will present the findings of the chapter.

1. Towards a definition of conditionals

The definition of what a conditional structure is has always been problematic. Ferguson *et al.* claim that "what constitutes a conditional construction in a given language has as yet no adequate theoretical answer" (1986: 5), whilst Declerck & Reed have argued that "it is extremely difficult, if not impossible, to give a precise definition of "conditional meaning" or "conditional interpretation"" (2001: 8). However, in order to analyse the use and functions of conditional structures it is crucial to know first what is a conditional and which structures may be defined as such. This section will be devoted to addressing the first part of this problematic issue, defining what a conditional structure is, whilst Section 2 will focus on the second part of the problem, indicating which structures are defined as conditional.

To date, most attempts to define conditionals have relied on the use of the logical[36] concept of implication as a starting point. This use, however, has proved problematic, as the equivalence between the notions of "conditional", used in linguistics, and "implication", used in logic, is not complete.

The starting point taken in this section is also the concept on implication. However, it will not be used to define conditionals straightforwardly, but rather as a model against which the characteristics of conditionals will be compared, highlighting the differences between the concepts. This is done with the intention of finding the defining characteristics of the notion "conditional structure" and devising

[36] Unless otherwise stated, the term "logical" will be used in this chapter with the sense "having to do with logic" and not "rational".

a *working*[37] definition of conditional structures. Thus, "conditional" will be defined by opposition to "implication".

In what follows, Section 1.1 presents the concept of implication and traditional accounts of conditionals based on it, Section 1.2 analyses the differences between both concepts. Finally, Section 1.3 provides the working definition used in this dissertation.

1.1. *Implication and conditionals: Traditional accounts*

Logicians define the concept of implication (frequently symbolised by the sign →) as a relationship between propositions, in which the truth of a given proposition *p* ensures the truth of another proposition *q*. As a logical concept, it holds truth values which can be represented in a truth table, as shown in Table 2.1:

p	***q***	***p → q***
T	T	T
T	F	F
F	T	T
F	F	T

Table 2.1: Truth table of the relationship of implication.

This definition has been frequently applied to linguistic conditionals straightforwardly. Thus, in its most prototypical definition, a conditional construction would be a *sentence* formed by *two clauses*, one of which, *presenting a conditional marker*, expresses a given content *whose consideration as truth* would trigger the consideration as truth of the second one.

The clause containing a conditional marker can be referred to as *protasis* (Gabrielatos 2010), *p-clause* (Dancygier 1998, Ferguson 2001, Declerck & Reed 2001), *conditional clause* (Quirk *et al.* 1985: 1088), or *if-clause* (Werth 1997, Ford 1997). Meanwhile, the second clause can be referred to as *apodosis* (Gabrielatos 2010), *q-clause* (Dancygier 1998, Ferguson 2001, Declerck & Reed 2001), *main clause* (Athanasiadou & Dirven 1997), *consequence clause* (Werth 1997), or *matrix clause* (Quirk *et al*. 1985: 1088).

[37] By using "working" here, it is meant that, rather than on theoretical grounds, this section is based on practical reasons, as the definition of the concept will be a framework on which other areas of the dissertation can be built. This interest in practical rather than theoretical grounds is explained by the fact that the central aim of this dissertation is to examine the uses and functions of conditionals in scientific discourse, rather than contributing to the ongoing debate on the "nature" of conditionality.

1.2. *Differences between implication and conditionals*

Logicians have frequently tended to define conditionality as the linguistic counterpart of implication, assuming a relationship between clauses alike to that of implication between propositions (Ferguson 2001: 62). However, both concepts, though frequently confused and mutually influencing, are not equivalent, and cannot be interchangeably used. The divergences between them can be grouped in four main areas: first, from a formal point of view, the structure of conditionals is not as simple and stable as that of implications. Second, there are mismatches between the semantic interpretation of conditionals and the truth-value of implications. Third, the relationship between the parts of the conditional can take place beyond the domain of the content of discourse, unlike in implications; and fourth, not all implications are acceptable as conditionals, as truth-value is not enough to build a well-formed natural language conditional. These four divergences are further analysed in what follows.

1.2.1. *Formal differences*

The first problem for prototypical, implication-influenced, definitions of conditionals is posed by the very formal nature of conditionals. Contrarily to the prototypical definition, conditionals are not always formed by two clauses. Conditionals may consist of only the protasis and, in fact, apodosis-less conditionals are quite common. This is seen in (1) below, in which the apodosis is elided:

> (1) “"If we take off the khat..." said the air hostess, drawing her finger across her throat. [A1V 884][38]” (Gabrielatos 2010: 234)

Moreover, the constituents of a conditional structure may not necessarily be clauses[39] either, but can be structures consisting of several coordinated clauses, as shown in (2) below.

> (2) “We must have a relief plan that the United Nations can implement throughout Somalia if there is to be peace and if the people are to be relieved. [HHV 23814]” (Gabrielatos 2010: 18)

Thus, from a formal point of view, whilst implication is a formally stable relation between two propositions, conditionals may present constituents of several types, and may also differ in number[40].

[38] Gabrielatos’s examples are taken from the *British National Corpus*. The code between brackets indicates the text and line in the text the example is taken from. The full list of text codes used in *BNC* is displayed at <http://www.natcorp.ox.ac.uk/docs/URG/bibliog.html> (Last updated January 2007).

[39] The terminology used in previous paragraphs reflects the prototypicality of clauses being the constituents of conditional constructions. In this sense, Gabrielatos (2010) argues for the use of terms not denoting a clausal nature, such as *protasis* and *apodosis*, to name the parts of the conditional construction, a position which will be followed in this dissertation.

[40] Formally non-prototypical conditionals are further analysed in Section 3.1 below.

1.2.2. *Mismatches in the semantic interpretation: conditional perfection*

The second difference is that conditionals often present semantic interpretations which do not conform to the truth-value of logical implications. As shown in Table 2.1 above, in logic, an implication is false if and only if the antecedent is true and the consequent is false. Thus, they allow for an interpretation in which the consequent takes place even if the antecedent does not take place. However, in natural language this is often not the case: conditionals are usually interpreted as biconditionals, as speakers usually interpret the protasis as being a *necessary* condition for the fulfilment of the apodosis. This is exemplified in (3) below.

(3) If you take this tablet, you'll feel better. (Ferguson 2001: 63)

Following the truth-table of implications, an interpretation of example (3) in which the hearer does not take the tablet but feels better anyway would be possible. However, such an interpretation would be strange in natural language, and a much usual interpretation would be "if and only if you take this tablet, you will feel better". This interpretation of all conditionals as biconditionals is a phenomenon known in the literature as "conditional perfection" (Geis & Zwicky 1971, Van der Auwera 1997, Horn 2000, Van Canegem-Ardijns & Van Belle 2008).

Comrie (1986) argues that conditional perfection is caused by an implicature[41]. An implicature is a process of assumption based on expectation. Following Grice's *Cooperative Principle*, any speaker in conversation is expected to make their contributions "such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange…" (1975: 45). This Principle is further detailed in a series of Maxims which are to be followed by all cooperative participants. Following Grice, when these Maxims are blatantly transgressed by the speaker, the hearer should interpret that there is a hidden meaning being transmitted, which the speaker supposes the hearer will be capable of grasping[42].

[41] Implicatures are intimately related to the mismatch of logical operators and natural language. In fact, Grice starts his 1975 transcription of his 1969 foundational talk referring to this mismatch:

> "It is a commonplace of philosophical logic that there are, or appear to be, divergences in meaning between, on the one hand, at least some of what I shall call the formal devices —~, ∧, ∨, ⊃, (*x*), ∃*x*, ∫*x* (when these are given a standard two-valued interpretation)— and, on the other, what are taken to be their analogs or counterparts in natural language- such expressions as *not, and, or, if, all, some* (or *at least one*), *the*." (Grice 1975: 41).

[42] This is an admittedly very succinct account of the Gricean definition of implicature. For the full account please consult Grice (1975), for other definitions, some challenging Gricean views or particular Maxims, view Lakoff (1973), Horn (1984) or Sperber & Wilson (1986, 1993).

Thus, the non-biconditional interpretation (in example 3, feeling better when not taking the tablet, or doing some other thing rather than taking the tablet), even though being accepted by logic, would be a transgression of Grice's first Maxim of Quantity[43] "make your contribution as informative as required" (1975: 45). The rationale behind this is that there would be no point in stating a condition if the contrary options led to the same result. Consequently, in order not to be considered a transgression, the hearer interprets the utterance as meaning something else: that taking the tablet is the only way to feel better: the conditional is interpreted as a biconditional[44]. Further proof in favour of this explanation is that the implicature is cancellable, as required in Grice (1975: 57). In (4) below, the addition of the comment "but you'll feel better anyway" cancels the biconditional reading of (3) above. In any case, Ferguson himself considers this new utterance "pragmatically odd".

> (4) If you take this tablet, you'll feel better – but you'll feel better anyway. (Ferguson 2001: 63)

1.2.3. *Functioning at different levels of discourse.*

The third problem is that conditionals, unlike implications, may apply in other levels of discourse beyond the level of content, as they also function at the reasoning and the speech-act levels, as explained in Sweetser (1990). For instance, in conditionals such as (5-6) below, the relationship between their constituents takes place in the world of reasoning, in the mind of the speaker and the addressee. These types of conditionals, which imply that given the protasis *it is safe to conclude* that the apodosis holds, include both generalisations such as (5) below, in which any speaker could reason and conclude the obvious relation of cause and consequence between the protasis and the apodosis; and deductions, such as (6) below, in which the addressee will need some previous knowledge shared with the speaker in order to understand what the relationship between the constituents is: for instance, in (6), both participants should share some previous knowledge so as to be able to infer that if John went to the party was because he was trying to infuriate Miriam.

> (5) If she's divorced, (then) she's been married. (Sweetser 1990: 116)

[43] A point has been made (Lewis 1976: 306) that asserting a conditional believed to be true because of its antecedent being false, a "vacuous truth", would be pointless, but also potentially misleading. Consequently, the transgression could also be taken to affect the Maxims of Quality and Relevance. In any case, this does not affect the general solution proposed.

[44] Another exemplification of this phenomenon is given by Sweetser: "where the speaker is attempting to get the hearer to do something ("If you do X, I'll do Y"), there would be little point to the conversation if the speaker intended to do Y whether or not the hearer did X. The conversational implication must be that the speaker would *not* normally do Y. The normal interpretation of such sentences is thus "I'll do Y if and only if you do X."" (Sweetser 1990: 116, emphasis in the original).

(6) If John went to that party, (then) he was trying to infuriate Miriam. (Sweetser 1990: 116)

In other cases, the relationship between the constituents takes place at the speech-act level. Example (7) below is an example of these. In it, the speaker is not really stating a condition for the apodosis, but pretending to ask for permission to utter the statement in the apodosis.

(7) If I may say so, that's a crazy idea. (Sweetser 1990: 118)

The relationship between the clauses occurs at the speech-act level, as the denial of permission asked in the protasis would imply the impossibility of the *utterance* of the apodosis. In Sweetser's words (1990: 118), "the performance of the speech act represented in the apodosis is conditional on the fulfilment of the state described in the protasis (the state in the protasis enables or causes the following speech act)[45]".

1.2.4. *Truth-value as an insufficient criterion for acceptable conditionals*.

Finally, the fourth difference, which is the most problematic, is that not all implications are acceptable conditionals. As already explained, an implication is false only if the antecedent is true and the consequent is false. But as noted by many authors (Austin 1961; Haiman 1978, 1986; Comrie 1986, James 1986, Sweetser 1990, Ferguson 2001), in natural language appropriate truth values are not enough to accept conditionals as valid, there needs to be *some kind of connection* between the clauses.

This explains why the often-quoted example of anomalous or infelicitous conditional in (8) below is usually not acceptable as a well-constructed sentence by speakers. From a logical point of view, (8) would be a totally valid implication, in which the fact that the proposition "Paris is the capital of France" is true would make the proposition "two is an even number" also true.

(8) If Paris is the capital of France, (then) two is an even number. (Sweetser 1990: 113)

However, it is difficult to accept (8) as a well formed conditional in natural language, as it is difficult[46] to imagine a context in which the evenness of two would be dependent on Paris being the capital of

[45] However, as Sweetser also recognises (1990: 118), the statement is always uttered without actually waiting for the permission. The conditional clause would thus be a mark of politeness, rather than an actual petition: the rules of politeness (Lakoff 1973) make participants in the interaction *pretend* to be asking (or having been asked) permission. In precise situations, should the content of the apodosis be considered inadequate, the hearer could also take advantage of the conditional and ignore or deny collaboration, considering the apodosis as "non-uttered", even though, with addressers using the conditional as a conventional mark of politeness, that could be taken as impolite and mean a loss of face.

[46] Sweetser (1990: 117) explains, in a rather tongue-in-cheek way, how, given sufficient context, a sentence like (9) could be indeed interpreted as adequate. She suggests imagining how Woody Allen might wake up from a

France (and a possible administrative decision to change the capital of France would be capable of altering the laws of mathematics). The conditional is not considered well-formed because the necessary connection between the clauses is missing.

This connection between the clauses may usually be of simple cause-effect, as in (3) above, but there are other possibilities beyond this: counterfactual conditionals (such as (9) below), which are used to state a conditional relation between a protasis and an apodosis when the protasis is already known to be false, show a relationship of enablement[47], whilst (5) and (6) above are examples of inference. In (7), the relationship of the parts of the conditional is not depending on their truth-value, but on their felicity, as they apply at the speech-act level.

> (9) If I were president, I'd sell the White House's Limoges china to fund bilingual education. (Sweetser 1990: 114).

Thus, it seems safe to conclude that conditionals cannot be defined simply on the grounds of the truth-value of their parts and that, in order for a conditional to be considered valid in natural language, some sort of relationship between the two terms of the construction beyond mere truth-value, be it a relation of inference, cause-effect, enablement, or any other, is needed.

The definition of this connection goes beyond the aims of this dissertation. There have been interesting proposals as part of the debate on the nature of conditionals, such as Haiman's, who considers protases a "frame of reference with respect to which the main clause is either true … or felicitous" (1978: 564), thus explicitly including speech-act conditionals, or Gabrielatos's (2010), who considers conditionals as "environments of indeterminacy" about which one can make hypotheses. However, the decision taken here has been not to define the nature of this relationship between protasis and apodosis, and to consider every kind of relationship between the two parts of the conditional structure as valid. In this sense, this dissertation is influenced by authors such as Van der Auwera (1985, 1986) or Sweetser (1990), who argue in favour of the *sufficient conditionality thesis*. This defends that the protasis expresses a sufficient (not a necessary) condition for the actualisation of the apodosis, be it the type of conditional it be.

---

nightmare in which "geography and mathematics were equally bizarrely disarranged" and how he would use the reassurance of Paris being the capital of France as proof of not being in a nightmare anymore and therefore concluding that two is still an even number. As she recognises, this rather complicated explanation is only further proof of the necessity of a connection of some kind between the two clauses instead of "the simple truth-value requirement imposed by a logical if-then".

[47] Example (9) states an idea (selling the White House's china) which cannot be executed now because of the obvious falsehood of the protasis. The relationship is of enablement because the hypothetical truth of the protasis would enable the realisation of the apodosis.

1.3. *A working definition of conditional*

The previous section has shown the differences between natural-language conditionals and the logical notion of implication: on formal grounds, natural language conditionals feature a higher degree of variability compared to implications, allowing for apodosis-less or non-clausal conditionals. At the same time, the interpretation of conditionals departs from that of implications, to the point that truth-value is put into question in the literature as a valid explanation of the relationship between the two constituents of conditional constructions. This is a consequence of the fact that the interpretation of natural language conditionals does not conform to the expectations of the truth tables of implications and that truth-values are insufficient to define conditionals, since a supplementary kind of connection is needed.

These findings seem to lead to the conclusion that the logical-based definition of conditional constructions presented above is not very adequate to comprehensively define all types of conditionals, and that a different definition is needed. Taking into account the considerations in the previous section, a conditional construction may be then defined as follows:

A conditional is a structure *prototypically* consisting of two constituents (but which may feature only one), which are prototypically clauses (although not necessarily so), in which one of them, obligatory and containing a conditional marker, expresses a given content whose consideration as truth, adequate or felicitous (whether in the conceptual, reasoning, or speech-act level) would, by virtue of a relationship of cause-effect, enablement, inference or any other, lead to the consideration of the other (not obligatory) constituent as truth, adequate or felicitous in their respective domains.

Admittedly, this definition is too broad and does not require the presence of a second constituent, thus preventing any possibility of discriminating conditionals on semantic grounds only or as the result of a connection between two constituents. However, once the definition is analysed, there is a characteristic which reveals itself as crucial for the definition of conditionals: *the necessary presence of a conditional marker in the protasis*. Thus, valid conditionals can be defined for the purpose of this dissertation as those in which there is a valid conditional marker[48]. Determining the validity of particular conditional markers is the topic of the next section.

[48]In this sense, this dissertation would be, according to Ferguson *et al*. (1986: 6), following the position of descriptivist accounts of conditionals, which also classify conditionals on account of the presence of a valid conditional marker.

2. Formal classification of conditionals

In order to characterise a category it is not only important to define it, but also to determine its scope, distinguishing which elements can be considered as members of the category and which ones fall out of its limits. This is even more certain of conditional structures, since, as explained above, their main defining characteristic is the presence of a conditional marker in the protasis, and, consequently, determining which of these markers are valid will also help determine which structures are to be considered as conditional.

At the same time, in order to be able to provide a comprehensive[49] account of the uses and functions of conditionals in scientific writing in English, it is necessary to create a formal classification of conditionals. This classification will provide not only one of the two principal parameters of study of this dissertation (together with the functional classification), but also a list of searchable conditional-defining elements, a list which is of capital importance to manage a corpus-based study such as this, since it is from this list that the terms to be queried will be extracted.

This section builds on the definition above and examines the literature in order to identify the particles that functioned as conditional markers in eighteenth and nineteenth century English. The discussion of this process is the aim of Section 2.1. Section 2.2 focuses on the different particles identified, analysing its particularities.

2.1. *Identifying conditional markers*

Determining which markers are to be considered as conditional is far from simple. Despite the fact that a fair share of studies dealing with conditionals focus mainly (Ferguson 2001) or only (Werth 1997, Ford 1997, Facchinetti 2001, Carter-Thomas & Rowley-Jolivet 2008, Warchal 2010, Hesabi, Dehaghi & Shahnazari 2013) on *if*-conditionals, it is well known that *if* is not the only particle which can introduce a conditional clause. There are sentences with other conditional markers showing clear semantic equivalences with *if* conditionals, such as (10) below.

(10) Had he not seen the car coming, he would have been killed. (Biezma, 2011: 555)

Thus, in order to define which elements are to be considered as conditional connectors, several works have been consulted, particularly Quirk, Greenbaum, Leech & Svartvik's *A Comprehensive Grammar*

[49] The aim of this dissertation, defining the uses of conditionals in a definite register and time, justifies the need of a comprehensive approach, disregarding positions such as Gabrielatos's (2010: 2), who uses *if*-conditionals as "a case study" on the grounds of their adding up to more than 80% of the total uses of conditionals.

of the English Language (1985) and Declerck & Reed's *Conditionals. A Comprehensive Empirical Analysis* (2001).

Apart from the well-known central conditional subordinators *if* and *unless,* Quirk *et al*. (1985: 1089) also consider as conditional markers some other conjunctions or locutions, such as *as long as, so long as, assuming (that), given (that), in case, in the event that, just so (that), on condition (that), provided (that), providing (that),* and *supposing (that)*. To these, Declerck & Reed (2001: 21) also add *on the understanding that* and *lest*.

Moreover, Quirk *et al.* (1985: 1081-1102) name a series of other subordinators which, having another principal meaning, include some nuances of conditionality. Among these, they consider subordinators expressing general recurrent contingency such as *once* (11), *when, whenever* (12), *where*, and *wherever* (13).

(11) Once known, such facts have been reported. (Quirk *et al.* 1985: 1086)

(12) When(ever) in doubt, see me. (Quirk *et al*. 1985: 1086)

(13) Where(ver) children are involved, divorces are particular unpleasant. (Quirk *et al.* 1985: 1086)

They also consider some subordinators combining the meanings of condition and time, such as *before* (14), *as long as, so long as* (15), *when, whenever*, and *once*; and particles combining exception with condition, such as *except that* (16) and *only*.

(14) Go before I call the police. (Quirk *et al*. 1985: 1081)

(15) As/so long as I live here, I do it my way (Quirk *et al.* 1985: 1083)

(16) Except (that) I had money on me, I won't pay you. (Adapted from Quirk *et al.* 1985: 1102)

Declerck & Reed (2001) add to these some other particles which have an even fainter nuance of conditional meaning, such as *after* (17), *the moment that*, *as soon as*, or *until* (18).

(17) You will be paid AFTER the job is finished, not before (Declerck & Reed 2001: 29, uppercase in the original)

(18) Nothing will change until there is a change of government (Declerck & Reed 2001: 30)

The case has also been made for the conditionality of expressions such as *whether… or…* (see 19 below) or *the + comparative… the + comparative* (20 below)[50].

(19) Whether you are overweight or not, it is always better to watch your diet. (Declerck & Reed 2001: 26)

(20) The more we hurry, the sooner we'll get there (Declerck & Reed 2001: 28)

Apart from all these particles, it is well known that conditionals can also be triggered without any subordinator, by means of the inversion of the operator in the protasis. According to Quirk *et al*. (1985: 1093-1094), the main operators allowing inversion with conditional interpretations are *had, were* and *should*, as well as *might* or *could* when occurring with an adverb such as *but* or *just,* as in (21) below*.* Declerck & Reed (2001) also propose the subjunctive *be* (22).

(21) Might/Could I but see my native land, I would die a happy man. (Quirk *et al.* 1985: 1094).

(22) […] be I right or wrong about that part of the story […] (Jackson 1998: 40 in Declerck & Reed 2001: 28)

Finally, the notion of conditionality has also been extended to some structures which show traces of conditional meaning even though they have neither a subordinator, nor conditional inversion. Quirk *et al.* (1985: 1090-1091) detect two types: absolute clauses, such as "barring bad weather", "god willing", or "time permitting"; and subjectless clauses with a subjunctive verb, such as "come to that" or "please God". Some authors go even further and also consider that conditional meaning can be conveyed with prepositions such as *with* (23) and coordinating conjunctions such as *and*[51] (24) and *or* (25), as well as with no particle at all as in "asyndetic paratactic conditionals" (26).

(23) With good weather, the roses will be out by June (Ferguson 2001: 62)

(24) Tell me the answer and I'll buy you a beer. (Ferguson 2001: 62)

(25) Publish or perish! (Declerck & Reed 2001: 35)

[50] According to these interpretations, in (19) the sentence expresses alternative conditions, which can be paraphrased as a set of two conditionals: "It is better to watch your diet if you are overweight + It is better to watch your diet if you are not overweight". In sentences such as (20), already lengthily analysed in the literature (Den Dikken 2005, Lipták 2009), the relationship expressed is one of parallel increase or decrease between the clauses: the elements in the second clause will vary in the measure in which the elements in the first clause vary.

[51] The expression of conditional meaning with the coordinating conjunction *and*, also known as "left subordinating *and*", has been the topic of a lengthy debate in the generativist tradition (Fraser 1969, Culicover & Jackendoff 1997) about their paratactic or hypotactic nature.

(26) You don't study, you fail (Bailey 1989: 278)

A summary of the elements considered conditional connectors by Quirk *et al*. (1985) and Declerck & Reed (2001) is presented in Table 2.2 below.

It could be possible to consider all these particles as conditional markers, something which would be in keeping with the common practice in descriptivist studies, as explained in Ferguson *et al.* (1986: 6). However, the decision taken has been to eliminate some of them from the formal classification adopted here.

There are two main reasons for this. On the one hand, extending the consideration as conditionals to all the particles listed in Table 2.2 would ignore the semantic overlap among the notions of conditionality, temporality, exception and contingency, simplifying all this range of meanings as "conditionality" and stretching the latter's scope too much.

Type of particle:	**Quirk *et al.* 1985**	**Declerck & Reed (2001)[52]**
Central conditional subordinators	*If, unless*	*If, unless*
Peripheral conditional subordinators	*As long as, so long as, assuming (that), given (that), in case, in the event that, just so (that), on condition (that), provided (that), providing (that), supposing (that).*	*Providing (that), provided (that), on condition that, on the understanding that, in case, lest, supposing, assuming, given that,*
Subordinators expressing general recurrent contingency	*Once, when, whenever, where, wherever*	*When*
Subordinators expressing condition and time	*Before, as long as, so long as, when, whenever*, *once*	*After, before, until, as long as, so long as, the moment that, as soon as, once*
Particles expressing condition and exception	*Except that, only*	---
Other types of particles and clauses	---	*Whether…or…* *The COMP… the COMP…*
Operators allowing conditional inversion	*Had, were, should; might* and *could + but/just*	*Had, were (to), should, could, be.*
Clauses with no subordinator	Absolute: "*barring bad weather*" Subjectless subjunctive: "*please god*"	*Paratactic conditionals.*

Table 2.2: Particles identified as elements introducing clauses with conditional interpretations in Quirk *et al*. (1985) and Declerck & Reed (2001).

[52] Declerck & Reed name other types of conditional constructions, not mentioned in here as they have not been seen elsewhere and the nuance of conditional meaning is even fainter. To see all of these, *cf.* Declerck & Reed (2001: 19-35)

Thus, subordinators combining meanings of contingency or time and conditionality, such as *once*, *when*, or *before* (examples 11-15 and 17-18 above), clauses of exception, such as (16) above, and structures such as *whether… or…* (19 above), *the + comparative… the + comparative* (20), absolute clauses, or subjectless conditional clauses have been excluded.

On the other hand, from a practical point of view, the consideration as conditionals of paratactic asyndetic clauses with nuances of conditional meaning such as those in (26) above would lead to the impossibility of a corpus-based analysis, as there would be no particle to search. This is also the case with *with, and,* and *or* in (23-25) above, as the difficulties their inclusion would raise during the process of searching for conditional particles (long process of disambiguation) combine with the desire to avoid overstretching conditional meaning[53] to justify their exclusion.

Thus, after finishing this process of elimination, there are only three kinds of conditional-triggering particles: central conditional subordinators *if* and *unless*, peripheral conditional subordinators, and operators allowing inversion with a conditional interpretation.

However, this process results in a list of *Present-Day* English conditional markers, and this work analyses conditionals during the period between 1700 and 1900. It is then necessary to adapt the formal classification to the period of study, so that the classification contains every conditional particle in use during the period. To do this, Rissanen's (1999) chapter on Syntax in Volume III of the *Cambridge History of English* and the *Oxford English Dictionary* (henceforth *OED*) have been consulted. These works show that all of the conditional particles in Present-Day English were already in use in 1700. However, it has also been found that during the period of study the selection of operators allowing conditional inversion was "more varied" than it is at present day (Rissanen 1999: 308-309) and that a number of conditional subordinators used during that period have since gone extinct or lost their conditional meaning. The inversion particles which have lost these uses since then include *did* and *is,* as well as probability modals, such as *may* or *would.* Of these, at least *did* was still in use during the first part of the twentieth century, as shown in example (27) below, taken from Visser (1964; in Iatridou & Embick 1994: 138).

> (27) There are other articles, to which, did time permit, we might draw attention. (Curme 1931: 327)

[53] Van der Auwera's analysis on sentences such as (25) and (26) described these as "simultaneously imperatives that p and/or q, and assertions about a conditional relation between p and q" (1986: 211). Although this account seems quite plausible, in it conditionality continues to be a secondary meaning, thus supporting the exclusion.

Regarding conditional subordinators, Rissanen (1999: 308-309), includes *so (that*), *if case* and *without* as particles introducing conditionals during the Modern English period. However, according to the *OED* the conditional uses of *if case* and *without* were extinct before the beginning of the eighteenth century (in 1630 and 1523[54] respectively). Meanwhile, in the case of *so (that)* there are conditional uses registered until 1859, as (28) below, taken from the *OED*.

> (28) "So that you do not serve me sparrow-hawks for supper, I will enter." (Tennyson 1859: 17)

Both the above mentioned inversion particles and *so (that)* have been thus included to the list of conditional particles so as to conform a formal classification of conditionals adapted to the period under study, shown in Table 2.3 below:

Central conditional subordinators	*If, unless*
Peripheral conditional subordinators	*As long as, so long as, assuming (that), given (that), in case, in the event that, just so (that), lest, on condition (that), on the understanding that, provided (that), providing (that)*, *supposing (that), so (that).*
Operators allowing inversion with conditional interpretation.	*Had, were, should, might, could, may, would, is, be, did*

Table 2.3: Elements introducing clauses with conditional interpretations during the period 1700-1900.

2.2. Particularities of the different types.

After having presented the formal classification of conditionals in the eighteenth and nineteenth centuries, it is necessary to briefly describe each of its types in order to show their particular characteristics and uses. In what follows, first *if* and *unless* are devoted their respective subsections, before analysing other conditional subordinators, such as *providing* or *as long as*, and, finally, the operators triggering inversion with conditional meaning.

2.2.1. *If*

If is commonly considered as the prototypical conditional connector, and has been often taken to represent all other conditional markers, with an important number of studies having ignored these other connectors, either openly or covertly, as explained above. In any case, *if* is the most frequently used conditional connector, "the most common and most versatile" (Quirk *et al.* 1985: 1089): corpus-

[54] In the case of *without* it is entry C1c in the *OED* that is being considered. Examples in entry B13, although considered as "often with conditional implication" by the authors of the *OED*, seem rather another example of stretching conditional meaning as in exception clauses above.

based studies have found that *if* accounts for more than 80% of conditional cases (Gabrielatos 2010: 2), and that it can also introduce every type of conditional[55].

Following these points, it seems safe to consider *if* as the unmarked conditional conjunction (Declerck & Reed, 2001: 19). In what follows, the rest of conditional particles will be described by opposition to *if*, highlighting their particularities.

2.2.2. *Unless*

Unless is a conditional subordinator which is used to express that the apodosis holds in all circumstances but in the one stated in the protasis, as shown in (29) below.

> (29) Unless the body is not discovered for a long time, the police pathologist will see that the man has been tortured. (Declerck & Reed: 2001: 21)

Thus, the basic meaning of *unless* is synonymous to "in a case other than", and it is generally interchangeable with *except if* and *if not* (Declerck & Reed, 2001: 447). However, there are some restrictions to this interchangeability. *Unless* is not interchangeable with *except if* in counterfactual conditionals, such as (30) below[56]. In these uses, *unless* is better replaceable by "if it hadn't been/weren't the case that".

> (30) But unless I'd gone along with you, you'd have told my husband, I bet (COB-W, in Declerck & Reed 2001: 455).

There are also several restrictions to the interchange with *if not.* Perhaps the clearest are those in which the use of *if not* is precluded on account of the presence of assertive or non-assertive items in the sentences, as shown in (31) and (32) below.

> (31) I won't do it unless you give me (some/*any) money (*at all). (Declerck & Reed, 2001: 451)

> (32) I won't do it if you don't give me (*some/ any) money at all. (Declerck & Reed, 2001: 451)

However, there is a more profound difference between *unless* and *if not* sentences. *If not* sentences can be used to express the idea that the apodosis results from not holding the protasis, as shown in

[55] However, this must not be taken to mean that all conditionals introduced by other particles could be rephrased with *if*: there are some contexts in which the use of *unless*, *in case* or other connectors is necessary and thus cannot be rephrased.

[56] This example is taken from real data, even though the use of *unless* in these sentences has been claimed impossible by some authors (Geis 1973: 242-243, Dancygier 1985: 70).

(33), rather than the usual *unless* meaning which expresses that the apodosis holds *except* when the protasis holds. With sentences such as (33), exemplifying the first of these senses, the use of a paraphrasis with *unless* as in (34) is blocked.

(33) I will be surprised if that book doesn't sell well. (Declerck & Reed, 2001: 451)

(34) *I will be surprised unless that book sells well. (Declerck & Reed, 2001: 451)

However, when *unless* clauses function as postcripts or comments, as in (35) below, they are always paraphraseable with *if not* (36):

(35) I'll give you £20—unless you give me a ticket. (Declerck & Reed, 2001: 453)

(36) I'll give you £20—if you don't give me a ticket. (Declerck & Reed, 2001: 453)

A final point is that *unless*-clauses cannot be focused, either by a question (see (37) below), a focusing adverb, or a cleft clause. This has been considered as a mark of the lack of semantic integration of the protasis in the apodosis.

(37) *Will you help us unless John asks you to? (Declerck & Reed, 2001: 451)

2.2.3. *Peripheral subordinators*

Apart from central conditional subordinators *if* and *unless*, there are a series of conjunctions and locative conjunctions that can function as conditional markers. The process of analysis of conditional uses in the eighteenth and nineteenth centuries explained above has left the following list of conditional subordinators to be considered: *As long as, so long as, assuming (that), given (that), in case, in the event that, just so (that), lest, on condition (that), on the understanding that, provided (that), providing (that)*, *supposing (that), so (that).*

These conditional subordinators show different semantic nuances, but a common characteristic has been identified in the literature, joining them together and setting them apart from *if* and *unless*: they have been found incapable of introducing non-finite and verbless clauses (Quirk *et al.* 1985: 1090) unlike *unless* and *if* (as shown in (38) and (39) below), thus showing their more restricted distribution, and their reference as peripheral[57], rather than central, subordinators.

[57] *Peripheral* will be used here with no intent of a judgmental value on the degree of adequacy or belonging to the class (or, indeed, any other judgmental value), but only as referring to the fact that these particles do not feature all the characteristics and have a more restricted distribution than central conditionals.

(38) Unless otherwise instructed, you should leave by the back exit (Quirk *et al.* 1985: 1090)

(39) If wet, the pipe won't give you a good smoke (Quirk *et al.* 1985: 1090)

These subordinators can be grouped according to their different meaning nuances. *Assuming, supposing* and *given that* show meanings very similar to those of *if*-clauses (Declerck & Reed 2001: 27), although the three imply, rather than a simple conditional relation, that the truth of the protasis must be entertained, expressing in the apodosis its possible results or consequences.

Providing, provided, on condition that and *on the understanding that* all tend to reinforce the biconditional interpretation (Declerck & Reed 2001: 21) characteristic of the phenomenon of *conditional perfection*, as explained in Section 1.2.2 above. Meanwhile, *in case* can be used to express several meanings, as caution, prevention, fear or concern (see (40) below) although most of its conditionals uses are "relevance" conditionals, such as (41) below, a use which Declerck & Reed argue is more common in American English (2001: 24). *Lest*, however, is mostly used to express prevention (42), although it is equivalent to *in case* in every context.

(40) I carried an umbrella in case it rained. (Declerck & Reed 2001:21)

(41) In case you need a car, you can rent one here. (Declerck & Reed 2001:21)

(42) I wore sunglasses lest I should be recognized (Declerck & Reed 2001: 25)

As explained above, *as long as* and *so long as* can express duration or necessary conditionality. However, in some cases, such as (43) below, these can be difficult to discern, showing the inherent ambiguity of the fuzzy borders of the category.

(43) You can use my camera as long as you pay for the films yourself. (Declerck & Reed 2001: 31)

Finally, it is worth mentioning that these conditionals also show meaning nuances related to their adequacy to different levels of formality: thus, *given that* or *lest* are considered formal, whilst *just so that* is informal (Quirk *et al.* 1985: 1089).

2.2.4. *Operators triggering inversion*

As explained above, conditional structures could be expressed through the inversion of the operator in the protasis. The particles which supported their inversion with this objective during the period between 1700 and 1900 include *had, were, should, might, could, may, would, is, be* and *did.* In contrast

with conditionals introduced by subordinators, there is no particle introducing a meaning nuance and, in principle, they appear to be in free distribution with their *if*-equivalents.

However, inversion conditionals show some grammatical restrictions. First, by their own nature, non-finite and verbless clauses are not possible with inversion conditionals (Quirk *et al.* 1985: 1090). This is quite obvious, as the particle inverted is the operator, which per nature is part of a finite verb clause. However, it is interesting to notice that this feature is shared with peripheral subordinators but not with central subordinators *if* and *unless.*

Another interesting property is the impossibility of the use of the contracted negation *n't* with the inverted operator (Quirk *et al.* 1985: 1094, Iatridou and Embick, 1994: 137), as shown in (44) below. However, negation with *not* (45) is perfectly possible.

(44) *Hadn't he seen the car coming, he would have been killed. (Iatridou and Embick 1994: 137)

(45) Had he not seen the car coming, he would have been killed. (Biezma 2011: 555)

Moreover, inversion conditionals cannot appear in apodosis-less conditionals, as the consequent must be present (Biezma 2011: 566). This explains why inversion conditionals cannot act as free-standing answers to questions or be clefted (Iatridou & Embick, 1994: 141), as shown in (46) below:

(46) *It is had John come that Mary would have left (Iatridou and Embick 1994: 141).

Some authors go beyond these characteristics and defend that inversion conditionals do in fact have a particular meaning, different from their *if*-counterparts. Iatridou & Embick (1994) defend that inversion in conditionals marks that the information in the protasis is old, and, since inversion only appears in counterfactual conditionals in Present Day English, that the protasis is known to be false when it is uttered.

Biezma (2011: 559), on the other hand, sees inversion as a strategy to relate the utterance to previous discourse, marking "the antecedent proposition as previously considered/entertained". According to her, and contrary to Iatridou & Embick, inversion in English counterfactuals cannot encode the truth-value of the protasis, as it would imply that counterfactuality is caused by a presupposition instead of by an implicature, and the fact that the counterfactual interpretation can be cancelled proved that this interpretation is wrong[58] (2011: 557).

[58] One of the characteristics of implicatures is, precisely, its cancellability (Grice 1975: 57). See Section 1 above.

Instead, Biezma defends that inversion denotes givenness, a concept which she understands following Schwarzschild (1999), as "An utterance is GIVEN iff it is entailed by prior discourse". This entailment, according to Biezma, does not need an exact match or even an overt antecedent, as it can be supplied by context (2011: 560-561), especially when there is a non-overt but culturally well-known dependency between facts[59].

This interpretation would explain as well why, under certain circumstances, an inversion conditional is interpreted as a reproach, as in (47) below. According to Biezma, this happens because the meaning nuance of inversion conditionals denoting that the information in the protasis is given (should be entertained) is used to remind the addressee that they failed to fulfil the truth of the protasis. In her words (2011: 568), "by means of inversion, the speaker reminds the addressee that the antecedent proposition leading to the desired state of affairs was prominent."

> (47) Mom: Had you done your chores, you would be able to go with your friends. (Biezma, 2011: 568)

On a different note, it has also been claimed (Iatridou & Embick 1994) that the use of *only* (see (48) below) and *even* is not possible with inversion conditionals, but Jong-Bok (2011: 7) argues that the use of inversion with *even* is possible and has been found in corpus data, as shown in (49) below:

> (48) (*Only) had I thought that would I have called him (Jong Bok 2011: 20)

> (49) Even had she known his birthday, she wouldn't have scoured Alburquerque thrifts (COCA 2006 FIC in Jong Bok 2011: 20)

Jong-Bok also found some instances of double conditional marking, i.e., simultaneous presence of *if* and *inversion*, in sentences such as (50) below.

> (50) The old man would never have left her here if had he seen it (COCA 2008 FIC in Jong Bok 2011: 19)

Finally, as with some peripheral conditional markers, some authors argue that inversion conditionals present some diafasic meaning nuances, being characteristic of formal (Declerck & Reed, 2001: 27) or literary (Quirk *et al.* 1985: 1094) English.

[59] These "well-known dependencies" between facts, also known as *laws,* are analysed in depth in Veltman (2005).

3. Other grammatical aspects in conditionals.

As shown in Section 1, real uses of conditionals, both in general and scientific discourse, go beyond the oversimplified accounts commonly present in traditional and EFL grammars. According to these traditional accounts, a conditional consists of two constituents of a clausal nature, with the protasis appearing first and featuring a small range of possible verb form combinations. But, as has been shown, the formal variability of conditionals goes well beyond these traditional accounts.

This section aims to analyse the variability of conditionals on account of three parameters: the formal structure of the conditionals (and more particularly, those conditionals which do not conform to prototypical accounts), the order of their constituents, and the combination of verb forms in the conditional constituents. Each of these aspects is devoted a subsection below in which their characteristics are studied. At the same time, the analysis will also be used to present the variables for each of them as will be used later in Chapter 5.

3.1. *Formally non-prototypical conditionals*

Conditionals are not always formed by two clauses. As explained in Section 1 above, conditionals can be formed by just one element (*apodosis-less conditionals*) and, moreover, their constituents need not be of a clausal nature. In what follows, these two types are briefly explained.

3.1.1. *Non-clausal conditionals*

Conditionals formed by constituents of a supraclausal level are very common in scientific discourse, in which it is often necessary to explain relationships between more than two premises. These relationships are encoded linguistically as conditionals in which a set of coordinated protases imply a simple apodosis, or a single protasis imply a set of apodoses. A further possibility is that a set of protases imply another set of apodoses. Example (51) below, already presented in Section 1 as example (2), illustrates the second of these types, in which a single apodosis relates to a set of protases.

> (51) “We must have a relief plan that the United Nations can implement throughout Somalia if there is to be peace and if the people are to be relieved. [HHV 23814]” (Gabrielatos 2010:18)

These uses are evidence of the versatility of conditionals. There is no linguistic limit to the number of premises which can be coordinated in either the protasis, the apodosis, or in both of them at once; and it is also possible to establish different relationships between these premises in either the protasis or the apodosis, by using different conjunctions, such as *and* or *or*.

3.1.2. *Apodosis-less conditionals.*

As explained above, a conditional structure is defined by the presence of a conditional particle in a protasis. Every other element is not obligatory, and thus there are conditionals in which there is no apodosis, such as (52) below, already presented in Section 1 as example (1).

> (52) “"If we take off the khat..." said the air hostess, drawing her finger across her throat. [A1V 884]” (Gabrielatos 2010: 234)

Apodosis-less conditionals are frequently associated with interactive communication. An apodosis may not be realised because the speaker may consider it obvious and not necessary for the hearer to understand the sense of their utterance; or they may also choose, as in example (52) above, to substitute the apodosis with a gesture, changing the mode of communication. It is also possible that the apodosis is not realised because it falls outside the turn of conversation in a dialogue, either because the speaker is interrupted and thus not able to utter it, or because the protasis is a free standing answer to a question (which would act as displaced apodosis), as shown in the dialogue in example (53) below:

> (53) A: When/Under what circumstances would Mary have come?
>
> B: If she had been offered many artichokes. (Biezma 2011: 164)

The use of apodosis-less conditionals, however, is restricted and does not include inversion conditionals. As explained above, these conditionals need the presence of the apodosis to be valid (Biezma 2011: 164-166), a fact which has also been related with the impossibility of inversion conditionals to act as answers to questions or to appear in cleft sentences.

3.2. *Order of conditionals*

As reported by Carter-Thomas & Rowley Jolivet (2008:195), traditional accounts have tended to consider the protasis-apodosis order as the norm:

> “Past linguistic research has tended to consider this initial positioning of the if-clause and post-positioning of the main clause as the default ordering, or even as a language universal (cf. Comrie, 1986 and the provocative title of Haiman’s 1978 article ‘Conditionals are topics’). Any non-initial positioning of conditional clauses has been regarded as a very marked choice and frequently even ignored in subsequent analyses.”

Thus, it has been common in the literature to regard protasis-first conditionals as the non-marked option, and apodosis-first conditionals as a marked choice. For instance, Ford & Thompson (1986)

claim that the apodosis-first order was dependent on syntactic and discursive constraints, and point at four triggers: the presence of an "interesting subject" in the apodosis, the occurrence of two or more adverbials at the beginning of the sentence, the length of the protasis, and its inclusion within a nominalization, an infinitive, or a relative clause. Other environments which have been claimed to trigger the apodosis-first order are recommendations (Ferguson 2001: 75) and afterthoughts or expressions of politeness, especially in oral data (Ford & Thompson 1986: 360).

Concurrently, conditionals in which the protasis appears inside the apodosis, such as (54) below, have often been ignored, as in Ferguson (2001), or excluded, as in Ford & Thompson (1986).

> (54) The diameter of the lesions, if they're adenomas, tends to be bigger (Carter-Thomas&Rowley-Jolivet, 2008: 195)

Indeed, past research has found that protasis-first conditionals are more common, but the proportion of other types of conditionals is not negligible. For instance, Ford & Thompson (1986), after excluding conditionals with protasis in the medial position (whose proportion is not known) shows that initial-protasis conditionals are 77% in their written data and 82% in their spoken data. The conditionals in Carter-Thomas & Rowley-Jolivet (2008) are mostly initial (59%), with final protasis accounting for 33% of the cases and medial protasis for a further 8%. However, their data shows important variability in terms of genre, with, again, a higher degree of initial protasis in oral than in written data.

A final point about the order of the constituents of conditionals has to do with its relationship with the information structure of the construction. As noted above, Haiman (1978) considers protases as background information against which a fact is checked[60], a position also shared in Ford & Thompson (1986), but which is not applicable to the whole range of English conditional structures, as shown by Sweetser (1990). Although it is not the central topic of this dissertation to study the information structure of conditionals, it will be interesting to cross the data from this parameter with the parameter of conditional type. It will be especially interesting to check the patterns of conditionals by inversion, which have been described as conditionals in which the protasis is normally understood as given information (Biezma 2011) precisely because of the use of inversion, and see if this correlates with a greater use of protasis-first conditionals, as should be expected.

For the analysis of data in Chapter 5, the order of conditionals and non-prototypical clauses will be considered as a single parameter. Thus, four types will be distinguished in this parameter: initial-

[60] This idea is intrinsically linked to the consideration of the protasis-apodosis order as the prototypical one, linking the presumed topicality of protases to their prototypical leading position in the structure.

protasis, final-protasis, medial-protasis, and apodosis-less conditionals. Non-clausal constituents will not be analysed as a full parameter.

3.3. *Verbal patterns*

As will be further explained in Chapter 3, the verbal form in each of the parts of the conditional has been one of the focal points of the study of these constructions, to the point that it is the main criterion in traditional typologies, such as those in EFL grammars, which classified three types of *canonical* conditionals[61], showing three different combinations of verb forms, and an increasing degree of hypotheticality in the situation described in the protasis. To these three, some grammars added a fourth, referred to as type zero or zero-conditional (Graver 1971, Eastwood 1984, Carter-Thomas & Rowley-Jolivet 2008: 192), in which the verbs in both constituents appear in present simple and which allowed using conditionals without hypotheticality, as in universal truths or scientific facts.

However, several specific studies (Hwang 1979, Maule 1988, Fulcher 1991, Ferguson 2001, Jones & Waller 2010) have shown that this representation does not reflect the real distribution of conditionals in language, either in what has to do with the different combinations of verbal forms and modals possible or in their coding of different meanings, which go well beyond the ones present in traditional typologies. This has also been noticed in works analysing the use of conditionals in scientific writing, in which the three canonical orderings account for small proportions of the uses of conditionals. For instance, canonical conditionals are only 14.7% of the total occurrences in Carter-Thomas & Rowley-Jolivet's study (2008: 195) and 18% in Ferguson's (2001: 70)[62].

Contrastingly, other uses beyond these three canonical types are much more common. Among others, there is a noticeable use of present + modal and past + modal: Present + modal conditionals account for 28% of the cases in Ferguson (2001: 70) and 17.2% in Carter-Thomas & Rowley-Jolivet (2008: 196), whilst past + modal ones account for 6% in Ferguson (2001: 70) and 4.5% in Carter-Thomas & Rowley-Jolivet (2008: 196). These uses are frequently variants of Type 1 and Type 2 canonicals in which the use of different modals (*might, may*) allows for a more nuanced assessment of probability. However, the most common combination of tenses was present + present, the so-called zero-conditionals (21%

[61] From this point, the term "canonical conditionals" will be used to refer to the set of the three types of conditionals enshrined in traditional accounts of the structure.

[62] This scarcity is particularly relevant among Type 3 conditionals, which only account for 1% of the cases in Ferguson (2001) and 1.3% in Carter-Thomas & Rowley-Jolivet (2008). The little use of Type 3 conditionals in scientific writing is explained by Carter-Thomas & Rowley-Jolivet (2008: 199), as the result of the fact that "the researchers would be doing themselves a disservice if they opened up other hypothetical spaces in which a different set of results might have been obtained, or a different approach seen to be more valid than the one they in fact chose".

of all conditionals in Ferguson's data, 21.3% in Carter-Thomas & Rowley-Jolivet's). These however, present many more uses than those commonly recognised in canonical accounts. Past + past conditionals (which are characteristic of the methods section, accounting for how a procedure was followed, as shown in example (55) below) sum 10% of the cases in Ferguson's data and 15.8% in Carter-Thomas & Rowley-Jolivet's.

> (55) The dose of paclitaxel was reduced by 20% if the patient had Grade 4 neutropenia that lasted >5 days. (Carter-Thomas & Rowley-Jolivet 2008: 197)

Finally, there is a proportion (around 16-17% in both studies) of other combinations of tenses. These combinations are very varied, as shown in Jones & Waller (2010: 2-5), including present + past conditionals, which accounts for 3.8% of the cases in Carter-Thomas & Rowley-Jolivet's study (2008: 196).

The proportion of use of the different combination of tenses in the studies by Ferguson (2001) and Carter-Thomas & Rowley-Jolivet (2008) can be seen in Table 2.4 below, in which the small proportion of canonical uses is very noticeable.

Combination of tenses	**Carter-Thomas & Rowley-Jolivet (2008: 196)**	**Ferguson (2001: 70)**
Canonical 1 (present+will)	7.5%	11%
Canonical 2 (past+would)	5.9%	6%
Canonical 3 (past perfect + would perfect infinitive)	1.3%	1%
Total canonical	**14.7%**	**18%**
Present + Other modals	17.2%	28%
Past + Other modals	4.5%	6%
Present + Present	21.3%	21%
Past + Past	25.8%	10%
Other combinations[63]	16.5%	17%
Total non canonical	**85.3%**	**82%**

Table 2.4: Proportion of use of different combination of tenses in conditional data, according to Ferguson (2001) and Carter-Thomas & Rowley-Jolivet (2008).

The determination of the variables to analyse the results of this parameter during the analysis of data is particularly difficult, as the level of variability is very high. However, at a first stage, the different uses of tenses will be considered as they are, and any possible further groupings would be made *a posteriori*. It will be necessary to combine these results with the analysis of the formal structure of

[63] Includes apodosis-less, non-finite and verbless conditionals.

conditionals (coordinated constituents, apodosis-less conditionals) as well as with the order of the constituents so as to find the variables which best allow to analyse the results.

Regarding the combination with other parameters, it will be specially interesting to analyse the matrix between type of conditional particle, function of the conditional in discourse and tense combinations, in order to find particularly used (or, conversely, avoided) combinations of types, functions and verb-forms. As an example, in Type 3 canonical conditionals the use of *unless* can render ambiguous interpretations as shown in case (56) below, which allows two possible interpretations: that the speaker had an helicopter and thus was able to get to Slough in time, or that he didn't have the helicopter and thus couldn't get in time. It will be interesting to note whether these or other combinations which create similar problems are avoided in real data in conditional discourse.

> (56) I couldn't have got to Slough in time unless I'd had a helicopter. (Declerck & Reed 2001: 458).

In what follows, the particular arrangements for modals and verbless and non-finite clauses are briefly explained, presenting the decisions taken on how to deal with the different combinations and how to transform them into variables of the parameter of verb-form combination for the analysis of data in Chapter 5.

3.3.1. *Modality*

As shown above, an important amount of conditionals use modals different from those in the canonical combinations in order to introduce information about the probability of a statement or to make a claim more nuanced, among other functions. This use of modals has been deemed a particular resource in academic discourse (Gotti & Dossena 2001), which takes advantage of modalisation to reflect both the inherent uncertainty of the probabilistic outcomes of research and the conventional distancing from making categorical claims in scientific writing (Ferguson 2001).

However, when devising the variables of the parameter of modality, it is necessary to consider that a single modal form can show several modal meanings. Thus, it is necessary to review the different classifications of modals in the literature in order to see whether it is necessary to consider modals in groups, as in these classifications, or by themselves.

Even though early instances were quite exhaustive in their classification of modals (Jespersen (1924) distinguished eighteen[64] different moods), most recent classifications (Lyons 1977, Palmer 1986, 1990) have primarily distinguished between "epistemic" and "deontic" modality. Epistemic modality is related to the speaker's commitment or opinion about the truth of the statement, conveying meanings of certainty, possibility, or certainty of falsehood; whilst deontic modality is related to authorised possibility or impossibility of action on the part of an agent, conveying meanings of obligation, permission, and prohibition. To these two types it is often added a third, called "dynamic" modality (Palmer 1990, Papafragou 2000), which is related to the notions of real world ability or intention of action. These three types do not feature explicit markers, but, on the contrary, may be realised by the same ones, as shown in examples (57-59), representing an epistemic, deontic and dynamic use, respectively, with the same modal marker, *may*.

(57) It may be cold tomorrow.

(58) You may go home now.

(59) The species may be found in the North of England only.

There have been some proposals departing from this three-way classification. Von Wright (1951) introduced two other types of modals, "existential", which are a special type of dynamic modals, expressing an existing or potential property of a subject (or lack thereof), and "alethic", which, stemming from logic, would refer to established laws, general truths, and logical inferences, as discussed in Papafragou (2000). Table 2.5 below shows the types and degrees of modality in von Wright (1951), following Vihla (1999: 25), who also adds "particular" to the degrees of existential modality.

Alethic	**Epistemic**	**Deontic**	**Existential**
necessary	verified	obligatory	universal
possible	not falsified	permitted	existing
contingent	undecided	indifferent	(particular)
impossible	falsified	forbidden	empty

Table 2.5: Types and degrees of modality in von Wright (1951) *apud* Vihla (1999: 25)

Further proposals (Coates 1995) have grouped together deontic and dynamic modalities, distinguishing between "epistemic" and "root" modalities. Thus, according to Coates, epistemic

[64] Jussive, Compulsive, Obligative, Advisory, Precative, Hortative, Promissive, Permissive, Optative, Desiderative, Intentional, Apodictive, Necessitative, Presumptive, Dubitative, Conditional, Hypothetical, and Potential, (Jespersen 1924: 320-321).

modality "is concerned with the speaker's assumptions or assessment of possibilities, and in most cases it indicates the speaker's confidence or lack of confidence in the truth of the proposition expressed", whilst root modality "encompasses meanings such as permission and obligation, and also possibility and necessity" (Coates 1995: 55).

Another type of classification is that by Gabrielatos (2010), which functions as the foundation for his classification of conditionals, as will be shown in Chapter 3 below. Gabrielatos's model stems from the "attitude" to factuality (or likelihood) and desirability, understanding "attitude" as the position of mind of a speaker towards a content (Gabrielatos 2010: 139), a notion influenced by the concept of *stance* (Biber & Finegan 1988).

He takes these two "attitudes" and distinguishes four types of modality, two for each. Related to the attitude towards likelihood, which includes "assessments of actuality, factuality, truth, knowledge, belief, possibility, likelihood or probability" (Gabrielatos 2010: 139), Gabrielatos distinguishes between *propensity* and *likelihood* modalities. This distinction is made on account of whether the judgment is based on "inherent properties" of the entities under study (the former) or not (the latter, including the expression of knowledge, belief, guess, prediction, and inference).

Type of modality	**Description**	**Expressed notions**
Likelihood	assessment of actuality, factuality, truth, knowledge, belief, possibility, likelihood or probability	knowledge, belief, guess, prediction, and inference
Propensity	judgement about the inherent properties of animate or inanimate entities, concepts, states, processes, or relations (abilities, skills, qualities, aptitude, feasibility or propensity)	expression of objective knowledge (inferences on the part of the hearer)
Directed desirability	expression of a state of affairs which the speaker would like to see materializing, with the objective of actively seeking its fulfilment by attempting to directly manipulate the action of others (or their own).	obligation, promise, advice, suggestion, invitation and permission
Non-directed desirability	expression of a state of affairs which the speaker would like to see materializing or developing, without any explicit attempt to influence themselves or others towards that.	volition, intention, willingness, wish, hope, desire or need

Table 2.6: Types of modality in Gabrielatos (2010: 139-141)

As shown in Table 2.6 below, regarding the attitude towards desirability, the two attitudes are distinguished on the grounds of whether or not the speaker tries to manipulate someone's action, be it that of others or their own, to have their actions implemented. Depending on this, he distinguishes

between directed desirability modality, the former case, which communicates the notions of "obligation, promise, advice, suggestion, invitation and permission" and non-directed desirability modality, the latter, with the notions of "volition, intention, willingness, wish, hope, desire or need" (Gabrielatos 2010: 141).

All of these classifications share the presence of some overlap between formal types of modals and their functions, making it necessary to analyse each of the uses in context in order to assign a particular function, something which implies a process of manual disambiguation. Consequently, no classification of modals will be used for the parameter of modality in the analysis of data, and the uses will be considered according to their formal type: i.e., classifying each use at face value, according to the modal form which is being used. This allows comparing the formal type of modal with the functions assigned during the contextual analysis of each conditional, and avoids the possible spurious correlations which could arise if the functions of conditionals were analysed using categories of modals, as it would imply analysing the co-occurrence of two parameters which have undergone a manual classification by the same researcher.

3.3.2. *Verbless and non-finite clauses*

Conditional constituents do not always need a verb, as shown in examples (60-61) below, where the conditional marker is only followed by an adjective.

(60) If wet, the pipe won't give you a good smoke (Quirk *et al.* 1985: 1090)

(61) I can discuss the matter with you, if necessary (Quirk *et al.* 1985: 1090)

In these conditionals, the adjective being shown is usually a subject complement of the subject of the apodosis: (60) could be reconstructed by adding this subject and the verb *to be*, as shown in (62) below:

(62) If [the pipe is] wet, the pipe won't give you a good smoke.

Non-finite clauses are also common, particularly with *–ed* participles, as in (63) below, although non-finite *–ing* clauses are also possible (64).

(63) Unless otherwise instructed, you should leave by the back exit (Quirk *et al.* 1985: 1090)

(64) It is nothing if not self-deceiving. [HA0 3580] (Gabrielatos 2010: 256)

These uses are also related to the pro-clauses[65] *if so* and *if not*, useful to introduce new consequences to already entertained statements.

Regarding the design of variables for the analysis of data, non-finite conditionals do not present any problem and will be classified as explained in Section 3.3 above, this is, at face value. Verbless conditionals are more problematic. It could be possible, as shown in example (62) above, to reconstruct the elided elements in these conditionals and classify them according to the tense in this reconstructed verb, but it is not reliable enough: example (60) above could also be reconstructed with different verb-forms, as shown in example (65) below.

(65) If [the pipe has been] wet, the pipe won't give you a good smoke.

Consequently, conditionals such as these will be classified as *verbless* for the purpose of the analysis of data in Chapter 5. Pro-clauses *if so* and *if not* will be also considered examples of verbless conditionals.

[65] A *pro-clause* is an element alike a pronoun which would have a whole clause (in this case, the apodosis) as its antecedent. (Hockett 1958)

Summary of the chapter

This chapter has provided both a definition and a precise scope for the object of study of this dissertation, conditional structures. Regarding their definition, conditionals cannot be described as a linguistic counterpart of the logical notion of implication, and, consequently, traditional definitions of conditionals based on the straightforward application of the properties of implications are also to be considered faulty. In fact, conditionals are much more varied, with a very important degree of variability both in their formal structure and in the type of meanings and syntactic relations they can sustain.

The criterion adopted here to determine the existence of a conditional structure, following descriptivist accounts, is the presence of a conditional marker. It has been found that there were three types of conditionals in the eighteenth and nineteenth centuries: central conditionals *if* and *unless*, peripheral conditionals such as *providing*, *as long as,* or *lest;* and inversion conditionals, which could be triggered not only by *had*, *were,* and *should* as in present-day English, but also by any modal or operator. These elements delimit as well the scope of the structure.

This formal typology, together with the functional one which will be the topic of the next chapter, are able to describe the most important characteristics of conditionals, and will provide the foundations on which the analysis of data in Chapter 5 will be based. Further parameters of study are provided in Section 3, which deals with a series of grammatical issues on the structure of conditionals, the order of their constituents and the different combinations of verbs which are used in them. These analyses are also used to construct a series of classifications which will be used in Chapter 5 below.

CHAPTER 3:

Conditionals: function in discourse

Introduction

As shown in the previous chapter, conditional structures present an important degree of variation. Regarding their structures, they can feature only a protasis or a protasis and an apodosis, and the protasis may appear before, after, or in the middle of the apodosis. Moreover, the protasis may be introduced by several types of particles, and the entire conditional structure, allowing multiple combinations of particles and tenses, can be inserted in different contexts[66].

This formal variability translates to their meaning: conditionals can fulfil very different functions in multiple contexts, from introducing hypothesis to expressing politeness, doubt or humility. In Dancygier's words, conditionals are "an area of language use where the interaction of form, meaning, and context is exceptionally complex and fascinating" (1998: 2).

The aim of this chapter is to study this functional versatility and provide a typology in order to classify conditionals on account of these functions. In order to do so, Section 1 will analyse the literature on the functions conditionals perform in scientific writing and Section 2 will review the different typologies of conditionals which have been proposed in the literature, so as to test their suitability for the purposes of this dissertation. After ascertaining the unsuitability of all the existing typologies, Section 3 offers a new typology, as well as the criteria followed to construct it and a presentation of the different types which are distinguished in it. A summary of the findings is included at the end.

[66] Several of these grammatical properties of conditionals are further analysed in Chapter 2, Section 3.

1. Functions of Conditionals in Scientific Discourse

Conditionals have been deemed a particularly valuable resource in scientific and academic discourse (Carter-Thomas & Rowley-Jolivet 2008: 191), a register in which they have been used particularly frequently (Horsella & Sindermann 1992: 131, Ferguson 2001: 69). This usefulness is in good part a result of their functional versatility, which allows conditionals to express a very high number of different functions in discourse[67].

In what follows, the functions which conditional structures perform in scientific writing will be analysed, as a necessary previous stage to the development of the corresponding functional typology in Section 3. To do this, Section 1.1 will analyse the functions of conditionals related with the content of the text and Section 1.2 will focus on the functions related to the interpersonal nature of scientific discourse. Section 1.3, meanwhile, studies the relationship of conditional structures performing an interpersonal or mitigating function with *hedging*, by examining the literature on the topic and providing a possible solution for the difficulties in classifying conditionals as hedges.

1.1. *Conditionals in scientific writing: content-related functions*

The core function of conditionals both in general and scientific language is to contribute to the advancement of the argument, indicating "the relationship between different segments of text and to make the readers recognise this relation" (Warchal 2010: 146). In other words, the function of conditionals is to establish a link, mainly causal, between two statements, optionally including a judgment on their probability. From a rhetorical point of view, conditionals are said to contribute to the establishment of *facticity* (Latour 1987), this is, the determination of the status of a statement as a fact, as conclusions stemming from valid conditional relationships and factual premises are consequently "promoted" to the status of facts (Warchal 2010: 146).

When applied to scientific discourse, this core function has several applications. As shown in (1) below, conditionals can be used to express well-known causal relationships, such as mathematical equalities.

(1) Given that $x=y$, then $n(x+a)=n(y+a)$ must also be true. (Quirk *et al*. 1985: 1090)

Conditionals can also help reflect on dependencies between situations (Ferguson 2001: 61), thus being used to express the relationship between a phenomenon and its consequences, both at a sentence-level, establishing relationships between statements, and at a text-level, establishing links between

[67] This is in keeping with the specialised nature of scientific language (Liddicoat 1997: 767), a condition which is normally exemplified in the lexicon but which also applies to syntactic structures, as in this case.

premises and conclusions or between different sections of the text. (2) and (3) below are examples of this kind of use.

> (2) If one accepts these treatments as valid, major changes in the management of cancer patients […] must be considered. (Carter-Thomas & Rowley-Jolivet 2008: 194)

> (3) If perceptions of change had been measured, then the findings may have been different (Warchal 2010: 144)

The contribution to the establishment of facticity is also the reason why conditionals are used when stating pre-requisites or instructions, as commonly done in the methods sections in scientific discourse. (4) is an example of this use:

> (4) Patients entered the study if they satisfied the WHO criteria for stroke (Ferguson 2001: 71)

On the other hand, conditionals are inherently non-assertive (Carter-Thomas & Rowley-Jolivet 2008: 191) and, consequently, can be used to introduce tentative claims or conclusions, both, again, at a sentence-level and at a text-level. This tentativeness may be regulated by using conditionals with different combinations of tenses[68], as this allows constructing a series of different structures, which are in "a cline from conditionals that are sufficient and necessary to those that are merely probable, thus determining the degree of certainty of the conclusions reached" (Horsella & Sindermann 1992: 138). An example of these uses can be seen in examples (5-6) below. In (5) tentativeness is absent, as the conditional is presented as an almost absolute certainty, whilst in (6), the conclusion is much more tentative as a result of the presence of *may*.

> (5) ...glucagon is ineffective if hepatic glycogen stores are depleted. (Ferguson 2001: 72)

> (6) If a patient has an early failure from a low anterior resection, they may be able to be retrieved by resection. (Carter-Thomas & Rowley-Jolivet 2008: 200)

At the same time, the possibilities of conditionals to speculate with outcomes are also useful in scientific writing to consider different options, evaluating the consequences of alternative courses of action, as well as to formulate hypothesis and theories (Horsella & Sindermann 1992: 131, Ferguson 2001: 61, Carter-Thomas & Rowley-Jolivet 2008: 191, Gabrielatos 2010: 1).

[68] These, however, go beyond the combinations usually presented in EFL grammars, as will be shown below.

1.2. *Conditionals in scientific writing: interpersonal functions.*

In all of the examples in the previous section, the conditional structure is contributing to the advancement of the argument at the propositional level. However, as explained in Chapter 1, ever since the substitution of logocentric scholastic knowledge with the new paradigms of science and the expansion of scientific communities, scientific discourse has been dialogic and interpersonal. Thus, scientific discourse now does not only revolve around the subject matter, but also takes into account the relationship between authors and their audience: authors have to engage with their peers, persuading them of the validity of their claims, whilst at the same time assuring the best reception possible for their works by using certain discourse strategies such as humility and politeness (Bazerman 1988; Myers 1989; Swales 1990; Atkinson 1996, 1999; Hyland 1996, 1998, 2000).

Conditionals, with their versatility, play an important role for the presentation of a researcher's work to their peers, to the point that they have been defined as "a rhetorical device for gaining acceptance for one's claims", by means of which "scientists try to reach a consensus with their readers" (Warchal 2010: 141). Thus, conditionals also fulfil several functions in which their role is basically interpersonal, "establishing agreement between the writer and the reader of an academic text" (Warchal 2010: 142), or, in other words, helping the author guide their audience towards acquiescence.

This drive towards consensus is basic in several aspects of scientific register. For instance, in order to present their research, scientists have to connect it to the existent body of works on the matter, circumscribing the scope of the claims. They also have to present their assumptions and negotiate the meaning of the concepts they use, so that their interpretation is shared with their audience. Conditionals, in their role as space-builders (Fauconnier 1994, Dancygier 1998) help researchers do this, by allowing them to create argumentative spaces, either real or hypothetical, in which their claims hold. This is used both to create the *niche* (Swales 1990) of a particular research publication and to delimit the scope of claims at a textual level (Carter-Thomas & Rowley-Jolivet 2008: 191). An example of this latter use can be seen in example (7) below, in which an entity is given a particular interpretation in the protasis, under which the apodosis holds.

> (7) As such, it can be said to belong to modality if the category is defined as the expression of the speaker's attitude or stance. (Warchal 2010: 148)

At the same time, as already explained, it is also important to achieve the best reception possible for one's work among one's peers. To achieve a good reception, authors must show solidarity and respect towards their peers. This is done both directly, through the use of express politeness, and indirectly, by recognising others' contributions, conceding competing points of view and envisaging possible

alternatives to one's claims (Declerck & Reed 2001, Carter-Thomas & Rowley-Jolivet 2008: 191). Conditionals are useful in these instances: for example, in (8) below the protasis introduces a possible alternative to the reasoning, under which the original point in the apodosis still holds, thus recognising that more than one point of view has been considered. Example (9) shows a direct (and conventional) politeness structure, used to soften the force of the words in the apodosis.

> (8) Even if health care providers are diligent in keeping current with genetic medicine, the interpretation of the results of genetic testing is often complex. (Carter-Thomas & Rowley-Jolivet 2008: 202)

> (9) If I may be quite frank with you, I don't approve of any concessions to ignorance. (Quirk *et al.* 1985: 1095)

It is also important for authors to show modesty, recognising uncertainty and avoiding categorical claims. As explained above, the inherent non-assertiveness of conditionals is useful for this, as it can be used to tone down claims that could otherwise be considered categorical, by making their validity conditional on a series of factors expressed in the protasis. At the same time, avoiding categorical claims and recognising one's uncertainty are also useful for authors to anticipate potential criticism. Examples (10-12) below show different uses of conditionals showing uncertainty, whether about the wording (10), the relevance (11), or the good understanding of others' points (12).

> (10) His style is florid, if that's the right word. (Quirk *et al*. 1985: 1096).

> (11) Finally (if this is important), the S1 meaning can be converted into an S meaning to recover a more intuitive object to represent the meaning of the original sentence. (Warchal 2010: 148)

> (12) Chomsky's views cannot be reconciled with Piaget's, if I understand both correctly. (Quirk *et al.* 1985: 1096)

Finally, conditionals are also useful for authors to manage interactions with their audience (Carter-Thomas & Rowley-Jolivet 2008: 191). An example of this is the use of conditionals as a signposting device, providing readers "with guidance about the author's intentions and the development of the text" (Carter-Thomas & Rowley-Jolivet 2008: 194). This is shown in example (13) below.

> (13) Now if we go to patients who experienced mucositis toxicity. (Carter-Thomas & Rowley-Jolivet 2008: 194).

This strategy is also used in face-to-face interaction, in which the conditional helps present a "proposed action on the part of the addressee contingent on the willingness of the addressee"

(Ferguson 2001: 77). This is particularly useful with difficult content, such as a bad prognosis in a medical consultation, which can be presented in a less threatening way by using a conditional that helps avoiding presenting it as definite (Ferguson 2001: 79). It is also common in presentations, a use more alike the signposting function discussed above.

1.3. *Defining the interpersonal uses of conditionals.*

As explained in Chapter 1, one of the characteristics of the evolving scientific register of the period under study is the permanent tension between the need of scientists to promote their unique contribution to a field, highlighting their individuality, and the need to move their readers towards consensus, emphasising their belonging to a community. Following the explanation in that chapter, this tension means that scientific writing is best seen as a negotiation between writer and readers, in which claims have to be asserted and mitigated at the same time in order to emphasise the possibilities of agreement. This led to the emergence of a series of strategies, such as avoiding categorical claims, emphasizing shared knowledge, recognising others' work and their conflicting points of view, using a cooperative and non-confrontational tone, or conveying respect, modesty and politeness, which are used by authors to steer their readers towards agreement.

Warchal (2010) distinguishes five sets of rhetorical strategies playing a role in this tension between individualism and consensus: Inclusive-*we* constructions, common knowledge markers, attitude markers, hedges, and certainty markers (also known as emphatics).

Inclusive-*we* constructions are used to include both the author and readers as members of the community, emphasising their common belonging to the same group of experts (Warchal 2010: 142). They help denote that readers and author share knowledge and values and thus predisposes the readers towards agreement. Similarly, common knowledge markers are used to refer to knowledge which the author assumes their readership shares (Koutsantoni 2004), thus helping the author relate their work to the field and supporting their claims by indicating that the approach is based on previous research which is accepted by the disciplinary community (Warchal 2010: 142). Common knowledge markers include evaluative adjectives and expressions of attribution, such as references.

Attitude markers express the author's affective values towards the content and their readers. They contribute to the establishment of a shared argumentative space in which to discuss the claims, guiding the interpretation of the reader in order to approximate them towards consensus (Hyland 1998). They include evaluative adjectives and adverbs, modals expressing obligation, and expressions denoting a negative evaluation of previous research (Koutsantoni 2004).

According to Warchal (2010:42), hedges are "expressions that tone down the force of a statement by limiting the commitment of the author to the expressed proposition". They have several functions: they help to separate claims from established knowledge, as the latter does not need cautious language in its wording, and they also open the possibility to criticism as they leave open the possibility of differing points of view. Among others, they are realised at the linguistic level by modals, verbs of cognition in the first person and expressions of probability. Some authors, such as Hyland (1994), also include conditionals, questions, passives and impersonal phrases.

Finally, certainty markers or emphatics, realised at the linguistic level by the same expressions as hedges, help authors express their confidence towards their findings. Thus, they predispose readers to be more willing to accept the authors' claims, avoiding a possible disagreement (Hoey 2000: 33). This is particularly useful when the acceptance of the claim is dependent on the acceptance of a previous claim (Warchal 2010: 142). Certainty markers and hedges are the main contributors to the balance between commonality and individualism.

As has been shown in the previous two sections, conditionals can perform some of these mitigating functions. Warchal defends that conditionals can be used as "a rhetorical device for gaining acceptance for one's claims" (2010: 141), and that they can perform any of the latter three functions (attitude markers, hedges and emphatics). According to her, conditionals can function as hedges when "they limit the assertiveness of a claim by making its validity conditional on some other factors" (2010: 142), this is, when they act as consensus-building strategies. At the same time, they can also perform the role of emphatics when they "add assertiveness to a claim" or when "they promote a claim to the status of the obvious once another claim is accepted" (2010: 142), as well as the role of attitude markers when they express concessive meanings.

However, Warchal's classification overlooks the controversial nature of hedges, which are often contradictorily defined by several authors: there is no consensus in the literature about the definition of *hedge*, the set of structures which are covered by this definition, and the borders with several related phenomena. These problems are shown in what follows.

Lakoff coined the term *hedge* to refer to linguistic structures, such as *sort of*, or *quite*, that were used by authors to disguise the meaning of a proposition, making "things fuzzy or less fuzzy" (1972: 194). However, this conception evolved, and *hedge* started to refer to a conventional phenomenon of academic style which is used by authors to reduce the strength of a claim in order to avoid disagreement on the part of their audience (Taavitsainen 1997) or to be seen as diplomatic or modest

(Fraser 1980, Myers 1989), as part of a set of fixed strategies which also includes expressions of recognition and politeness.

Similarly, Hyland (1998) considers that hedges are "any linguistic means used to indicate either (a) a lack of complete commitment to the truth value of an accompanying preposition, or (b) a desire not to express the commitment categorically" (Hyland 1998: 1). This makes hedges be tightly linked to epistemic modality, and in fact Hyland considers that "items are only hedges in their epistemic sense, and only then when they mark uncertainty" (Hyland 1998: 5).

This approach has related the concept to other phenomena, such as *stance*, *evidentiality* and *metadiscourse*, with which it is sometimes confused, as they all feature some degree of involvement of the writer. Thus, *stance* is defined as the expression of the speaker/writer's "personal feelings, attitudes, value judgements or assessments" (Alonso 2012: 202), whilst *evidentiality* relates to the expression of the source of information (Dendale & Tasmowski 2001), being also useful to determine the attitude of the author towards the arguments being used. Finally, *metadiscourse* refers to a series of expressions "used to negotiate interactional meanings in a text, assisting the writer (or speaker) to express a viewpoint and engage with readers as members of a particular community" (Hyland 2005: 37-38). These three concepts have also received several, sometimes contradictory, names by different authors[69], and their limits are, again, fuzzy.

This reflects an extended problem in the literature, as *hedge* remains "a concept that evades definition" (Lewin 2005: 165), but which has nonetheless been used as a label to identify very different phenomena. In Alonso's words, "the notion of hedging has been used as a stock category, often used to account for unclear strategies in discourse showing some degree of epistemic modality" (Alonso 2012: 199).

Being this the case, it is not surprising that there is uncertainty about how to identify members of the category (Crompton 1997). Hedges can be realised in several ways at the surface level, from modals such as *might,* to adverbs expressing probability such as *perhaps*, as well as expressions showing the opinion of the author, such as *I think*. However, there is no easy way to identify the real uses of the category.

Crompton, who defined hedges as "an item of language which a speaker uses to explicitly qualify his/her lack of commitment to the truth of a proposition he/she utters" (1997: 281), applied this definition to the identification of single uses of hedges. According to him, hedges are those

[69] In Chafe (1986), *evidentiality* was used as a label to refer to what is here defined as *stance*.

expressions which, if changed, would render the truth-value of the proposition unchanged but would increase the commitment of the writer. However, this operational definition was criticised by Salager-Meyer, as it would narrow the category too much, even though it would lead to unequivocal identification of the members of the category. Thus, she defends the fuzziness of the concept, holding that the identification of hedges was to be based on introspection and contextual analysis (Salager-Meyer 1998: 298). This is also assumed by Alonso, who defends that "[t]he analysis of context is not only necessary, but unavoidable if one really wants to highlight the cases of hedging with any degree of confidence" (Alonso 2012: 204).

The paragraphs above have shown that *hedge* can be considered a problematic term. Several of the definitions presented above are too fuzzy, and others, such as Crompton's or Hyland's, seem too narrow to be helpful for the classification here. Moreover, it is not clear whether conditionals are considered as examples of this phenomenon: Hyland (1994) includes *if*-conditionals as hedges, but the same author decided to exclude them in his 1998 work.

Consequently, references to the consideration of conditionals as hedges will be avoided here. The focus will be put, instead, on their performance of two pragmatic functions (which are, moreover, intimately related with those performed by hedges): interpersonality and mitigation. Conditionals are considered *mitigating* when they are used to tone down the assertiveness of a claim, as well as when they are used to mark politeness or humility on the part of the authors. They are considered *interpersonal* when their use helps "establishing agreement between the writer and the reader of an academic text" (Warchal 2010: 142). These include conditionals which guide the readers' interpretation, negotiate terms and concepts, ward off possible criticism, or acknowledge others' points of view, among others.

These two pragmatic functions will be used as one of the criteria to define a typology of the functions of conditionals in scientific writing, as will be shown in Section 3 below. However, they are not enough to define all the different uses of conditionals in eighteenth and nineteenth-century scientific writing, and further examination of the literature will be needed.

2. A review of conditional typologies

The previous section has shown that conditionals play very different functions in scientific discourse compared to their uses in general language. They contribute to the advancement of arguments in the subject matter of the text (relating facts and statements and establishing causal relationships both at the sentence and the textual level, as well as speculating about outcomes and hypothesizing, among

other functions), but, at the same time, they also play a role in the development of the interpersonal nature of scientific writing, being used by authors to mitigate the force of a statement through their non-assertiveness and to convey humility, in an attempt to seek acceptance for their claims (Warchal 2010).

As already explained, in order to analyse the functions of conditionals in scientific writing it is paramount to devise a typology with which to classify these particular uses. However, before devising the actual typology, it is necessary to consult first the already existing typologies in order to analyse their suitability as a workable functional typology of conditionals in eighteenth and nineteenth-century scientific writing.

These typologies and the criteria on which they were based have been evolving through time, configuring a series of waves or generations of typologies. Traditional typologies, analysed in Section 2.1 below, based their classifications on the sequencing of verb forms between the different constituents of the conditionals, as well as on the related notion of the different degrees of hypotheticality of the conditions expressed. These first attempts at classifying conditionals started to be criticised from the latter part of the 1980s, when a second generation of typologies surged (Comrie 1986, Sweetser 1990, Athanasiadou & Dirven 1997). In these second generation typologies, the topic of Section 2.2, new criteria, such as the concepts of "possible worlds" and of conceptual domains of discourse, were used.

This second generation has come under review more recently, a process during which some of their insufficiencies have been highlighted, leading to a newer generation of typologies, analysed in Section 2.3. These are characterised by their attempts at defining types of conditionals using several criteria, be it by classifying them on account of the interaction of the criteria in a matrix (Gabrielatos 2010) or, more simply, by using several typologies, depending on different criteria, at once (Declerck & Reed 2001).

However, these typologies analyse the use of conditionals in general language only. As the aim of this chapter is to provide a typology of conditionals according to their function in eighteenth and nineteenth century scientific discourse, a series of corpus-based typologies have also been analysed, dealing with conditionals both in discourse in general (Ford & Thompson 1986, Ford 1997, analysed in Section 2.4) and in scientific register (Carter-Thomas & Rowley-Jolivet 2008, Warchal 2010, analysed in Section 2.5). In what follows, all these different generations of typologies are analysed in detail, first describing their characteristics and the individual typologies and later analysing the problems they pose both for the description of conditionals in general and in scientific writing in particular.

2.1. *Traditional typologies*

The main criterion for the classification of conditionals in traditional typologies was the sequencing of tenses between the different parts of the conditional structure. These accounts, heavily influenced by classical works on logic and rhetoric, also frequently related these verb sequences to the degree of hypotheticality of the condition expressed.

The most traditional typology, still in use in most EFL grammars, presents three different types of conditional structures, according to their combination of different verb forms. These three combinations would correlate with different degrees of hypotheticality of the situation described. The structure EFL grammars refer to as "first type conditional", shown in (14) below, presents a verb in the present simple in the protasis and *will* in the apodosis. The "second type" (example 15) presents a past simple form in the protasis and *would* in the apodosis, and the "third type" (shown in example 16) features a past perfect in the protasis and *would* + perfect infinitive in the apodosis.

(14) If it rains, we'll go home. (Ferguson 2001: 64)

(15) If it rained, we would go home. (Ferguson 2001: 64)

(16) If it had rained, we would have gone home. (Ferguson 2001: 64)

This three-type account echoes the classification of conditionals as correlates of implication in works on logic. These works name these three types of conditional "real", "hypothetical" and "counterfactual" conditionals, respectively. Other works with the same typology prefer other terminology, such as Lewis (1976), who names the three types "necessary", "possible", and "impossible" conditionals, respectively.

Some EFL grammars add a fourth type, sometimes called "zero-conditional" (Graver 1971, Eastwood 1984) which features a present simple form in both the protasis and the apodosis, as shown below in (17). This type would be used to express universal truths or scientific facts, according to the authors.

(17) If you heat water, it boils. (Carter-Thomas & Rowley-Jolivet 2008: 192)

Other traditional accounts preferred to use the degree of probability of the realisation of the situation referred to in the protasis rather than the tense sequencing of the constituents as a criterion. An instance of this is Leech & Svartvik's (1975) typology, which distinguishes only two types of conditionals: "open" (probably realisable) and "hypothetical" (not probably realisable) conditionals.

Comrie (1986: 92) also follows this criterion, devising a typology of conditionals with "lower" and "higher" hypotheticality (also referred to as "counterfactuals"). However, he also takes into account

tense, as he states that conditionals with higher hypotheticality tend to feature tense backshifting, whilst those with lower hypotheticality do not. As shown below, example (18), a lower hypotheticality conditional, shows no backshifting, whilst example (19), a higher hypotheticality one, does.

(18) If you come tomorrow, we'll play tennis. (Ferguson 2001: 64)

(19) If you came tomorrow, we would play tennis. (Ferguson 2001: 64)

A summary of these typologies, based on either tense sequencing or the degree of probability of realisation of the protasis is shown below in Table 3.1.

Traditional typology (Tense sequencing)	**Degree of probability of realisation of the protasis.**	
EFL grammars.	**Leech & Svartvik 1975**	**Comrie 1986**
1st type conditionals: Present simple + *will*	Open	Lower Hypotheticality
2nd type conditionals: Past simple + *would*	Hypothetical	Higher hypotheticality
3rd type conditionals: Past perfect + *would* present perfect.		

Table 3.1: Traditional typologies

These traditional typologies are not suitable to reflect the functional uses of conditionals in scientific writing. Their principal problem is that they do not reflect the real use of conditional structures (Hwang 1979, Maule 1988, Fulcher 1991, Ferguson 2001, Jones & Waller 2010). In the case of EFL grammars, conditional structures are oversimplified and pigeonholed into three or four tense-based types in order to make them easier to learn for EFL students, ignoring all other combinations of tenses or modals and their different meanings, as well as the different discourse functions of conditionals or their role in the construction of an argument. These problems also affect typologies based on the principle of different degrees of hypotheticality, as they also incur in the oversimplification of tense sequence-based typologies and ignore whole types of conditionals.

This process of oversimplification is not confined to the tense-sequence based classification, but affects every other aspect of conditionals as well: traditional typologies ignore all conditional structures departing from the prototypical, such as non-clausal components or apodosis-less conditionals. Moreover, they tend to present the protasis-apodosis order as the default option.

2.2. *Second generation typologies*

It was the realisation that traditional typologies could not account for all existing conditional constructions that prompted the first attempts to surpass these accounts. Thus, second generation typologies rejected the criteria of tense sequencing and hypotheticality and considered other possible criteria, such as the syntactic relationship between the constituents and the speaker's assertion (or

not) of their opinion on the truth or falsehood of the conditional, the "possible worlds" the conditional refers to, and the domain of discourse in which it is integrated.

2.2.1. *Typologies based on the syntactic relationship of the constituents*

It was examples such as (20) below, in which there is no causal relationship between the constituents of the conditional, that triggered the first departure from traditional accounts: they prompted authors such as Dancygier & Mioduszewska (1984) to make an initial distinction between "consequential" conditionals (those expressing a causal relationship between protasis and apodosis, as in all the examples in the typologies in the previous section) and "non-consequential" conditionals (those, such as 20, which do not express such a causal relationship).

> (20) If Susie is listening at the door, she is breathing quietly. (Dancygier & Mioduszewska 1984: 122)

However, Dancygier & Mioduszewska (1984) typology goes beyond this first distinction and also takes into account other criteria. Influenced by Leech's (1971) classification of types of meaning, Dancygier & Mioduszewska's main criterion is the will of the speaker to assert (or not) a certain opinion on the truth of the events narrated. According to this criterion, they classify conditionals into "factual", "theoretical" and "hypothetical".

For them, speakers using factual conditionals express their conviction that the situation described is a fact in the actual world, either in the present or in the past. Speakers using hypothetical conditionals express their "assumption that the happening described will not, does not or did not take place" (1984: 129), and, consequently, they assert the falsity (in present or past) or probable non-realisation (in the future) of the events described in the real world, and the fact that they may be true in other worlds. Finally, theoretical conditionals are characterised by their not asserting a judgement on the truth of the events narrated.

2.2.2. *Typologies based on the notion of "possible world".*

Dancygier & Mioduszewska's classification is partially influenced by the notion of possible world. A *possible world* is, in Jackson's words (1991: 4), "a way things might be, one of which is the way things actually are, the actual world". This is, a possible world is one outcome among all the different *possible* outcomes of a given situation, and the real world is just one among all of them.

This notion of possible world has been used *per se* as a criterion for the classification of conditionals, in typologies such as Huddleston & Pullum's (2002). These authors distinguish between "open" and "remote" conditionals. Remote conditionals are those in which the condition is fulfilled "in a world

which is potentially different from the actual world" (2002: 748), whilst open conditionals are based on a relation implying some consequence between the two parts of the structure in the *actual* world.

This criterion, however, has been criticised on the grounds that their categories are not mutually exclusive. As explained above, the *actual world* is just one among the set of possible worlds, and nothing prevents an imagined possible world to be equal to the real one in the aspects relevant to the fulfilment of the conditional. Thus, all open conditionals would also be remote at the same time, as one could imagine a world *potentially different from the actual world* in which they are also fulfilled, thus making the distinctions between the types (and, consequently, the typology) of little use.

2.2.3. *Typologies based on the notion of domains of discourse*

A further step in the search for a valid criterion was the application of the notion of the different conceptual domains of discourse. This is based, as explained above, on the recognition of the existence of three domains or levels of discourse (the content, the epistemic, and the speech-act levels) on which conditionals can apply. This notion was already behind Dancygier & Mioduszewska's (1984) distinction between consequential and non-consequential conditionals, and is developed further in Quirk *et al*.'s (1985) Sweetser's (1990), and Athanasiadou & Dirven's (1996, 1997) typologies.

a) Quirk *et al*.'s (1985) typology.

Quirk *et al*.'s (1985) typology is only partially influenced by this notion. It takes Dancygier & Mioduszewska's distinction between consequential and non-consequential conditionals on account of the existence of a causal relation between the clauses and adopts it as its top-level criterion, distinguishing between "direct" and "indirect" conditionals. Direct conditionals are those in which the situation in the apodosis is directly contingent on that of the protasis, whilst indirect conditionals are "more peripheral uses" in which "the condition is not related to the situation in the matrix clause […] rather, the condition is dependent on the implicit speech act of the utterance" (1985: 1089)[70].

Quirk *et al*. develop this two-way classification, dividing each of the two types into subclasses. Direct conditionals can be "open" or "hypothetical". Open conditionals are those that do not state the fulfilment (or not) of the condition, being thus neutral, whilst hypothetical conditionals convey "the speaker's belief that the condition will not be fulfilled (for future conditions), is not fulfilled (for present conditions), or was not fulfilled (for past conditions)" (1985: 1091), echoing the definition of their namesakes in Dancygier & Mioduszewska (1984)'s classification.

[70] These differences have an immediate syntactic correlation: in direct conditionals the protasis functions as an adjunct, whilst in indirect conditionals it is a conjunct. (Quirk *et al.* 1985: 1072).

Indirect conditionals are subdivided into four classes, on account of the function of the protasis. These four subclasses are "politeness", "metalinguistic", "uncertainty" and "condition" conditionals. In politeness conditionals, such as (21) below, the protasis is a conventional expression of politeness. Metalinguistic conditionals (22) are used to comment on the correctness or reliability of the *wording* of the utterance, making the reader cautious about its precision or its intended meaning and implicitly calling for their agreement. Uncertainty conditionals (23) are used to express the doubts of the speaker about the extralinguistic knowledge necessary to correctly interpret the utterance. And, finally, in condition conditionals, (24 below), the protasis expresses a real world state of affairs influencing the situation in which the utterance is made.

(21) If I may be quite frank with you, I don't approve of any concessions to ignorance. (Quirk *et al.* 1985: 1095)

(22) She is resigning, if you know what I mean. (Quirk *et al.* 1985: 1096)

(23) Chomsky's views cannot be reconciled with Piaget's, if I understand both correctly. (Quirk *et al.* 1985: 1096)

(24) If you want to borrow a shoebrush, there's one in the bathroom. (Quirk *et al.* 1985: 1096)

Quirk *et al.* (1985: 1094) also introduce the so-called "rhetorical" conditionals, which *appear* to express an open condition, but in which the blatancy of the truth-value of the content helps convey a strong assertion. A summary of Quirk *et al*.'s classification can be seen in Table 3.2 below.

Direct	Open
	Hypothetical
Indirect	Politeness
	Metalinguistic
	Uncertainty
	Condition
Rhetorical	

Table 3.2: Typology in Quirk *et al.* (1985)

b) Sweetser's (1990) typology

The domain of discourse in which the conditional takes place is the only relevant criterion in Sweetser's (1990) typology. Thus, just as there are three domains of discourse, she presents three types of conditionals: "content", "epistemic" and "speech-act" conditionals.

Content conditionals, such as (25) below, are used to indicate that the realization of the protasis is a sufficient condition for the realization of the apodosis. In this type of conditionals, the relationship between the constituents takes place in the socio-physical world, and normally purports a cause-effect relationship.

(25) If Mary goes, John will go. (Sweetser, 1990: 114)

Epistemic conditionals (such as (26) below) denote that "knowledge of the truth of the hypothetical premise expressed in the protasis would be a sufficient condition for concluding the truth of the proposition expressed in the apodosis" (1990: 116). These conditionals imply a process of reasoning, with the protasis acting as grounds for a deduction expressed in the apodosis, and, consequently, the relationship between the constituents takes place in a "world of reasoning". Epistemic conditionals could be paraphrased by the expression "If I know [protasis], then I conclude [apodosis]." (1990: 121).

(26) If John went to that party, (then) he was trying to infuriate Miriam. (Sweetser 1990: 116)

Finally, in speech-act conditionals the protasis and apodosis are related at the speech act level, with the protasis being used to justify or explain the relevance of the *speech act* performed in the apodosis. This is, the performance of the speech act in the apodosis is dependent, or at least apparently dependent, on the fulfilment of the protasis. They can be paraphrased as "If [protasis], then let us consider that I perform this speech act (i.e., the one represented as the apodosis)" (1990: 121). In (27) below, the request in the apodosis is only to be considered as made if the state declared in the protasis is fulfilled.

(27) If I haven't already asked you to do so, please sign the guest book before you go. (Sweetser 1990: 121)

Typologies which are comparable to that by Sweetser are those by Harder (1996), who presents the same categorisation but changes the name of content conditionals to "trigger" conditionals, and Dancygier (1998) (also adopted later in Dancygier & Sweetser 2005), who distinguishes "content" and "inference" conditionals, as in Sweetser (1990), but divides speech act conditionals between "speech act" proper and "metatextual" ones.

c) Athanasiadou & Dirven's typologies.

The criteria of the domains of discourse is also used by Athanasiadou & Dirven 1997. They propose a new classification, which would also be used later on in Ferguson 2001, in which they single out "course of event" conditionals, a type which includes conditionals describing habitual co-occurrence, such as (28) below. These are distinguished by the possibility of paraphrasing *if* by *whenever*.

(28) If there's a drought this year, the eggs remain dormant. (Athanasiadou & Dirven 1997: 61)

The other two types they propose in their classification are "pragmatic" conditionals (comprising the same structures as in Sweetser's speech act conditionals) and "hypothetical" conditionals, in which they subsume all of Sweetser's content and epistemic conditionals but for those previously singled out in their course of event type.

However, Athanasiadou & Dirven's 1997 typology is a simplification of their previous (1996) work, in which they propose a more complete, three-level classification. The top-level distinction in Athanasiadou & Dirven's 1996 typology echoes Quirk *et al.*'s (1985) and Dancygier & Mioduszewska's (1984) in distinguishing between "event-based" and "marginal" conditionals on account of whether or not there is a causal relationship between the premises. In the second level, event-based conditionals are divided into "hypothetical" and "course of event" as in their 1997 typology, with the latter type being further divided into three subtypes: "descriptive", "inferencing" and "instructive" course of event conditionals.

Descriptive conditionals, exemplified in (29) below, describe events observed in reality; inferencing conditionals (30) express the inference of the apodosis from the data in the protasis, and instructive conditionals (31) are used to indicate advice, instructions or suggestions.

(29) If there are no passengers, he will come back here to the garage and get on with some repair work. (Athanasiadou & Dirven, 1996: 618)

(30) He looked at his watch; if the soldier was coming, it was nearly time. (Athanasiadou & Dirven, 1996: 624)

(31) It is wise to call the doctor in all cases of sore throat, especially if there is a fever of 101º. (Athanasiadou & Dirven, 1996: 616)

Marginal conditionals (renamed as "pragmatic" in their 1997 typology) present two second-level sub-types, "logical" and "conversational" conditionals. The former refer "to one event and the logical identification of one of its participants based on truth conditions" (1996: 613). They are exemplified in (32), in which the protasis suggests that in case there is an elite in China, this one has to be formed by the masses.

(32) If there's an elite in China, she wrote, it's the masses; and the masses are the workers, peasants and soldiers. (Athanasiadou & Dirven, 1996: 611).

Conversational conditionals are roughly identical to Quirk *et al.*'s (1985) indirect or Dancygier & Mioduszewska's (1984) non consequential conditionals. These are divided into three third-level subtypes, comprising "performative", "elliptical" and "parenthetical" conditionals. In performative conditionals such as (33) below "the link between the two parts of the whole sentence is a performative act" (Athanasiadou & Dirven, 1996: 641). Elliptical Conditionals, such as (34) below, are defined by their lack of an apodosis, whilst in parenthetical conditionals (35) the protasis "lies outside the main clause and could not form a semantic unit with it" (1996: 643).

(33) If anyone wants me, I am downstairs.

(34) And if these venerable, old ideas are thought not to be worth bothering about. (Athanasiadou & Dirven, 1996: 643).

(35) The shooting-season opens Saturday and the birds will be scattered all over the place after that - if there is any left. (Athanasiadou & Dirven, 1996: 643).

Athanasiadou & Dirven's typologies are summarised in Table 3.3 below.

<table>
<tr><td rowspan="5">Event-based</td><td rowspan="3">Course of event</td><td>Descriptive</td></tr>
<tr><td>Inferencing</td></tr>
<tr><td>Instructive</td></tr>
<tr><td>Hypothetical</td><td rowspan="2"></td></tr>
<tr><td rowspan="4">Marginal (= 1997 Pragmatic)</td><td>Logical</td></tr>
<tr><td rowspan="3">Conversational</td><td>Performative</td></tr>
<tr><td>Elliptical</td></tr>
<tr><td>Parenthetical</td></tr>
</table>

Table 3.3: Typology of conditionals in Athanasiadou & Dirven 1996 (adapted from Gabrielatos 2010: 158, categories present in both 1996 and 1997's works are marked in italics).

d) Criticism

A series of problems have been identified in all these domains of discourse-based classifications. The main one is that the distinction between the different domains of discourse is sometimes fuzzy. In Ferguson's (2001) words, while criticising Sweetser's (1990) typology: "it is sometimes unclear as to which domain a given conditional should be allocated, and only careful, prolonged scrutiny of the discourse context is helpful in resolving the uncertainty[71]" (2001: 65). He exemplifies this problem using one of Sweetser's examples, shown as (36) below, which is analysed by Sweetser as a content conditional. Ferguson argues that it could be given an epistemic interpretation instead,

[71] In fact, Palmer (1990: 175) concluded that "all conditionals could be described in terms of inference".

paraphraseable as "If I know that on this occasion that he had departed before they arrived, then I conclude that it was necessary for them to leave a message" (Ferguson 2001: 65), thus showing the fuzziness of these types.

(36) If he was already gone, they had to leave a message. (Sweetser 1990: 123)

Athanasiadou & Dirven's (1997) model complies with this criticism by subsuming Sweetser's content and epistemic conditionals into their hypothetical type, but their proposed course of event type is also problematic: Ferguson (2001) doubts about the very consideration of these course of event structures as valid conditionals (2001: 66), whilst Gabrielatos (2010) again finds significant overlaps between them and hypotheticals[72].

Second generation typologies are thus considered not valid for describing the functions of conditionals in scientific writing. However, the criteria they present to distinguish between different types offer useful insights for the study of conditional structures.

2.3. *Contemporary typologies*

The problems of second generation conditionals prompted the emergence of a new generation of conditional typologies from the turn of the millennium. These new typologies are characterised by their using several sets of criteria at once to classify conditionals, but in different ways. The two main examples of these contemporary conditional typologies are Declerck & Reed (2001) and Gabrielatos (2010).

2.3.1. *Declerck & Reed's (2001) typology*

Declerck & Reed (2001) do not present a single typology, but several at once. They argue that attempts at defining a conditional typology "have at best been only partially successful, because what we should be looking for is not *a* typology but *a number of* typologies" as "there are so many different parameters to be taken into account" (2001: 4, italics are the authors'). Consequently, they present two different typologies: one is based on the possible worlds the conditional refers to, and the other on the functions of conditionals in discourse.

The first typology is based on the criterion of possible worlds, also taking into account the tenses used in both protasis and apodosis, especially when these are modals or subjunctives. It distinguishes in a

[72] Apart from that, Gabrielatos also denies the validity of the actual occurrence of events as a valid criterion to distinguish conditional types, as "[e]ven when the content of the protasis is actual/factual, by virtue of its being presented within an if construction the content (or part of it) is presented as less than actual/factual" (Gabrielatos 2010: 162-163).

first level between "factual" and "theoretical" conditionals, as in Huddleston & Pullum's (2002) typology explained above. Theoretical conditionals are further subdivided into "neutral" and "non-neutral". The former are simple suppositions in which there is no evaluation of the probability of the events in the conditional, whilst the latter convey some sort of presupposition. These non-neutral conditionals are further divided into four third-level subtypes (closed, open, tentative and counterfactual) according to "the assumed truth relation between the supposed possible world and the actual world" (Declerck & Reed 2001: 53). A summary of Declerck & Reed's first typology can be consulted in Table 3.4 below.

<table>
<tr><td colspan="3">Factual</td></tr>
<tr><td rowspan="5">Theoretical</td><td colspan="2">Neutral</td></tr>
<tr><td rowspan="4">Non Neutral</td><td>Closed</td></tr>
<tr><td>Open</td></tr>
<tr><td>Tentative</td></tr>
<tr><td>Counterfactual</td></tr>
</table>

Table 3.4: Declerck & Reed's (2001) first typology.

Declerck & Reed's second typology is based on the function of the conditional in discourse. Echoing Dancygier & Mioduszewska's (1984) top-level distinction, conditionals are divided into "case specifying conditionals", those characterised by "Q[73] applying in the case that P obtains" (2001: 7), and "rhetorical conditionals", those in which dependencies are harder to detect.

Each of these types is further subdivided: case-specifying conditionals comprise three different subtypes. "Actualization" conditionals are those which express a condition for the actualization of the apodosis, "inferential" conditionals express an inferential reasoning process, and "purely case-specifying" conditionals are those "in which the P-clause just specifies the case(s) in which (or the circumstances under which) the Q-situation actualizes" (Declerck & Reed, 2001: 304).

Likewise, rhetorical conditionals are divided into five subtypes (Declerck & Reed 2001: 360-361). "Utterance" conditionals are those in which the apodosis identifies the conditions "in which it is possible, meaningful, or relevant to utter the Q-clause", "comparing" conditionals have the aim of just comparing both propositions, whilst "commenting-P" conditionals introduce in the protasis the speaker's opinion about the relationship expressed. "Pseudo-implicatives" are conditionals with the form of implicatives which carry another meaning by means of irony, similarly to Quirk *et al*.'s (1985) rhetorical type; and, finally, "pleonastic" conditionals are those in which the apodosis is a repetition

[73] Decleck & Reed use the abbreviations P for Protasis and Q for Apodosis.

of the protasis. Both case-specifying and rhetorical subtypes show several more levels of subdivisions, which are partially included in Table 3.5 below.

Case-specifying conditionals	Actualization	actualization-triggering preclusive actualization-licensing nonpreclusive "In case"
	Inferential	direct inferentials (standard direct inferentials, backtrackers, nonpreclusive-P inferentials) indirect inferentials (ad absurdum, indirect with counterfactual verb form in Q, indirect with contradictory Q, indirect with assertoric interrogative Q) pseudo Q inferentials
	Purely case specifying	several subtypes
Rhetorical conditionals	Utterance	relevance conditionals anchoring-P conditionals performative Q-conditionals metalinguistic-Q conditionals nonassertoric-Q utterance conditionals, commenting-Q utterance conditionals
	Comparing	similarity-expressing conditionals contrastive conditionals gradation conditionals concessive-P conditionals
	Commenting-P	downtoning-P conditionals boosting-P conditionals evaluating-P conditinionals (+ subtypes) metalinguistic-P conditionals speech condition-defining-P conditionals reminding-P conditionals hedging-P conditionals
	Pseudo implicatives	
	Pleonastic	

Table 3.5: Declerck & Reed's (2001) second typology.

Declerck & Reed's (2001) typology has been praised for its level of detail. For instance, Gabrielatos (2010: 178) recognises as a strength "the numerous and fine-grained sub-cases they have recognised". However, this typology's main strength is also its main weakness: the high level of detail makes the typology impractical to use as a classification. This impracticality increases from the fact that the enormous number of subtypes are not always well defined, showing several overlaps. A final problem is that, having two different typologies, the classification of conditionals ends up being more of an exercise of description of their features than an attempt at providing a catalogue, a criticism also posed by Gabrielatos, who considers Declerck & Reed's classification, "an inventory of conditionals,

rather than a coherent classification" (2010: 178). Thus, although some of the classifications in the typologies are illuminating, Declerck & Reed's model is not applicable in this dissertation.

2.3.2. *Gabrielatos' (2010) typology*.

Gabrielatos (2010) typology also analyses conditionals focusing on two different criteria, but, contrarily to Declerck & Reed, these two criteria do not form their respective typologies, but combine into a single one. Gabrielatos's two criteria are the nature of the link between protasis and apodosis and the semantic function of the whole conditional construction. Conditionals are defined by their position in the matrix formed by the interaction of both criteria, or, in his own words, as "vectors. That is, the type of a given conditional construction is defined as (P-A[74] LINK, SEMANTIC FUNCTION)" (Gabrielatos 2010: 236).

The first criterion, the nature of the link between protasis and apodosis, yields a classification echoing Quirk *et al.*'s (1985) first level difference between direct and indirect conditionals, but ignoring all its subtypes. In "direct" conditionals the realisation of the content of the apodosis is directly contingent "on the realisation, actuality or factuality of the content of P.", whilst in "indirect" conditionals, "what is contingent on P is not the content of A, but the relevance of its very uttering, or the wording of its content, or its clarity for the hearer/reader" (Gabrielatos 2010: 239).

Indirect conditionals are fully subdivided into two subtypes: "relevance" and "comment" conditionals. The main difference between them is that in relevance conditionals, exemplified in (37) below, it is the relevance of the content of the apodosis (in this case, a question) that is depending on the protasis holding, whilst in comment conditionals (shown in 38) it is the wording of the apodosis that is put into question, rather than its content.

> (37) If antibiotics are likely to clear up the infection, why are we having this long discussion? [CH1 592] (Gabrielatos 2010:239)
>
> (38) He's not a bad sort, for a brother if you know what I mean [AN7 3257] (Gabrielatos, 2010:239)

This first classification of conditionals as direct or indirect is also supported by its reflex on syntactic analysis, since, as mentioned above, protasis in direct conditionals are adjuncts, whilst in indirect conditionals they are disjuncts (Quirk *et al.* 1985: 1072). Gabrielatos stresses the importance of the fact that the classification in direct and indirect conditionals affects only the relationship between

[74] Gabrielatos frequently uses the abbreviations P for Protasis and A for Apodosis.

protasis and apodosis and not semantic functions: as he puts it, "the semantic functions performed by direct conditionals can also be performed by indirect ones" (2010: 240).

These semantic functions are examined as the second criterion of classification. Gabrielatos (2010: 237) defends that the semantic interpretation of conditional constructions as a whole is closely related to modality[75] and, consequently, he studies modality in depth, proposing a typology of modals with which to classify conditionals according to this second criterion. He distinguishes four modal types[76] (likelihood, propensity, directed desirability and non-directed desirability), which correspond with the four types of conditionals according to this second criterion.

Likelihood conditionals (see example 39 below) are those in which the apodosis assess the likelihood of the conditional. This idea of likelihood is to be understood in an inclusive way, including "the overlapping notions of inference, deduction, guess, supposition and prediction" (2010: 242), and all the possible assessments in the clines from total certainty to absolute uncertainty and from confirmed truthfulness to assured falseness. Contrarily, propensity conditionals (40 below) "express the ability, trends, tendencies etc. of an entity or situation" (2010: 243).

> (39) If physicists had tried to discover a way to release nuclear energy before 1939, they would have worked on anything else rather than the field which finally led to the discovery of fission, namely radiochemistry. [B78 1973] (Gabrielatos 2010: 238)

> (40) If I can live with them, so can everyone else. [FS9 2538] (Gabrielatos 2010: 238)

Directed desirability conditionals (exemplified in 41) express notions of obligation or permission, and can "function as an order, command, directive, rule, regulation, permission, promise, threat, advice, suggestion etc.", whilst non-directed desirability conditionals (42) express "the notion of volition, and the related notions of intention, insistence, hope, wish, desire etc." (Gabrielatos 2010: 243).

> (41) This is the best "bargain offer" pensioners have ever had, and any woman over 60 or man over 65 should take advantage of it if possible. [C8Y 946] (Gabrielatos 2010: 238)

> (42) If anything can be salvaged from the tragedy it's hoped the publicity surrounding his death will help his work become more well known. [K21 3757] (Gabrielatos 2010: 238)

[75] In fact, he defends that the main hint in order to decide the allocation of a given conditional based on this criterion is the notion expressed in the apodoses in each conditional, especially if there is explicit modal marking present (Gabrielatos, 2010: 238).

[76] See Section 3.3.1 in Chapter 2.

As explained above, the two criteria are to be combined, forming a matrix such as the one shown in Table 3.6, in such a way that a given conditional would be classified according to the intersection of their position in the two axes.

		Likelihood	Propensity	Directed desirability	Non-directed desirability
Direct					
Indirect	Relevance				
	Comment				

Table 3.6: Gabrielatos's (2010) typology.

Gabrielatos's typology is the only non-traditional typology that does not present problems of overlapping, as the author himself recognises his interest in devising a consistent, comprehensive and non-overlapping typology (2010: 231-233). He achieves this by recognising the intimate relationship between conditionals and modals and analysing the semantic function of conditional constructions on the grounds of the different types of modal meaning, whilst, at the same time, using his own overlapping-free classification of modals.

However, Gabrielatos's (2010) is a typology based on the internal structure of the conditional more than on the use of the conditional on discourse, and conditionals used in very different functions could be grouped together in this model. Thus, although it cannot be criticised on grammatical grounds, Gabrielatos's typology does not conform to the aims of this dissertation, and is, consequently, not to be used in it. However, his criteria and, particularly, his idea of using modal meaning as a criterion for establishing a typology are of great utility. In fact, the presence of modals in the conditional has been included as a further variable of study, as explained in Section 3.3 in Chapter 2.

2.4. *Typologies of conditionals in discourse*

The previous three subsections have dealt with typologies classifying conditionals in general language. However, it is also necessary to analyse typologies classifying the uses of conditionals in discourse, and, particularly, in scientific discourse. This section analyses the typologies dealing with particular uses of conditionals in discourse, such as Ford & Thompson's (1986) and Ford's (1997), whilst the next one will focus on the particular uses in scientific discourse.

Ford & Thompson's (1986) typology is based on the order[77] of the constituents of conditional structures in respect to each other. Ford & Thompson starting point is Haiman's (1978) claim that conditionals are topics and, from there, they analyse their relation with surrounding and, especially,

[77] See Section 3.2 in Chapter 2 for a more detailed account of this feature.

previous discourse, using actual data from written and spoken English. Thus, they distinguish two types of conditionals according to the position of the protasis: "initial" and "final" conditionals, finding that protases tend to appear in initial rather than in final position, something which, they claim, is in relation to their nature as creators of "backgrounds for subsequent propositions" (1986: 370).

Ford & Thompson claim that the final position of protases is dependent on syntactic or discursive constraints, showing four triggering causes: the position of the protasis within nominalizations, infinitives or relative clauses; the length of the protasis, the occurrence of two or more adverbials at the beginning of the sentence, and the presence of an "interesting subject" (1986: 360) in the apodosis. Apart from these, they also found that in spoken data, final protases are frequently afterthoughts or expressions of politeness, as well as an important amount of final conditionals which are used to make evaluations and form questions.

Among initial protases, Ford & Thompson distinguish five types. "Assuming" conditionals are used to repeat an earlier claim, "particular cases" conditionals exemplify an earlier generalization, "contrasting" conditionals are used to contrast an earlier claim with a new one, and "exploring of options" conditionals help weighing new options "made available by earlier procedural or logical steps" (1986: 361). Apart from those, there are others expressing "polite requests", which are only present in spoken data. Ford & Thompson's typology is shown in Table 3.7 below:

Initial conditionals	Assuming
	Particular cases
	Contrasting
	Exploring of options
	Polite requests (spoken uses only)
Final conditionals	

Table 3.7: Conditionals in Ford & Thompson (1986)

Ford (1997)'s typology is part of her work analysing the use of conditionals in conversation. She uses fifty-five examples taken from video and audio recordings of thirteen conversations in American English, and she focuses on their function as politeness and face-preserving strategies in interactions. She finds five main uses of conditionals in this sense, as shown in Table 3.8 below.

Making a current turn relevant
Displaying alternative understandings
Being agreeable
Making difficult moves hypothetical
Proposing others' action.

Table 3.8: Interactional functions of conditionals in Ford (1997).

Conditionals are frequently used at the beginning of a turn in order to introduce or "gain" the turn in a conversation. By appearing at the start of their turn, speakers can justify using a turn in a conversation even though they might not normally do so under normal conversational rules. Conditionals are also frequently used by speakers to suggest a new direction of thought in contrast to an assumption that had been held until that moment.

Apart from that, conditionals are used in order to soften an expression of disagreement, whether expressing disagreement directly with a conditional or using a set of two alternative uses encoding agreement and disagreement (1997: 397). Conditionals can also be used to soften another speaker's disagreement, rewording a negative by another speaker by trying to introduce an exception. Finally, the hypotheticality of conditionals is used to introduce "interactionally difficult" (1997: 390) information in a hedged manner as well as to propose action on the part of the addressee without threatening their face.

Both these approaches, although very useful in their description of often disregarded types of conditionals, present problems. Ford & Thompson's (1996) approach is faulty, as it eliminates conditionals which appear in the middle of the sentence, as well as cases with *unless*, whilst focusing mainly in initial conditionals and not dealing with final ones accordingly. Ford's (1997) proposal only classifies conditionals in interactional discourse, disregarding other genres. Neither of the two is directly applicable to the aims of this dissertation, although their approaches will be taken into account.

2.5. *Typologies of conditionals in scientific discourse*

As explained in Section 1 above, conditionals fulfil an array of specialised roles in scientific discourse, different from those in general discourse. Thus, it seems interesting to analyse typologies classifying conditionals in scientific discourse, and see if and how these particular uses are classified. The typologies here analysed are Carter-Thomas & Rowley-Jolivet's (2008) and Warchal's (2010).

2.5.1. *Carter-Thomas & Rowley-Jolivet's (2008) typology*

Carter-Thomas & Rowley-Jolivet's (2008) typology is the result of a work in which they analyse the uses of conditionals in academic discourse, focusing on their argumentative power. Their typology concentrates on the different functions of conditionals in disciplinary discourse (medicine, in this case), emphasizing "the syntactic and pragmatic potential of the conditional structure and how its multiple formal variants are used in disciplinary practice" (2008: 193). This could be considered a data-driven study, as the classification arises from the regularities observed in the data and not from predefined categories, but, nevertheless, it is influenced by other typologies based on the notion of

the conceptual domains of discourse. Thus, these authors distinguish three different functions in their typology: "factual", "refocusing" and "discourse-management" conditionals.

Factual conditionals are used to express either events considered as fact or completed procedures in methods, as can be seen in (43) below. These conditionals help establish the facticity (Latour 1987) of a statement, thus being "particularly relevant to scientific discourse" (Carter-Thomas & Rowley-Jolivet, 2008: 193) as they help construct common ground between the writer and its audience. They are identified by the possibility of the paraphrasis of *if* by *whenever*, as with Athanasiadou & Dirven's (1997) course of event conditionals.

> (43) If 10% or more of the malignant nuclei were stained, the slide was scored as negative. (Carter-Thomas & Rowley-Jolivet 2008: 194).

Refocusing conditionals have a more argumentative function, being useful in the process of "expanding or contracting the argumentative space" (Carter-Thomas & Rowley-Jolivet, 2008: 174) as part of the process of making claims in scientific discourse. This is, by using conditionals, researchers can speculate about the relationships of consequence or effect between two premises inside a "manoeuvring room" of suppositions provided by the use of conditionals. These refocusing conditionals are a type which does not only include conditionals similar to Athanasiadou & Dirven's (1997) hypotheticals, as the one exemplified in (44) below, but also other types of conditionals expressing concession or recommendation, as in (45) and (46) below, respectively.

> (44) If we ever do get other agents which are effective drugs in colorectal cancer it may be possible to combine them at full doses with infusional 5-FU. (Carter-Thomas & Rowley-Jolivet 2008: 194).

> (45) Thus, even if nonsurgical treatment could achieve similar high rates of local tumor control, distant metastasis would still be the dominant limitation. (Carter-Thomas & Rowley-Jolivet 2008: 194).

> (46) Such an eventuality [outlawing all cloning] must be avoided if potential advances in medical research are not to be substantially harmed. (Carter-Thomas & Rowley-Jolivet 2008: 194).

Finally, discourse management conditionals, exemplified in (47) below, are used by the author to express their intentions and guide the audience about the development of the text. They are more restricted than Athanasiadou & Dirven's pragmatic and Sweetser's speech act conditionals, as Carter-Thomas & Rowley-Jolivet include in this type conditionals which act as meta-discursive signals or

signposts exclusively, and obviate uses expressing other pragmatic functions. However, this type shares with other pragmatic conditionals their use as a strategy to avoid threatening face (see Section 1 in Chapter 2), as these signposting instructions are made less face-threatening to the reader by the use of conditionals.

> (47) Now if we go to patients who experienced mucositis toxicity. (Carter-Thomas & Rowley-Jolivet 2008: 194).

Carter-Thomas & Rowley-Jolivet's typology is valuable in that it adapts general language typologies to scientific discourse, including discipline and genre-specific uses and highlighting the argumentative uses of conditionals, typical of scientific writing. However, it is still very much influenced by the typologies based on the criterion of the domains of discourse; and by distinguishing only three types of conditionals, echoing the three domains of discourse, it does not provide the fine grain analysis needed for distinguishing the functions of conditionals in scientific register.

2.5.2. *Warchal's (2010) typology*.

Warchal's (2010) typology classifies conditionals according to their discourse functions in research articles on linguistics, focusing in the interpersonal functions of conditionals as examples of the dialogic nature of scientific writing.

Her typology, shown in Table 3.9. below, stems from Sweetser's (1990) distinction between content, epistemic and speech-act conditionals explained above. However, she modifies Sweetser's typology, dividing the speech-act category into four categories ("politeness", "relevance", "metalinguistic" and "reservation" conditionals), adapting Quirk *et al.*'s (1985) typology. She also introduces "rhetorical" conditionals, also present in Quirk *et al.*'s model, and conditionals with concessive uses. These ones, paraphraseable by *even if,* were considered as part of refocusing conditionals in Carter-Thomas & Rowley-Jolivet's (2008) typology.

Content	
Epistemic	
Speech act	Politeness
	Relevance
	Metalinguistic
	Reservation
Rhetorical	
Concessive	

Table 3.9: Conditional typology in Warchal (2010)

According to Warchal, all the types of conditionals except the content ones feature some kind of interpersonal meaning. Epistemics would present the proposition as a logical consequence of an already accepted premise, thus guiding the readers' train of thought. Concessives express the assurance of the writer about their claims, as the claim in the apodosis will take place despite the obstacles presented in the protasis. Finally, all types of speech act conditional have some type of interpersonal meaning, as they are used to redefine the scope of a claim, avoid criticism or express politeness, among other functions which are useful in a scientific discourse conceived as a dialogic exercise.

Warchal's typology was devised to be applied to a corpus of scientific register and, apart from the fact, already explained above during the examination of Sweetser's (1990) typology, that all content conditionals can also be analysed as an epistemic process, it does not present *a priori* problems for their use as a typology of conditionals in scientific discourse, appearing to be the best-suited typology for the aims of this dissertation. However, it was necessary to test its suitability with an analysis of conditionals obtained from real scientific texts from the eighteenth and nineteenth centuries.

The pilot studies (Puente-Castelo & Monaco 2013, Puente-Castelo 2016) testing the suitability of Warchal's (2010) typology to eighteenth and nineteenth century scientific texts showed some problems. The most important is that categories in these centuries were not as clear-cut as they are today, and in some cases an overlap has been found, confirming the necessity of establishing clearer criteria: among others, this is the case of some conditionals showing politeness overtones even though they are primarily expressing another function. On the other hand, some categories in Warchal's classification are too broad, and ignore some of the categories and distinctions present in other typologies. This is the case, particularly, of epistemic conditionals and their fuzzy limit with content ones. Thus, Warchal's classification is not applicable for the classification of eighteenth and nineteenth century conditionals either.

Consequently, after checking that no conditional typology can be satisfactorily applied to the conditionals in use during the period under study and that they do not reflect all the different nuances and types existing at the period, it was decided that a new typology should be created.

3. A new functional typology of conditionals in scientific writing.

The review of the literature in the previous section has shown that there is no single existing conditional typology suitable to classify the functions of conditionals in late Modern English scientific

discourse. Consequently, a new typology to classify conditionals in scientific writing on account of their function in discourse needs to be created.

This section presents the process followed to construct this typology, as well as the actual typology. It is divided in three parts. Section 3.1 presents the criteria used to design the new typology, some of which follow those of the typologies examined in the previous section. Section 3.2 presents the actual typology, together with a detailed explanation of the different types (the different functions conditionals can play in discourse), examples, and indications on how to disambiguate potentially problematic cases. Finally, Section 3.3 relates the different functional types identified with the notions of interpersonality and mitigation as described in Section 1.3 above.

3.1. *Criteria used to devise the typology*.

The first criterion used to devise the typology presented here has been based, echoing the decision of authors such as Dancygier & Mioduszewska (1984), Quirk *et al.* (1985), Sweetser (1990), Athanasiadou & Dirven (1996), Gabrielatos (2010) and Warchal (2010), on the *syntactic link between the constituents of the conditional*: in some conditionals protases are adjuncts, whilst in others they are disjuncts. As explained in Gabrielatos (2010: 239), this syntactic difference is motivated by the fact that in conditionals in which the protasis is an adjunct the content of the apodosis is contingent on the "realisation, actuality or factuality of the content of P" (Gabrielatos 2010: 239). Meanwhile, in conditionals in which the protasis is a disjunct, "what is contingent on P is not the content of A, but the relevance of its very uttering, or the wording of its content, or its clarity for the hearer/reader" (Gabrielatos 2010: 239).

Thus, the first distinction in this typology is to discriminate conditionals in which the protasis is a disjunct, and call them "speech-act" conditionals. These are similar to Dancygier & Mioduszewska's (1984) "non consequential", Quirk *et al.*'s (1985) and Gabrielatos' (2010) "indirect", Sweetser's (1990) and Warchal's (2010) "speech act" and Athanasiadou & Dirven's (1997) "conversational" conditionals, ignoring their subtle differences.

On a second level, following and adapting Quirk *et al.*'s (1985) and Warchal (2010)'s typologies, these speech act conditionals are further subdivided. Thus, this typology distinguishes four subtypes of speech act conditionals on the basis of which aspect of the utterance of the apodosis is contingent on the protasis: these are "politeness", "relevance", "metalinguistic" and "non-committal" conditionals.

A third step has consisted on detecting structures which, even though they take the form of a conditional, are not fulfilling the role of a conditional. This has led to the distinction of "directive" conditionals, which encode a desirable course of event (recommendations or orders), and "rhetorical"

conditionals, which are assertions, both under a conditional form. It has also led to the distinction of "concessive" conditionals, in which the protasis introduces an impediment for the fulfilment of the apodosis.

Finally, the rest of conditionals (conditionals in which the apodosis is directly contingent on the protasis and which are not acting as other structures), are classified according to their semantic effect, this is, to the effect their use has in scientific discourse, taken into account as well their mitigating and interpersonal character, as will be explained below. This has led to the distinction of "known fact", "hypothesizing", "scope restricting" and "method" conditionals.

3.2. *Typology.*

In what follows, a brief description of each of the types is included.

Known fact conditionals are used to state widely accepted facts and mathematical truths. They include examples such as (48) below, which is the prototypical example of "zero" conditional, but also other, less prototypical, cases, such as the one exemplified in (49) below.

(48) "If you heat water, it boils" (Carter-Thomas & Rowley-Jolivet, 2008: 192)

(49) "Given that *x=y*, then *n(x+a)=n(y+a)* must also be true". (Quirk *et al*. 1985: 1090)

Known fact conditionals are on a cline with hypothesizing conditionals, with an extensive overlap zone of cases which can be classified as either of the two types, a common problem with other typologies, as already noted in Section 2 above. The criterion followed in this typology to disambiguate between these two types has been to include only mathematical or uncontroversial, universally acknowledged facts in the "known fact" conditional type. Thus, their scope is narrower than that of Athanasiadou & Dirven's (1997) "course of event" and Carter-Thomas & Rowley-Jolivet's (2008) "factual" conditionals, as known-fact conditionals in this typology do not include conditionals describing habitual co-occurrence or the narrative of procedures, as the other two types do, respectively.

Known fact conditionals cannot be identified by the substitution of *if* by *whenever*, which can be wrongfully extended[78], but by their subject matter and by the attitude of the author towards their use: known-fact conditionals are so widely accepted that they are not compromising for the author,

[78] In fact, the identity in meaning between *if* and *whenever* is put into doubt by several authors (Tar Meulen 1986, Ferguson 2001). Tar Meulen argues that *whenever* requires some temporal relation between the constituents, while *if* does not (Tar Meulen 1986: 134), whilst Ferguson argues that "[i]t is also possible that 'if' involves a marginally lesser degree of speaker commitment to the occurrence of the situation in the protasis and is hence a more detached an impersonal way of speaking" (Ferguson 2001: 66).

who does not need any type of mitigation. They are relevant in establishing facticity (Latour 1987) and designing the common grounds and shared assumptions on which argumentative discourse can be built.

Hypothesizing conditionals are used to state the likelihood of an apodosis holding, given a protasis. This statement of likelihood is to be understood in the broadest sense, both in what has to do with the judgement of probability made, including from almost certainty to impossibility and counterfactuality, and in what has to with the type of judgement, including, quoting Gabrielatos, "the overlapping notions of inference, deduction, guess, supposition and prediction" (2010: 242). Thus, this type of conditionals includes the three canonical types defined in traditional typologies based on verb combinations, but also any of the many other combination of tenses expressing an evaluation of likelihood, and which are especially common in highly specialised scientific writing, as shown in example (50) below.

> (50) If a patient has an early failure from a low anterior resection, they may be able to be retrieved by resection. (Carter-Thomas & Rowley-Jolivet, 2008: 200)

They also include other uses, such as the one exemplified in (51) below, labelled as a "closed non-neutral theoretical conditional" by Declerck & Reed (2001). This type of conditional is a logical deductive construct presented as a conditional even though the reality of the protasis is well-known, and is used as a device to guide readers towards the same conclusion the author has reached.

> (51) If Bill is Mary's nephew, he's a distant relative of mine. (Declerck & Reed 2001: 53)

Hypothesizing conditionals can be used as a mitigating device, but this effect is mainly achieved by the use of modals rather than by the presence of the conditional itself.

Scope-restricting conditionals are used to restrict the scope of a claim by limiting the apodosis on condition of the protasis. This is, they are used to describe the scenario or build the argumentative space in which the claims made held. This type of conditionals includes both conditionals such as (52) below (already presented as 7 above), which are used to provide a definition of how a concept is to be understood and under the light of which the apodosis has to be interpreted, and others such as (53), in which the protasis specifies the universe to which the claim in the apodosis applies.

> (52) As such, it can be said to belong to modality if the category is defined as the expression of the speaker's attitude or stance. (Warchal 2010: 148)

> (53) The diameter of the lesions, if they're adenomas, tends to be bigger. (Carter-Thomas & Rowley-Jolivet 2008: 195)

Just as known fact conditionals, scope-restricting conditionals are also in a cline with hypothesizing ones, with which they should not to be confounded. Scope-restricting conditionals do not introduce a judgement on the apodosis on account of the fulfilment of the condition in the protasis, but rather specify the conditions under which the apodosis holds, either in what has to do with the metaphorical extension of the definition of a concept or with the set of elements affected by the apodosis. This type of conditionals is very useful for authors as it lets them limit the scope of their claims by limiting either the set of elements affected by it or the conceptual space the claim affects. In this way, scope restricting conditionals let authors create "manoeuvring room" (Carter-Thomas & Rowley-Jolivet, 2008: 174) in order to further their claim without risking their image, avoiding possible criticism by simply ruling out scenarios in which their claims do not hold.

Method conditionals are used to narrate completed methodological procedures (if referring to past time, as in 54 below) or to introduce instructions on how procedures are to be conducted (if referring to future time, as in 55 below):

> (54) If 10% or more of the malignant nuclei were stained, the slide was scored as negative. (Carter-Thomas & Rowley-Jolivet 2008: 194).
>
> (55) A urinary catheter should be passed if renal failure is suspected so that the flow of urine can be measured accurately. (Ferguson, 2001: 75)

These conditionals are very much used in the methods section, as discovered by several authors, in order to introduce both set instructions (whose observance may or may not take place) and narratives of procedures and the decisions taken during these. They are also comparable to "normative" conditionals as described by Fachinetti (2001: 137-8).

Rhetorical conditionals are, as explained above, strong assertions which take the form of conditional structures. In rhetorical conditionals, the blatancy of the truth-value of the content leads[79] the hearer to conclude that the speaker is actually making an assertion. Authors (Quirk *et al.* 1985: 1094, Warchal 2010: 146) distinguish two types of rhetorical conditionals: one in which the apodosis is blatantly absurd, which is used to convey that the protasis is false (56); and another in which the protasis is obviously true, meaning the apodosis is considered true by the speaker (57). They are considered not to be very common in scientific writing, with just one example being found in Warchal (2010).

[79] Via the implicature mechanism explained in Section 1 in Chapter 2, based in this case in the blatant transgression of the Maxims of Relevance and Quality. It is also noticeable that the two types of rhetorical conditionals coincide in their interpretation with the well-known rules of inference *modus tollens* (56) and *modus ponens* (57), respectively.

(56) If they are Irish, I'm the Pope (Quirk *et al.* 1985: 1094)

(57) He's ninety if he's a day. (Quirk *et al.* 1985: 1095)

Concessive conditionals express a meaning of concession, that is, they are used to introduce (in the protasis) the information of an apparent impediment for the fulfilment of the apodosis, under which, nevertheless, it holds, as shown in example (58) below. They can be paraphrased by *even if.*

(58) Our point still goes through if the minimal phrase containing both parts of this idiom is always headed by a verb (Warchal 2010: 146)

Particularly prominent among this type are conditionals of the type *if not [term]*, as in (59) below.

(59) Indeed, Langacker suggests that the use of change predicates is possible precisely because they apply to the virtual entities, if not to the actual entities that ultimately ground them. (Warchal 2010: 142)

Both rhetorical and concessive conditionals are mainly identical to the types identified in Quirk *et al.* (1985) and Warchal (2010).

Directive conditionals are used to present an obligatory or, at least, desirable course of event as if it were optional and not compulsory (Ferguson 2001: 77). These conditionals include two main types, depending on the reality they affect: metadiscursive guiding and real-life advice or recommendations.

Example (60) below is an example of the former. In it, the conditional acts as a signposting device, telling the audience about how the text is going to develop and the authors' intentions, being thus fairly similar to Carter-Thomas & Rowley-Jolivet (2008: 194) discourse management conditionals.

(60) Now if we go to patients who experienced mucositis toxicity. (Carter-Thomas & Rowley-Jolivet 2008: 194).

However, in (61) below, an example of the latter subtype, the speaker proposes a real life action on the part of the addressee, while helping maintaining their face (Lakoff 1973, Brown & Lavison 1987) by presenting a recommendation as if it were an option for the addressee to consider.

(61) If you go outside, Sister will fix things up (Ferguson 2001: 78)

Speech Act conditionals. As explained above, in speech act conditionals the fulfilment of the apodosis is not dependent of the content of the protasis, but rather on its fulfilment as a speech act. There are four types:

Politeness conditionals (62) are used to introduce a conventional expression of politeness:

> (62) If I may be quite frank with you, I don't approve of any concessions to ignorance. (Quirk *et al.* 1985: 1095)

These expressions are characterised by their semi-formulaic uses, as well as by the extensive occurrence of modals in them.

Relevance conditionals are used to explain the circumstances under which the statement of the apodosis is relevant: stating the apodosis in any other circumstance would result in an unjustified transgression of the maxim of relevance. In general language, these conditionals include examples such as (63) and (64) below.

> (63) If I do not see you before Thursday, have a good Thanksgiving! (Dancygier & Sweetser 2005)

> (64) If you're hungry, there's biscuits in the tin (Ferguson 2001: 65)

In (63), the author establishes a scenario against which the wish stated in the apodosis is to be analysed. Following the explanation above, only if the protasis holds (this is, if the speaker does not see the addressee) is the apodosis to be taken as effective. Thus, the speaker justifies their well-wishing because it is possible that the risk expressed in the protasis, not seeing the addressee before Thanksgiving, takes place. Should it not hold (i.e. should the speaker and the addressee see each other), the apodosis would be considered as non-uttered.

Example (64) is somewhat less transparent, as an invitation is being made. This could be considered a case of directive conditional, but it is rather different, as in directive conditionals the desirable course of event is presented in the protasis, and in this case the invitation appears in the apodosis and the protasis establishes the conditions under which this invitation is to be taken as effective, thus being a relevance conditional[80].

These conditionals are also used in scientific discourse, as shown in (65) below, in which they usually indicate that the information in the apodosis is considered as an extra and should only be taken into account if considered relevant by the reader:

> (65) Finally (if this is important), the S1 meaning can be converted into an S meaning to recover a more intuitive object to represent the meaning of the original sentence. (Warchal 2010: 148)

[80] This type of conditionals have been called "biscuit conditional". (Ebert, Endriss & Hinterwimmer 2008).

Metalinguistic conditionals (66) are used to make a comment on the wording of the discourse, implying that a word may be incorrect or that there is a better alternative.

(66) His style is florid, if that's the right word. (Quirk *et al*. 1985: 1096).

Metalinguistic conditionals are not to be confounded with concessive *if not [term]* conditionals, such as example (59) above, in which the main meaning is not that of commenting on the precision of the term used, but, rather, conveying the idea that, for a given fact, the status named in [term] could be considered, but it is definitely as defined in the apodosis in any case. In example (59), then, the idea transmitted is not a questioning of the correctness of "virtual entities" as a term and a proposal of "the actual entities that ultimately ground them" instead, but rather a commentary on the fact that although some peers could suggest that change predicates could apply "to the actual entities that ultimately ground them", they definitely apply to the virtual entities. They must also be distinguished from those scope-restricting conditionals in which a term is defined, as metalinguistic conditionals do not attempt to define a concept, but rather comment on the adequacy of the term used to refer to it.

Non-committal conditionals are used by authors to distance themselves of claims which are presented but not asserted. These claims may be the author's or others'. Non-committal conditionals cover both Warchal's "reservation" conditionals (67) and Quirk *et al.*'s "uncertainty" conditionals (68).

(67) If we are correct in suggesting that there is an isomorphism between the Helmholtze-Gibson debate and the debate about linguistic knowledge, then a computational approach to language seems promising. (Warchal 2010: 147)

(68) Chomsky's views cannot be reconciled with Piaget's, if I understand both correctly. (Quirk *et al.* 1985: 1096)

The distinction between non-committal conditionals, especially those most similar to Warchal's reservation conditionals, and scope-restricting conditionals can sometimes become fuzzy. However, whilst in the scope-restricting type the focus is on the circumstances under which the claim would hold true, in non-committal conditionals the focus lies in the will of the author not to commit to the claim.

In order to summarise the information, Table 3.10 below includes the different types recognised, with a brief explanation of their function and an example for each of the uses.

Type	**Function**	**Example**
Known fact	To state widely accepted facts and mathematical truths.	Given that *x=y*, then *n(x+a)=n(y+a)* must also be true.
Hypothesizing	To state the likelihood of an apodosis given a protasis.	If a patient has an early failure from a low anterior resection, they may be able to be retrieved by resection.
Scope-Restricting	To describe the scenario or build the argumentative space in which the claims made held, either by defining a concept or specifying the universe to which the claim affects.	As such, it can be said to belong to modality if the category is defined as the expression of the speaker's attitude or stance.
Method	To narrate completed methodological procedures or to introduce instructions.	If 10% or more of the malignant nuclei were stained, the slide was scored as negative.
Rhetorical	Strong assertions which take the form of conditional structures	If they are Irish, I'm the Pope. He's ninety if he's a day.
Concessive	To introduce an impediment for the fulfilment of the apodosis, under which, nevertheless, it held.	Our point still goes through if the minimal phrase containing both parts of this idiom is always headed by a verb. …the use of change predicates is possible precisely because they apply to the virtual entities, if not to the actual entities that ultimately ground them.
Directive	To present an obligatory desirable course of event as if it were optional and not compulsory.	Now if we go to patients who experienced mucositis toxicity…
Politeness (Speech act)	To introduce a conventional expression of politeness	If I may be quite frank with you, I don't approve of any concessions to ignorance.
Relevance (Speech act)	To explain the circumstances under which the statement of the apodosis is relevant	Finally (if this is important), the S1 meaning can be converted into an S meaning to recover a more intuitive object to represent the meaning of the original sentence.
Meta-linguistic (Speech act)	To make a comment on the wording of the discourse	His style is florid, if that's the right word.
Non-committal (Speech act)	By authors, to distance themselves from others' claims.	Chomsky's views cannot be reconciled with Piaget's, if I understand both correctly.

Table 3.10: Typology of conditionals proposed in this work

3.3. *Interpersonality and mitigation in the typology*.

As explained in Section 1.3 above, the functions of conditionals in scientific writing can be divided into two main groups: their main function is to advance the arguments of the scientific narration being presented, but, at the same time, conditionals can also be used to improve the reception of the narration by the audience, by means of conveying some sort of interpersonal meaning. As already

explained, this latter function is particularly relevant in scientific discourse, as one's claims have to be accepted by one's peers in order to be considered scientific.

At the same time, conditionals can also be used to mitigate these claims, presenting them in a less categorical way, in order to improve the chances of success. This mitigation can be expressed directly through the use of the conditional structures, or indirectly, by using some other linguistic devices, such as modals, in the environment of the conditional structure.

Consequently, two pragmatic effects are identified, showing to be intimately related with conditionals in scientific writing: *interpersonality* and *mitigation*. To study this relationship will be the aim of this section.

Known fact conditionals express uncontroversial, universally acknowledged facts. They feature neither an interpersonal nor a mitigating function: they are completely related to the subject matter and their uncontroversial nature implies that there is no need for any mitigation. This is also the case of method conditionals, which simply state completed methodological procedures or general rules on how procedures are to be conducted. Again there is no need for any mitigation.

Hypothesizing conditionals are perhaps the most variable among all the different types defined in this classification, something perhaps not surprising, as they cover all types of conditionals making some sort of judgment about the likelihood of the apodosis. This type of conditional does normally contribute to the advance of the discussion on the contents, but may have an interpersonal function if it is used to guide the readers' train of thought, assuring that they reach the conclusion the writer intends them to reach (as in 51 above). In this type of conditionals, mitigation is not the responsibility of the conditional protasis, but of the possible (and frequent) modal verbs used in both the protasis and the apodosis.

Concessive and rhetorical conditionals deserve special attention. Concessive conditionals are useful to anticipate potential impediments towards the realisation of the protasis suggested by the readers. Thus, they help the author avoid potential criticism whilst, at the same time, emphasizing the sense of belonging to the same community and sharing knowledge. Their interpersonal nature is clear, but they do not mitigate the force of the claim in the apodosis, they rather imply that the apodosis would hold even in the case that the content in the apodosis holds. Rhetorical conditionals, on the other hand, are strong assertions which take the form of a conditional and which are interpreted by means of implicatures, as explained in Section 1 in Chapter 2. Rhetorical conditionals are necessarily interpersonal: as already explained, any implicature is to be interpreted by readers, basing their interpretation on a common ground, which in this case is the obvious status of truth or false of part

of the conditional. However, they obviously do not mitigate discourse, rather otherwise, they reinforce the content of the claim being made by presenting it as obvious.

All the other types of conditionals are both interpersonal and mitigating. Scope-restricting conditionals are used to make sure that the reader interprets the claims being made as only applying as expressed in the protasis, thus contributing to make explicit the sharing of concepts between author and audience. At the same time they are mitigating as they tone down the claims by making their validity conditional on their being interpreted as instructed in the protasis. Directive conditionals are used to present an instruction to the interlocutor (reader/hearer) as if it were optional, thus diminishing its force and saving the face of the interlocutor. Finally, speech act conditionals are used to make the validity of the utterance of the apodosis dependent on the content of the protasis holding. These protases can make reference to the reader's permission, to the consideration of the comment as relevant, to the precision of the wording or to the correctness of the information. In all these cases this information is dependent on the interpretation of the hearer, thus making its interpersonal nature clear. At the same time, they also make the validity of the protasis conditional on the fulfilment of a series of claims, thus featuring a mitigating function.

Known fact	Not interpersonal, not mitigating
Hypothesizing	Sometimes interpersonal, not mitigating (per se)
Scope-Restricting	Interpersonal and mitigating
Method	Not interpersonal and not mitigating
Rhetorical	Interpersonal, not mitigating (Blatant/Reinforcers)
Concessive	Interpersonal, not mitigating
Directive	Interpersonal and mitigating
Politeness	Interpersonal and mitigating
Relevance	Interpersonal and mitigating
Metalinguistic	Interpersonal and mitigating
Non-committal	Interpersonal and mitigating

Table 3.11: Classification of conditional structures according to their interpersonal and mitigating function.

A summary of the correlation between the conditional types presented in Section 3.2 and their interpersonal and mitigating functions can be seen in Table 3.11 above.

Summary of the Chapter

This Chapter has examined the functions of conditionals in scientific discourse, and has provided a typology based on these functions.

Section 1 has found that the uses of conditionals in scientific writing have an enormous degree of variability. Conditionals do not only contribute to advance the argument in the subject matter, but have also an important array of interpersonal functions, in keeping with the interpersonal nature of science and scientific discourse highlighted in Chapter 1. This section also presents the main pragmatic functions of conditionals, their use as interpersonal devices and their power to mitigate otherwise strong assertions through their inherent non-assertivity, arguing that they can be used as a criterion to classify different types of conditionals.

Section 2 focused on the examination of the wide array of existing conditional structures, and found that none of them can be successfully applied to the functions of conditionals in eighteenth and nineteenth century scientific writing. Consequently, a new typology had to be constructed. This is the aim of Section 3, which tries to classify the functions of conditionals in scientific discourse found in Section 1 in a new typology, taking into account the criteria discovered in Section 2. This new typology distinguishes eleven different types of conditionals according to their function in scientific writing, being influenced by the two pragmatic functions described above, mitigation and interpersonality. These eleven types of conditionals according to their function in discourse are known fact, hypothesizing, scope-restricting, method, rhetorical, concessive, directive, politeness, relevance, metalinguistic, and non-committal conditionals.

CHAPTER 4:

Corpus and methodology

Introduction

The previous chapters have covered the situation of science and scientific register in the period under study as well as the different types of conditionals which have been distinguished in the literature and the typologies used to classify them. However, before progressing to the actual analysis of data in Chapter 5, it is necessary to explain how the data which will be analysed have been obtained, and why these data are considered to be representative of eighteenth and nineteenth-century scientific English. This is the aim of this chapter, describing the corpus and the methodology followed to obtain and study the data used in this dissertation.

In what follows, Section 1 will describe the corpus used in the dissertation, the *Coruña Corpus of English Scientific Writing*, focusing on its design, the rules for the compilation of samples and the process of computerisation. At the same time, it will also explain how the corpus has been designed in order to fulfil the conditions of representativeness and balance by using a series of parameters, which are also described and discussed.

Section 2 depicts the set of samples in the *Coruña Corpus* which are used in the dissertation, the three subcorpora on astronomy, philosophy, and life sciences. It focuses on the distribution of samples and words according to the parameters mentioned in Section 1.

Section 3 describes the tool allowing the extraction of cases from the corpus, the *Coruña Corpus Tool*, together with some of its functionalities, necessary to obtain the data.

Finally, Section 4 presents the methodology used to obtain the cases further analysed in Chapter 5. It will focus on the process of disambiguation which has been applied to the first retrieval of occurrences in order to obtain the definite examples, as well as on the treatment of the data once the occurrences have been obtained and on the parameters used to analyse the data. Finally, a summary of the chapter is also offered.

1. The *Coruña Corpus*

The *Coruña Corpus of English Scientific Writing* (henceforth *Coruña Corpus* or *CC*) is a corpus of eighteenth and nineteenth-century scientific writing in English which is being compiled at present by the Research Group on *Multidimensional Corpus-Based Studies in English* (*MuStE*) at the Universidade da Coruña.

This section revolves around the characteristics making the *Coruña Corpus* a representative corpus for the study of eighteenth and nineteenth-century scientific English, and it is structured so as to echo the process of creation of a corpus. Thus, Section 1.1 addresses the general design of the *Coruña Corpus*, Section 1.2 reviews the principles of compilation, this is, the rules guiding the process of selection of particular samples conforming the corpus, and, finally, Section 1.3 analyses the computerisation of the samples and the editorial decisions taken during the process.

1.1. *General design of the* Coruña Corpus

The *Coruña Corpus* is a "purpose-built electronic corpus conceived of as a resource for the study of scientific writing[81] in English" (Moskowich 2012: 35), containing samples of texts of a scientific nature from the eighteenth and nineteenth centuries written in English. It consists of several twin subcorpora, all with the same design and principles of compilation, and one for each different field of knowledge or discipline.

The *Coruña Corpus* is designed to allow research at all linguistic levels except phonology (Crespo & Moskowich, 2009: 2) using the corpus as a representation either of the scientific writing of the period when taken as a whole, or of the register used in each of the disciplines when each of the subcorpus is considered individually (Parapar & Moskowich 2007: 289). The *CC* allows diachronic studies, as texts

[81] It is important to make clear that, in the context of the *Coruña Corpus*, "scientific writing" is to be understood in its broadest rather than in its narrow sense, as the *CC* includes texts on philosophy, history or linguistics. These disciplines, due to their not being a part of "hard sciences", present researchers with interesting opportunities to explore variation among very different disciplines.

are evenly distributed throughout the period under study, and comparative studies, for sets of samples can be compared on account of their discipline or of any of the other parameters taken into account during the process of corpus design, as shown in Section 1.2 below.

Moreover, each sample in the corpus is accompanied by a metadata file with information regarding its author's life and works, thus allowing for the consideration of sociolinguistic variables as well as being of interest to historians of science (Moskowich 2012: 35, 48). In what follows, some of the general traits of the design of the *Coruña Corpus* are analysed, namely the time-span it covers, its size, and its relevance in the field of historical corpora on scientific English.

1.1.1. *Time span*

The *Coruña Corpus* covers the period between 1700 and 1900. The eighteenth and nineteenth centuries are a period of deep change both in science and in the way it was written. The relevance of this period for the study of social changes in science and scientific writing, as well as the selection of 1700 and 1900 as boundaries for the corpus, are topics already studied in depth in Chapter 1, and nothing else will be added in here about them.

However, some characteristics of the period are relevant to the development of the compilation process. Among them, perhaps the most important are the constraints affecting the beginning of the period. During the first decades of the eighteenth century the different disciplines were still undergoing a process of specialization, and several disciplines such as chemistry and medicine, for instance, were still intermingled and not clearly distinguished from one another. At the same time, the process of vernacularisation of language was still under way, this is, science was still undergoing the transformation by which the language of scientific writing changed from Latin to English. These problems manifest in a higher difficulty to find suitable texts during this period.

1.1.2. *Size*

For a corpus to be considered representative, it has to feature a *sufficient*[82] size. Each subcorpus of the *Coruña Corpus* contains a series of samples of texts, each of which is approximately 10,000 words long, at a rate of two samples per decade to add up a total of 20,000 words per decade and discipline, 200,000 words per century and discipline, and 400,000 words per subcorpus. This would, arguably, allow to consider the whole *Coruña Corpus* big enough so as to dilute idiosyncrasy and be representative of the scientific writing of the period.

[82] What is to be considered "sufficient", a matter of debate in the epistemology of corpus linguistics, is a topic which greatly exceeds the scope of this work, and will not be addressed in here.

The size of each sample has been a matter of conscious selection: even though Biber (1993) has argued that 1,000-word samples are enough to study variation in scientific register, the *Coruña Corpus* contains samples of approximately[83] 10,000 words instead. The decision to select 10,000 words as the size of each sample is based mainly on the belief that scientific register was less standardised at the time (Moskowich 2016: 5) than it is today, and that 1,000-word samples, though perhaps representative enough in contemporary scientific register, would be neither satisfactory for a good representation of the register, nor sufficient for intra-textual study of variation in eighteenth and nineteenth-century samples. At the same time, and given the scarce number of valid samples particularly at the beginning of the period, the use of 10,000-word samples means that an inferior number of samples is needed for the same total number of words in the corpus.

Samples have been selected so that they cover all parts and sections of the text[84], thus avoiding the critique posed by the compilers of the *Lampeter Corpus*, which defend that samples are "arbitrarily cut-out smaller text chunks" (Claridge *et al.* 1999: introduction) and that full texts should be selected instead. However, in some cases texts are indeed included *in toto*. This is the case of shorter pieces, such as early astronomical articles (for instance, Wilson's 1774 article "Observations on the solar spots" published in the *Philosophical Transactions*), which are included, even though they don't reach the 10,000-word threshold, because these types of work are also representative of the scientific writing of the time. However, whenever such a sample is included, care has been taken to balance the total number of words in the decade.

1.1.3. *The* Coruña Corpus *in context*

The *Coruña Corpus* intends to cover a gap in the panorama of historical corpora on scientific English taking into account two different aspects. On the one hand, it covers a period which has been comparably less studied than other stages of the history of English (Beal 2012: 6), and which continues the chronology of other corpora, such as the *Lampeter Corpus* (1640-1740) or the *Helsinki Corpus* (730-1710). Thus, it complements these corpora and contributes to the development of the study of Late Modern English in general and of scientific register at that period in particular. On the other hand, the configuration of the *CC* is different from any other corpus: It does not cover science in general without

[83] Samples do not include exactly 10,000 words because one of the principles of compilation is paragraph integrity, thus making it very difficult to select samples of exactly 10,000 words. In fact, no sample in the set of subcorpora used in this study contains exactly 10,000 words.

[84] However, the section of the text the sample belong to has not been implemented as a parameter of study in the *Coruña Corpus*. This stands out among the most probable and profitable further developments of the *CC*, although the differences in sections and contents among different genres could represent a problem in order to have a sufficiently balanced distribution to enable the use of this parameter as a variable for study.

distinguishing disciplines (as the *Lampeter Corpus*), nor does it cover a single discipline (as the *CEEM - Corpus of Early English Medical writing-* does), neither does it include material outside scientific disciplines, as the *Helsinki* or *ARCHER* corpora. Moreover, the *ARCHER* corpus contains scientific samples only from the *Philosophical Transactions*, thus having a narrower scope relating to scientific texts than the *CC* (Moskowich 2011: 71).

1.2. *Principles of compilation*

The process of compilation has followed a basic criterion: selecting samples in such a way as to create a model which mirrors scientific writing (and each discipline) at the period as faithfully as possible, making the corpus *representative* (Biber 1993, McEnery & Wilson 1996, Biber *et al*. 1998: 251-253, McEnery *et al*., 2006: 5) of what was considered scientific writing during the period under study. This representativeness manifests in two aspects: the suitability of particular texts as examples of scientific writing (this is, the fulfilment of the requisites for each text in order to be considered for inclusion in the *CC*), and the selection of a set of samples which includes examples of the different types of scientific writing at the time. This set of samples is thought to conform, when considered as a whole, a balanced representation of the register at the time.

1.2.1. *Suitability of texts as examples of scientific writing*

In what has to do with the suitability of texts, the team of compilers established that only texts written directly in English should be considered eligible for inclusion in the corpus, discarding translations even when the authors were the translators themselves, as interferences from the original language (at the period, mainly Latin), would have appeared in the translated text. Moreover, only prose texts were selected (Moskowich 2012: 39), discarding texts in verse, which would show a distorted use of language because of their inherent constraints.

Whenever it has been possible, only first editions have been selected. However, when first editions were not available, editions published within a thirty-year timespan starting from the publication of the first edition were also allowed. This span is not arbitrary, as it follows Kytö, Rudanko & Smitterberg's (2000: 92) assumption that language change can be observed after thirty years (Moskowich 2016: 5). This is done in order to truly represent scientific language at a particular period and to avoid distorting the results by including samples dated at a given period but representing a more ancient model of language, that of the period when they were first published.

Finally, only written, edited and published manifestations of scientific writing have been considered. This is, in part, the result of the impossibility to obtain oral data from most of the period. This is an obvious limitation for the analysis of the scientific uses of English at the time, as the oral models of

scientific English used in the time cannot be analysed directly and, even though transcriptions of lectures are included, the corpus can be said to represent scientific *written* English only.

1.2.2. *Balance and representativeness of the samples*

The necessity for balance and representativeness in the set of samples imposed a careful selection[85] of each sample using a series of parameters to make the whole set as truthful a depiction of the reality of the period as possible. This methodology, leaving arbitrariness aside, renounces to randomization in order to ensure representativeness[86] and, at the same time, allows for socio-historical studies based on the parameters which are used to assure the representativeness of the set of samples. The parameters and the decisions taken during the compilation process regarding each of them are further analysed in what follows:

a) Disciplines

As explained above, the *Coruña Corpus* consists in a series of twin subcorpora dealing with particular disciplines. As a consequence, the first and perhaps most important parameter of selection is the discipline of each of the samples.

In order to select and classify samples according to their disciplines, UNESCO's *Classification of Science and Technology* (1988) has been used. However, as shown in Chapter 1, from the start of the scientific revolution, science has been undergoing a process of ever-increasing specialization, resulting that the further back one goes in time, the more general the disciplines were. UNESCO's Classification, then, had to be adapted (Moskowich 2012: 38, 2016: 4) in such a way as to make subcorpora more representative of what were considered different disciplines at the time. This adaptation has consisted, on the one hand, in the grouping of several specialised disciplines into single subcorpora: for instance, samples dealing with disciplines such as biology, biochemistry, geology, or botany, have been included in *CELiST*, a single corpus dealing with "Life Sciences", as they were not considered individual disciplines during the whole period under study. On the other hand, texts which would not be now considered examples of a given discipline (or indeed, texts which would not be now considered scientific) were included, as they were considered to be part of those disciplines during the period under study. An example of this is the inclusion of texts dealing with astrology in the astronomy

[85] Obviously, the selection of particular samples in a project dealing with eighteenth and nineteenth-century texts is also influenced by the physical availability of the different texts.

[86] Randomization could not be implemented as there were not enough texts available in the period in order to allow a randomization process within parameters of representativeness. This would not be the case of a contemporary scientific writing corpus, in which randomization would be maintained.

subcorpus, as during the eighteenth century the distinction between both disciplines was not clear cut and many scientific texts dealt with matter which would not be considered scientific nowadays[87].

Another important aspect is that no medical text has been included, as the *Corpus of Early English Medical Writing* (1375-1800) was being compiled by Taavitsainen and Pahta, and it could be considered as complementary to the *Coruña Corpus*, allowing for contrasting with medical writing.

Consequently, the compilers of the *Coruña Corpus* have selected ten different disciplines, which correspond to ten different subcorpora as shown in Table 4.1 below. Out of these ten subcorpora, the first three, *CETA*, *CEPhiT*, and *CELiST*, dealing with astronomy, philosophy, and life sciences, respectively, have either been published (*CETA* in Moskowich & Crespo 2012, *CEPhiT* in Moskowich *et al*. 2016) or are sufficiently developed to be ready to use in a Beta version (*CELiST*).

Discipline	**Subcorpus**
Astronomy	*CETA*
Philosophy	*CEPhiT*
Life Sciences	*CELiST*
History	*CHET*
Physics	*CETePh*
Linguistics	*CETeL*
Mathematics	*CEMaT*
Chemistry	*CECheT*

Table 4.1: Subcorpora of the *Coruña Corpus* and their disciplines

b) Genre of the texts[88]

The *Coruña Corpus* features different types of scientific texts. The inclusion of different genres is necessary in a study such as this, as, quoting Moskowich, "within one single discipline or discourse domain multiple cases of linguistic modifications and changes may be in evidence, depending on the

[87] In fact, one of the characteristics of many texts of the period is their tendency towards miscellany, as shown in James Dodd's 1752 *An essay towards a natural history of the Herring*, in which anatomical descriptions of the animal share space with recipes to cook them.

[88] Compilers of the *Coruña Corpus* refer to this parameter/variable as "genre" rather than as "type of text". The reason for this is that compilers consider that their categories conform better to the concept of genre than to that of type of text. Following compilers (Moskowich 2012b, Moskowich & Crespo 2012b, Crespo 2016), text types are considered to be the result of a classification according to the internal characteristics of the texts, such as form, style and purpose; whilst genres also take into account their external functions (García-Izquierdo & Montalt 2002), extralinguistic factors such as subject matter, purpose, discourse situation (Rissanen 1996), and the reader's perspective (Moessner 2001: 132). Nevertheless, for the classification of samples, compilers have used Görlach's (2004) definition of what he considers text-types as one of their tools. As this is a complicated question, on which compilers have reflected (Moskowich & Crespo, 2012b: 18) and which exceeds the scope of this dissertation, the decision taken here has been to follow the compilers' terminology, and thus maintain terminological unity in works using the *Coruña Corpus*.

genre to which that discourse sample belongs" (2012: 37). Moreover, featuring texts from different epistemological levels (Fortanet *et al.* 1998) allows finding interesting differences based on the type of readership and the medium of publication of each text.

In order to create a typology of genres which can approximately mirror production at the time (Moskowich 2012: 42, Görlach 2004: 1), compilers have conducted a close examination of the textual reality of the period, paying attention both to the textual characteristics of the samples and to their epistemological features and social functions (Crespo 2016). After this has been completed, eight different genres were distinguished in the three subcorpora under analysis: *Article, Dialogue, Essay, Lecture, Letter, Treatise, Textbook* and *Others*, in which several little-represented categories have been put together.

In order to assign a genre to each individual sample, compilers have conducted a process of external classification, using two main criteria: Present-day definitions of the different genres, such as those by Görlach (2004), and the *Oxford English Dictionary*, which can be seen in Table 4.2 in the next page; and the perspective of the period under study, especially the opinion of the authors of the texts about which genre they were writing as stated in the titles and the prefaces of their works (Moskowich 2012b: 28, Crespo 2016: 26, Moskowich & Crespo forthcoming).

These categories are not evenly represented over time or between the different disciplines. Instead, they are represented according to the reality of the period. For instance, as already explained in Chapter 1, articles are rare in the eighteenth century and more relevant in the nineteenth century, as they were not so developed at the time of study as they are today; whilst textbooks, among other types, were essential in the initial segment of the period, contributing to the dissemination of knowledge in disciplines such as astronomy, but they appear to be less important in disciplines such as philosophy or at a later stage.

c) Authorship and biographical parameters

In order to select their works, authors also had to fulfil a series of requirements. A prerequisite is that, in order to avoid any bias of idiosyncrasies in the results and thus avoid jeopardising representativeness, only one work per author is allowed in all of the *Coruña Corpus*.

Authors were carefully selected, and preferably those "about whom we could find basic biographical information and hence whose linguistic habits we could infer" (Moskowich 2012: 48) were selected. However, this is not always possible as information about the authors of some of the earlier works is scarce. Two variables have been taken into account regarding the representativeness of the authors: geographical provenance and sex.

Category	**Görlach's Definition**	***OED* Definition**
Article	Non-fictional composition or dissertation in a newspaper, journal or read at a conference	Literary composition forming materially part of a journal, magazine, encyclopedia or other collection, but treating a specific topic distinctly and independently.
Dialogue	Literary work in conversational form.	Literary work in the form of a conversation between two or more persons
Essay	Short prose composition, first draft.	Composition of moderate length on any particular subject or branch of a subject; originally implying want of finish, an irregular undigested pieces, but now said of a composition more or less elaborate in style though limited in range.
Lecture	Formal discourse delivered to students. Piece of writing intended to be read aloud.	A discourse given before an audience upon a given subject, usually for the purpose of instruction. The regular name for the discourses or instruction given to a class by a professor teacher at a college or University
Letter	Written communication (not necessarily sent by post).	A missive communication in writing, addressed to a person or body of persons; an epistle. Also, in extended use, applied to certain formal documents issued by persons in authority.
Treatise	Discussion of a topic including some methodological issues.	A book or writing which treats some particular subject; commonly (in mod. use always), one containing a formal or methodical discussion or exposition of the principles of the subject; formerly more widely used for a literary work in general.
Textbook	Book used as a standard book.	A book used as a standard work for the study of a particular subject, now usually one written specially for this purpose; a manual of instruction in any science or branch of study, esp. a work recognised as an authority. // A book containing a selection of Scripture texts, arranged for daily use or easy reference.

Table 4.2: Definitions of categories according to Görlach (2004: 88) and the *Oxford English Dictionary* (apud Moskowich, 2012b: 29-30)

c.1) Geographical provenance

The samples in the corpus do not only include texts by authors writing in British English, but also American, Scottish, or Irish authors, thus allowing for analyses based on their geographical provenance.

As already explained, only texts written primarily in English (and not translations) were selected, in order to maintain the representativeness of the samples as instances of scientific writing in English. This is also the rationale for the exclusion of non-native writers, whose use of English would not be representative of the language used at the time either.

The information about the geographical origin of the authors is based on their place of education instead of on their birthplace. The motivation for this is that "this is where they were most likely to have acquired the linguistic habits to be found in their writings" (Moskowich 2012: 48).

The distribution of samples is not even. Again, the reason for this is the necessity of preserving the representativeness of the texts. This is why, for instance, there are comparably fewer samples written by American authors in the eighteenth than in the nineteenth century, as this distribution would mirror the reality of a period in which America was ridden by war and science was still developing.

c.2) Sex

The majority of the samples of the *Coruña Corpus* were written by men, as was the case of science in general during the period of study. At this time, women had serious difficulties to access scientific knowledge and faced very important obstacles to become part of the social community of scientists, as shown in Chapter 1. However, every subcorpus of the *Coruña Corpus* presents samples of texts written by women. This has not always been easy, as women authors lacked biographical information much more often than men did[89], and they also had to write under pseudonyms or anonymously more frequently (Crespo 2014).

Again, the distribution of samples is not balanced, but it reflects the reality of the time in order to assure the representativeness of the corpus. In fact, in certain subcorpora some women were consciously left aside in order to avoid a bias of over-representation.

1.3. *Computerisation and editorial policy*

The process of computerisation of the original samples consists of two parallel processes: first, the original texts, after being scanned on PDF, have to be converted into plain text (.txt), and then, this text has to be tagged in order to be encoded as an .xml file.

The process of transcribing original samples into plain text is long and sometimes problematic: as the *Coruña Corpus* contains eighteenth and nineteenth-century texts, many of them are not ready for a raw Optical Character Recognition (OCR) process, not only because of the quality of printing and their state of conservation (ink blots, faulty printing, missing pages…), but also because of the presence of old spellings such as <ſ> or <ct> ligature. This means that most texts, especially those from the eighteenth-century, have had to be manually typed. Only the most recent texts from the nineteenth-century could be OCR-processed. In any case, both manually-typed and OCR-processed texts have

[89] In fact, women's change of surname on the event of their marriage is, perhaps surprisingly, a very serious, sometimes unsurmountable, obstacle when looking for information on women authors.

undergone subsequent revisions (up to three times, each by a different member of the compilation team) in order to provide the most faithful representation of the original[90].

After this process is completed, these .txt files of plain text have to be tagged, using eXtended Mark-up Language, or XML, as the mark-up language. Text Encoding Initiative (TEI) guidelines (Sperberg-McQueen and Burnard, 2002) have been followed, using some of the tags proposed by TEI (but not all) in the process of tagging, as shown in Table 4.3 below. The result is an .xml file which is readable by the *Coruña Corpus Tool* (*CCT* or *CCTool*) as will be explained in Section 3 below.

Tag	**Meaning**
<pb>	Page Numbers
	Division of chapters and sections
<head>	Titles of chapters and sections
<p>	Paragraph
<abbr>	Abbreviation
<emph>	Italics
<note>	Footnote
<del>	Contents which are not analysable.

Table 4.3: TEI tags used in the *Coruña Corpus* (taken from Camiña & Lareo, 2012: 51-52)

For each sample, a metadata file with information about the author and the text sampled has also been tagged. This, furthermore, allows the use of sample-selection parameters as variables of study, as will be explained below.

1.3.1 *Editorial decisions*

The main criterion established by the compilers during the process of computerisation has been rendering the computerised versions of the texts as similar to the original texts as possible. However, this desire had to be weighed against the need for usability, "offering researchers the possibility of working with the information stored in the texts in an open, flexible and productive way" (Moskowich 2012: 51), in such a way that a compromise had to be reached between the two factors. Finally, these two factors were also influenced by the limitations of the *Coruña Corpus Tool*, which, even though designed to fulfil these principles to the largest extent possible, has also placed some limitations in the edition of the text. Consequently, a series of compromises have had to be reached.

[90] Admittedly, some inconsistencies might still be found as this is a totally manual process subject to human error (Camiña & Lareo, 2012: 44, 2016: 45).

a) Headers

Each and every computerised sample in the *Coruña Corpus* contains a header complying with the TEI rules, including four small sections with information, as shown in Figure 4.1 below. The first section includes information about the name of the file, the full name of the research group, the sponsors of the study and the name of the head of the research group. The second one includes the name of the subcorpus and the number of words in the sample. The third section shows, in bold pink, the acronyms of the research group and the text "Coruña Corpus". Finally, the fourth section includes the full reference of the text sampled and the pages selected from it.

After the header, each file starts with the title of the text, its author, and the year of publication in bold and centered, and, after that, the page number and, in a larger bold blue font, the name of the chapter in which sampling starts. Subsequent chapters appear in a similar fashion, blue, bold and centered, whilst page numbers appear centered, but in regular black font, with the original numbering being maintained.

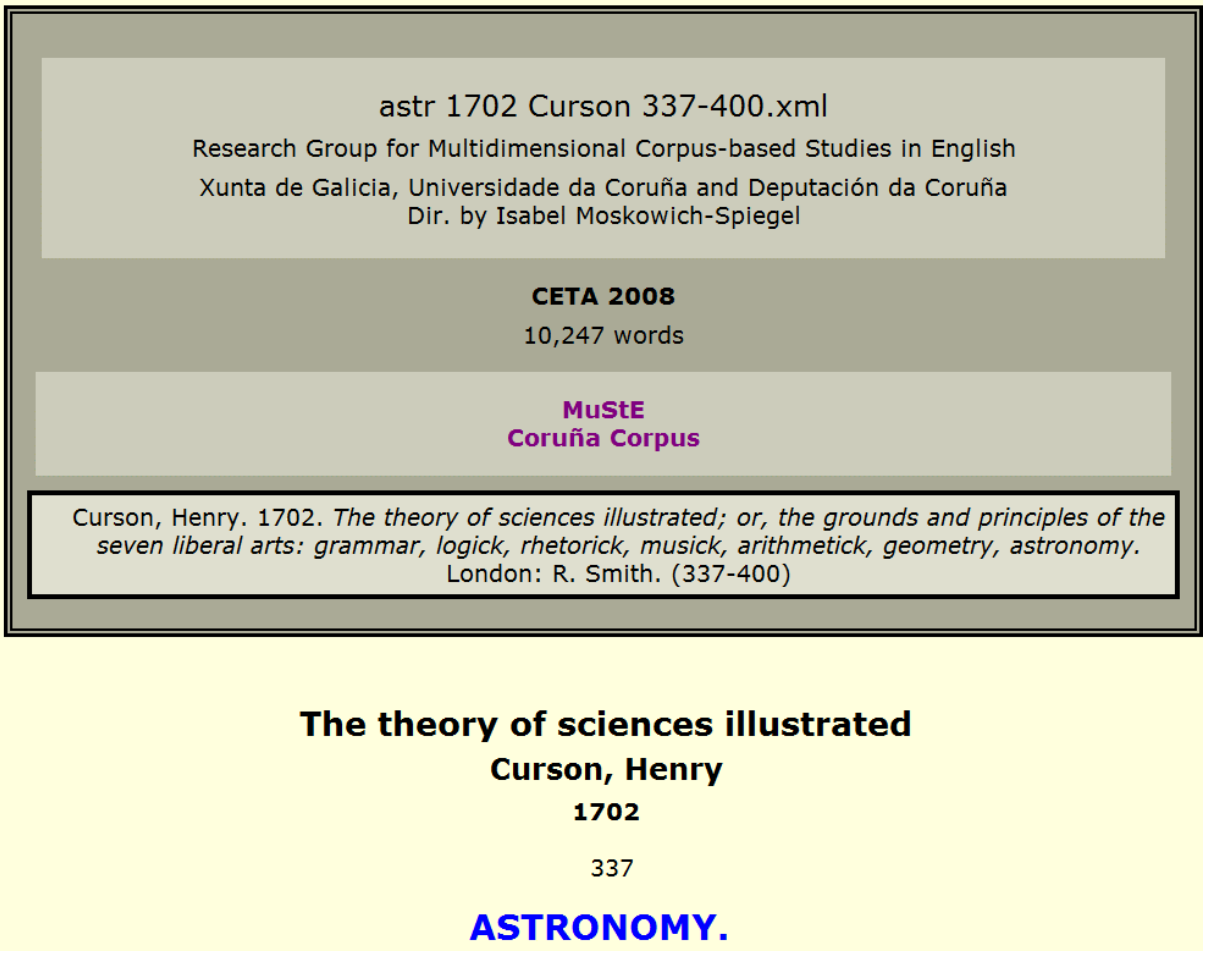

Figure 4.1: Header and first lines of Curson's 1702 text.

b) General Layout

The font used in the *Coruña Corpus* is Arial Unicode MS, with font size 13 in plain text, thus allowing for comfortable reading. Original paragraphs have been kept, though lines are not faithfully represented, and truncated words have been re-joined. However, paragraphs have not been respected in footnotes, since the division of footnotes in paragraphs is restricted by TEI rules. All notes, disregarding their original position in the page, appear after the word they refer to, and not at the end of the page or document, to allow for an easier comprehension.

Editorial material referring to the indexing of the text, or appearing in page headers, footers & margin notes, has been eliminated, as were any repeated words, including the repeated last word of a page at the beginning of the following one, common in eighteenth century texts (Camiña & Lareo 2016: 53).

c) Content

Regarding the content of the text, the drive for faithfulness to the original explained above manifests in the use of characters provided by the Unicode consortium (Camiña & Lareo 2012: 50, 2016: 51) to represent old spelling occurring at the period under study, such as <ſ>, or <ct> ligature, as well as symbols such as those representing the signs of the zodiac. This decision has influenced the design of the *CCT*, as it takes into consideration varying spellings, so that when a word with evolving spellings is searched, all its different spellings through time appear in the results window.

Similarly, other spellings are maintained in their original form provided that they are attested in the *OED*, in order to represent the language of the period as faithfully as possible. However, the compilers have decided to correct the spellings when they are not attested in the *OED*, as they consider these a typo or a mistake of the printer and not a conscious decision on the part of the author (Moskowich 2012: 52). Some elements of punctuation have also been regularised, eliminating extra blank spaces before punctuation signs as well as stops before question marks, among others. Additionally, hyphens are maintained when they appear in compounds, but substituted by EM-dashes when used as layout marks.

d) Quotations and non-analysable material

The treatment of quotations depends on whether their content affects the comprehension of the text or not. If the quotation can be eliminated without affecting the meaning of the text, it is eliminated (as are poems or editors' comments); otherwise, it is maintained. In any case, quotations are never indexed by the *CCT*, this is, the content of quotations does not appear among the results when the sample is analysed with the *CCT*, and they are not part of the word count of the samples, either. The

rationale behind this decision is that these words are not part of the language of the author, as they are not written by them, but quoted from other authors' works. They are non-analysable items, and their presence is denoted in the document view of the *CCT* by appearing in red. Other non-analysable elements are symbols, as the signs of the zodiac mentioned above, or successions of letters or numbers, such as those appearing when referring to geometrical figures, angles or coordinates.

e) Editorial marks

Finally, editorial marks have been added where needed, appearing between square brackets. They are used to identify unclear elements, marking them as [unclear], as well as to provide information about the location of quotations, figures, tables or formulae in the original text. A summary of the different editorial marks used in the *Coruña Corpus* can be seen in Table 4.4 below.

[quotation]
[quotlat], [quotgreek] etc
[fragment]
[fragmentlat], [fragmentgreek] etc
[note], [endnote], [margin note]
[figure], [table], [poem], [formula]
[unclear]
[omitted pages], [missing page(s)]

Table 4.4: Editorial marks used in the *Coruña Corpus*.

Square brackets are also used to disambiguate between homographic forms: for instance, the Roman numeral [I] appears enclosed in brackets in order to avoid it be mistaken for the personal pronoun I.

THE
GOLDEN RULE
OF
Divine Philoſophy.

CHAP. I.

WHEN God at firſt created the Heavens, the Earth and Sea, and all Things contained in them, it pleaſed him to create the heavenly Beings, a pure aerial Spirit without a Subſtance, gave them Beings without Want, or Need of any Kind of material Subſiſtance.

He gave them alſo a Will, and Ability to exerciſe their Wills at freedom, only reſerving to himſelf the Reins of Government, that they ſhould not exerciſe their Wills beyond his Licence.

But ſome of them growing Vain-glorious of thoſe great and glorious Abilities of Will and Power, and not knowing that it was only a Gift, and limited, began to envy their Creator, or rather his Bleſſed Son, with whom they thought they could claim Precedence, or at leaſt Equality, vainly conceiting

```
<front>
 <titlePage>
  <titlePart>The Golden Rule of Divine
Philosophy</titlePart>
   <docAuthor>Kirkpatrick, Robert</docAuthor>
   <docImprint>Printed by R. Kirkpatrick
   <pubPlace>London</pubPlace>
<docDate>1730</docDate></docImprint>
  </titlePage>
 </front>
 <body>
<pb n="7"/>

<p><abbr>CHAP.</abbr> <num>I</num>.</p>

<p>WHEN God at firſt created the Heavens, the
Earth and Sea, and all Things contained in them,
it pleaſed him to create the heavenly Beings, a
pure aerial Spirit without a Subſtance, gave them
Beings without Want, or Need of any Kind of
Material Subſiſtance.</p>

<p>He gave them alſo a Will, and Ability to
exerciſe their Wills at freedom, only reſerving
to himſelf the Reins of Government, that they
ſhould not exerciſe their Wills beyond his
Licence.</p>

<p>But ſome of them growing Vain-glorious of
thoſe great and glorious Abilities of Will and
Power, and not knowing that it was only a Gift,
and limited, began to envy their Creator, or
rather his Bleſſed Son, with whom they thought
they could claim Precedence, or at leaſt
Equality, vainly conceiting
```

The Golden Rule of Divine Philosophy
Kirkpatrick, Robert
1730

7

The Golden Rule of *Divine Philosophy.*

[CHAP]. [I].

WHEN God at firſt created the Heavens, the Earth and Sea, and all Things contained in them, it pleaſed him to create the heavenly Beings, a pure aerial Spirit without a Subſiſtance, gave them Beings without Want, or Need of any Kind of Material Subſiſtance.

He gave them alſo a Will, and Ability to exerciſe their Wills at freedom, only reſerving to himſelf the Reins of Government, that they ſhould not exerciſe their Wills beyond his Licence.

But ſome of them growing Vain-glorious of thoſe great and glorious Abilities of Will and Power, and not knowing that it was only a Gift, and limited, began to envy their Creator, or rather his Bleſſed Son, with whom they thought they could claim Precedence, or at leaſt Equality, vainly conceiting

Figure 4.2: Process of computerisation of the first page of Kirkpatrick's 1730 sample. From left to right, original scanned text, XML-tagged text and output of the text in the document view of the *CCT*.

By enclosing the numeral with the square brackets, the *CCT* is able to consider it as a different word, thus avoiding both its misrepresentation and its miscounting. Other examples of this use are the abbreviation for number [no.], which could be confounded with the negative adverb *no*, as well as any combination of names of points and segments rendering a result homographic to an existing word. The evolution from scanned original texts to tagged output of a *Coruña Corpus* sample can be seen in Figure 4.2 above.

2. Corpora used in this study

This study uses three of the subcorpora of the *Coruña Corpus*: the *Corpus of English Texts on Astronomy* (*CETA*), the *Corpus of English Philosophy Texts* (*CEPhiT*) and the *Corpus of English Life Sciences Texts* (*CELiST*). These three corpora contain 122 samples of texts, and add up to 1,215,003 words. The texts which have been used are listed in Appendix 1 below. In what follows, the corpus used in the study is described in detail, organising the information according to the parameters used during the process of compilation (as explained in Section 1.2.2 above), which are also the parameters of the analysis of data. This analysis will review the distribution of words and samples according to each of them, starting with that of discipline, and continuing with the time of publication, the genre of the text, the geographical origin, and the sex of the author.

2.1. *Disciplines*

Samples from three subcorpora, dealing with astronomy, philosophy and life sciences, have been selected. The use of these three disciplines intends to give a representative overview of the uses of scientific register as a whole, since they are sufficiently different in nature as to represent different styles and approaches, as explained in Chapter 1. As can be seen in Figure 4.3 below, *CETA*, the Astronomy subcorpus, presents 42 samples and 409,909 words. *CEPhiT*, the Philosophy subcorpus, presents 40 samples and 401,129 words; whilst *CELiST*, dealing with Life Sciences, contains 403,965 words and a further 40 texts.

As explained in Section 1 above, the differences between the disciplines are due to the fact that the samples contain *approximately* 10,000 words, thus allowing for slight differences when adding up the numbers of each discipline, a variation which will also be present in all the different parameters presented below.

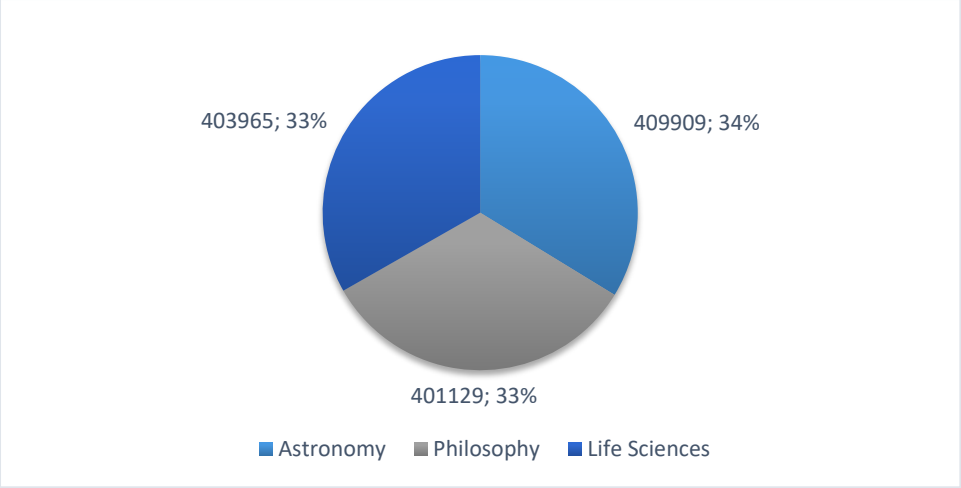

Figure 4.3: Words per discipline

The subcorpus on astronomy, *CETA*, presents 42 texts instead of 40 as four texts (two each in the 1770s and 1880s) have been included *in toto* (see Section 1.1.2 above) despite containing fewer than 10,000 words each, summing these approximately 10,000 words when considered in pairs, instead. This difference in the number of samples will also be present throughout the analysis of the different parameters, and, as will be the case with the difference regarding the length of the samples.

2.2. *Period of study*

The three subcorpora are used in this study in their entirety, thus analysing the full period between 1700 and 1900. As shown in Figure 4.4 below, samples from both the eighteenth and nineteenth centuries add up to a similar figure of words: there are 61 samples in each one, with 608,644 words between 1700 and 1800 and 606,359 words in the period between 1800 and 1900.

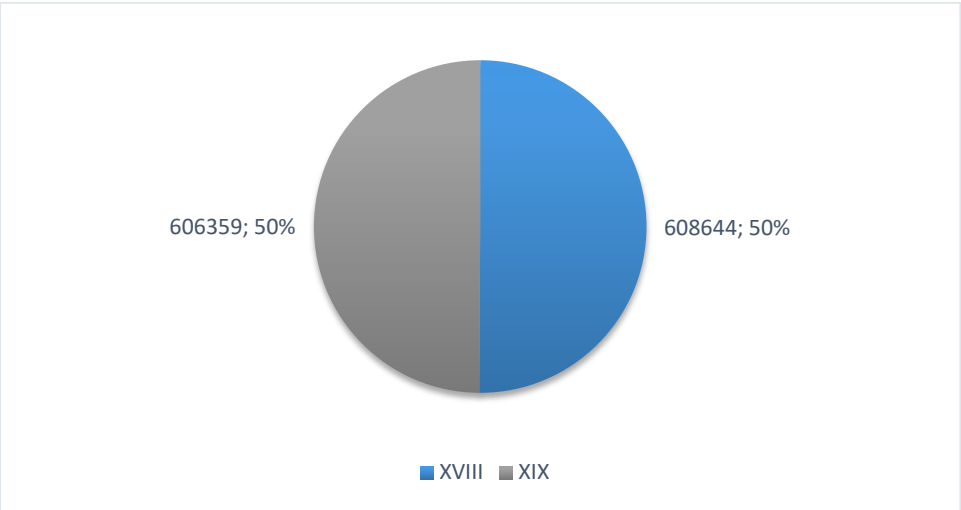

Figure 4.4: Distribution of words per century

Analysing the distribution of the data over the period, each decade[91] features six samples, but for the 1770s and 1880s, which show seven works each. As can be seen in Figure 4.5 below, samples from each decade add up to approximately 60,000 words, with a variation between the 58,830 words of the decade whose samples feature the fewest words (1840s) and the 64,086 words of the one with the highest amount of words (1850s).

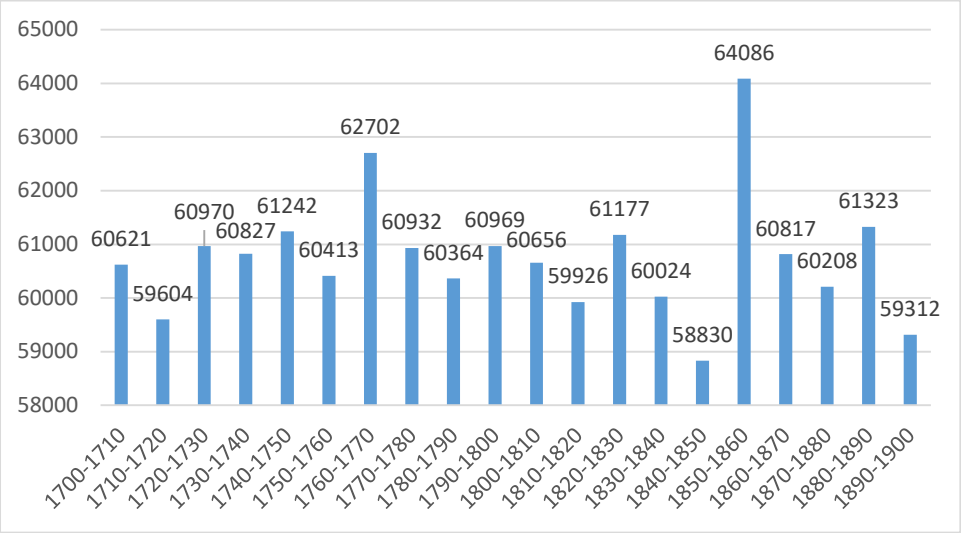

Figure 4.5: Distribution of words per decade (N.B: *y* axis starts at 58,000 words)

2.3. *Genre of the samples*

The samples selected provide a representative view of the different genres used in English scientific writing during the period under study. As can be seen below in Figure 4.6, most of the samples (61 out of 122, adding up to 610,183 words) are treatises, in line with the common uses of the period. After treatises, the most frequently used genres were textbooks (20 samples, 206,277 words), reflecting the drive for popularisation of scientific knowledge at the period; essays (14 samples, 142,554 words), and lectures (12 samples, 120,538 words).

There are seven samples of articles, the first examples of the genre which would later, as explained in Chapter 1, dominate scientific writing, but which only add up to 53,861 words, thus showing their shorter length. There are also some examples of genres which are nowadays not normally used in scientific writing, such as the five examples of letters (51,555 words), a genre then very much in use as a way of communicating scientific knowledge; and the two dialogues (19,991 words), characteristic of the earlier scholastic paradigm but still in use (though receding) in scientific writing at the start of

[91] Texts are selected at a rate of two samples per decade and subcorpus, irrespective of the actual year of writing. Consequently, the distribution of texts inside each decade is not regular and it is by considering the diachronic distribution in terms of decades and not years that the best comparative view is offered.

the period. Finally, there is also a dictionary, which appears under the label "others[92]" and which contains 10,044 words.

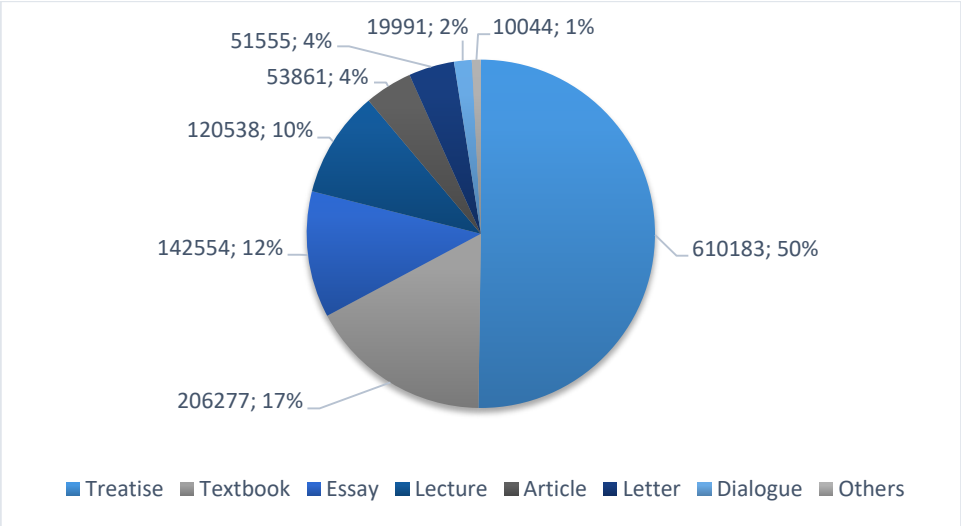

Figure 4.6: Distribution of samples and words per genre.

2.4. *Geographical distribution*

The samples included in the study were not only written by English authors, but also by authors coming from Scotland, Wales, Ireland, and North America, thus representing the entirety of *native* English-speaking areas at the period.

The results presented below in Figure 4.7 show that the majority of texts (56 texts, 556,885 words) were written by English authors, particularly during the eighteenth century. There is also a sizeable number of samples (28, 276,331 words) written by Scottish authors, whilst Irish (10 samples, 101,723 words) and North American authors (16 samples, 158,170 words) appear less frequently.

It is also noticeable that there is an important number of authors (12 samples, adding up to 121,894 words) which are classified under the label "others". This label includes two different types of authors: some of them are authors about whose upbringing the compilers of the corpus have not found definite information, thus denying the possibility of their classification. Another sizeable group is formed by authors who have been educated in several countries during their lifetimes. These authors might have thus been influenced by more than one diatopic variety and might have used a mixed variety themselves.

[92] This label includes more than dictionaries, as other subcorpora, not selected in this dissertation, include other genres, all of them sharing the characteristic of their being less frequently used.

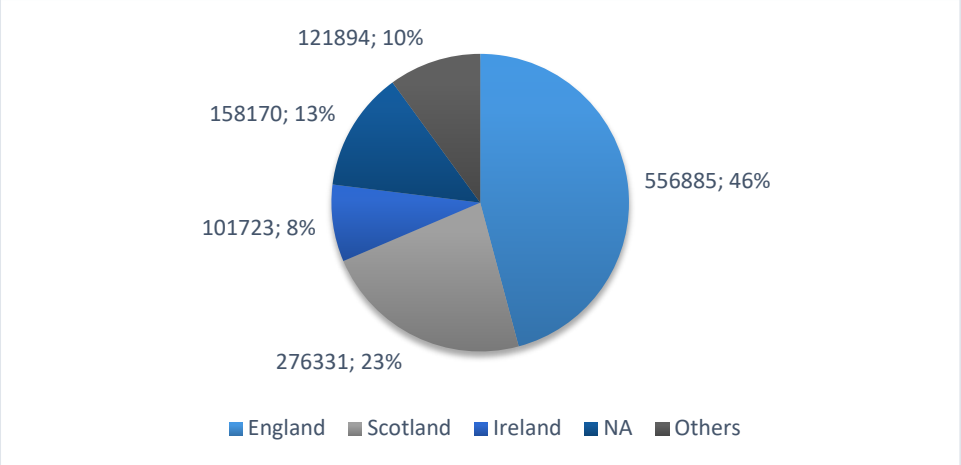

Figure 4.7: Distribution of word per provenance of the author.

The decision of gathering these two types together may be put into question, but the second group is too heterogeneous (several combinations of countries at different periods resulting in particular and different idiolectal varieties) to consider it as a definite group, and the first one is not a group as such, but rather an assortment of authors about whose upbringing there is no information[93].

2.5 *Sex of the authors*

The great majority of the samples were written by men (110 out of 122), and just twelve were written by women. As can be seen below in Figure 4.8, this means that only 10% of the words (123,978) in the corpus were of female authorship, whilst 90% (1,091,025 words) were written by men. As explained in Section 1 above, this figures can be considered to be in keeping with the reality of the time.

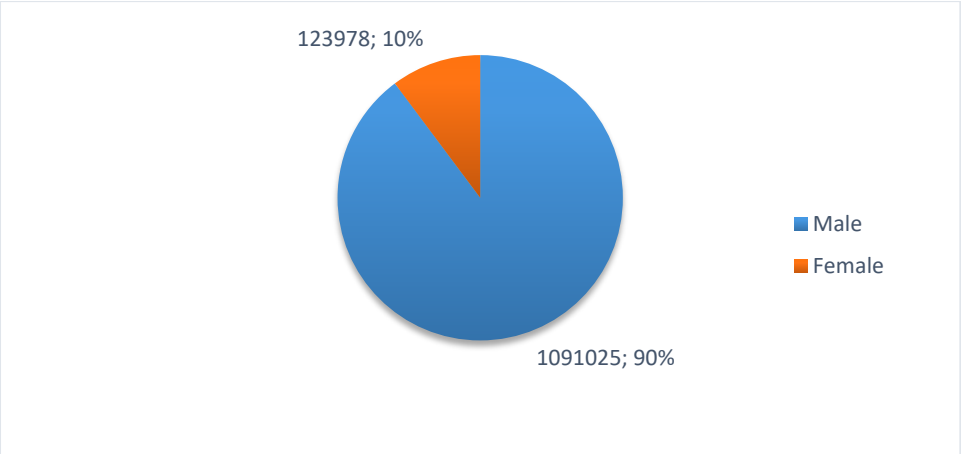

Figure 4.8: Distribution of words per sex of the author

[93] Although not being able to obtain information about an author is interesting *per se*, as it might be considered a significant evidence of their social status, the fact that an author's provenance is unknown is no ground to constitute a group, as each of these authors whose provenance is not known would probably have a different background and the result would be another hodgepodge.

3. *The* Coruña Corpus Tool (CCT)

To obtain the data, that is to say, the individual examples of uses of conditionals in scientific writing which are analysed in Chapter 5, searches for the relevant particles have been made in the selected subcorpora of the *CC* with the help of the *Coruña Corpus Tool*.

The *Coruña Corpus Tool* is a corpus management tool developed by the IRLab of the Universidade da Coruña in collaboration with the MuStE Research Group. The *CCT* has been specifically designed under the supervision of the compilers of the *Coruña Corpus* for its use with the texts of the *CC* "to help linguists to extract and condense valuable information for their research" (Parapar & Moskowich 2007: 290). Even though, as already explained in Section 1.3 above, the design of the *CCT* has influenced the process of texts computerisation by imposing some limits, it has been designed so as to fulfil the criteria of faithfulness and usability to the utmost degree.

The main feature of the *CCT* is that it creates an index from the set of samples compiled in the *CC* and, in order to conduct searches, it works with this index and not with plain text, as most concordance programmes do (Lareo & Moskowich 2012: 8). Moreover, the *CCT* can extract information using several criteria (date, genre, or discipline of the samples, among others), as it has been built with a multi-field index based on the metadata file accompanying each sample.

Once in the *CCT*, after the process of launching the Corpus is completed[94], the user finds three main tabs: "Search", "Tags" and "Info".

3.1 *Info Tab*

The Info tab allows users to see a tree in which the different samples are presented, organised according to the subcorpus they belong to. Once any sample is selected, two files will be shown, called Metadata and Document.

The Metadata file, shown in Figure 4.9 below, presents information about the author and the sample. This includes demographic data (sex, date of birth and death, occupation and place of education), a short biography of the author, and bibliographical information about the sample (data sampled, genre, year and place of publication, age of the author at publication and further information about the text, especially having to do with edition).

[94] See Lareo & Moskowich's (2012: 3-4).

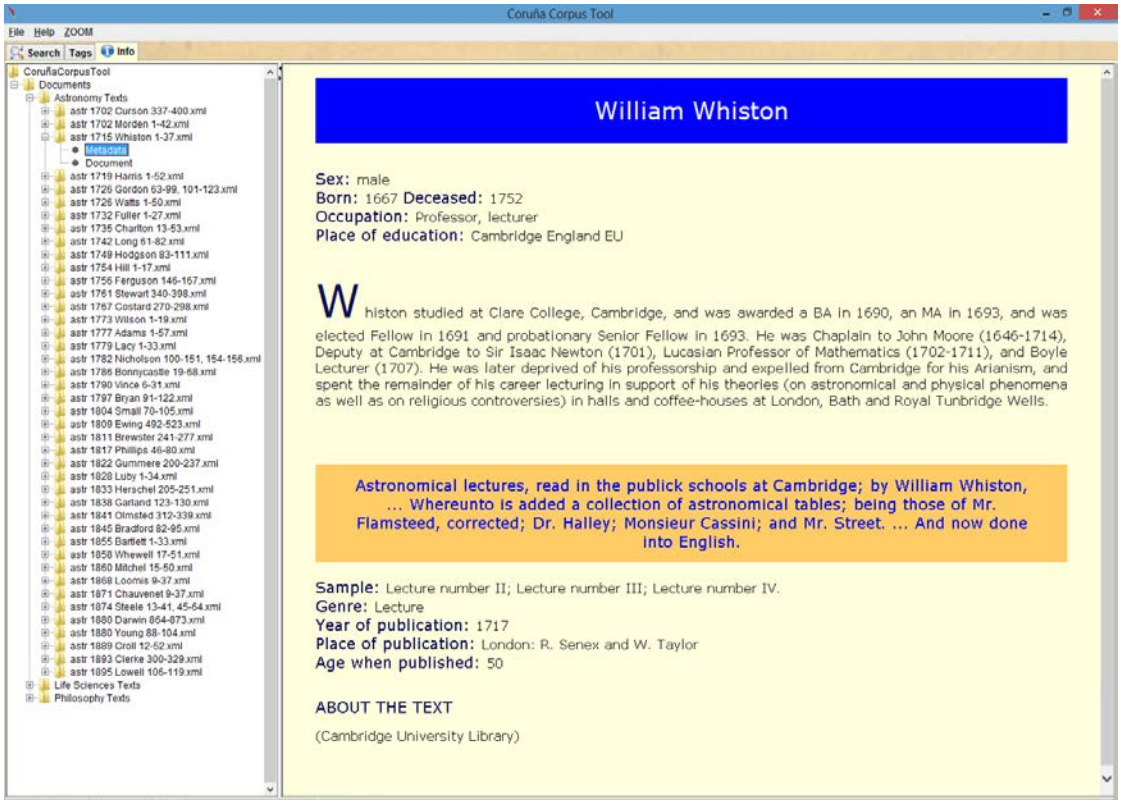

Figure 4.9: Metadata file of William Whiston's 1717 sample.

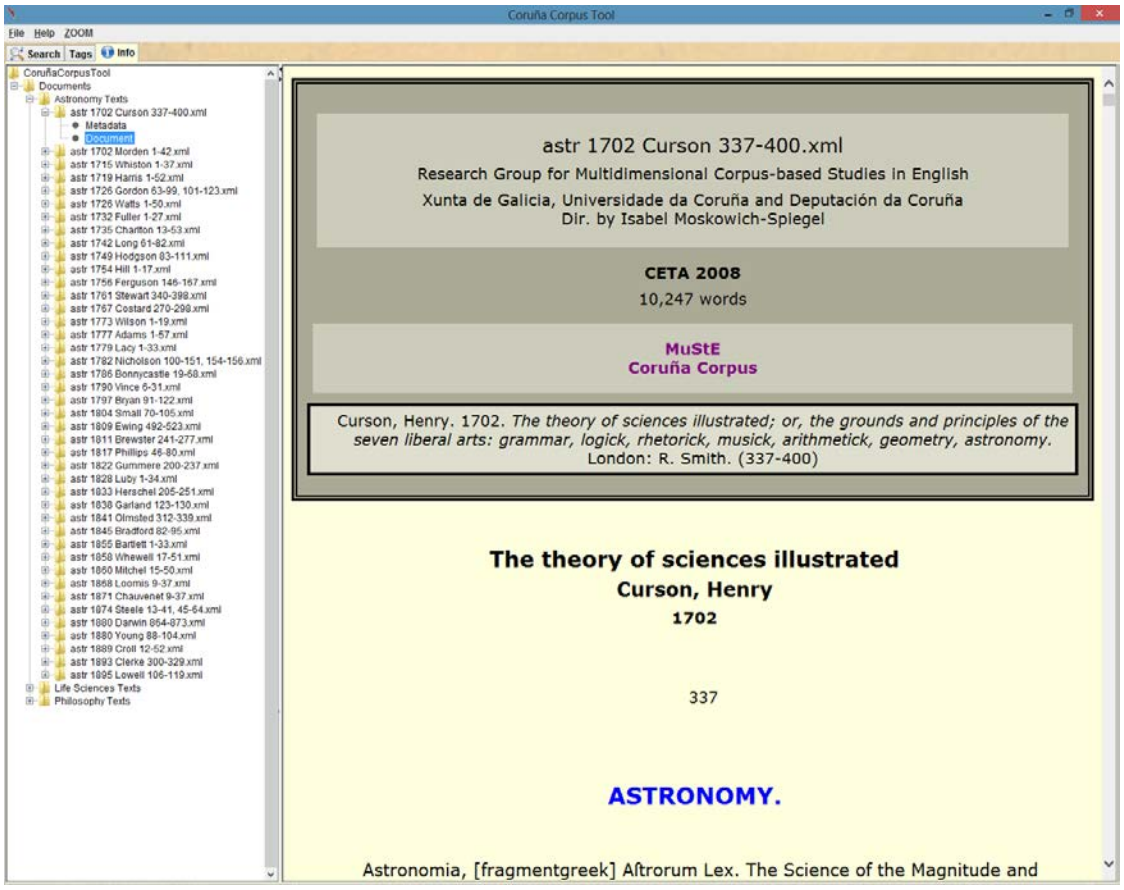

Figure 4.10: Document file of Curson's 1702 sample.

The Document file, as shown in Figure 4.10 above, presents the computerised output of the file, representing the pertinent sample following the editorial decisions explained in Section 1.3 above. This is "where the team's editorial work is seen best" (Lareo & Moskowich, 2012: 7), as it features the maximum faithfulness towards the original text.

3.2. *Search tab*

The search tab is the main interface of the *CCT*. As can be seen in Figure 4.11 below, most of it is occupied by a big screen in which results are shown.

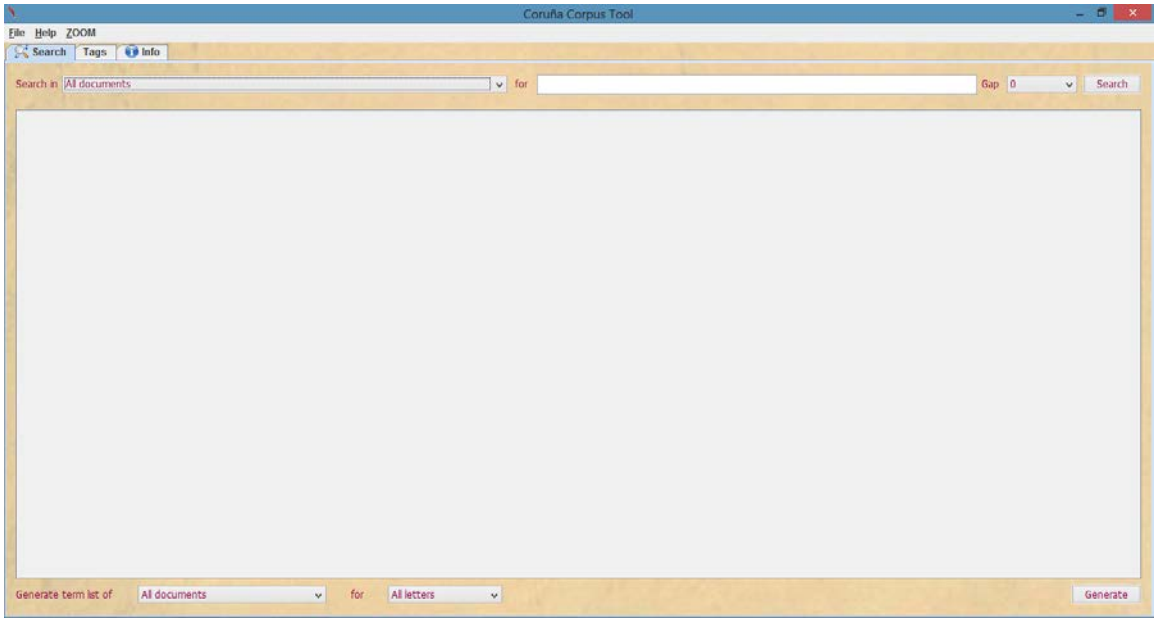

Figure 4.11: View of the Search window of the *CCT*.

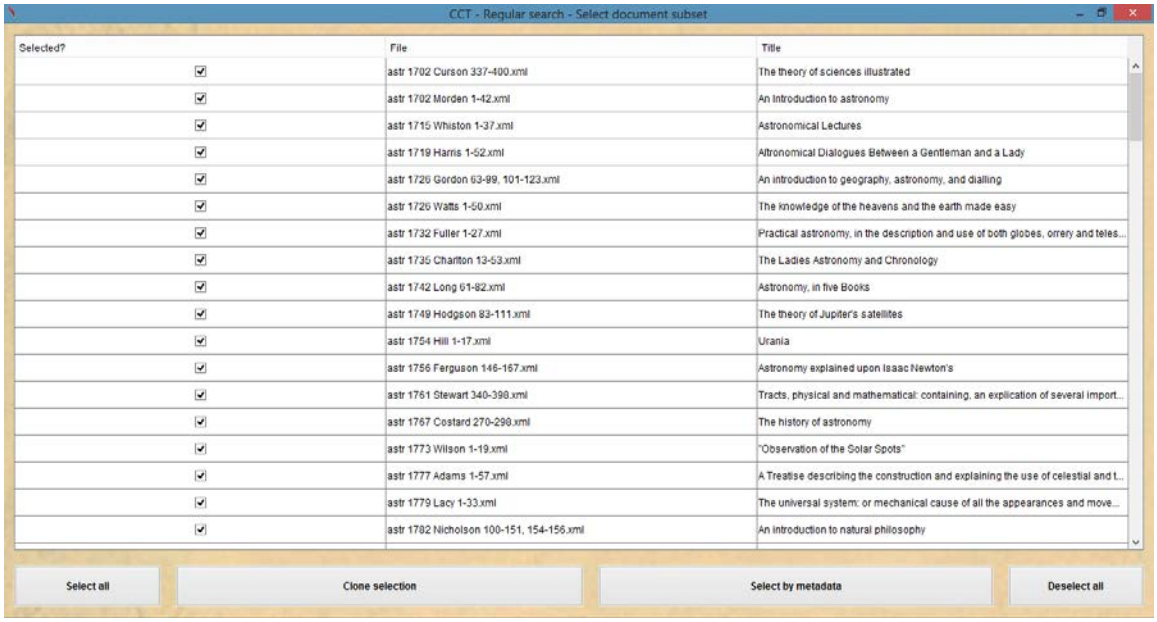

Figure 4.12: View of the subset selection window of the *CCT*.

This results window is surrounded by the two main options of the Search tool, which allows performing searches and generating term lists, in a series of menus above and below the results window, respectively. In both features, the leftmost pull-down menu allows to restrict the number of text samples to analyse. Users can select to conduct searches in the whole index, a single document from the list, or a subset. In case the option "subset" is selected, a new window pops up, as shown in Figure 4.12 above.

This new window allows users to select different samples manually, as well as to select them with a series of tools. Among these, "select all" and "deselect all" are self-explanatory. By clicking "selection with metadata", another window will pop up (shown in Figure 4.13 below) allowing to select texts according to a series of parameters as present in the metadata of the samples. These parameters are based on information on both the author and the documents. In what has to do with the documents, selections can be made based on their discipline or genre, as well as selecting a timespan for their publication. In what has to do with authors, one can select texts based on timespans to their dates of birth and death, as well as selecting authors of a given age, sex, or place of education. In this latter parameter, texts can be selected on a three-level basis. The first level ("Place 3") identifies the continent, the second level ("Place 2") identifies the country or US state, and the last level ("Place 1") identifies the city or county.

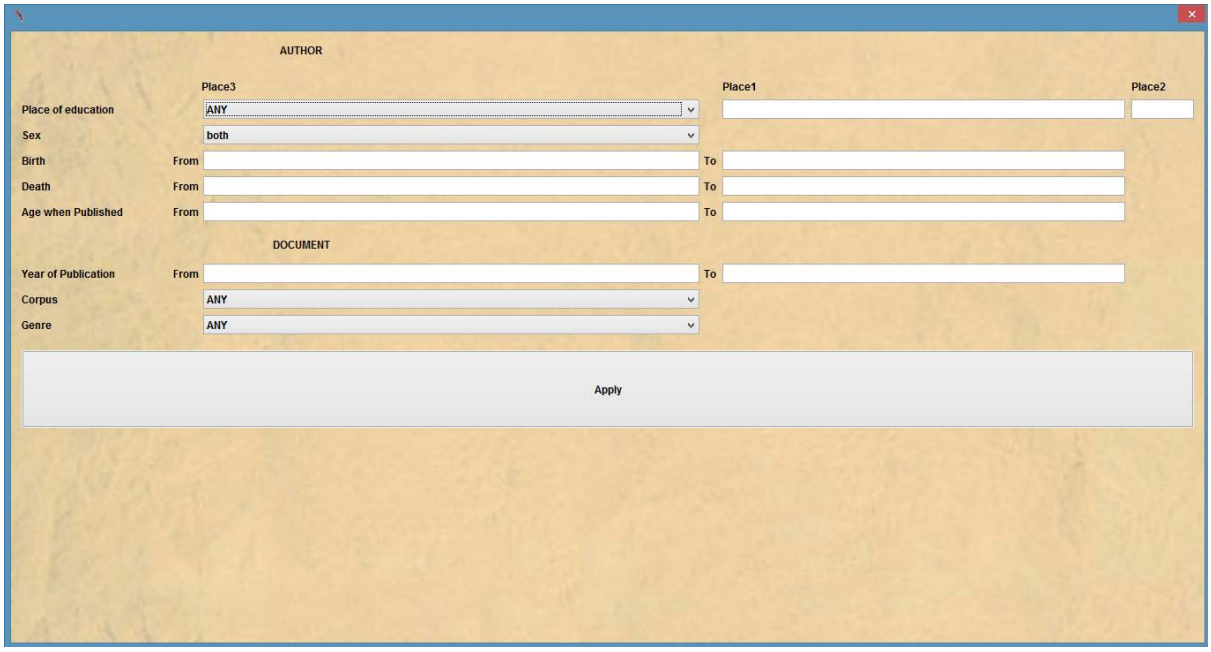

Figure 4.13: Selection by metadata window of the *CCT*.

Finally, the tab "clone selection" allows to copy the subset of samples which has been selected, in order to export that selection to other features of the corpus. For instance, if this tab is pressed after selecting a subset to be searched with the Search Tool, it will copy the subset so that it can be used

with the Generate Term List Tool, and vice versa. Users can run both simple and advanced searches with the Search Function:

3.2.1. *Simple searches*

In Simple term searches a single word is searched, showing all the occurrences of that given word in the set of documents selected by the researcher. These occurrences are grouped according to the sample in which they belong and, as shown below in Figure 4.14, provide, from left to right, information about the sample, the numeric position the word occupies in the sample, the page of the sample, the position (expressed in percentage) of the word in that given page, and the context of the occurrence to the left and right, respectively.

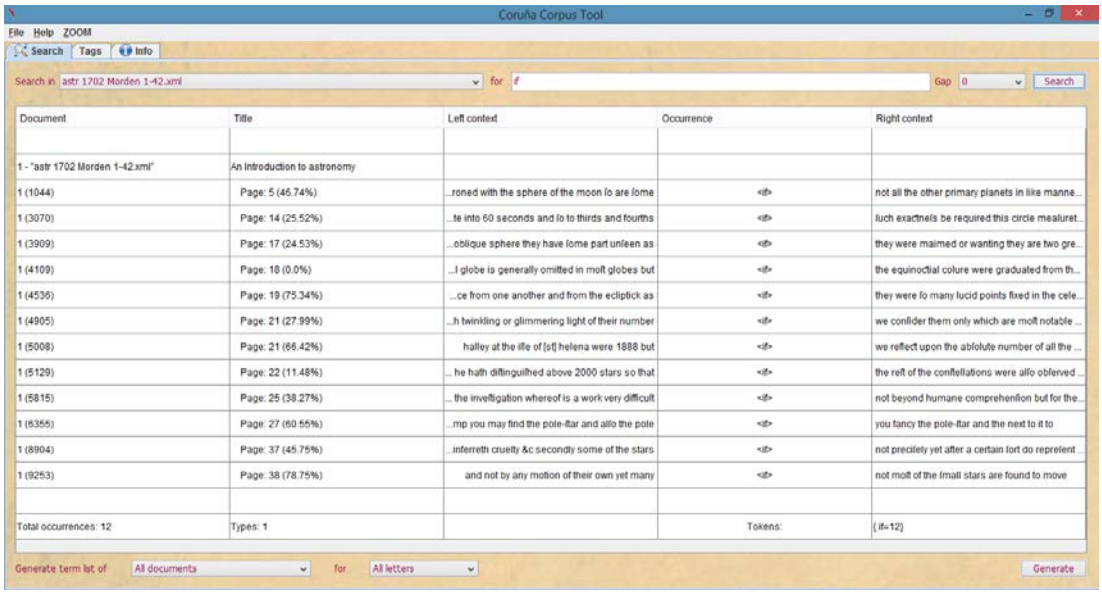

Figure 4.14: Search results window.

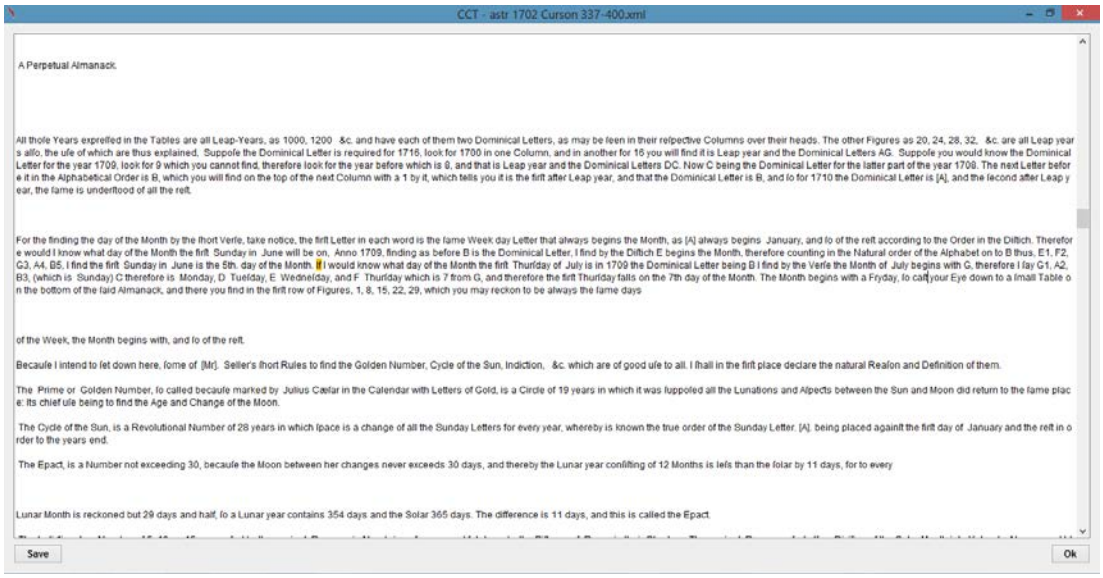

Figure 4.15: Context location window.

If any of these results is clicked on, a new window will pop up showing the occurrence, highlighted, in the document in which it appears. This way, users can see more context than it is shown in the main results window. This can be seen in Figure 4.15 above.

The last row in the results window displays a summary of the results. It shows the total number of occurrences rendered by the search, the different types the search has found and the number of occurrences for each type[95]. If this last row is clicked on, a new window will appear (see Figure 4.16 below), showing the results grouped according to their type and to the sample in which they appear. These results are tabulated, so that they can be easily pasted into a spreadsheet.

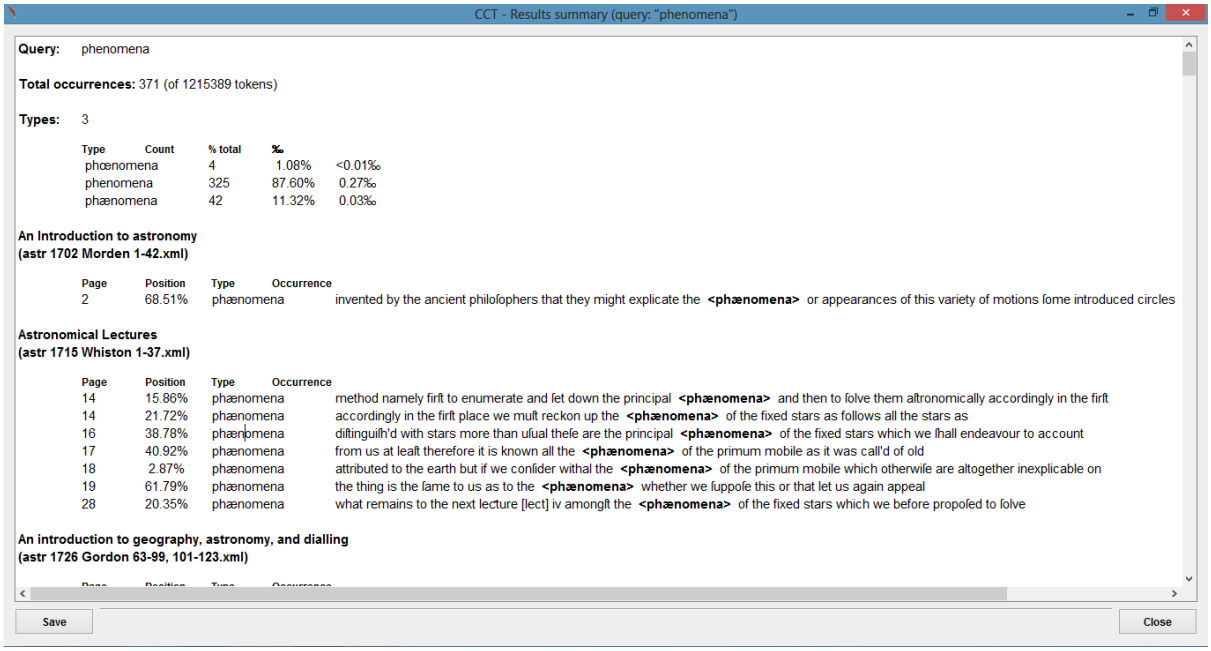

Figure 4.16: Results summary window.

3.2.2. *Advanced searches*

A series of advanced searches can also be carried. These include searches for multiple terms, searches with wildcards, and searches on tags and editorial marks. Everything which has been explained above for simple searches also applies to advanced ones.

a) Multiple terms

Multiple terms can be searched by introducing them in the search query. If nothing else is done, only occurrences in which both terms appear consecutively will appear in the results. In order to search for

[95] This is interesting, because, as explained above, the *CCT* renders all the different spelling variables of a word when this is searched. For instance, after introducing a query such as "phenomena", the *CCT* renders not only results for "phenomena" but also for "phœnomena" and "phænomena" (Lareo & Moskowich, 2012: 15).

near (non-contiguous) occurrences between these terms, one should select the maximum number of words which can appear between the two terms in the right-most pull-down menu named "Gap" (see Figure 4.11 above). By selecting a given number, the *CCT* will show all occurrences in which the two words being searched appear within the given number of words being selected (this is, by selecting a gap of 3, results will include occurrences of the two words searches in which there are three, two, one and no words between the terms queried). The maximum gap allowed by the *CCT* is nine words.

b) Wildcards

The *CCT* allows a number of wildcards in searches, which can furthermore be combined in order to make more complex searches possible.

A dot (.) can be used to stand for any single character, but just for one. For instance, if "ma.e" is queried, examples both of "made" and "make" will appear, among others, but not of "machine", as each dot stands for a single character.

An asterisk (*) after a given character represents that that character may appear zero or more times. For instance, if "be*" is queried, the results will include "be" and "bee", but also "b" and "beee". This wildcard is useful to search for differences in spelling, as for instance "armou*r" would render results both for "armor" and "armour". In combination with a dot, an asterisk can be used to replace any string before or after a series of characters. For instance, a scholar studying prefixes could find all words including the prefix "dis-" by querying "dis.*" although this would also include words such as "disc" which they would have to discard.

Plus (+) after a given character represents that that character may appear one or more times. Following with the previous example, if "be+" is queried, the results will include "be", "bee" and "beee", but not "b", as the character before the plus must appear at least once.

Parentheses are used to make the characters they enclose an indivisible cluster. This is useful in combination with other wildcards, as, for instance, asterisks: If "(counter-)*espionage" is searched, the results will include "espionage" "counter-espionage" and "counter-counter-espionage".

The vertical bar (|) stands for "either…or" this is, only allows for the presence of one of the two options being given. For instance, if "t(y|i)re" is queried, results will include "tyre" and "tire" but not "tore".

Finally, [^X]* (substituting X by any string) restricts the presence of a given string in a search, with all other strings of characters being possible. So for instance, if "dr[^o]*w.*" is queried, results such as "draw" "drew" and "drawing" appear, but the restriction of the presence of the string "o" between

"dr" and "w" avoids the presence of results such as "drowsy" or "drown" which would otherwise have appeared. A summary of these wildcards can be seen in Table 4.5 below.

Wildcard	**Effect**
.	To stand for any (but only one) character
*	Stands for the previous character, which may appear zero or more times.
+	Stands for the previous character, which may appear one or more times.
()	Characters enclosed function as an indivisible cluster.
|	Either one or the other, used in combination with strings between brackets
[^X]*	Restricts a string.

Table 4.5: Wildcards accepted in the *CCT* (Taken from Lareo & Moskowich, 2012: 18-24)

c) Editorial marks and tags

Finally, searches can also locate particular editorial marks and tags in the text. The set of particular editorial marks and tags which the *CCT* is capable of searching is shown in Table 4.6 below. In order to search for a given editorial mark it is necessary to introduce a backward slash before each square bracket. For instance, if one wants to find all the fragments marked as [fragmentgreek], the query must be \[fragmentgreek\]. To search tags it is necessary to go to the Tags[96] tab, in which a pull-down menu shows the different tags which can be searched.

Editorial Marks	**Tags**
[quotation]	<abbr>
[quotlat], [quotgreek] etc	<emph>
[fragment]	<note>
[fragmentlat], [fragmentgreek] etc	
[note], [endnote], [margin note]	
[figure], [table], [poem], [formula]	
[unclear]	
[omitted pages], [missing page(s)]	

Table 4.6: editorial marks and tags which the *CCT* identifies in searches

3.3. *Term lists*

To access to the function of generation of term lists, the user must go to the clickable button at the right-most bottom of the window (See Figure 4.11 above). In this function, apart from the left-most pull-down menu which, as already explained, allows the selection of the samples to be analysed, there is a second pull-down menu, called "for" in which users can decide to show the full term list or to restrict it to terms starting with a single character. There is also the option to select "special", which

[96] This tab will also be used to allow for morphological searches once the *Coruña Corpus* is POS-tagged.

will restrict the list to terms whose initial characters are not part of present-day alphabet, this is, numbers, symbols, squared bracketed words and characters no longer used, such as <ſ> or <æ>.

Once a term list is generated, it will pop up in a new window (Figure 4.17 below), showing the set of samples being analysed at the top, and then each term appearing in the set of samples selected with the information about the total number of times it appears.

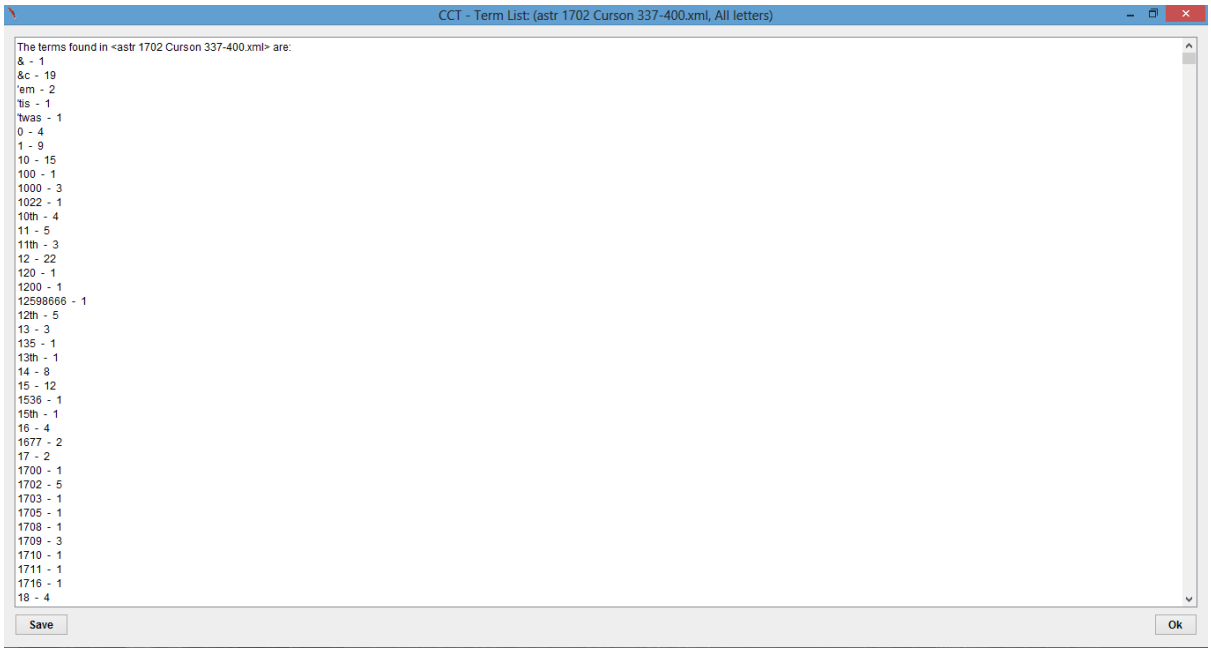

Figure 4.17: Term list window.

The terms are ordered so that words whose first characters are symbols appear first, words whose first character is a number second, and later squared bracketed words, words ordained alphabetically, and, finally, words starting with a character not used in present-day English. It is interesting to note that, contrarily to searches, in this view words with more than one spelling throughout time will appear as two different words.

4. Methodology

The final section of this chapter is concerned with the process followed in order to obtain and classify the cases which are analysed in Chapter 5 below. It is divided in two sections. Section 4.1 explains the process to obtain the cases and Section 4.2 presents the parameters used to analyse the results and organise the study, together with the different variables in each of them and a short explanation of the way they will be used.

4.1. *Searching and disambiguation*

In order to obtain the data to analyse in Chapter 5 below, the selected particles presented in Section 2 of Chapter 2 have been searched in the selected subcorpora of the *CC* with the help of the *Coruña Corpus Tool*, using the functions of simple and multiple-term search. The spelling variants of each of these particles have also been searched for when data from the *Oxford English Dictionary* indicated that they were still in use during the period under study.

However, the *Coruña Corpus* is not POS-tagged and, consequently, it is impossible to refine the results of the searches *propter hoc*. This is, when conducting a query, all the occurrences fulfilling that query will appear, independently of their different meanings or functions. This was the case with the searches in this dissertation, in which, after searching for conditional cases with the selected particles, a good proportion of the results did not show any conditional reading.

Consequently, the list of occurrences obtained with the *CCT* has had to undergo manual disambiguation, in a laborious process in which all non-conditional uses of the particles have been eliminated. Among others, discarded occurrences include all the uses of inversion triggers in which these particles do not introduce conditionals, the uses of *if* as an interrogative, *as long as* and *so long as* when they were part of a comparative structure, *in case of* when followed by a noun phrase, or all the cases of *if* as part of the conjunctive locution *as if*.

After this process was finished, the number of occurrences of conditionals in the corpus was 3,735. These examples were copied with sufficient context both before and after the occurrence of the searched query word. This was done in order to make possible a pragmatic analysis such as the one needed to ascertain the function the conditional was playing in discourse. After this, each occurrence was classified according to a number of parameters, which are explained in what follows.

4.2. *Parameters of the study*

The categories used as parameters in this study can be classified into two different groups: extra-linguistic and linguistic parameters.

4.2.1. *Extra-linguistic parameters*

The first group includes categories which are dependent on the extra-linguistic reality. They affect the results at the sample-level and they are used as criteria to classify different samples into sets whose combined results are compared. These categories and the variables in each of them have been provided by the compilers of the corpus (as explained in Sections 1 and 2 above), but are discussed here to indicate how they have been applied in the treatment of the data. Apart from the Corpus as a

whole, which is considered to be a representation of the whole scientific discourse of the eighteenth and nineteenth centuries, there are five such categories:

a) Classification according to diachronic variation

The first parameter used is the diachronic evolution. This parameter is analysed by means of three different groupings of samples. These three groupings are not always used: instead, they are used according to the requirements of the analysis. The first of them is the century in which each sample was written, thus providing a quick dichotomous comparison between the uses in eighteenth and nineteenth-century samples. A second level of classification takes into consideration the date (more concretely, the year) of publication of each sample on its own, allowing to run analyses for correlations with other factors[97]. Finally, there is a third, intermediate level of analysis, in which the samples are grouped according to the decade in which they were written. This third grouping provides sets of samples of c. 60,000 words in which individual idiosyncrasies wane, but which allow more fine-grained analyses than the classification according to the century in which each sample was written.

b) Classification per discipline of the text

As explained above, the corpus used in this dissertation includes material from three different subcorpora, *CETA*, *CEPhiT*, and *CELiST*; each of them containing samples of texts about ***Astronomy***, ***Philosophy***, and ***Life Sciences***, respectively. Thus, by comparing the uses of conditionals in each of the subcorpora, the particular uses of each discipline might be discovered.

This parameter will also be used in combination with that of diachronic variation, separating the eighteenth and nineteenth century sections of each of the three subcorpora and thus distinguishing six different subsets of samples. This allows analyses about the diachronic variation in a given discipline or about disciplinary differences over a given period of time.

c) Classification per genre of the text

The results will also be examined from the point of view of the genre of each text sample. As explained above, this parameter presents eight variables: ***Treatises***, ***Textbooks***, ***Essays***, ***Articles***, ***Dialogues***, ***Lectures***, ***Letters*** and ***Others*** (which, in this case, is a sample taken from a dictionary). This parameter allows the analysis of possible genre-motivated differences, contributing to the study of the author-audience relationship by comparing different types of readership according to the different genres.

[97] Correlation analyses require a high number of individual measures to be effective and reliable, thus advising the consideration of each sample as a variable in the analysis, rather than bigger groups.

d) Classification per sex of the author

A further parameter is that determined by the sex of authors. Using this parameter two different subsets are distinguished: the one formed by ***Male***-authored samples, which, as explained above, contains 110 samples (*c*. 1,080,000 words), and the subset of ***Female***-authored samples, containing twelve samples (*c*. 120,000 words). This parameter is particularly significant, as the differences between male and female samples may reflect certain strategies of use in order to avoid discrimination, as explained in Chapter 1.

e) Classification per origin of the author

The final extra-linguistic parameter taken into account is the geographical origin of the author, useful for the study of how the provenance of the authors (as well as the contact with different linguistic varieties during their formation) may exert an influence on their writing habits. This parameter presents five different variables, distinguishing authors from ***England***, ***Scotland***, ***Ireland***, ***North America***, and ***Others***. The "Others" variable includes both authors whose origin is unknown and authors which were educated in more than one country, thus avoiding the identification of a single linguistic influence. This subset is disregarded in the analysis.

4.2.2. *Linguistic parameters*

The second group of parameters consists of categories which depend on the linguistic reality, affecting results at the level of each example rather than at the sample level, this is, every case remaining after the search and disambiguation processes has been classified, before the analysis, according to these parameters in order to obtain the results which are here analysed. These categories provide points of view for the analysis rather than criteria to group the samples in sets. They have been presented and analysed in detail in Chapter 2, and in here they are further considered, explaining how these predetermined categories have been used during the analysis and classification of real uses.

There are four linguistic parameters, in addition to the results of all conditional structures in the corpus as a whole, which constitutes a first level of analysis. Three of these (the type of conditional, the order of the constituents and the verb forms used in each constituent) are *objective*[98] parameters which are obtained directly from the content of the results, whilst another one (the function of the conditional in discourse) is the result of a process of pragmatic classification by the researcher.

[98] By "objective" it is meant that the results are recorded as they appear.

a) Type of conditional

The first linguistic parameter is the type of conditional. As explained in Section 1 of Chapter 2, the presence of a conditional particle is the most important element identifying a conditional construction. The conditional particles which were in use during the period analysed in this dissertation (1700-1900) were identified in Section 2 in Chapter 2, which also elaborates on the process followed to obtain this list. As mentioned above in Table 2.3 in Chapter 2, the particles are the following:

Simple or central conditional subordinators	*If, unless*
Locutive or peripheral conditional subordinators	*As long as, so long as, assuming (that), given (that), in case, in the event that, just so (that), lest, on condition (that), on the understanding that, provided (that), providing (that), supposing (that), so (that).*
Operators allowing inversion with conditional interpretation.	*Had, were, should, might, could, may, would, is, be, did*

Table 4.7: Elements introducing clauses with conditional interpretations during the period 1700-1900. (Already presented as Table 2.3 in Chapter 2).

As explained above these particles are also the query words for the searches in the *Coruña Corpus*. In this analysis, four major types will be distinguished: ***If***, ***unless***, ***inversion conditionals*** and ***peripheral conditionals***. In the latter two types, the individual particles will also be examined.

b) Function of the conditional in discourse

The second linguistic parameter is the function of conditionals in discourse. As proposed in Chapter 3, a typology of eleven categories (shown in Table 4.8 in the next page) will be studied.

In order to obtain the results for this parameter, a process of classification in which a given function has been assigned to each conditional result has been conducted, in a lengthy and burdensome process. The main difficulty has laid on the fact that known fact, hypothesizing, scope-restricting and method conditionals show a certain degree of overlap, in which all of them have some clear textual functions but also moderately large "grey zones"[99]. Table 4.9 below shows the textual functions pertaining clearly to a given category, as well as those in the grey zone.

[99] Examples in these grey zones could be classified, arguably, in at least two categories.

Type	**Function**	**Example**
Known fact	To state widely accepted facts and mathematical truths.	Given that *x=y*, then *n(x+a)=n(y+a)* must also be true.
Hypothesizing	To state the likelihood of an apodosis given a protasis.	If a patient has an early failure from a low anterior resection, they may be able to be retrieved by resection.
Scope-Restricting	To describe the scenario or build the argumentative space in which the claims made held, either by defining a concept or specifying the universe to which the claim affects.	As such, it can be said to belong to modality if the category is defined as the expression of the speaker's attitude or stance.
Method	To narrate completed methodological procedures or to introduce instructions.	If 10% or more of the malignant nuclei were stained, the slide was scored as negative.
Rhetorical	Strong assertions which take the form of conditional structures	If they are Irish, I'm the Pope. He's ninety if he's a day.
Concessive	To introduce an impediment for the fulfilment of the apodosis, under which, nevertheless, it held.	Our point still goes through if the minimal phrase containing both parts of this idiom is always headed by a verb. …the use of change predicates is possible precisely because they apply to the virtual entities, if not to the actual entities that ultimately ground them.
Directive	To present an obligatory desirable course of event as if it were optional and not compulsory.	Now if we go to patients who experienced mucositis toxicity…
Politeness (Speech act)	To introduce a conventional expression of politeness	If I may be quite frank with you, I don't approve of any concessions to ignorance.
Relevance (Speech act)	To explain the circumstances under which the statement of the apodosis is relevant	Finally (if this is important), the S1 meaning can be converted into an S meaning to recover a more intuitive object to represent the meaning of the original sentence.
Meta-linguistic (Speech act)	To make a comment on the wording of the discourse	His style is florid, if that's the right word.
Non-committal (Speech act)	By authors, to distance themselves from others' claims.	Chomsky's views cannot be reconciled with Piaget's, if I understand both correctly.

Table 4.8: Typology of conditionals proposed in this work. (Already presented as Table 3.10 in Chapter 3)

Name of Function	Functions
Known Fact	Universal truths Mathematical equalities Physical properties
Hypothesizing	Likelihood relations Logical deductions (in which the author makes the audience follow his train of thought).
Scope-Restricting	Definitions Identification of a subset (among a larger set)
Method	Methodological instruction Explanation of methodological decision
Grey Zone	Compulsory consequences (corollaries) A consequence from a condition created as part of an experiment. A consequence from the very experiment as an event. A consequence of a non-natural (but neither experimental) event. A consequence of an interaction between the receptor and a natural or artificial condition. A consequence of an immutable natural state of affairs. A consequence of admitting a point of view

Table 4.9: Textual functions assigned to each category.

Among the functions in the grey zone, some appear on the overlapping area between known fact and hypothesizing conditionals. An example of these is that of compulsory consequences, as the one in example (1):

> (1) Let a line be drawn according to the plane of the occipital foramen; it will pass from the posterior edge along the surface of the condyles, and, if continued anteriorly, will come out just under the orbits. [68 (6855)[100]]

Other conditionals appear to be in the overlapping zone between the hypothesizing and method categories, as example (2), whilst others seem to overlap the categories of hypothesizing and scope restricting conditionals, as in (3).

> (2) If the Cotylédons of a bean be cut off, the young plant, being deprived of nutriment, is ſtarved and dies, or becomes very weak; [62 (3177)]

[100] Examples taken from the *Coruña Corpus* are presented according to the codification given by the *Coruña Corpus Tool*. This consists in a sequence of two numbers, the second of them between brackets. The first number indicates the number of the text among the texts in the *Coruña Corpus* (see Appendix 1), whilst the second indicates the order in the particular sample of the word which is queried. This way, each and every single word in the *Coruña Corpus* has a univocal identification. In this case, the number given identifies the conditional particle, as queries have been based on these words in this study.

> (3) If we admit them to be inferior, it seems to consist rather in the narrow limits of their intellectual faculties, than in their conformation, which, like that of all other creatures, discovers such perfection of design, that it is impossible to say in what class of animals it is most conspicuous. [64 (498)]

The problems posed by this sort of functions "sitting on the fence" between several categories is not a new issue in pragmatic classifications, which are renowned for the difficulties they put researchers into. In order to avoid personal bias when it is necessary to assign ambiguous examples to a category in a pragmatic classification and, particularly, when the researcher is also designing the classification, as in this case, researchers have a series of possibilities, which are here briefly summarised.

One of the solutions is creating a new category out of the problematic or "mixed" cases, which would allow discriminating those conditionals which are clearly identified as full members of a given category and avoid contamination of these categories by "in-between" cases. In a way, this was the solution used in the parameter of authors' origin, as all authors whose education was not clearly assignable to a single nation were joined together in a single, hodgepodge, group whose results are ignored. However, this is not an adequate solution in this case, for the number of problematic cases is too high for this solution to be viable, and the remaining results would be inevitably wrecked.

A second possible solution would be *double-tagging*, or assigning more than one category to a single case. This would allow their identification as "in-between" cases by assigning their uses to more than one category, thus avoiding the problem of the excessive number of mixed cases. This solution has three main problems. First, among the problematic cases in the data there are examples which could be arguably assigned to three or even four categories, thus complicating the implementation of this solution. Second, in-between cases are not in the exact middle between two categories, but in a cline, in which some of them are nearer the paradigmatic examples of a given category than others. Thus, giving all of them an equal treatment would be unfair, as the problem consists in where to put the limits in a cline, rather than in whether to decide which side each in-between case should be assigned to. Finally, the main problem for this solution is that it would inflate the results for this parameter, and for this parameter only. Thus, the results would have different totals depending on the parameter being studied, making it impossible to compare the different parameters and variables, and effectively disabling this option.

The third solution is to redraw the limits of the categories of the parameter. This was the solution adopted here. In order to do so, two factors were taken into account. On the one hand, the definition of hypothesizing conditionals in Chapter 3 stated, in relation to their scope, that "[t]his statement of

likelihood is to be understood in the broadest sense, both in what has to do with the judgement of probability made, including from almost certainty to impossibility and counterfactuality, and in what has to do with the type of judgment, including, quoting Gabrielatos, 'the overlapping notions of inference, deduction, guess, supposition and prediction' (2010: 242)." Thus, the limits of hypothesizing conditionals are sufficiently malleable to cover most if not all the cases in the grey zone. On the other hand, the position of interpersonality and mitigation as factors for defining these conditional categories was taken into account. As already explained in Chapter 3, hypothesizing conditionals are mitigation-neutral, and the mitigating power they may display is not the responsibility of the conditional markers, but of the frequent modal verbs used in both protases and apodoses, in contrast with other types of conditionals, such as speech act ones, in which conditional markers seem to introduce mitigating force *per se*. Moreover, known fact conditionals were characterised by their being so universally accepted that they are not compromising for the author, who may utter them without needing any mitigation[101].

Thus, the solution finally implemented has consisted on extending the scope of hypothesizing conditionals so that it covers all of the functions named in the grey zone in Table 4.9 above, but for compulsory consequences. The rationale behind this decision is that all of these types of conditionals have the potential for variable, modal-based mitigation, and thus seem to fit best in the hypothesizing category. The exception, corollaries, are not included among hypothesizing conditionals as they are compulsory consequences of a fact, and can be stated without needing any mitigation whatsoever, thus belonging in the known fact category. Finally, scope restricting and method conditionals are limited to their core functions as explained in Table 4.8 above. All other conditional categories present well defined limits and are, consequently, much less problematic.

The adoption of these measures regarding how to comply with this process of pragmatic classification has, as explained above, the intention of preventing researcher bias, as both the design of the typology and the process of classification have been undertaken by the same person. A further measure in the same spirit has consisted in undertaking a series of blind reviews of the classifications, first during the elaboration of the pilot studies previous to the design of the typology (a process which benefited

[101] Admittedly, modals are commonly used in known fact conditionals. However, these modals appear not to introduce a meaning of mitigation affecting the relation between protasis and apodosis, but, rather, they are used to mitigate the whole conditional structure (i.e., commenting on the possibility of the whole fact occurring rather than on the veracity of the relation between the premises) thus introducing meaning nuances similar, if fainter, to those of relevance conditionals.

greatly from the very illuminating discussions on the disagreements in the classifications), and later on selected samples of the final classification[102].

c) Order of the constituents in the structure

The third linguistic parameter is the order of the constituents of the conditional structure. This parameter is adopted in order to represent part of the structural variability of conditional structures.

As already explained in Chapter 3, the functional versatility of conditionals is echoed in their very important degree of formal variability, in which conditionals have multiple options of combination (one and two-part conditionals, with one or more coordinated constituents in each part, which may fulfil their role at different grammatical levels and appear in different positions, etc.). In order to account for this variability, several possibilities have been contemplated:

First, all these levels of formal variability may be regarded as a single parameter, with every single combination considered a variable for the parameter. However, the number of individual combinations of these different levels is just too high, rendering a very high number of variables which would make the parameter unworkable. This effectively makes it impossible to establish a single parameter accounting for all structural variability.

A second possible alternative is to analyse each and every level of combinatorial possibilities separately as discrete parameters, but this also poses some problems, as the different levels of combination are not discrete, but dependent on each other, presenting important interrelations. Moreover, the combinatorial analysis needed to understand these effects increases exponentially with each and every new parameter, making it inadvisable to introduce a high number of new parameters in the analysis.

Consequently, the only possibility left is to consider the order of the constituents in conditionals as a representative of their structural variability. This decision was taken as the result of the fact that the order of the constituents is, out of the different combinatorial levels, the one presenting more potential for significant results (the other being more dependent on the logical content of the statements), and the one presenting previous results to compare with, as explained earlier in Chapter 2.

[102] It is fair to reiterate here the acknowledgement to Dr. Crespo and Maria Monaco for their invaluable contributions on this particular issue, as well as to restate that any remaining possible misclassification is solely attributable to the author.

Four variables are distinguished for this parameter, on account of the position of the protasis in the structure: ***Initial*** conditionals, in which the protasis appears before the apodosis, ***Final*** conditionals, in which it appears after the apodosis, ***Middle*** conditionals, in which it appears inside the apodosis; and ***Apodosis-less*** conditionals. The incorporation of apodosis-less conditionals, though not being strictly a position of the protasis, helps to account for part of the first level of structural variability, as it helps distinguish one and two-part conditional structures, and can be perfectly integrated with the other three positions, which only affect two-part conditional structures, thus avoiding any overlapping.

d) Verb forms used

The final linguistic parameter used in this dissertation is the examination of the verbal form in each of the constituents of the conditional. This parameter has traditionally been used as the main criterion to establish the categories of conditionals in traditional typologies. As explained in Section 2 of Chapter 3, traditional typologies distinguished three types of the so-called "canonical" conditionals, presenting an increasing degree of hypotheticality, to which some authors added a fourth category, the so-called "zero-conditionals", which feature a verb in the present simple form in both the protasis and the apodosis. However, as already explained, the possible combinations of verb forms in conditional structures go well beyond these three types, which account for only a small fraction of all the uses of conditionals. Thus, it is necessary to check the actual distribution of all combinations of verbal forms, as well as the correlations they may establish with other parameters. In this dissertation, all uses of conditionals have been classified according to the verbal form in each of their constituents. These results have been counted and, as explained in Section 3 of Chapter 2, are to be analysed at face value, without previously established categories, in order to analyse the frequency of each combination, including modal verbs, non-finite forms and verbless clauses. If the results are too fragmented to be of any use, groupings could be made, but always *a posteriori*.

Despite the important tradition of different classifications of modal verbs, they are in here classified as they appear. As explained in Section 3.3.1 of Chapter 2, this allows to compare the modal verb used, a formal category, with the function played by the conditional structure in discourse, and avoids probable spurious correlations which could appear if the modals were to be analysed in grouped categories.

Summary of the chapter

This chapter intended to present the data on which the analysis in this dissertation will be based, a selection of three subcorpora from the *Coruña Corpus of English Scientific Writing*.

The *Coruña Corpus* is a corpus containing samples of eighteenth and nineteenth-century scientific texts, organised as a collection of twin subcorpora, one for each discipline and all sharing the same design and principles of compilation. The *Coruña Corpus* fulfils McEnery *et al*.'s (2006: 5) criteria: the *Coruña Corpus* is a *machine-readable* collection of *authentic texts* which are *sampled* in order to be *representative* of a particular language or language variety, in this case eighteenth and nineteenth-century scientific English. This balance and representativeness is assured by the careful selection of samples according to a series of parameters, which are also available as variables for the analysis. Its compilation and computerisation have been influenced by the competing drives for faithfulness towards the original text and usefulness towards the user. The study uses three of the subcorpora, dealing with astronomy, philosophy and life sciences, which follow the same principles of balance and representativeness.

The Coruña Corpus is used with the help of the *Coruña Corpus Tool* a corpus exploitation tool specifically designed for the *Coruña Corpus*. This chapter presents its diverse functions, some of which were used in order to obtain the data.

The latter section of the chapter has delved into the methodology applied to obtain the data with examples of the occurrences of conditionals from the samples in the *Coruña Corpus* and the treatment of these examples. This process is highly influenced by the need for a manual disambiguation process as a result of the fact that the *CC* is not POS-tagged. It has also presented the parameters used in the study, distinguishing between extra-linguistic and linguistic parameters, defining the variables in each of them and explaining the processes with which these variables have been obtained.

CHAPTER 5:

Analysis of the results

Introduction

The previous chapters of this dissertation have presented the socio-historical context of science and scientific discourse in the period under study, the formal characteristics and the functions of conditionals in scientific discourse and the corpus used in the analysis. This chapter examines the actual data, the uses and functions of conditionals in a corpus of real scientific texts from the eighteenth and nineteenth centuries. In it, the contributions from the previous chapters are brought together in order to provide an exhaustive description of these uses on a corpus of samples of work by authors from different origins, working on different disciplines at different times over a two-hundred-year period.

A recurrent structure will be used in order to analyse the data and provide an exhaustive description of the uses, functions and forms of the conditionals according to the different parameters. The chapter will be divided in five main sections or *blocks*, corresponding to the five levels of analysis on linguistic criteria identified in Chapter 4. Thus, Section 1 will provide a general analysis of the data; in Section 2 the results will be analysed in relation with the different types of conditionals used, Section 3 will focus on the results classified from the point of view of the function of the conditional in discourse, Section 4 will analyse the influence of the order of the constituents in the structure, and, finally, Section 5 will examine the data according to the verb forms used in both parts of the structure.

Each of these sections will be divided into a series of subsections. Each of these will be devoted to the analysis of the results from the point of view of the combination of the linguistic parameter analysed

in the section and the different extra-linguistic parameters as presented in Chapter 4. It will start with the results from the whole corpus, and it will then analyse the different distributions according to their diachronic evolution, the discipline and genre of the samples and the sex and origin of their authors.

	General results	Type of conditional	Function of conditional	Order of constituents	Verb forms
Whole corpus	1	2	3	4	5
Diachronic variation	1.1	2.1	3.1	4.1	5.1
Per discipline	1.2	2.2	3.2	4.2	5.2
Per genre	1.3	2.3	3.3	4.3	5.3
Per sex	1.4	2.4	3.4	4.4	5.4
Per origin	1.5	2.5	3.5	4.5	5.5
		Type	3.6	4.6	5.6
			Function	4.7	5.7
				Order	5.8

Table 5.1: Matrix presenting the organisation of the section on analysis of data, presenting the subsection for each combined analysis.

This organisation is summarised in Table 5.1 above, which shows a matrix in which the number in each crossing indicates the subsection dealing with that particular point of view in the analysis. For instance, Section 2.2 will analyse the distribution of the uses of the different types of conditionals in the different disciplines. Thus, Table 5.1 can be used as an index or guide, as well.

As can be seen, starting from the third section, further subsections are included beyond the five extra-linguistic parameters used[103].

1. General results

After the process of search and disambiguation explained in Chapter 4 was finished, the number of conditional structures in the three corpora under scrutiny is 3,735. This corresponds to a normalised[104] figure of 3074.07 conditional structures per million words: this is, one should expect to find three conditional structures[105] every 1,000 words in the corpus as a whole.

[103] These further subsections reflect the interaction of the different linguistic parameters between themselves. Thus, for instance, Section 4.7 is devoted to the distributions of conditionals according to the combination of the parameters of their function in the discourse and their order. This is done only from the third section onwards, since in the first two sections there is no previous linguistic parameter with which to cross the results.

[104] Unless otherwise stated, all normalised figures in the dissertation refer to cases per million words.

[105] There are two possibilities to indicate the proportion of use of a given structure in discourse: measuring their use per total number of words or per total number of structures. Since the *Coruña Corpus* is not tagged and, consequently, it is not easy to quantify the number of structures, it has been considered preferable to select the number of conditional structures appearing every number of words as a measure of proportion. Of course, the proportion of use of conditionals among all structures would be higher than three out of every thousand.

1.1. *Diachronic analysis*.

The distribution of the results over the two centuries, shown in Figure 5.1 below, reveals that the use of conditionals, in general, decreases over time. There are 2,062 conditionals in the set of eighteenth-century samples, whilst there are only 1,673 in the nineteenth century.

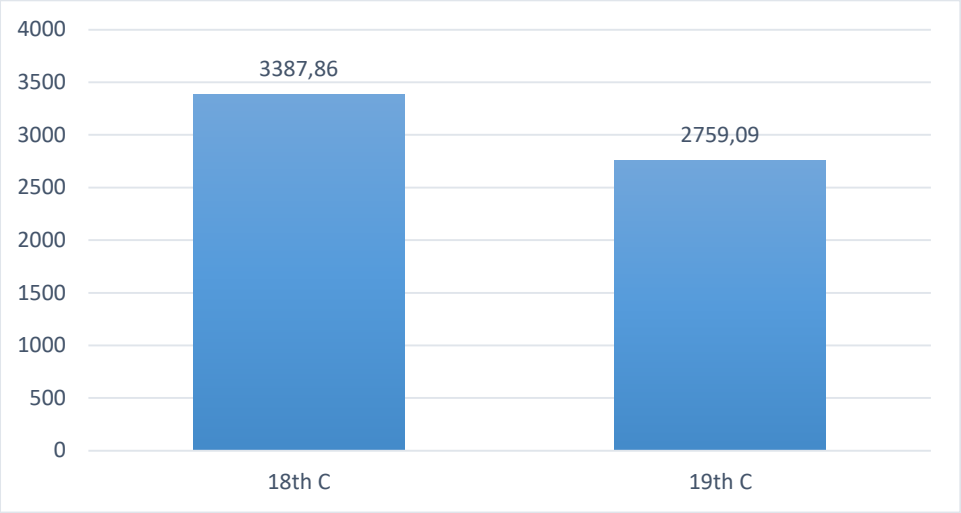

Figure 5.1: Use of conditionals per century. Normalised figures.

Decade	**Number of conditionals**
1700-1710	3398.16
1710-1720	4798.34
1720-1730	2378.22
1730-1740	3468.85
1740-1750	4147.48
1750-1760	2863.62
1760-1770	1929.76
1770-1780	2593.05
1780-1790	2501.49
1790-1800	5855.43
1800-1810	1879.45
1810-1820	2369.59
1820-1830	4086.50
1830-1840	2149.14
1840-1850	2923.68
1850-1860	2871.14
1860-1870	3699.62
1870-1880	2906.59
1880-1890	3294.03
1890-1900	1348.80

Table 5.2: Use of conditionals per decade. Normalised figures.

However, if the use of conditionals is analysed by decades instead of centuries, as shown in Table 5.2 above, new analytical nuances appear: the results show, again, a decreasing use of conditionals, but this descend is less sharp than the one shown in Figure 5.1 above. In fact, the single decade with the highest proportion of conditionals is the last decade of the eighteenth century (1790-1800), which also contains the two samples with the highest number of conditionals, sample 19 (Vince, 1790) and sample 101 (Crombie, 1793), presenting 128 and 88 uses of conditionals respectively.

These results have been statistically tested in order to examine whether the passing of time is a statistically significant factor explaining the variation in the use of conditionals in the whole corpus. As shown in Figure 5.2 below, the results of the statistical test applied to the data (linear correlation) indicate that diachronic evolution explains only 6.72% of the variation in the data of the whole corpus, and that these results are not statistically significant (R^2=0.0672, p>0.05).

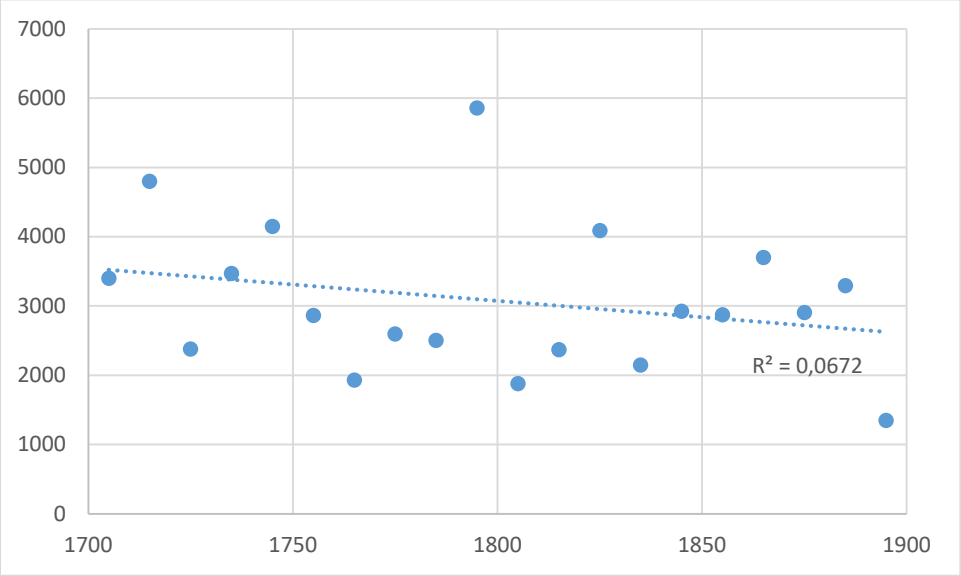

Figure 5.2: Diachronic evolution in the use of conditionals, whole corpus. Normalised figures.

Therefore, even though the use of conditionals tends to decrease with the passing of time, diachronic evolution is not a statistically significant factor explaining the use of conditionals in the whole corpus.

1.2. *Results per discipline of the sample*.

The examination of the results according to the discipline of the text draws a picture in which there is a stark contrast between one of the disciplines and the other two. As can be seen in Table 5.3 below, Astronomy and Philosophy samples present a clearly more frequent use of conditionals, almost doubling the frequency of use of the structure in Life Sciences samples (3525.17 and 3771.85 uses per million words, respectively, versus only 1923.43 uses per million words in life sciences texts).

Discipline	Number of conditionals	Normalised Figures
Astronomy	1445	3525.17
Philosophy	1513	3771.85
Life Sciences	777	1923.43

Table 5.3: Uses of conditionals per discipline, whole corpus.

As explained above, the results have also been analysed on account of the differences between the eighteenth and nineteenth century sections of each discipline. Findings (shown in Figure 5.3 below) reveal that the use of conditionals decreases between the eighteenth and the nineteenth centuries in all disciplines, just as was the case with the corpus as a whole.

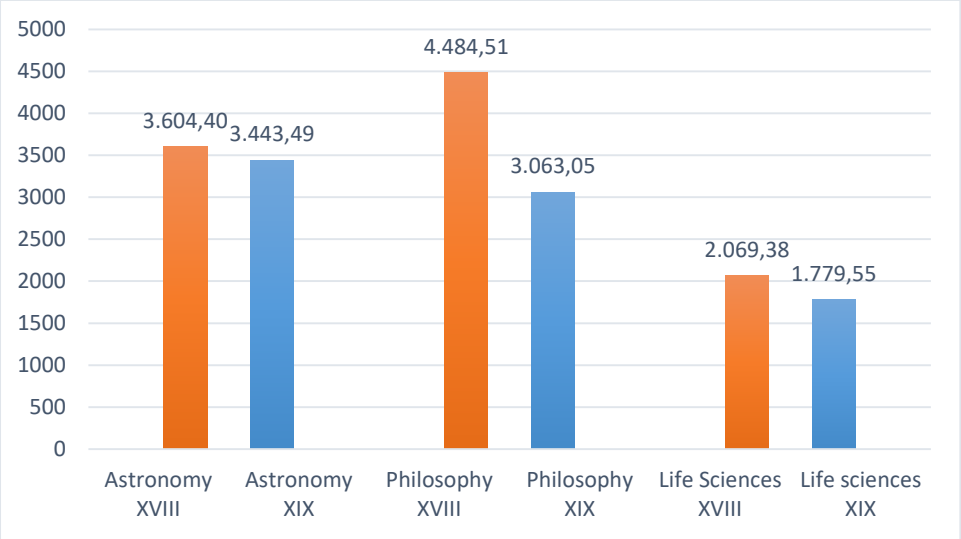

Figure 5.3: Uses of conditionals per discipline and century. Normalised figures.

However, the strength of the decrease varies across disciplines. Astronomy samples present a very slight decrease in the use of conditionals between the two centuries (only 4.46%). On the contrary, the decrease is more important in life sciences (14.00%) and, particularly, in philosophy samples. These show the most marked decrease of use among all disciplines, with 31.70% less conditionals being used in the nineteenth than in the eighteenth century samples.

1.3. *Results per genre of the sample.*

The examination of the use of conditionals according to the genre of each sample shows important differences as well, as can be seen in Table 5.4 below.

The dialogues and essays in the corpus show a markedly more frequent use of conditionals than other genres (4502.02 and 4384.30 uses of conditionals per million words, respectively), and articles, treatises, textbooks and lectures show results nearer the whole-corpus average of 3074.07 uses per million.

Genre	Number of conditionals	Normalised Figures
Treatise	1795	2941.74
Textbook	594	2879.62
Essay	625	4384.30
Lecture	321	2663.06
Article	183	3397.63
Letter	103	1997.86
Dialogue	90	4502.02
Others	24	2389.48

Table 5.4: Uses of conditionals per genre, whole corpus.

Conditionals are much less frequently used in letters, with 1997.86 cases per million words only.

1.4. *Results per sex of the author*.

The analysis according to the sex variable reveals that male authors use a substantially higher number of conditionals than their female counterparts (3180.50 vs. 2331.06 uses per million words, respectively). This is shown in Figure 5.4 below.

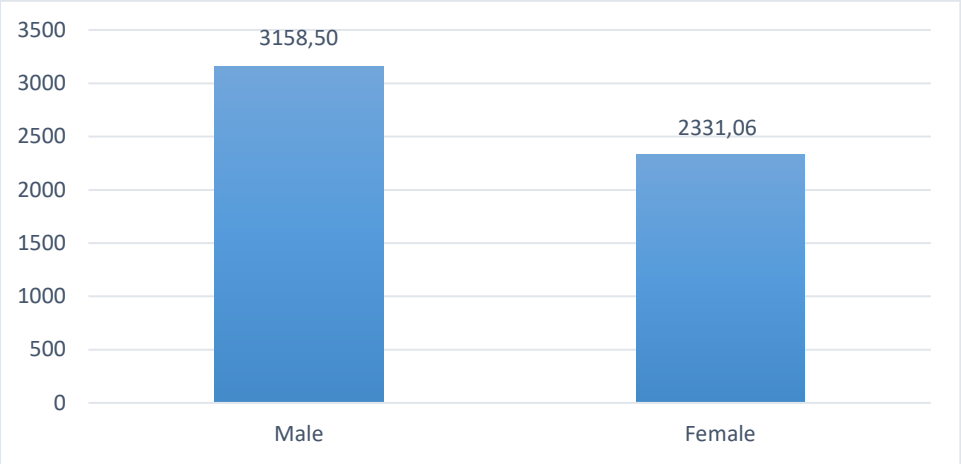

Figure 5.4: Uses of conditionals per sex of the author. Normalised figures.

When not only the sex of the author, but also the discipline of the sample, is taken into account, the results vary. Women use less conditional than men generally and also in life sciences (1301.53 vs. 2060.58), but this difference is especially remarkable in the case of astronomy (1346.61 vs. 3641.59), as can be seen in Figure 5.5 below. However, in philosophy texts, it is women that use an impressively higher number of conditionals than men: 5497.78 cases per million words[106], whilst their male counterparts use 3631.36.

[106] This proportion represents that 0.55% (more than 1 in 200) of all words in the samples are conditional particles.

It is also noticeable that whilst women authors present an important variability in the use of conditionals depending on their discipline (5497.78 cases per million in philosophy texts vs. 1346.61 in astronomy and 1301.53 in life sciences), samples by male authors are less variable (3.641.59 cases per million in astronomy texts, 3631.36 in philosophy and a substantially inferior rate in life sciences, 2060.58).

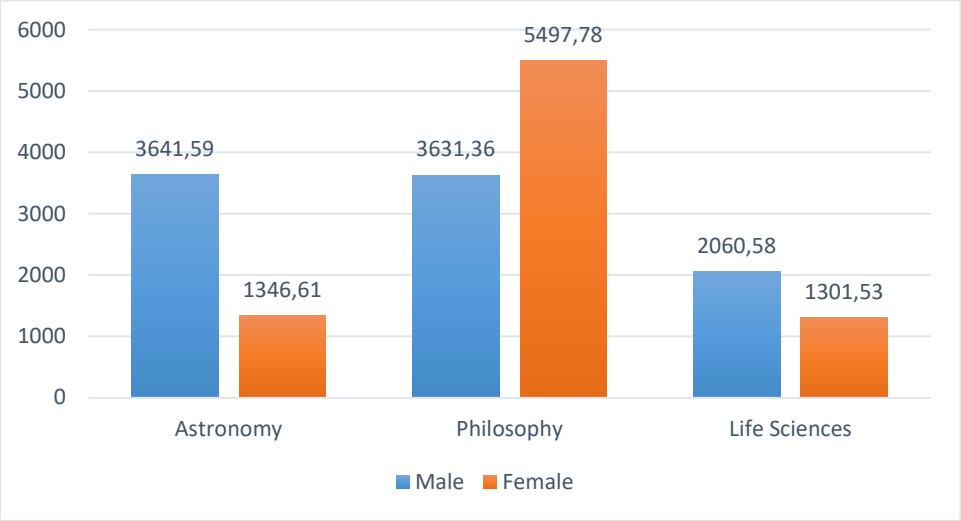

Figure 5.5: Uses of conditionals per sex of the author and discipline. Normalised figures.

All in all, when analysing these data it must be remembered that the distribution of the variables in the corpus is not uniform, and, for instance, all cases of philosophy texts by female authors are also texts from the eighteenth century, thus making it difficult to discern which parameter (or combination of parameters) is influencing the results the more.

1.5 *Results per origin of the author*.

The results of the use of conditionals according to each sample's author's provenance are presented in Table 5.5 below. As can be seen, all results are close to the whole-corpus average of 3074.07 uses of conditionals per million words.

Origin	**Number of conditionals**	**Normalised Figures**
England	1776	3189.17
Scotland	769	2782.89
Ireland	315	3096.64
North America	422	2668.02
Others	453	3716.34

Table 5.5: Uses of conditionals per origin of the author, whole corpus.

North American authors use the fewest conditionals (2668.02), whilst the highest proportion is by authors in the category "Others", which includes authors about whose origin or place of education

there is no information, or which have been educated in more than one place, thus receiving influence from several diatopic varieties. In any case, the differences between the categories are small and the parameter seems to be less of a factor to determine the proportion of use of conditionals in discourse.

2. Results per type of conditional

After examining the results according to the type of conditional used in each sample, it was found that *if*-conditionals appear 2585.18 times per million words, accounting for 84.10% of all uses of conditionals (see Table 5.6 and Figure 5.6 below), in line with the findings in previous analyses in which *if*-conditionals account for more than 80% of all conditionals (Gabrielatos 2010: 2).

Type of conditional	Number of conditionals	Normalised Figures
If	3141	2585.18
Unless	151	124.28
Inversion	258	213.35
Total Peripheral	185	152.26

Table 5.6: Use of conditionals per type of conditional.

Among the other types of conditionals, inversion conditionals, considered as a whole, are the next most frequently used type, accounting for 213.35 cases per million words and 6.91% of the uses of conditional particles. The different peripheral conditional subordinators (see Chapter 2 above) account together for 4.95% of the uses, with 152.26 cases per million words; finally, the 151 cases of *unless* are 4.04% of the uses, appearing 124.28 times every million words.

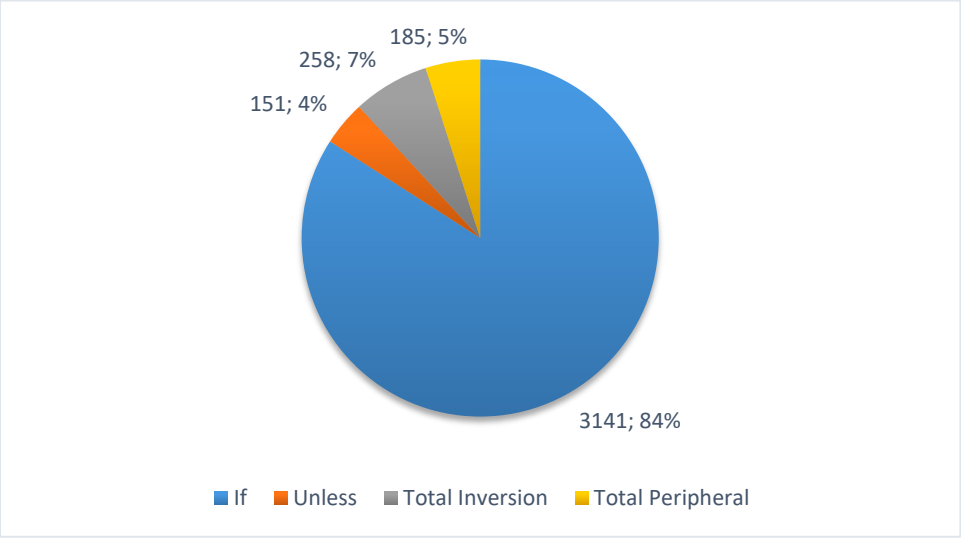

Figure 5.6: Use of conditionals per type of conditional.

The examination of peripheral conditionals in detail reveals that the particle most commonly used, as shown in Figure 5.7 below, is *supposing*[107], with 68.31 uses per million words, which account for 45% of the uses among peripheral conditionals. The next most frequent peripheral particles are *provided* (25.51 cases per million, 17% of peripheral conditional subordinators), *in case* (20.58, 13%), *so long as* (18.93, 12%), and *as long as* (11.52, 8%). *Lest*, *assuming*, and *on condition* appear only five times, three times, and once in the corpus, respectively. Finally, no cases have been found of *given that*, *in the event that*, *just so*, *on the understanding that*, *providing*, or *so that*.

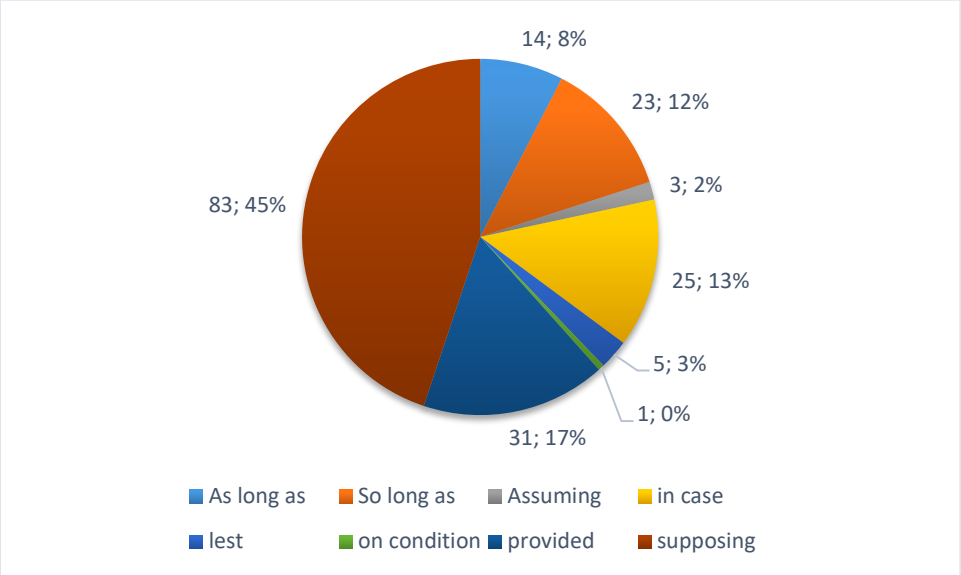

Figure 5.7: Use of different types of peripheral conditionals

Among inversion conditionals, shown in Figure 5.8 below, *were* is the most frequent inversion-triggering particle, with 106.17 uses per million words, accounting for half the uses of inversion conditionals or 3.45% of the total uses of conditionals. Next come *had* (54.32 uses per million, 25% of the uses among inversion conditionals) and *should* (25.51 cases per million, 12%). *Did* is less frequently used (13.99 cases per million, 7%), as is *could* (9.88 per million[108], 5% among inversion conditionals).

[107] As explained in Chapter 2, it must be remembered that these numbers account only for the uses of these particles as conditionals, excluding other uses in which the particles have different functions. The list of these particles is provided in Table 2.3.

[108] Among these cases of conditional inversion with *could*, only one case presents a supportive *but* before the lexical verb, contrarily to Quirk *et al.*'s indications:

"More rarely, the operator may be *could* or *might*: *Might/Could* I but see my native land, I would die a happy man. For this construction, these two operators require an adverb such as *but* or *just* before the lexical verb" (1985: 1094).

The example in question is "Those far-off lights seem full of meaning to us, could we but read their holy message; they become real and sentient, and, like the soft eyes in pictures, look lovingly and inquiringly upon us" [36 (231)].

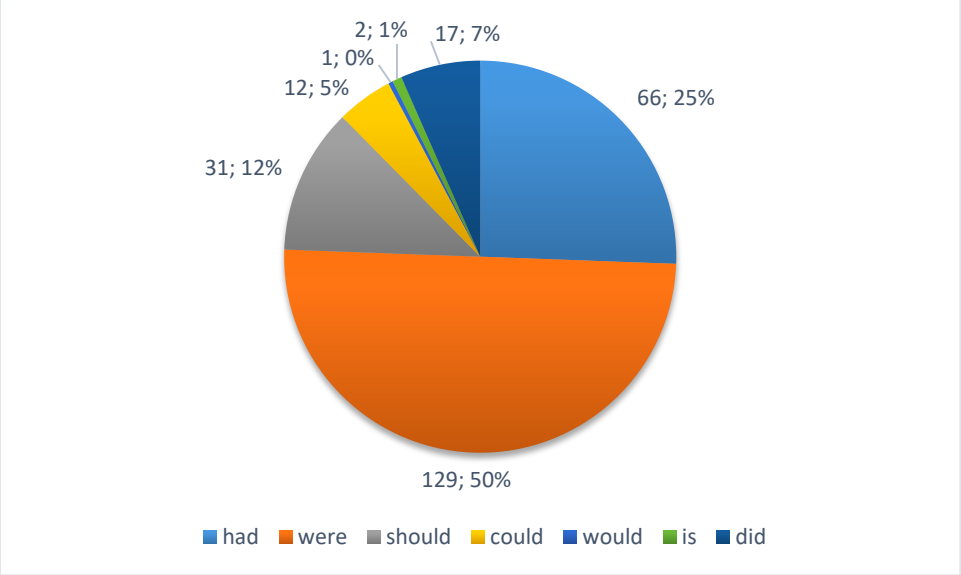

Figure 5.8: Use of different types of inversion conditionals

Two cases of conditional inversion with *is* and one with *would* have also been found. These three cases, all of them from samples in the first decade of the corpus (1700-1710) are presented here as examples (1-3).

> (1) Is he her Equal and no unſuitable Match, if his Deſigns are fair, why don't they Marry, ſince they are ſo well pleas'd with each other's Converſation, which in this State can be frequently and ſafely allow'd? [82 (8266)]

> (2) *Is* he her Better, and ſhe hopes by catching him to make her Fortune, alas! The poor Woman is neither acquainted with the World nor her ſelf, ſhe neither knows her own Weakneſs nor his Treachery, and tho' he gives ever ſo much Encouragement to this vain Hope, 'tis only in order to accompliſh her ruin. [82 (8303)]

> (3) Therefore *would* I know what day of the Month the firſt Sunday in June will be on, Anno 1709, finding as before B is the Dominical Letter, I find by the Diſtich E begins the Month, therefore counting in the Natural order of the Alphabet on to B thus, E1, F2, G3, A4, B5, I find the firſt Sunday in June is the 5th. day of the Month. [0 (3513)]

Despite the lengthy process of search and disambiguation, no cases of conditional inversion with *might*, *may* or *be* were found.

2.1. *Diachronic analysis*

The results in Section 1.1 showed that, when considering all types of conditionals as a whole, the use of conditionals diminished from 3387.86 uses per million words in the eighteenth century to 2759.09

uses in the nineteenth century. However, this decrease does not affect all the different types of conditionals uniformly, as shown in Figure 5.9 below. *If* and inversion conditionals do indeed decrease their use (from 2917.96 to 2251.14 cases per million in the case of *if* and from 234.95 to 189.66 in the case of inversion conditionals), but *unless* and peripheral conditionals present an increase (from 108.44 to 140.18 in the former and from 126.51 to 178.11 in the latter).

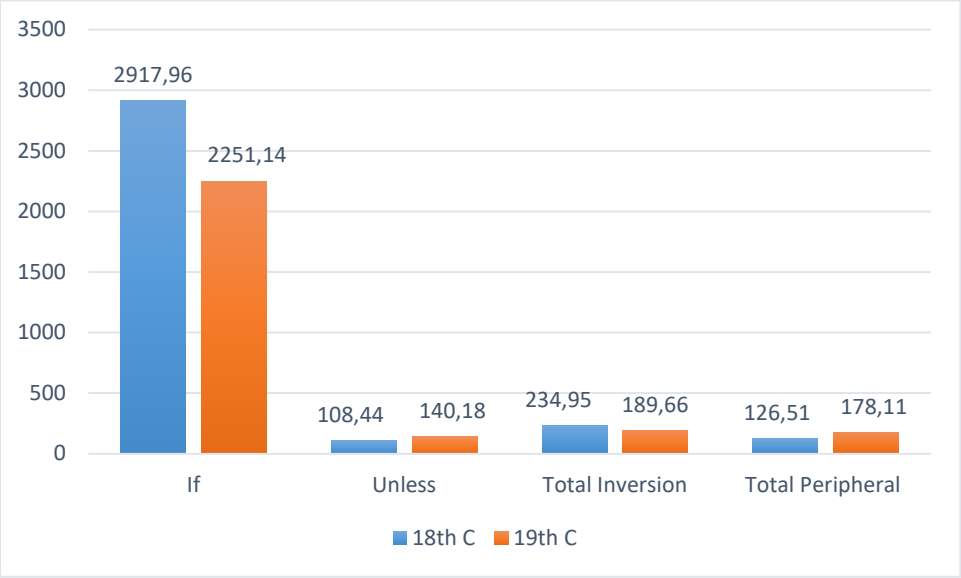

Figure 5.9: Use of types of conditionals per century. Normalised figures.

If diachronic evolution is analysed per decades instead of centuries, the results still show a slight decrease in the use of conditionals. The results of the statistical test applied to the data (linear correlation) indicate that diachronic evolution explains 8.76% of the variation in the use of *if*, but that these results are not statistically significant (R^2=0.0876, p>0.05), as shown in Figure 5.10 below.

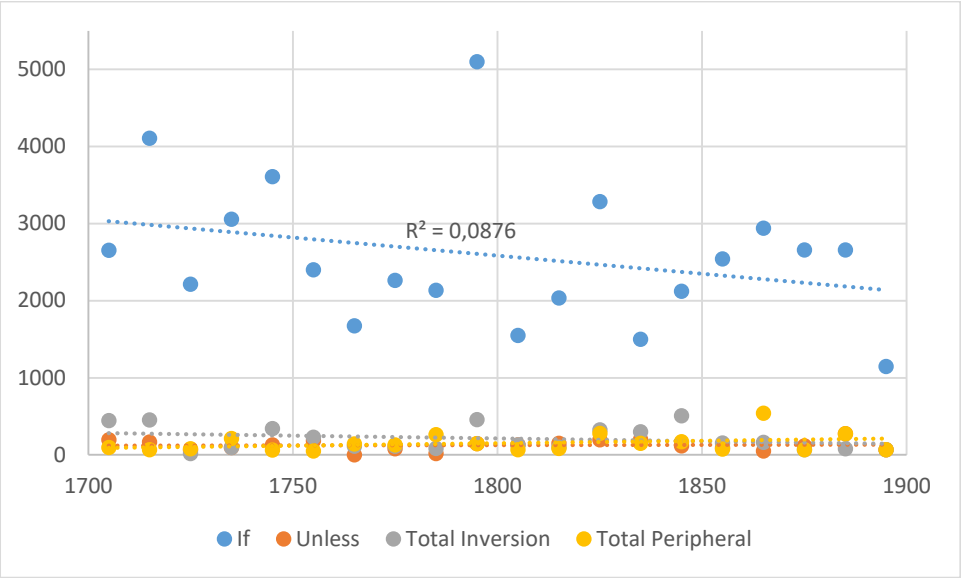

Figure 5.10: Diachronic evolution in the use of types of conditionals. Normalised figures.

The other types of conditionals, shown in Figure 5.11 in detail, show a more erratic evolution. Inversion conditionals show a slight decrease, but the linear regression test shows that only 6.95% of their variation is explained by the time axis (R^2=0.0695, p>0.05), whilst both *unless* and peripheral conditionals show slight increases, which in the case of *unless* only explains 0.33% of the variation (R^2=0.0033, p>0.05), and in the case of peripherals 9.93% (R^2=0.0993, p>0.05). In all cases the results are not significant.

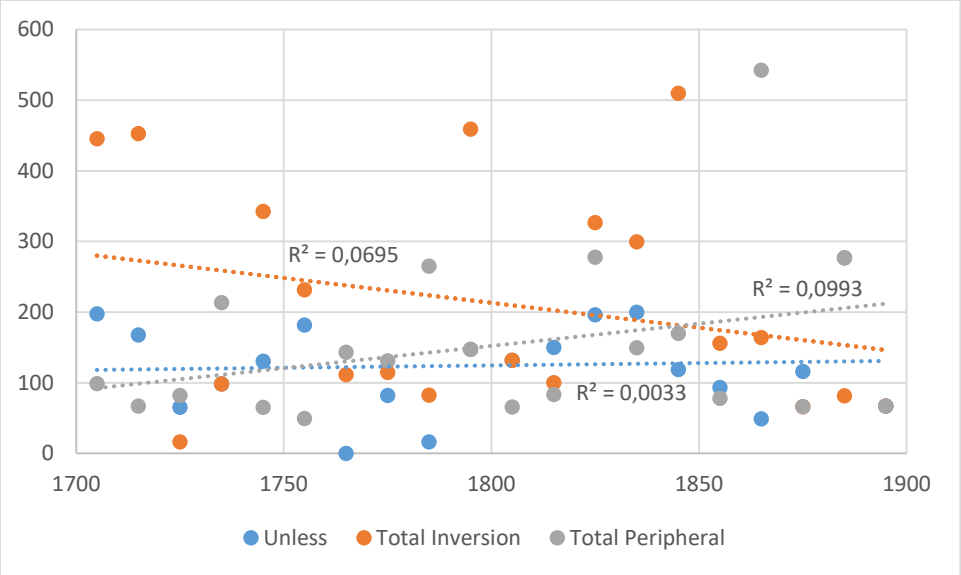

Figure 5.11: Diachronic evolution in the use of types of conditionals (detail). Normalised figures.

These results show a picture in which one of the strategies to encode conditionality, the inversion of the operator, is gradually decreasing its use; whilst the other, using a subordinating particle, increases it. These results must also take into account the particular distribution of the number of individual elements used in each of these strategies.

Thus, the range of subordinating particles expressing conditionality becomes more varied over time, experimenting the emergence of new particles, such as *in case* (first appearance in the corpus in 1774), *lest* (1790), *assuming* (1845), or *on condition* (1867); and a general increase in the use of conditional subordinators other than *if*. At the same time, several inversion triggers disappear at the beginning of the period under study (final uses of *is* as an inversion trigger in the corpus in 1700, of *would* in 1702), and, as shown in Figure 5.12 below, the tendency appears to be an evolution towards a scenario with less variability, such as the present-day model in which only *had*, *were* and *should* are commonly used as conditional inversion triggers.

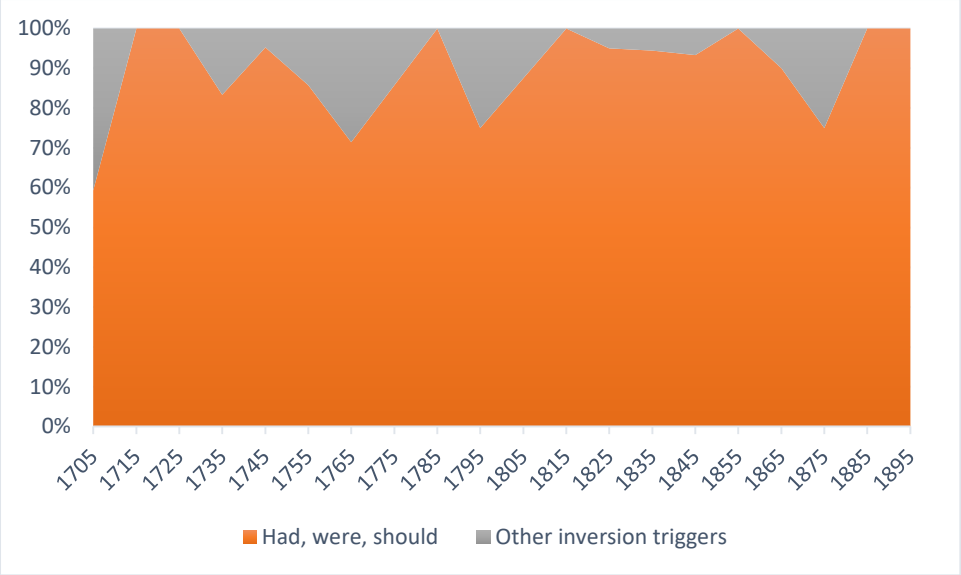

Figure 5.12: Use of *had*, *were* and *should* as inversion triggers vs. inversion conditionals with other triggers, per decade.

2.2. *Results per discipline of the sample*

The distribution of the different types of conditionals according to their disciplines is more or less comparable to the general results: all types of conditionals show a higher number of uses in philosophy and astronomy texts, whilst life sciences texts show the lowest figures, as shown in Figure 5.13 below.

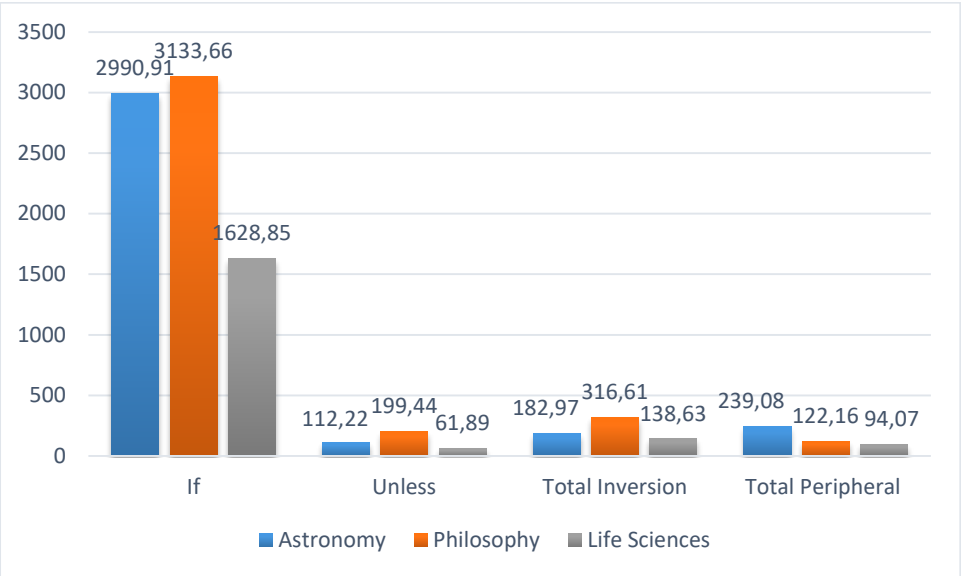

Figure 5.13: Use of types of conditionals per discipline, normalised frequencies.

However, if the results are analysed according to the proportion of use of each type, some differences are found. These can be seen in Figure 5.14 below, in which it is evident that, whilst all three disciplines present a similar proportion of use of *if* conditionals, astronomy texts present a higher proportion of

use of peripheral conditionals and a lower proportion of inversion conditionals. On the contrary, in philosophy texts, the proportion of use of peripheral conditionals is lower, whilst the use of both inversion conditionals and *unless* is higher. Life sciences texts reflect the general scenario.

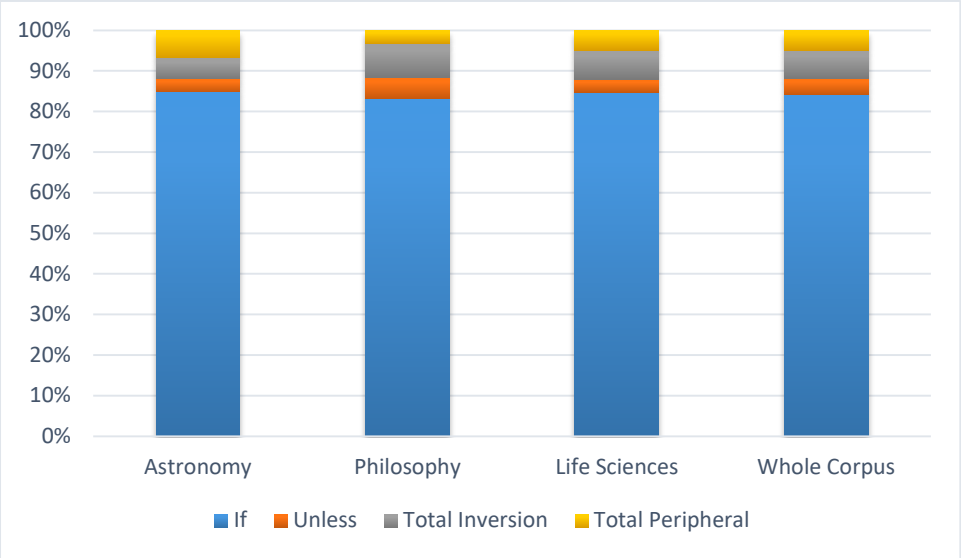

Figure 5.14: Proportion of use of types of conditionals per discipline.

Analysing the use of the different peripheral conditionals it is noticeable (Figure 5.15 below) that both *provided* and *supposing* have a distribution which is similar to that of the whole class of peripheral conditionals, whilst *so long as* appears more frequently in philosophy texts. On the contrary, *in case* is not present at all in that discipline.

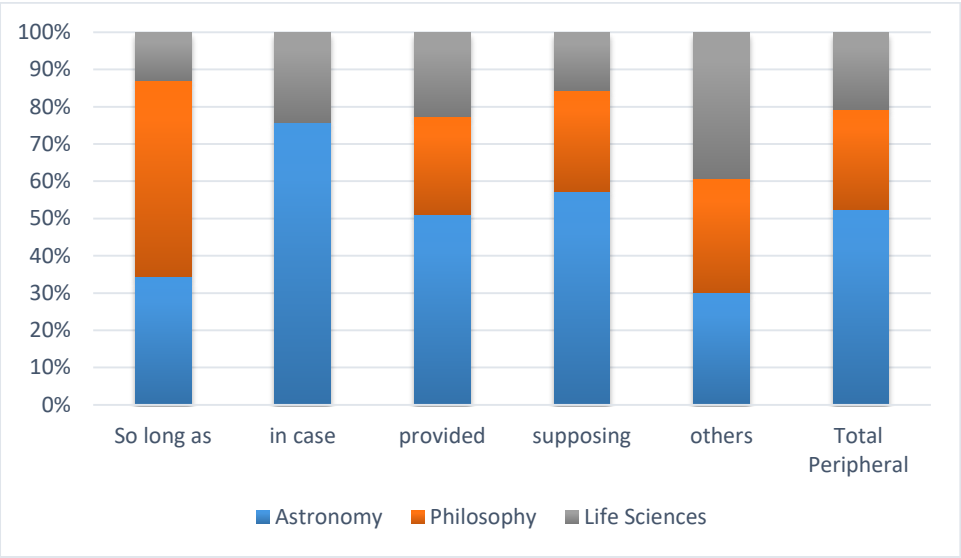

Figure 5.15: Proportion of use of peripheral conditional subordinators per discipline[109].

[109] Both in Figure 5.15 and 5.16, uses with less than twenty-five total cases have been grouped together under the label "others".

In the case of inversion triggers, as can be seen in Figure 5.16 below, the only one which deviates from the general frequency pattern is *should*, which shows a noticeably more frequent use in life sciences texts.

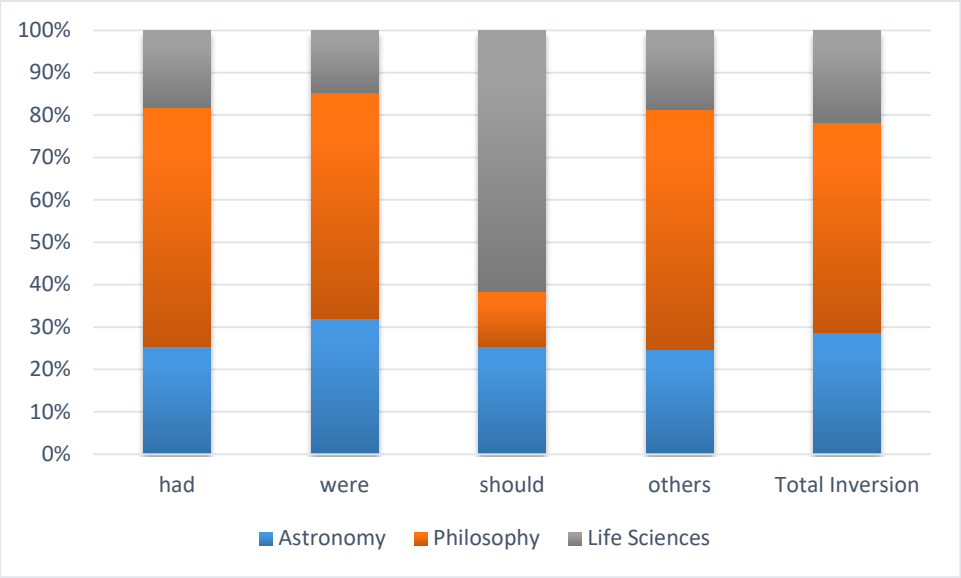

Figure 5.16: Proportion of use of inversion conditional triggers per discipline.

Regarding the diachronic evolution in the use of the different types of conditionals in each discipline (Figure 5.17 below), *if* occurs consistently less frequently in the nineteenth than in the eighteenth century in all disciplines, but the other three types exhibit a different behaviour.

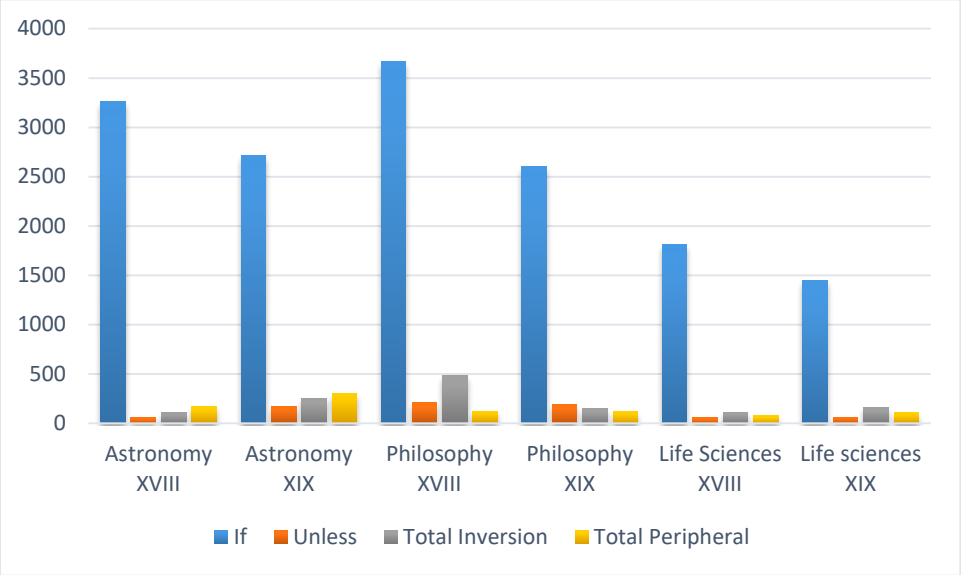

Figure 5.17: Uses of types of conditionals per discipline and century. Normalised figures

Unless, inversion, and peripheral conditionals show a common decrease in their use in philosophy samples during the period, as can be seen in more detail in columns 3 and 4 for each of the types in

Figure 5.18 below. On the contrary, both in astronomy and life sciences texts (columns 1 and 2, and 5 and 6, respectively, for each of the types) the results show an increase in the use of these conditionals between the two centuries.

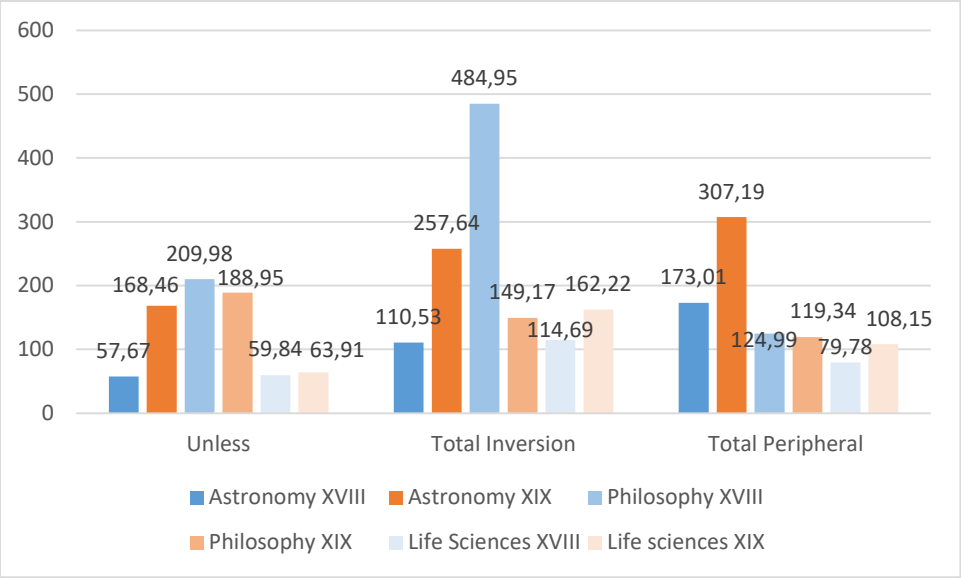

Figure 5.18: Uses of types of conditionals per discipline and century (excluding *if*). Normalised figures

2.3. *Results per genre of the sample*

The analysis of the results of the different kinds of conditionals on account of the genre of the samples provides further insights, shown in Table 5.7 below. Treatises show a distribution of uses in line with the whole corpus regarding both the use of each conditional and the proportion of use, with all types in the range of ±1% of the average.

	If	Unless	Total Inversion	Total Peripheral	Total
Treatise	2453.36	118.00	201.58	168.80	2941.74
Textbook	2549.97	77.57	130.89	121.20	2879.62
Essay	3654.76	196.42	350.74	182.39	4384.30
Lecture	2347.81	116.15	132.74	66.37	2663.06
Article	2432.19	185.66	501.29	278.49	3397.63
Letter	1609.93	77.59	232.76	77.59	1997.87
Dialogue	3951.78	300.14	150.07	100.05	4502.03
Others	2090.80	99.56	0.00	199.12	2389.49
Whole Corpus	2585.18	124.28	212.035	152.26	3074.07

Table 5.7: Use of types of conditionals per genre. Normalised figures

Textbooks show a higher proportion of use of *if* (88.55% of the cases of conditionals, versus 84.10% in the average), which is not driven by a particular preference for its use, (2549.97 cases per million words, in line with the average of the corpus, 2585.18), but by particularly lower proportions of use of the rest of the types of conditional. Essays show a different behaviour, with higher than average uses for all types of conditionals which are proportionally most acute in inversion conditionals, which represent 8% of the cases of conditionals in this genre, in contrast with 6.91% of the uses in the whole corpus.

Lectures and dialogues, with their disparate overall use of conditionals (dialogues use almost twice as many conditionals as lectures), show remarkably similar proportions of use of the different types. Both show a higher preference for *if* (88.16% and 87.78%, respectively) and *unless*, in this case slightly lower in lectures (4.36%, compared to an average for the whole corpus of 4.04%) and more prominent in dialogues (6.67%). Consequently, both present much lower proportions of both inversion and peripheral conditionals: Inversion conditionals are 4.98% of all conditionals in lectures and 3.33% in dialogues (6.91% of average use in the whole corpus), whilst peripheral are 2.49% in lectures and 2.22% in dialogues, compared to 4.95% in the whole corpus.

Letters present a lower general use of conditionals, affecting all types but inversion conditionals, which are used more frequently (232.76 times per million words, vs. 212.04 in the whole corpus) and account for 11.65% of all conditional uses in letters, a proportion much higher than the 6.91% in the average of the whole corpus. Finally, articles show higher than average uses of *unless* (5.46%), inversions (14.75%) and peripherals (8.20%), which result in the lowest proportion of *if* uses among all genres, 71.58%, contrasting with 84.10% in the average of the whole corpus.

2.4. *Results per sex of the author*

The analysis of the use of the different types of conditionals according to the sex of the author echoes the general distribution presented in Section 1.4 above (3158.50 uses of conditionals per million words in the case of male-authored texts and 2331.06 in the case of female-authored texts). As can be seen in Figure 5.19 below, all types of conditionals show lower levels of use in female-authored texts but for the inversion type, which shows a higher frequency in texts written by women (266.18 uses per million words) than in those written by men (206.23).

The analysis of the combined effects of the sex of the author and the discipline of the text shows little difference in relation with the general distribution (presented in Section 1.4 above), with almost all types of conditionals behaving uniformly.

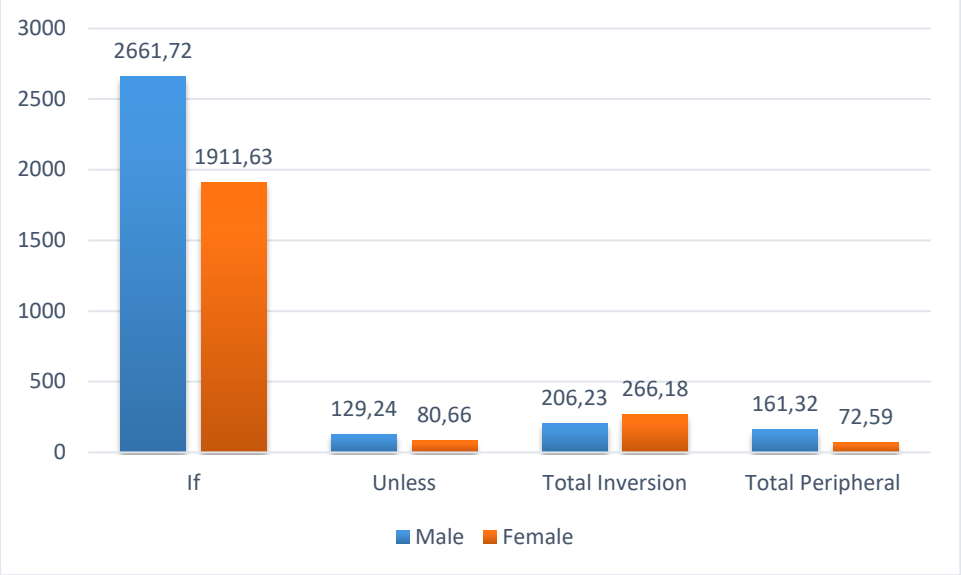

Figure 5.19: Use of types of conditionals per sex of the author, normalised frequencies.

As can be seen in Table 5.8 below, all types of conditionals appear less frequently in female authored texts on astronomy and life sciences than in the texts by their respective male peers, with important proportional differences in all cases.

		If	Unless	Total Inversion	Total Peripheral
Astronomy	Male	3094,19	115,65	187,60	244,14
	Female	1058,05	48,09	96,19	144,28
Philosophy	Male	3032,88	199,50	277,68	121,32
	Female	4371,73	198,71	794,86	132,48
Life Sciences	Male	1737,30	66,47	148,05	108,77
	Female	1137,13	41,10	95,90	27,40

Table 5.8: Use of types of conditionals per sex of the author and discipline. Normalised figures.

On the contrary, the use of conditionals is higher in female-authored philosophy texts. This is, particularly, the result of the higher uses of *if* and inversion conditionals, whilst peripheral conditionals and *unless* show proportions of use similar to those in male-authored texts (even a little inferior in the case of the latter).

2.5. *Results per origin of the author*

Finally, the analysis of the distribution of the different types of conditionals according to the origin of the author shows a different situation to that explained in Section 1.5 above. Texts from England show a distribution similar to the average, whilst texts from Ireland show a higher use of *if* conditionals and a lower use of the rest of the types.

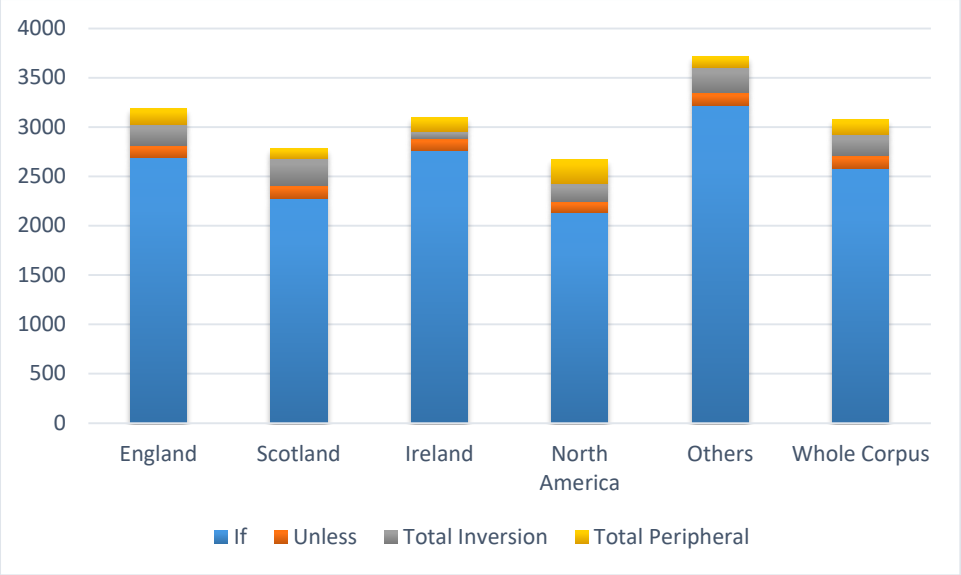

Figure 5.20: Use of types of conditionals per origin of the author, normalised frequencies

Contrarily, texts from both Scotland and North America show a lower use of *if* conditionals, emphasizing the use of inversion and peripheral conditionals, respectively. These results can be examined in Figure 5.20 above.

3. Results per function in discourse

The results of the distribution of the data in relation with the parameter of the function of conditionals in discourse are shown in Table 5.9 and Figure 5.21 below. The findings confirm that the most common function of conditionals is that of hypothesizing, accounting for 75.31% of all uses.

Function	Number of conditionals	Normalised Figures
Known Fact	229	188.48
Hypothesizing	2824	2324.27
Scope-Restricting	193	157.85
Method	0	0
Rhetorical	12	9.88
Concessive	197	162.14
Directive	21	17.28
Politeness	29	23.87
Relevance	161	132.51
Metalinguistic	17	13.99
Non-committal	52	42.80

Table 5.9: Use of conditionals per function in discourse.

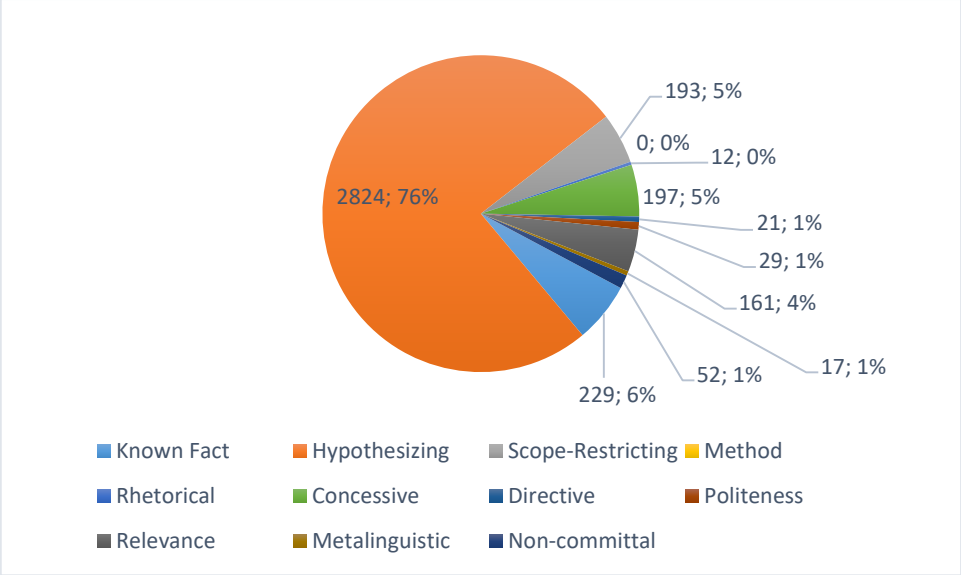

Figure 5.21: Use of conditionals per function in discourse.

The next most frequent function is that of known fact conditionals, which account for 6.13% of all the cases. These include not only conditionals accounting for mathematical operations and equalities, such as (4), but also other kinds of universally acknowledged relations of premises, such as (5), which presents a geometric property; (6), which explains the relations between physical properties of objects participating in a chemical reaction; and (7), regarding the properties of biological bodies.

> (4) Again, if 4 Minutes, 59 Seconds, 18 Thirds, the mean Motion for one Day, which ſtands againſt the firſt of January, be doubled, the Sum 9 Minutes, 58 Seconds, 36 Thirds, or 9 Minutes, 59 Seconds, will be the mean Motion for two Days [9 (1679)]

> (5) That any Body whatever, which is cut with innumerable Plains, interſecting each other in one common Line or Axis, if all the Sections produc'd in the Surface of it, be circular, it cannot be other than Spherical. [2 (266)]

> (6) If we bring carbon to a high temperature in contact with oxygen, it burns, and the compound carbonic-acid gas is the result; [113 (3332)]

> (7) Thus, as a rule, men and animals of the class of mammalia die if the internal temperature of their bodies reaches 111º, the heat natural to birds; [113 (2337)]

After that, the next most frequent conditionals are concessive ones, which account for 5.27% of the uses. Concessive conditionals include two subtypes. The first one, exemplified in (8), is characterised by the use of the protasis to state an apparent impediment for the fulfilment of the apodosis, under which it holds anyway. The second subtype (9) usually introduces a single phrase, and is used to

express that the author is conscious that the idea in the protasis could be true, but, nevertheless, decides not to affirm it because the apodosis is definitely true: in short, it allows the author to introduce a possible idea without affirming it.

> (8) It may be that some natural peculiarity does not appear till late in life, and yet may justly deserve to be considered natural, for if it is decidedly exceptional in its character its origin could hardly be ascribed to the effects of nurture. [79 (213)]

> (9) Our actions, if not determined, are at least influenced by motives; and the motive is a prior link in the chain, and a condition of the action. [115 (1675)]

Scope restricting conditionals also show an important proportion of use, accounting for 5.17% of the cases. These are conditionals that delimit the scope of a concept or group, stating its definition or limits. Some of their uses are shown in examples (10-12).

> (10) If liberty be defin'd, A power to paſs different judgments at the ſame inſtant of time upon the ſame individual propoſitions that are not evident […] it will follow, that Men will be ſo far irrational, and by conſequence imperfect agents, as they have that freedom of judgment. [85 (2559)]

> (11) If, however, we define a siderial day to be the time of the earth's rotation, although it is not equal precisely to the interval between the transits of a star, yet it is a quantity which may be calculated from that interval, and therefore available as a unit of time. [28 (3583)]

> (12) This is equally true if consciousness is taken to be, as it might perhaps be maintained that Sir William Hamilton in this connection intends it to be, a general name for our acts of intuitive judgment. [117 (958)]

The next most frequent function, accounting for 4.31% of the uses, is that of relevance conditionals, the most common type of speech act conditionals. These conditionals, exemplified in (13) and (14) below, are used to explain the circumstances under which the statement of the apodosis is relevant. This is, following the Gricean interpretation of Speech Act conditionals explained in Chapter 2, if the reader does not think the condition of the protasis is fulfilled, they would not need to be concerned with the content of the apodosis.

> (13) If any of my readers should think, that, in this section, I make too wide, and too abrupt a transition from the question concerning the origin of our knowledge, to that which relates to the moral constitution of human nature, I must beg leave to remind them that, in doing so, I

> am only following [Mr] Locke's arrangement in his elaborate argument against innate ideas. [103 (6037)]
>
> (14) If any one deny a vacuum, let him look into the mind of an unreflecting person, and he will find one; not indeed exactly what he may be looking for, but figuratively so; [20 (9741)]

All the other types of conditionals occur less than 2% of the time. Non-committal conditionals (examples (15) and (16) below) have been found in 1.39% of the cases, whilst politeness (17) account for 0.78%. The former are used by authors to distance themselves from claims, often by other authors, which are presented and whose consequences are explained, but which are not asserted. The latter introduce expressions of politeness from the author to the reader, without introducing any new content.

> (15) The admixture of the relative element not only does not take away the absolute character of the remainder, but does not even (if our author is right) prevent us from recognising it. [110 (8606)]
>
> (16) for if we may believe Antigonus the Caryſtian, quoted by Diogenes Laertius, his life correſponded to his doctrine. [94 (4221)]
>
> (17) partly from thoſe ſhe in a manner appropriates to herſelf, irony, hyperbolé, alluſion, parody, and (if the reader will pardon my deſcending ſo low) paronomaſia, [97 (8350)]

Directive conditionals (18) account for 0.56% of the uses, metalinguistic conditionals (19) account for 0.46%; and rhetorical conditionals, exemplified in (20), for only 0.32%. Directive conditionals are used to present an action the author desires the reader to comply with, and are also used metaphorically as metadiscursive guidance so that the audience follows the explanations of the author. Metalinguistic conditionals are used by authors to make comments on the accuracy or felicity of the selection of words used to encode a point. Rhetorical conditionals are constructions which take the form of a conditional although they do not express a conditional relationship, but, rather, assert a point by means of the blatant truth or falsehood of one of its parts.

> (18) If we proceed, and take a ſurvey of thoſe more noble animals of the winged race, we ſhall alſo obſerve… [98 (8600)]
>
> (19) The features constituting the whole process, including the associations of the original contents, thus drawn out under four heads, which describe in general terms its essential elements as an act of choice, are in actual experience "telescoped," if I may use the word, into one another; [121 (7965)]

(20) I know not whether or no Women are allow'd to have Souls, if they have, perhaps it is not prudent to provoke them too much, leaſt ſilly as they are, they at laſt recriminate, [82 (2515)]

Finally, it is necessary to note that no case of method conditional has been found. Even though the development of sections on the methodology followed in scientific processes was slow, the samples analysed contain discussions on these issues, and some uses of this type of conditional were expected. However, none was found and, consequently, they will not be considered from now on.

3.1. *Diachronic analysis*

The use of the different functions of conditionals over the two centuries under study is presented in Table 5.10 below.

Function	18th century	19th century
Known Fact	233.31	143.48
Hypothesizing	2604.15	2043.34
Scope-Restricting	134.73	183.06
Rhetorical	16.43	3,30
Concessive	139.65	184.71
Directive	24.64	9.90
Politeness	36.15	11.54
Relevance	134.73	130.29
Metalinguistic	21.36	6.60
Non-committal	42.72	42.88

Table 5.10: Use of the functions of conditionals in discourse per century. Normalised figures

The results show a decrease in the use of known fact, hypothesizing, and most types of speech act conditionals (but for the non-committal type, which shows no evolution overtime). The only types which increase their use are scope restricting and concessive conditionals.

These results, however, are influenced by a context in which there is a general decrease in the use of conditionals, as explained above. Consequently, these results cannot be considered at face value only, and it is the proportion of use that gives the best explanation for their evolution. As shown in Figure 5.22 below, known fact and hypothesizing conditionals, despite maintaining their dominant position throughout the period, show the most important decrease, whilst speech act conditionals remain fairly stable over time when considered as a whole.

This evolution corresponds with an increase in the use of concessive and scope restricting conditionals, which share their condition as structures that allow to establish cooperative links with the audience in a more covert way than the more explicit speech act conditionals.

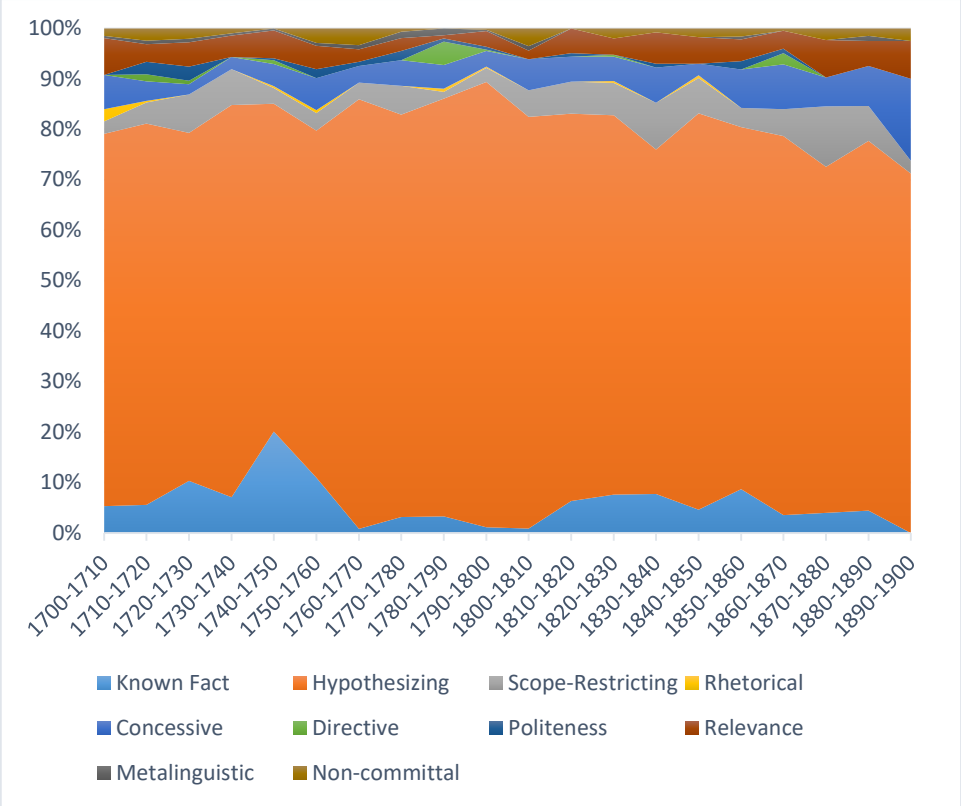

Figure 5.22: Diachronic evolution in the proportion of use of functions of conditionals in discourse.

On the contrary, the two dominant types are characterised by the fact that they show no mitigation (known fact) or that this mitigation is dependent on the modal marking and not established by the conditional itself (hypothesizing conditionals).

3.2. *Results per discipline of the sample*

The study of the distribution of conditional functions in different disciplines reveals some contrasts between astronomy samples, on the one hand, and philosophy and life sciences samples, on the other.

Known fact, relevance and scope-restricting conditionals are used more frequently in astronomy than in both life sciences and philosophy texts. Relevance conditionals account for 5.12% of the uses in astronomy samples, 3.70% in philosophy and 3.99% in life sciences; and scope-restricting conditionals for 5.33%, 5.09%, and 5.02% respectively. However, the most noticeable difference is the one among known fact conditionals, which account for 12.53% of all the uses in astronomy samples, compared to 2.05% in philosophy and 2.19% in life sciences.

With concessive, non-committal, and, particularly, hypothesizing conditionals the opposite distribution appears, as the three functions are used noticeably less frequently in astronomy than in the other two disciplines. Concessive conditionals account for only 3.81% of the uses in astronomy, compared to 6.41% in philosophy and 5.79% in life sciences; non-committal account for 0.35%, 1.72%

and 2.70% of all the uses of conditionals in each respective discipline. Most noticeably, hypothesizing conditionals account for 72.04% of the uses in astronomy samples, versus 77.99% and 77.61% for philosophy and life sciences, respectively. The results can be examined in Figure 5.23 below.

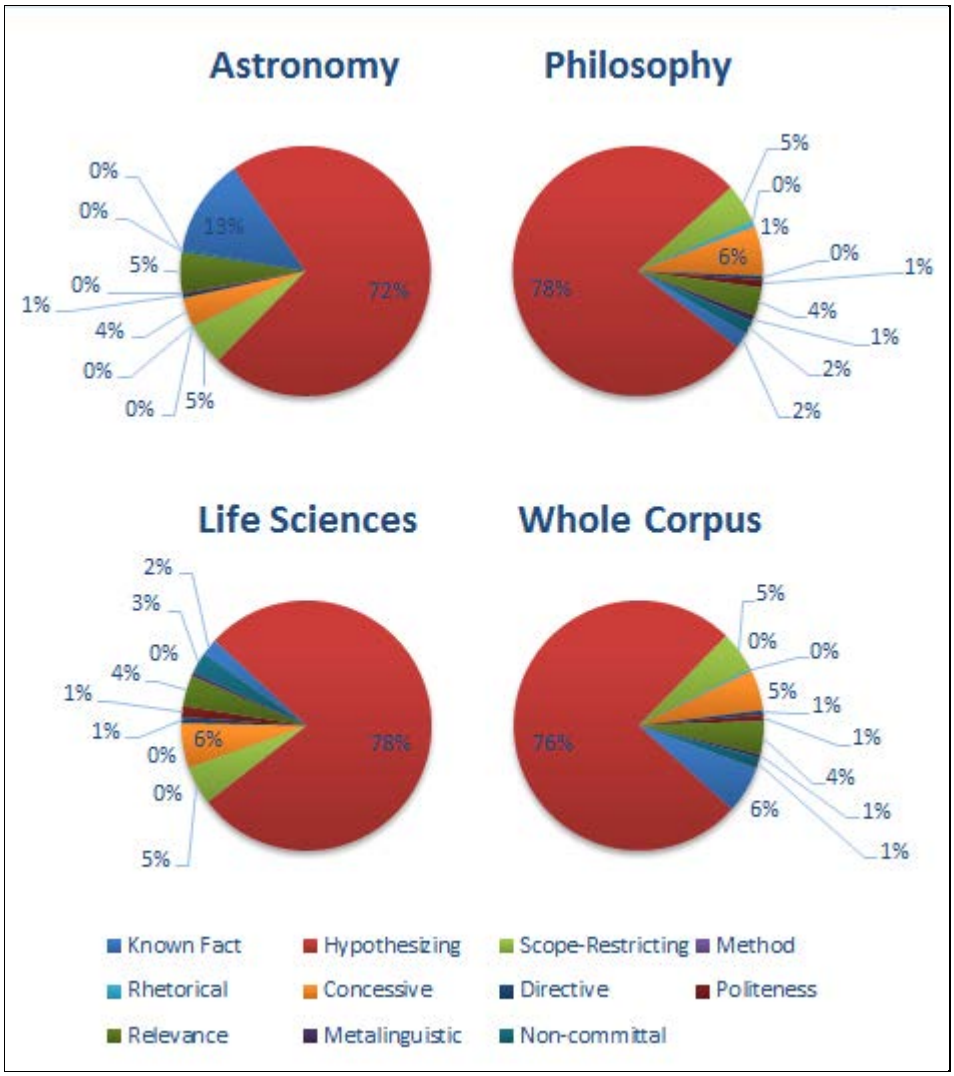

Figure 5.23: Use of the functions of conditionals in discourse per discipline.

Analysing the evolution in the use of conditional functions in the different disciplines over time, shown in Figure 5.24 below, it has been found that the decrease in the use of conditionals in philosophy texts (which was, as explained in Section 1.2 above, much sharper than in either astronomy or life sciences samples) is accounted for almost exclusively by the reduced use of hypothesizing conditionals, whose use falls from 3564.61 cases every million words in eighteenth century philosophy texts to 2322.15 in the nineteenth century. All the other functions combined show a comparatively modest decrease, from 919.9 uses every million words in the eighteenth century to 740.9 in the nineteenth century. The only functions that increase their use are relevance and concessive conditionals.

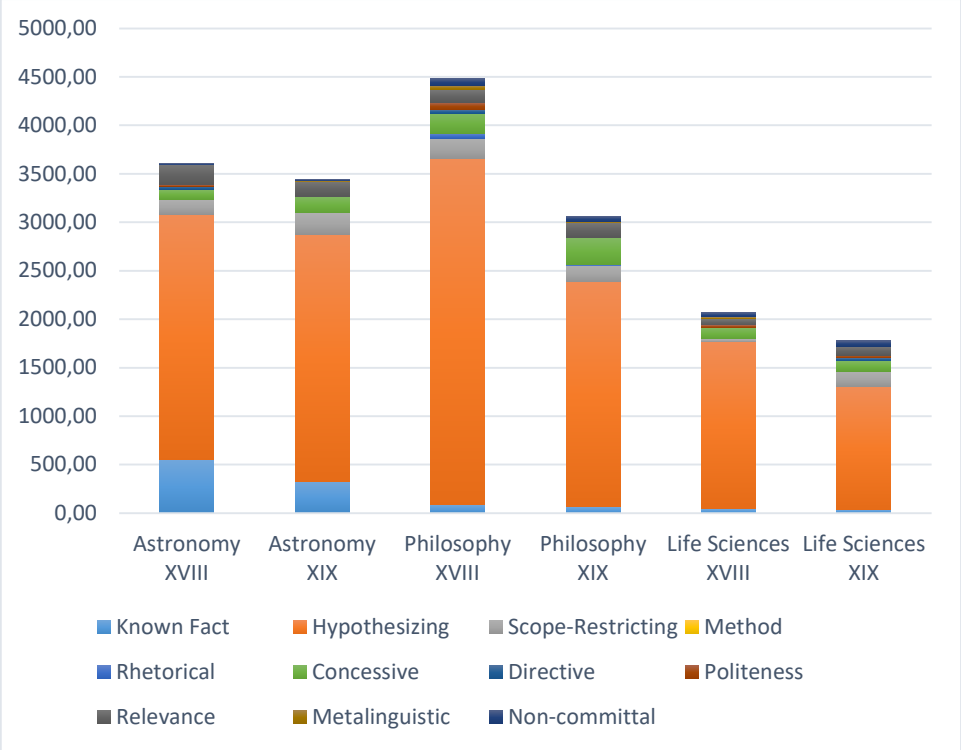

Figure 5.24: Use of the functions of conditionals in discourse per discipline and century. Normalised figures.

In the case of astronomy texts, the slight decrease identified above concentrates on known fact conditionals, which decrease from 552.67 uses every million words in the eighteenth century to 327.01 in the nineteenth (even though they continue to be more common than in any other discipline). The proportion of use of hypothesizing conditionals remains stable (2527.89 in the eighteenth century and 2551.65 in the nineteenth) whilst there is a slight increase in both scope restricting (218.01 in the nineteenth century from 158.59 in the eighteenth) and concessive conditionals (168.35 from 100.92).

Finally, the general decrease in life sciences texts is accounted for by hypothesizing conditionals, whose use diminishes from 1725.32 cases per million words in the eighteenth century to 1263.38 in the nineteenth. The rest of the functions show a general stability or a very slight decrease, with the exception of scope restricting conditionals, whose use increases fivefold from 29.92 uses per million words in the eighteenth century to 162.22 in the nineteenth century.

3.3. *Results per genre of the sample*

As was the case for the distribution of genres along the different types of conditionals (see Section 2.3 above), treatises show a distribution in line with the average for the whole corpus, with only a slight preference for hypothesizing conditionals and a slight disfavour of known fact conditionals. Articles reproduce the average distribution as well, presenting a slightly lower than average use of known fact

conditionals and a slightly higher use of scope restricting, concessive and relevance conditionals, as shown in Figure 5.25 below.

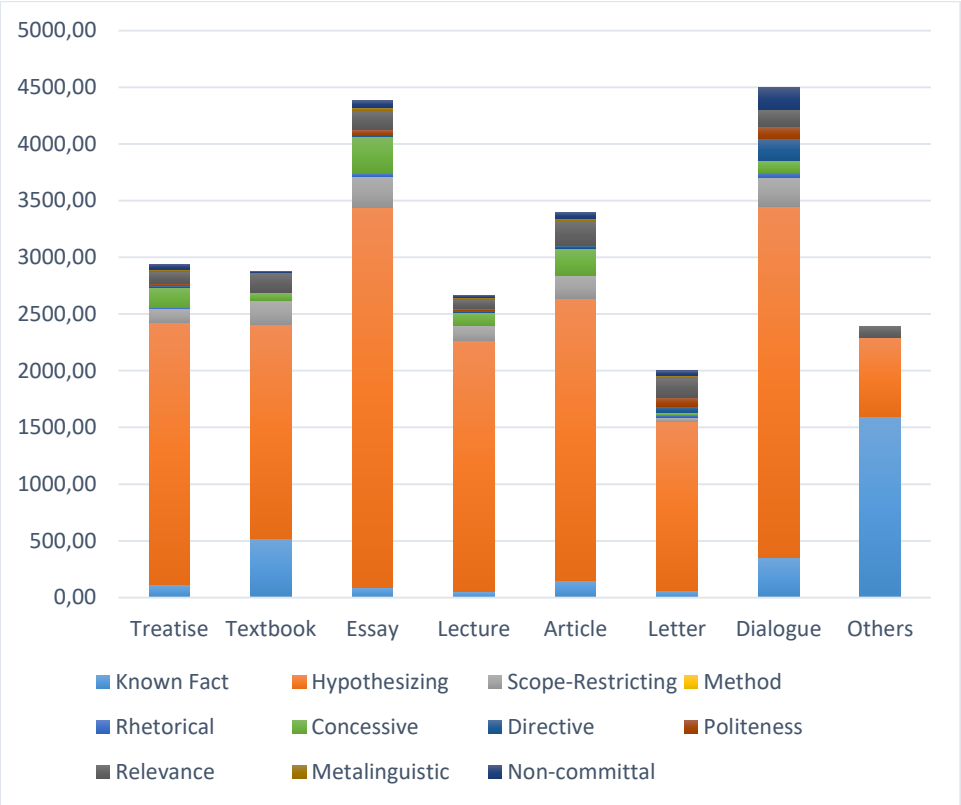

Figure 5.25: Use of the functions of conditionals in discourse per genre. Normalised figures.

Textbooks present a distribution of functions with a more noticeable deviation from the average. The proportion of use of known fact conditionals is much higher (523.57 uses per million, or 18.18% of all uses of conditionals, versus 188.48 uses per million or 6.13% in the whole of the corpus) and that of hypothesizing conditionals much lower (1880.97, or 65.32%, against 2324.37 and 75.61% in the whole corpus). Moreover, the results of speech act conditionals (excluding relevance ones) account for only 0.68% of the total uses, while in the whole corpus they account for 2.63%.

As already explained in Section 1.3 above, both dialogues and essays use conditionals more frequently than the average, but they present different distributions of functions. Essays appear to be the exact opposite of textbooks, with a lower than average use of known fact conditionals (91.19 uses per million, 2.08%), which contrasts with their general higher than average use of the rest of the functions. Dialogues present higher than average uses in all functions except for concessive conditionals. This difference is particularly relevant in politeness (100.05 uses per million words vs. 23.87 in the whole corpus), rhetorical (50.02, vs. 9.88), and directive conditionals (200.09 uses per million words in dialogues vs. 17.28 in the whole corpus).

Finally, lectures and letters also present lower than average proportions of known fact conditionals, 1.87% and 2.91%, respectively. However, the distribution of the rest of the functions differs. Lectures emphasise the use of hypothesizing conditionals, whose use represents a higher proportion of the total than in any other genre (83.18%, the average is 75.61%). Letters, as dialogues did, emphasise the use of directive and politeness conditionals, but it is relevance conditionals that are particularly more frequent, accounting for 8.74% of the cases, whilst they only account for 4.31% of the cases in the average of the whole corpus.

3.4. *Results per sex of the author*

Regarding the uses of the different functions of conditionals according to the sex of the authors, the results show that women authors seem to avoid known fact and scope restricting conditionals, preferring hypothesizing conditionals instead: Known fact conditionals account for 1.04% and scope restricting for 2.77% of the uses in women-authored texts. The respective percentages in texts by male authors are 6.56% and 5.37%. On the contrary, hypothesizing conditionals account for 78.89% of the cases in texts by female authors and for 75.33% in texts by their male counterparts. These results can be examined in Figure 5.26 below:

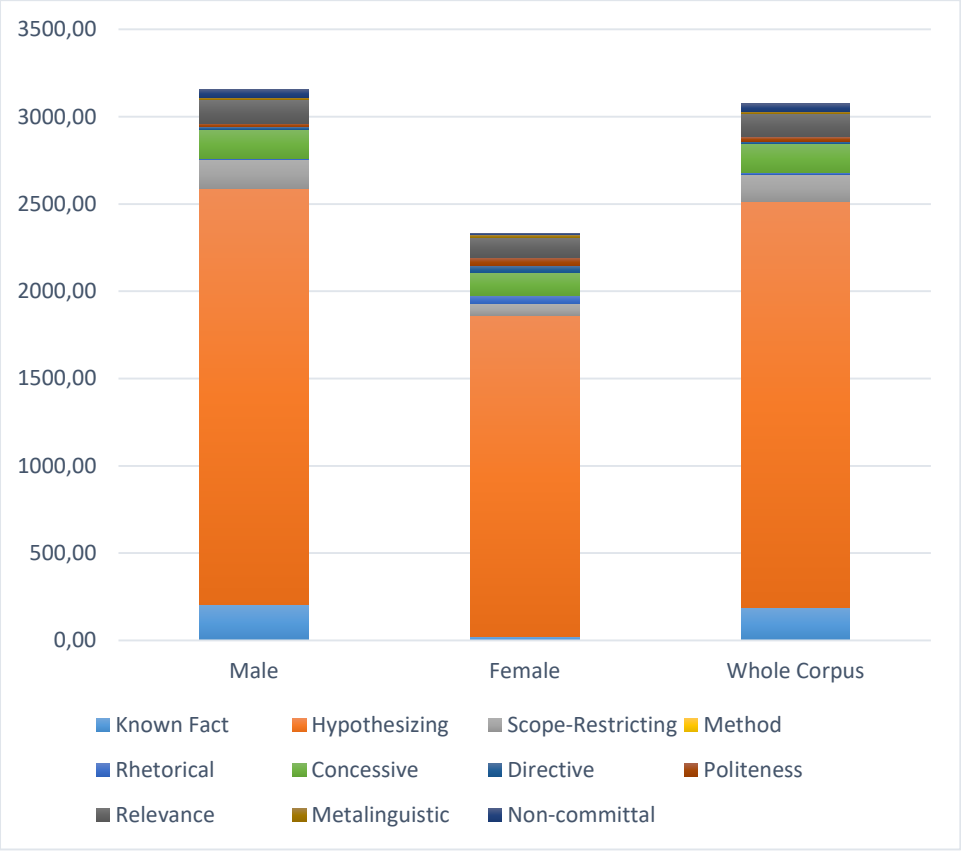

Figure 5.26: Use of the functions of conditionals in discourse per sex of the author. Normalised figures.

Regarding the other functions, it is noticeable that women use more directive, rhetorical, and politeness conditionals (1.73%, 2.08%, and 2.08% of all the uses of conditionals, versus 0.46%, 0.17%, and 0.67%, respectively, in male-authored texts), and less of the non-committal type (0.35%, against 1.48% for male authors).

As already done in Sections 1.4 and 2.4 above, the parameters of discipline and sex of the authors are also combined, although caution must be taken as there are inherent limitations because of the different size of the resulting samples. These results are shown in Table 5.11 and Figure 5.27 below. Apart from the difference in the overall use of conditionals, it is particularly noticeable how the uses of known fact conditionals are especially favoured by male authors on astronomy, (460.02 uses per million words, with all the other sets of samples presenting less than 100) and how the set of samples by female philosophers presents the highest use of hypothesizing conditionals.

	Astronomy		Philosophy		Life Sciences	
	Male	Female	Male	Female	Male	Female
Known Fact	460,02	96,19	80,88	33,12	51,36	0,00
Hypothesizing	2626,47	913,77	2825,29	4371,73	1589,25	1054,92
Scope-Restricting	197,88	0,00	191,41	198,71	111,79	27,40
Method	0,00	0,00	0,00	0,00	0,00	0,00
Rhetorical	2,57	0,00	13,48	198,71	0,00	0,00
Concessive	133,64	144,28	231,85	364,31	129,92	27,40
Directive	17,99	0,00	8,09	165,60	18,13	0,00
Politeness	5,14	48,09	37,74	33,12	21,15	54,80
Relevance	182,46	144,28	148,27	33,12	63,45	137,00
Metalinguistic	2,57	0,00	26,96	66,24	12,09	0,00
Non-committal	12,85	0,00	67,40	33,12	63,45	0,00
TOTAL	3641,59	1346,61	3631,36	5497,78	2060,58	1301,53

Table 5.11: Use of functions of conditionals in discourse per sex of the author and discipline. Normalised figures.

Comparing male and female authored texts in each discipline shows that certain functions, such as known fact and non-committal conditionals, are less common in texts by female authors irrespectively of the discipline, whilst others show a distribution dependent on the discipline. The most frequent among these distributions is that of functions being used less frequently in female-authored texts in astronomy and life sciences, but being more common in philosophy texts. This is the situation for hypothesizing, scope-restricting, rhetorical, directive and metalinguistic conditionals. Politeness conditionals show just the opposite distribution, with a lower (compared to their male counterparts) usage in female-authored philosophy texts and a higher usage in both astronomy and life sciences texts by women authors. Finally, concessive conditionals are more common in texts written by women

in both astronomy and philosophy, and in those by men in life sciences; and relevance conditionals present exactly the opposite distribution.

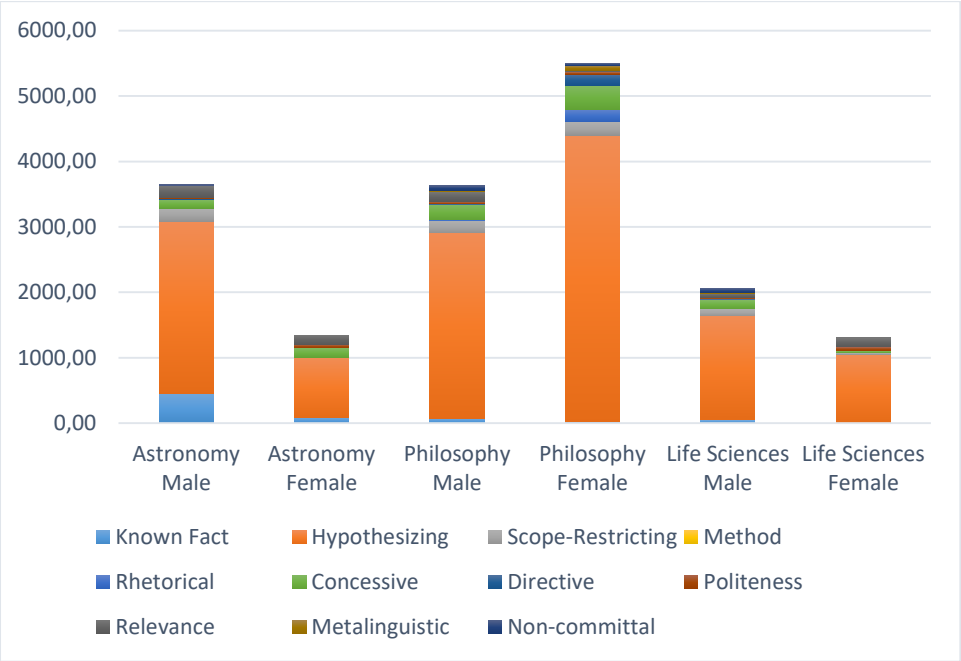

Figure 5.27: Use of functions of conditionals in discourse per sex of the author and discipline. Normalised figures.

3.5. *Results per origin of the author*

Similarly to what happened in Sections 1.5 and 2.5 the results analysed according to the geographical provenance of the author exhibit less variability in comparison to the average than in the other parameters. Thus, as can be seen in Figure 5.28 below, once the category "Others" is excluded, the results for most sets of samples are similar to those in the average of the whole corpus.

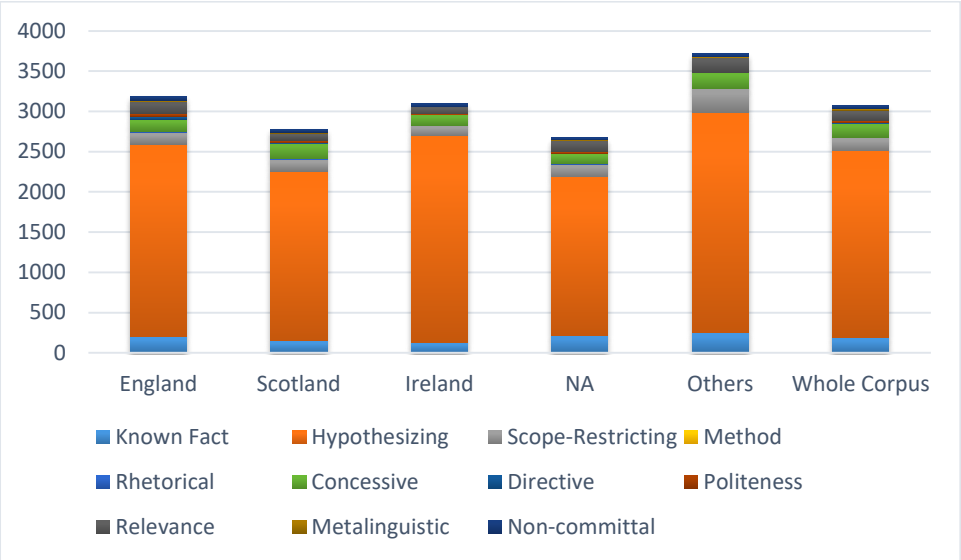

Figure 5.28: Use of functions of conditionals in discourse per origin of the author. Normalised figures.

The only exception are texts by Irish authors, which show a lower proportion of use of both known fact (4.13%) and scope restricting (3.81%) conditionals (compared to 6.13% and 5.17%, respectively, in the average), and a much higher proportion of use of hypothesizing conditionals, 83.17%, against 75.61% in the whole corpus.

3.6. *Results per type of conditional*

The final subsection examines the proportion of use of the different functions for each type of conditionals[110]. The results (see Table 5.12 below) show that a series of functions are only expressed with *if* conditionals: these are directive, politeness and metalinguistic conditionals. Rhetorical and non-committal conditionals are also almost exclusively functions of *if* conditionals, presenting a single example with *unless* and with inversion conditionals, respectively.

	If	Unless	Total Inversion	Total Peripheral	Total
Known Fact	208 (171.19)	10 (8.23)	3 (2.47)	8 (6.58)	229 (188.48)
Hypothesizing	2333 (1920.16)	125 (102.88)	221 (181.89)	145 (119.34)	2824 (2324.27)
Scope-Restricting	157 (129.22)	7 (5.76)	9 (7.41)	20 (16.46)	193 (158.85)
Method	0	0	0	0	0
Rhetorical	11 (9.05)	1 (0.82)	0	0	12 (9.88)
Concessive	183 (150.62)	0	10 (8.23)	4 (3.29)	197 (162.14)
Directive	21 (17.28)	0	0	0	21 (17.28)
Politeness	29 (23.87)	0	0	0	29 (23.87)
Relevance	131 (107.82)	8 (6.58)	14 (11.52)	8 (6.58)	161 (132.51)
Metalinguistic	17 (13.99)	0	0	0	17 (13.99)
Non-committal	51 (41.98)	0	1 (0.82)	0	52 (42.80)
TOTAL	3141 (2585.18)	151 (124.28)	258 (212.35)	185 (152.26)	3735 (3074.07)

Table 5.12: Use of functions of conditionals in discourse per type of conditional. Normalised figures between brackets.

[110] As explained above in the Introduction; from Section 3 on, further subsections, in which results will be examined from the combined perspective of the already presented linguistic parameters, will be included.

Most other conditional functions (which are also the most frequently used) can be expressed with all types of conditionals. However, as shown in Figure 5.29 below, *unless*, peripheral and inversion conditionals all show a higher proportion of use of hypothesizing conditionals (82.78%, 78.38% and 85.66%, respectively) than *if*, in which the proportion is only 74.28%.

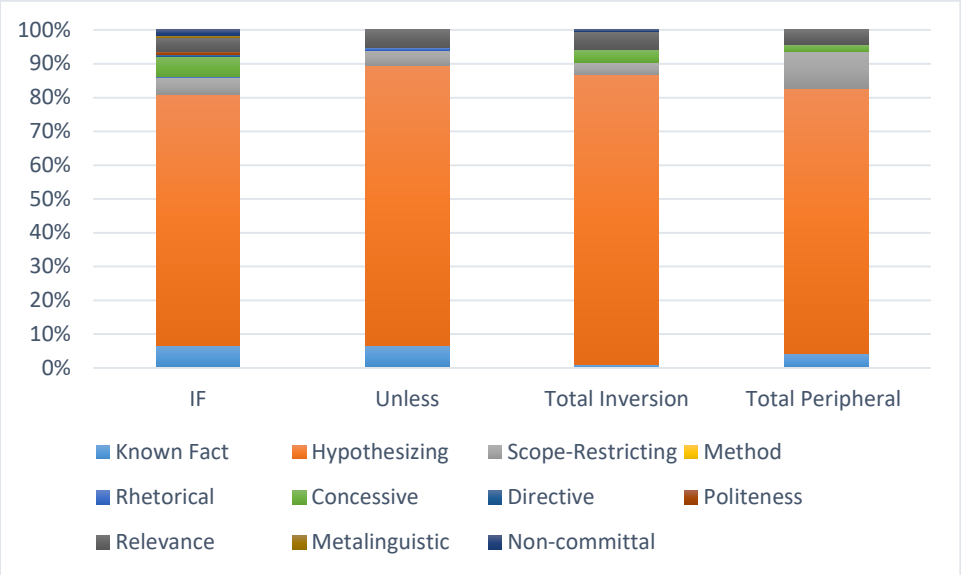

Figure 5.29: Proportion of use of functions of conditionals in discourse per type of conditional.

Moreover, it has been found that inversion conditionals do not normally function as known-fact conditionals (only 1.16%) and that there is not a single use of concessive conditional with *unless*. On the contrary, peripheral conditionals are the ones with the highest proportion of scope-restricting uses (10.81%).

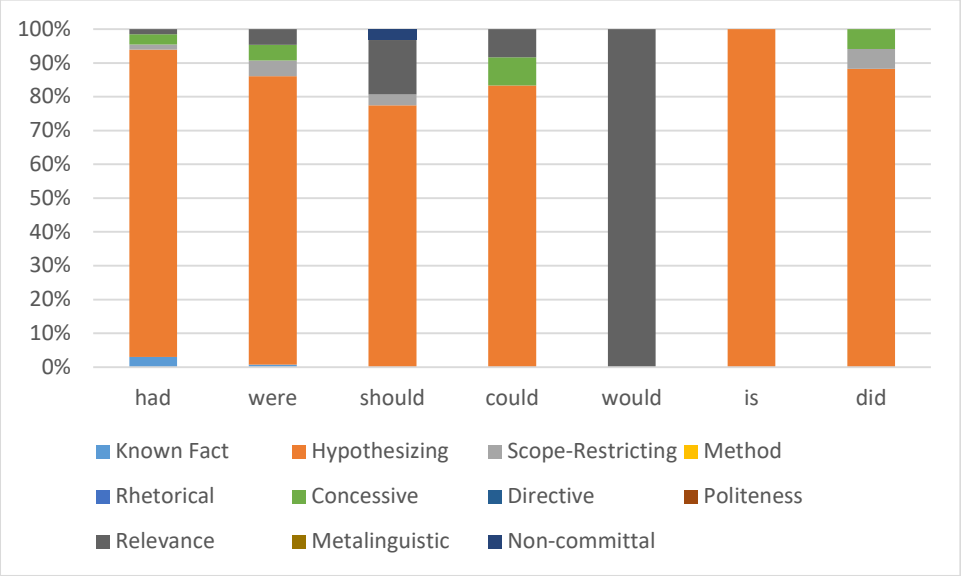

Figure 5.30: Proportion of use of functions of conditionals in discourse among inversion conditionals.

The different inversion or peripheral particles echo the general distribution, with most types presenting a majority of hypothesizing uses. The only exceptions are the single case of conditional inversion with *would* and the five conditional uses of *lest*, all of which play the role of relevance conditionals, as shown in Figures 5.30 above and 5.31 below, respectively.

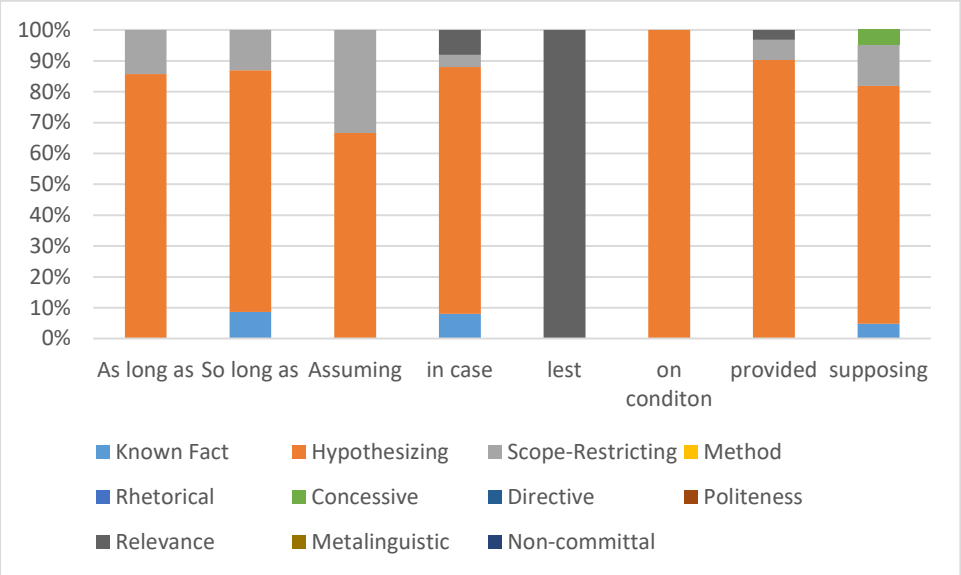

Figure 5.31: Proportion of use of functions of conditionals in discourse among peripheral conditionals.

As can be seen, most types do not present any case of known fact conditionals, with only *had*, *were*, *so long as*, *in case* and *supposing* presenting some of these uses. On the contrary, scope-restricting conditionals are much more widespread, particularly among peripheral conditionals.

4. Results per order of the constituents

The analysis according to the order of the constituents shows results which are similar to those obtained in part of the previous studies. As shown in Figure 5.32 below, Initial conditionals account for 2204.93 uses per million words, 71.73% of all conditional uses. Final conditionals account for 634.57 uses per million (21.53%), Middle conditionals appear 197.53 times per million (6.43%), and, finally, apodosis-less conditionals appear only 9.05 times every million words (0.32%).

These results are in line with Ford & Thompson's (1986), who found that initial conditionals account for 77% of the uses of conditionals and final conditionals for the remaining 23% in a study on conditionals in written discourse, in which they excluded Middle and Apodosis-less conditionals. On the contrary, Carter-Thomas & Rowley-Jolivet (2008) examination on the uses of conditionals in the language of medicine, showed that initial conditionals are 59%, final conditionals 33% and middle

conditionals 8%, a much lower percentage than the one found in our corpus. In both studies, the proportion of uses of initial conditionals was higher in oral than in written data, something which may be related to the consideration of initial conditionals as the prototypical position for conditionals.

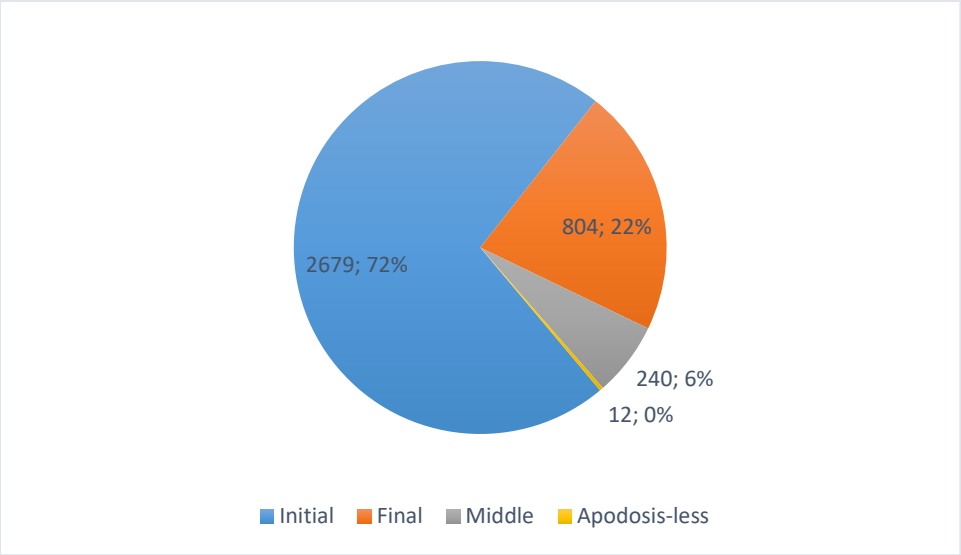

Figure 5.32: Uses of conditionals according to the different orders of their constituents.

4.1. *Diachronic analysis*

In what regards the evolution of this parameter over time (Figure 5.33 below), initial and final conditionals experiment a decrease from 2433.28 uses per million words in the eighteenth century to 1975.73 in the nineteenth; and from 775.49 to 547.53, respectively. Concurrently, there is an increase in the use of Middle conditionals, from 169.23 uses per million words in the eighteenth century to 225.94 in the nineteenth, and apodosis-less conditionals remain invariable, with 9.86 uses per million words in the eighteenth century and 9.90 in the nineteenth century.

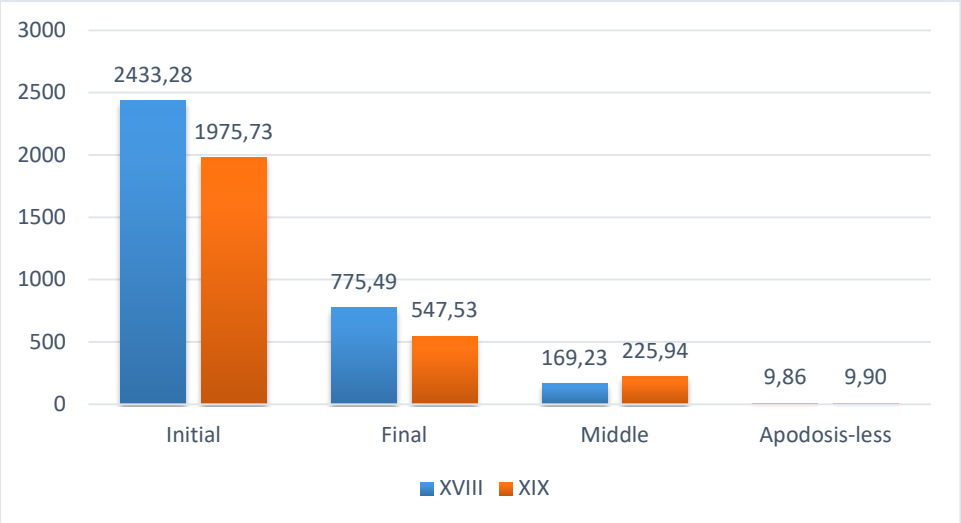

Figure 5.33: Use of the different orders of conditional constituents per century. Normalised figures

As explained above, these results are influenced by a general decrease in the use of conditionals. Therefore, it is necessary to check both the absolute numbers and the proportion of use of each function in each century. The results show that initial and apodosis-less conditionals remain stable in their proportion of uses between the two centuries, with a difference of less than 0.2%. It is final and middle conditionals that differ: final conditionals decrease their proportion of use, from 22.89% in the eighteenth century to 19.84% in the nineteenth, whilst middle conditionals increase their proportion from 5.00% to 8.19%.

The analysis of the proportion of uses decade by decade, shown in Figure 5.34 below, reinforces these results, revealing how the level of use of initial conditionals, even presenting ups and downs, remains comparatively the same, whilst the use of final conditionals shrinks and that of middle ones increases, in particular towards the end of the nineteenth century.

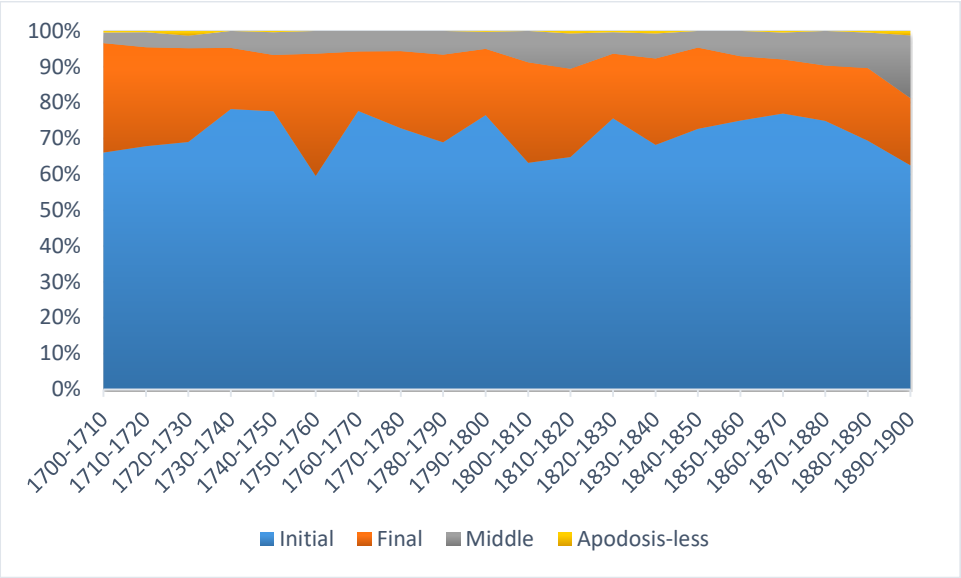

Figure 5.34: Diachronic evolution in the proportions of use of the different orders of conditional constituents.

4.2. *Results per discipline of the sample*

There are only relatively small differences between disciplines in the use of each of the orders of constituents. As can be seen in Figure 5.35, the main distinction according to this parameter is between astronomy samples on the one hand, featuring a high proportion of initial conditionals (76.68%) and a low usage of final ones (17.85%), and philosophy and life sciences samples on the other hand, with a lower proportion of initial conditionals (69.93% and 66.02%, respectively) and a higher usage of structures with a final protasis (23.40% in philosophy texts and 24.71% in life sciences texts). The differences between these two groups, however, become blurred if middle conditionals are analysed, as they show a low degree of usage in both astronomy and philosophy texts (5.26% and

6.15%) and a higher degree of usage in life sciences (9.14%). Apodosis-less conditionals are most frequently used in philosophy samples (0.51%), but they represent only 0.21% of uses in astronomy and 0.13% in life sciences.

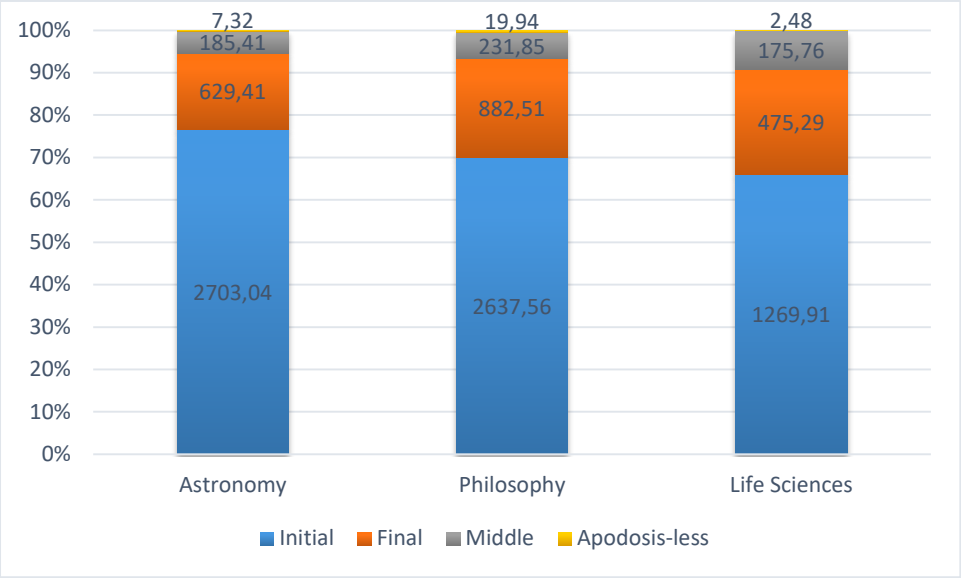

Figure 5.35: Use of the different orders of conditional constituents per discipline. Normalised figures.

The evolution of these uses in the different disciplines are shown in Figure 5.36 below. As expected from the results for the whole corpus, the highest decrease between the eighteenth and the nineteenth century appears in philosophy conditionals. However, it is necessary to consider the proportion of use of each order in each discipline to obtain the full picture of the data.

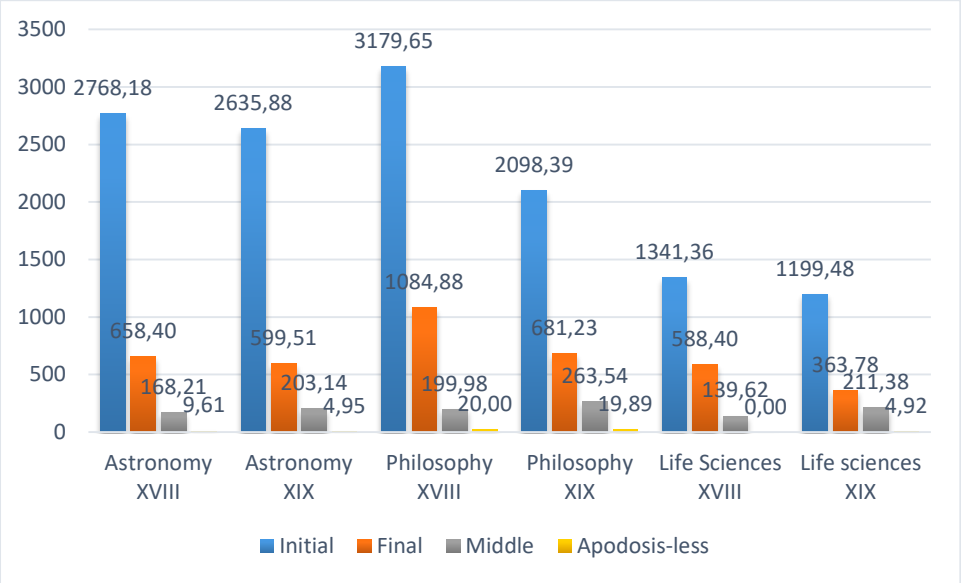

Figure 5.36: Use of the different orders of conditional constituents per discipline and century. Normalised figures.

The data reveal that the use of the different orders of conditionals remains very stable over time in astronomy texts, with a decrease of less than 1% in the proportion of use for each of the types. The exception to this trend are middle conditionals, which increase from 4.67% of the uses in the eighteenth century to 5.90% in the nineteenth. Philosophy texts show a similar pattern, but with higher decreases in the proportion of use of both initial and final conditionals (from 70.90% to 68.51% and from 24.19% to 22.24%, respectively), which correspond with a higher increase in the proportion of use of middle conditionals (from 4.46% to 8.60%). Finally, life sciences samples show a different pattern, in which it is only final conditionals that decrease its proportion of use (rather sharply, from 28.43% to 20.44%), whilst both initial and middle conditionals increase it, from 64.82% to 67.40% and from 6.75% to 11.88%, respectively.

4.3. *Results per genre of the sample*

The proportion of use of the different orders of conditional constituents among the different genres is, again, influenced by the general use of conditionals in each genre. These proportions present a fairly uniform scenario, with differences within a 3% range from the average, as shown in Table 5.13 below.

	Initial	Final	Middle	Apodosis-less
Treatise	2087.90	655.54	191.75	6.56
Textbook	2302.73	416.92	155.13	4.85
Essay	3002.37	1094.32	266.57	21.04
Lecture	1816.85	622.21	199.11	24.89
Article	2320.79	761.22	315.63	0.00
Letter	1435.36	387.94	174.57	0.00
Dialogue	3301.49	1000.45	150.07	50.02
Others	1792.11	597.37	0.00	0.00
TOTAL	2204.93	634.57	197.53	9.05

Table 5.13: Use of the different orders of conditional constituents per genre. Normalised figures.

The only genres which do not conform to this general uniformity are textbooks and dialogues. Textbooks show the highest proportion of use of initial conditionals, accounting for 79.97% of all uses, contrasting with an average of 71.73% for the whole corpus. This corresponds to the lowest proportion of final conditionals, only 14.48%. Dialogues, contrarily, are particularly noticeable for their lower proportional use of middle conditionals (3.33% only, against an average of 6.43%), which allows for a slightly higher use of all the other orders, most relevantly apodosis-less ones, which account for 1.11% of the uses in dialogues, versus an average of 0.32%.

4.4. *Results per sex of the author*

The results on account of the parameter of the sex of the author of each sample shows a noticeable difference in the proportion of use of initial and final conditionals. Men authors use a higher proportion of initial conditionals (72.37%) and a lower proportion of final conditionals (20.92%), whilst women use less initial conditionals (64.01%), and, particularly, more final ones (28.72%). In fact, and even allowing for their general lower use of conditionals, women use more final conditionals than men, as can be seen in Figure 5.37 below.

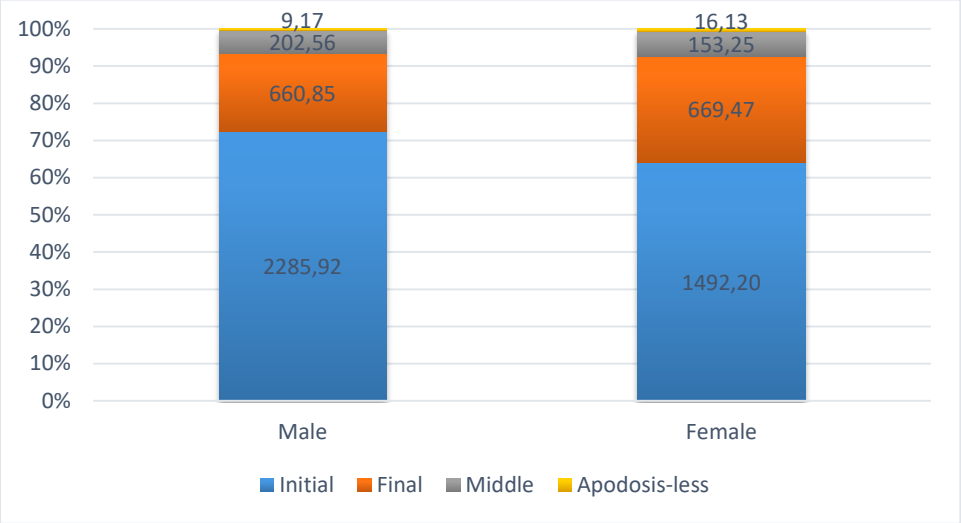

Figure 5.37: Use of the different orders of conditional constituents per sex of the author. Normalised figures

Combining the parameters of sex of the author and discipline of the samples reveals a scenario in which all three disciplines present important differences between their male and female authors. This is shown in Figure 5.38 below.

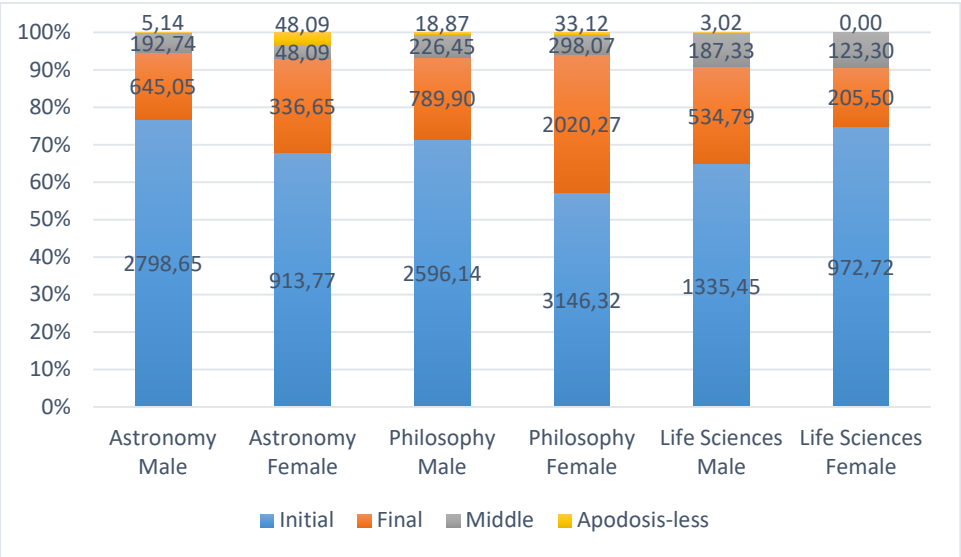

Figure 5.38: Use of the different orders of conditional constituents per sex of the author and discipline. Normalised figures.

Astronomy texts show the least important differences: male authors use a higher proportion of initial conditionals than their female counterparts (76.85% vs. 67.86%) whilst female authors use a higher proportion of final conditionals (25.00% vs. 17.71%). This situation is repeated in philosophy texts, but with noticeably higher differences: male authors on philosophy use almost 14% more initial conditionals than female philosophers (71.49% vs. 57.23%) whilst these women use many more final conditionals than their male counterparts (36.75%, or 2020.27 uses per million, vs. 21.75%).

Life sciences texts show the opposite distribution, with a higher proportion of initial conditionals (74.74% vs. 64.81%) and a lower proportion of final conditionals in female-authored texts (15.79 vs. 25.95%), compared with their male counterparts. The use of middle and apodosis-less conditionals shows less differences between male and female authors, with the exception of texts by female astronomers, in which the proportion of use of middle and apodosis-less conditionals is the same (3.57%). This constitutes a particularly scarce usage of middle conditionals and a particular frequent use of apodosis-less ones.

4.5. *Results per origin of the author*

The results on the distribution of this parameter on account of the origin of the author show two clear groups. Texts by European authors conform (within the ±2% range) to the average of the whole corpus, whilst texts by American authors show a higher proportion of use of initial conditionals (76.54%) and a lower proportion of final conditionals (17.54%), compared to the average of the whole corpus (71.73% and 21.53%, respectively). The results for this parameter can be consulted in Table 5.14 below:

	Initial	Final	Middle	Apodosis-less
England	2235.65	738.03	202.91	12.57
Scotland	1972.27	589.87	209.89	10.86
Ireland	2202.06	697.97	186.78	9.83
NA	2042.11	467.85	158.06	0.00
Others	2805.72	697.33	205.10	8.20

Table 5.14: Use of the different orders of conditional constituents per origin of the author. Normalised figures.

4.6. *Results per type of conditional*

The study of the distribution of the different orders of constituents on account of the type of conditional is useful to check whether some of the formal characteristics of conditionals present co-occurring patterns. The data, shown in Table 5.15 below, show some co-occurrences between the use of particular types of conditionals and the order of the constituents: 79.47% of the uses *unless* conditionals appear with the protasis after the apodosis, compared with an average use for all types

of conditionals of 21.53%. Peripheral conditionals also present a higher than average use of final conditionals, which account for 36.76% of the cases. The proportional uses in *if* and inversion conditionals are more in line with the average, although in the case of inversion conditionals it is noticeable that middle conditionals account only for 3.88% of the cases.

	If	Unless	Total Inversion	Total Peripheral
Initial	1943.21	18.11	158.85	84.77
Final	461.73	98.77	45.27	55.97
Middle	172.84	5.76	8.23	10.70
Apodosis-less	7.41	1.65	0.00	0.82

Table 5.15: Use of the different orders of conditional constituents per type of conditional. Normalised figures.

The analysis in detail of the results of each inversion trigger and each peripheral conditional particle (shown in Figures 4.39 and 4.40 below, respectively) shows that the majority of inversion conditionals appear in a protasis-apodosis order, with lower than average levels of use of final conditionals among all types (presenting no single use in *would* and *is*), but for *did*. The only trigger which introduces a protasis used in the middle of the apodosis is *were*.

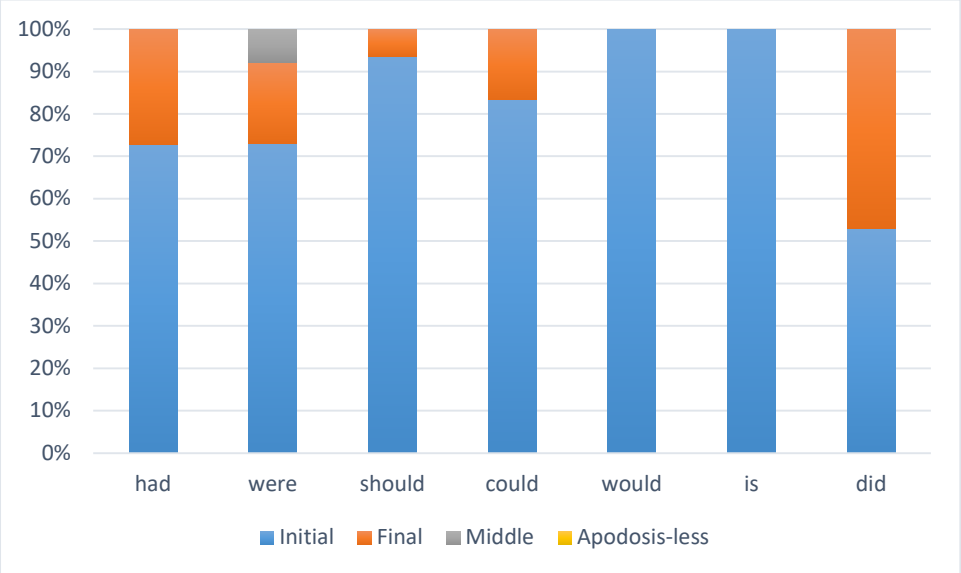

Figure 5.39: Proportion of use of the different orders of conditional constituents among inversion conditionals

Peripheral conditionals show a greater degree of variability, with *in case* and *lest* conforming to the average levels of use, whilst *supposing* and *so long as* show a higher than average proportion of final conditionals. The majority of uses of *as long as*, *on condition* and *provided* conditionals are final, whilst *assuming* conditionals are always initial conditionals.

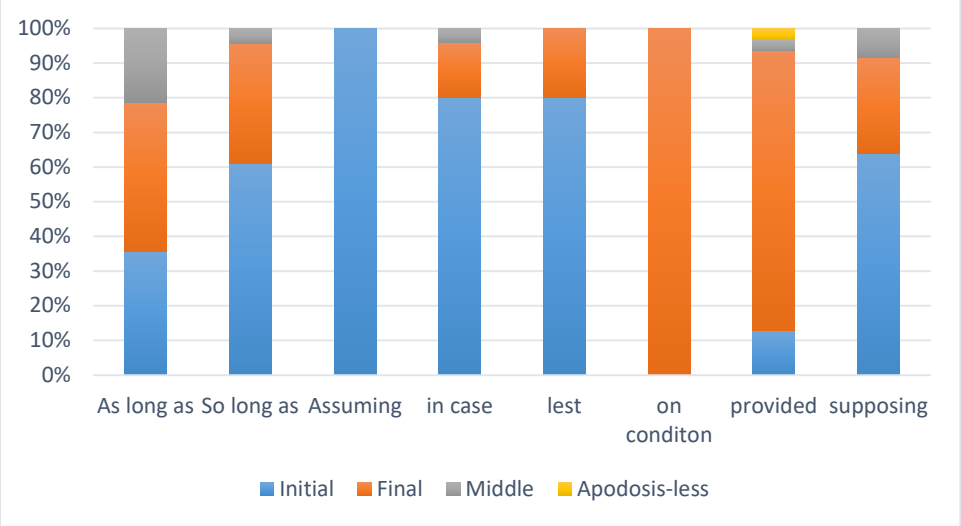

Figure 5.40: Proportion of use of the different orders of conditional constituents among peripheral conditionals.

4.7. *Results per function in discourse*

Finally, conditionals have also been analysed from the point of view of the relation between the order of their constituents and the function they play in discourse. The data are shown in Figure 5.41 below.

Hypothesizing, scope restricting and relevance conditionals show nearly average proportions of use: In hypothesizing conditionals, the initial order accounts for 74.15% of all the uses, whilst final conditionals account for 21.85% and medial ones for 3.97%. Among scope restricting conditionals, initial conditionals are 72.54%, final 20.21% and middle 3.97%. In the case of relevance conditionals, the proportions of use are 68.94%, 19.88% and 6.83%, respectively. Directive conditionals are also close to the average (71.43% initial, 28.57% final), but in this case with no use of middle conditionals.

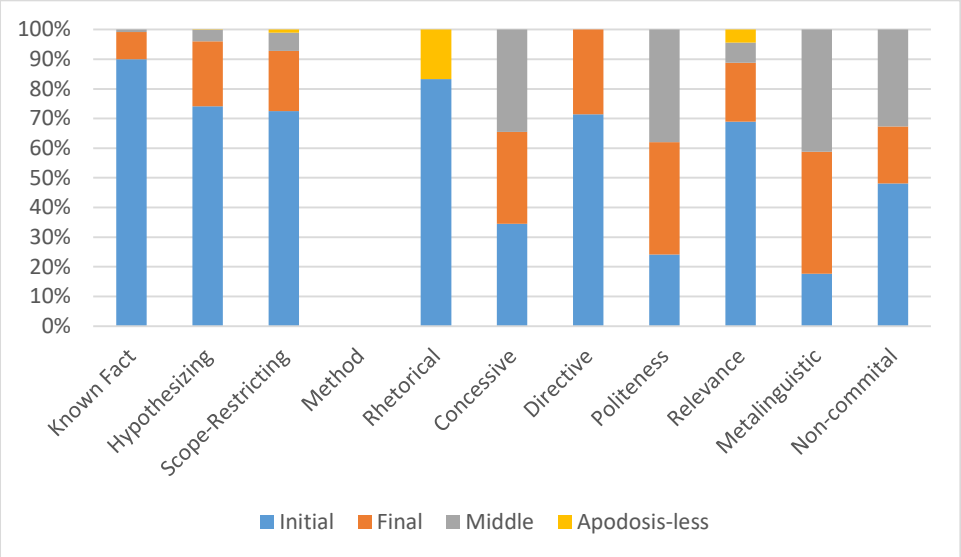

Figure 5.41: Proportion of use of the different orders of conditional constituents among the functions of conditionals in discourse.

In contrast, known fact conditionals are characterised by a higher proportion of use of initial conditionals, which account for 89.96% of all the uses, with 9.17% of final conditionals and 0.87% of middle ones. The high proportion of initial conditionals also appears among rhetorical conditionals (83.33% of all the uses), but in this case the rest of the uses (16.66%) are examples of apodosis-less conditionals.

The remaining four functions show a lower proportion of initial conditionals, and a characteristically high proportion of middle conditionals: in non-committal conditionals, the former account for 48.08% and the latter for 32.69%, with 19.23% of uses being examples of final ones. In the case of the concessive type, there is the same level of use of initial and middle conditionals (34.52% each) with the remaining 30.96% being uses of final ones. Both politeness and metalinguistic conditionals show a minority of uses of initial conditionals. In the former, these account for 24.14% of the uses, with final and middle conditionals accounting for 37.93% of the uses each. In the latter, the proportional use of initial conditionals is even lower (17.65%), and the uses of final and middle conditionals (41.18% each), higher.

5. Results per verb forms used

The final parameter of study analyses the combinations of verb-forms used in the constituents of conditional structures. As explained in Chapter 4, all the different combinations of verb forms have been classified as they appear in the results, without previously established categories. The analysis shows that there are 225 different combinations of verb forms in the corpus. The twenty most frequently used combinations are shown in Table 5.16 below. As can be seen, the most frequently used combination is *present simple, present simple*, followed by *past simple, would* and *present subjunctive, present simple*.

This very high quantity of combinations highlights the important level of variability in conditional structures, which goes well beyond the traditional typologies of three types of conditionals, as also explained in Chapter 3. Even though the three types of canonical conditionals identified by traditional typologies do indeed appear as some of the most frequently used combinations in Table 5.16, they account for only 18.79% of all the conditional uses (Type 1: 6.96%, Type 2: 10.39%, Type 3: 1.44%)[111].

[111] Even including *present simple, present simple* conditionals, which are the single most frequent type and which are considered in some traditional typologies as a fourth type of canonical conditional (Type 0), these uses are still in the minority. *Present simple, present simple* conditionals account for 16.01% of the cases and the four (three canonical + Type 0) types combined would add up to 34.80% only. In any case, it is important to underline

Verb form combination	**Number of uses**
Present simple, present simple	598
Past simple, would	388
Present subjunctive, present simple	276
Present simple, will	260
Present subjunctive, will	231
Present simple, must	108
Verbless[112], present simple	88
Present simple, can	75
Present simple, may	73
Present subjunctive, must	73
Past simple, Could	65
Past simple, present simple	62
Past simple, should	61
Past perfect, would present perfect	54
Present simple, shall	48
-ed participle, present simple	48
Verbless, verbless	47
Present subjunctive, can	42
Past simple, might	40
Can, present simple	35
OTHER 205 combinations	1063

Table 5.16: Uses of conditionals per verb forms in their constituents. Raw data.

In any case, the enormous number of different combinations would be unworkable when analysing the results on account of the different parameters used in the study. Consequently, the number of categories used in the analysis has been reduced to just thirteen, as shown in Table 5.17 below. The new categories have been designed in accordance to the results shown in Table 5.16. Thus, present simple, present subjunctive, and present continuous forms have been subsumed as Present forms, whilst uses of *shall* have been considered together with those of *will*. Uses of *-ed* participles have been considered as equivalent to those of past simple, and *past perfect, past perfect* conditionals have been considered equivalent to *Past perfect, would present perfect* conditionals.

that the uses of *present simple, present simple* found in this corpus go beyond the uses considered by classical grammars when designing Type 0 conditionals (see Chapter 2).

[112] Conditional constituents were classified as "verbless" when there was not an overt verb in the constituent, as explained in Section 3.3 in Chapter 2. Three different types of such uses were found: pro-clause uses such as "if so"/"If not", quasi-fixed expressions such as "if necessary", and uses in which the protasis is modifying the apodosis at the phrase (rather than at the clause) level and introduces a single phrase or word.

Category	**Combinations included**	
Present, present	Present simple, present simple	Present simple, present continuous
	Present simple, present subjunctive	Present subjunctive, present simple
Type 1	Present simple, will	Present subjunctive, will
	Present continuous, will	Present simple, shall
	Present continuous, shall	Present subjunctive, shall
Type 2	Past simple, would	-ed participle, would
Type 3	Past perfect, would present p.	Past perfect, past perfect
Past, past	Past simple, past simple	-ed participle, past simple
	-ed participle, -ed participle	
Past, present	Past simple, present simple	-ed participle, present simple
Present, past	Present simple, past simple	Present simple, -ed participle
	Present subjunctive, past simple	Present subjunctive, -ed participle
Mixed Types 1,2,3	All other types presenting combinations of the different constituents of types 1,2, and 3, as well as uses of present perfect:	
	Past perfect, present simple	Past perfect, past simple
	Past simple, past perfect	Present simple, present perfect
	Present subjunctive, present perfect	Present perfect, present simple
	Past simple, present perfect	Present perfect, present perfect
	-ed participle, present perfect	Present perfect, willPast simple, will
	Past simple, shall	-ed participle, will
	Past perfect, will	Present simple, would
	Present subjunctive, would	Past perfect, would
	Past simple, would present perfect	-ed participle, would present perfect
Present, modal	Present simple, can	Present simple, could
	Present simple, may	Present simple, might
	Present simple, must	Present simple, ought to
	Present simple, should	Present subjunctive, can
	Present subjunctive, may	Present subjunctive, might
	Present subjunctive, must	Present subjunctive, need
	Present subjunctive, ought to	Present subjunctive, should
	Present subjunctive, would	
Past, modal	Past simple, can	Past simple, Could
	Past simple, may	Past simple, might
	Past simple, must	Past simple, ought
	Past simple, should	-ed participle, can
	-ed participle, could	-ed participle, may
	-ed participle, might	-ed participle, must
	-ed participle, ought to	-ed participle, should
Other modal combinations	All combinations not present in the categories above presenting a combination of modals or modals and verb forms	
Verbless	All combinations presenting a verbless constituent	
Other	All other combinations, including those in which there is a non-finite verb form, an imperative, or apodosis-less clauses.	

Table 5.17: Conditional categories according to the combinations of verb forms in the conditional constituents.

Once the 225 different combinations of verb forms are grouped together in the thirteen categories presented above, the analysis of the use of these categories (as can be seen in Figure 5.42 below) shows that the most frequently used category is Present-Present conditionals (23.48% of the cases).

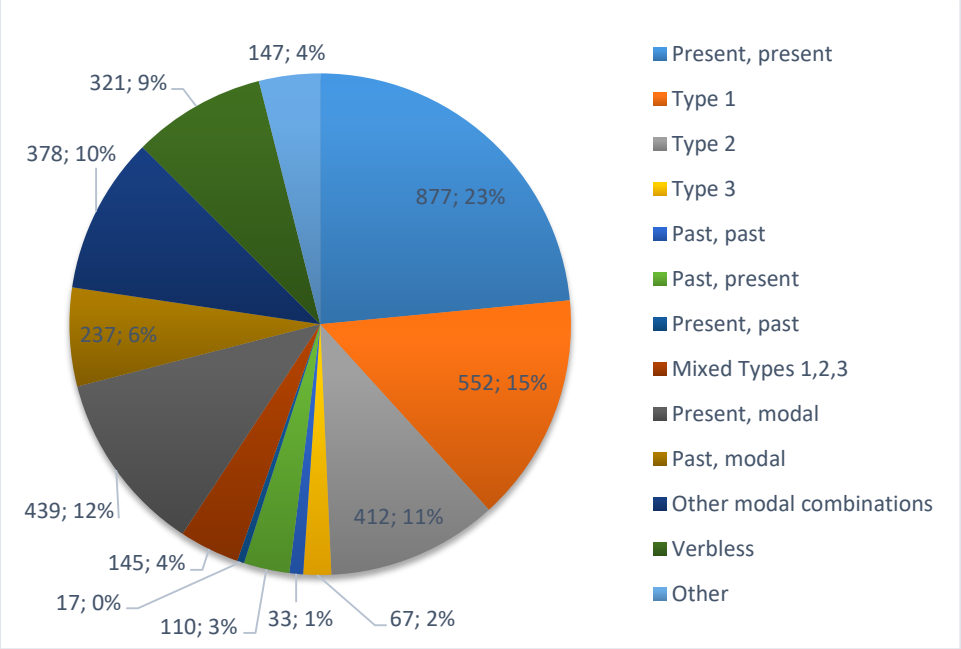

Figure 5.42: Uses of conditionals per verb forms in their constituents, grouped in categories.

The next most frequent categories are Type 1 conditionals, accounting for 14.78% of the uses, and Present-Modal conditionals, accounting for 11.75%. As can be seen in Figure 5.42, even when considering the uses of the combinations of verb forms grouped in categories and not by themselves (this is, even when considering not only the exact combinations, but also related ones), the three canonical conditional types account for only 27.60% of the cases, Present-Present conditionals for 23.48%, and the rest of the cases (a majority) corresponds to diverse combinations of verb-forms beyond the three (or four) canonical types.

5.1. *Diachronic analysis*[113]

The uses of the different verb-form combinations over time shows that there are scarce differences between the eighteenth and the nineteenth centuries. Table 5.18 below shows that the six most used combinations of verb forms (*Present simple, present simple; Past simple, would; Present subjunctive, present simple; Present simple, will; Present subjunctive, will*, and *Present simple, must*) are the same in the two centuries, and there are only minor differences from the seventh most common combinations onwards, showing a higher use of verbless conditionals in the nineteenth century and some changes between the modal combinations preferred in the two centuries.

[113] From this point, the different sections will show both raw results and results grouped in categories. In the body of the text, variables making reference to raw results will be presented in italics, and variables referring to grouped categories will be presented in normal typeface and capitalised. In tables and figures this distinction will be neutralised, as the caption already indicates the type of variable.

Verb form combination, 18th century	**Use**	**Verb form combination, 19th century**	**Use**
Present simple, present simple	328	Present simple, present simple	270
Past simple, would	201	Past simple, would	187
Present subjunctive, present simple	167	Present simple, will	111
Present simple, will	149	Present subjunctive, present simple	109
Present subjunctive, will	149	Present subjunctive, will	82
Present simple, must	57	Present simple, must	51
Present subjunctive, must	49	Verbless, present simple	50
Present simple, can	41	Past simple, should	39
Past simple, Could	38	Present simple, may	36
Verbless, present simple	38	Present simple, can	34
Other 174 combinations	845	Other 147 combinations	704

Table 5.18: Use of conditionals per verb forms in their constituents per century. Raw data.

This situation of scarce diachronic evolution also appears when the different combinations are grouped together in categories. This is shown in Figure 5.43 below, in which it is shown how the differences in use among the different verb form categories between the eighteenth and the nineteenth centuries are very subtle:

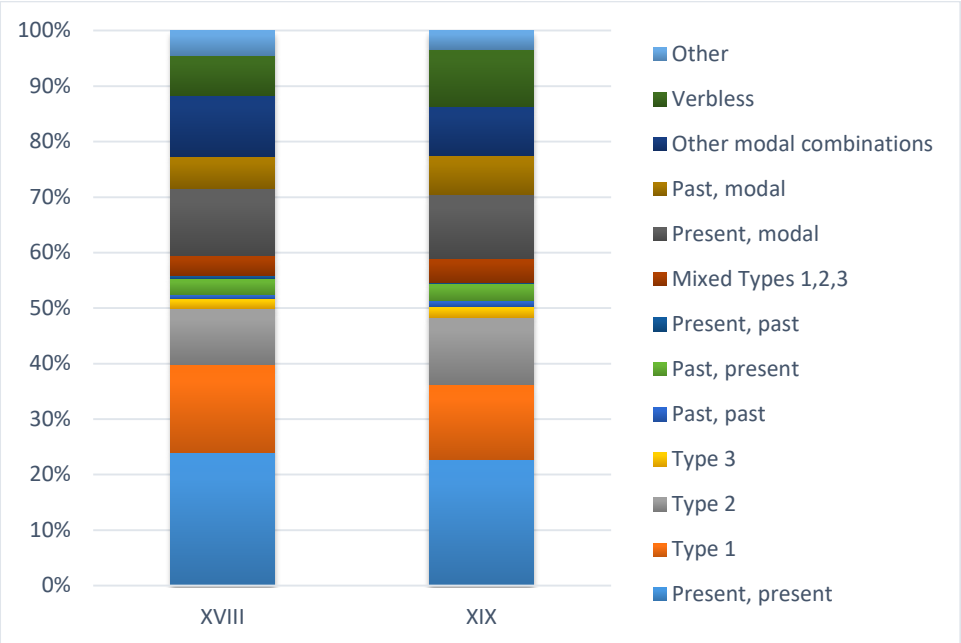

Figure 5.43: Proportion of use of conditional categories according to the verb forms in their constituents per century

However, a noticeable difference between the centuries is the tendency towards a lower use of the subjunctive in protases over time, which is shown in Figure 5.44 below. In the figure, it is shown how

the proportion of use of present simple conditionals remains stable over the two centuries studied, whilst the use of present subjunctive conditionals decreases.

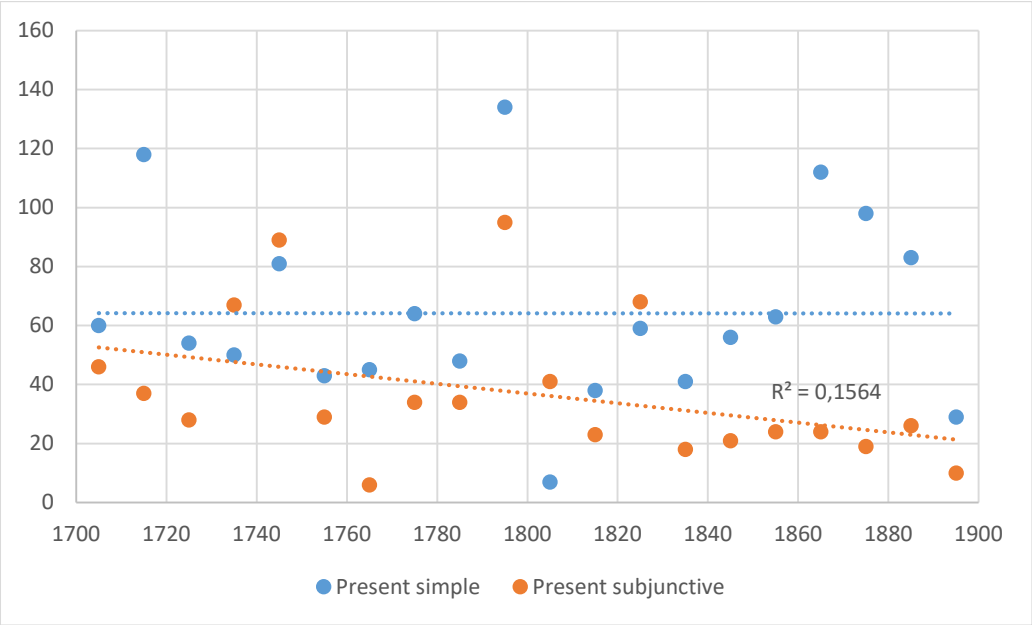

Figure 5.44: Diachronic evolution of the use of conditionals with present simple and present subjunctive in their protases.

These results have been statistically tested in order to examine whether this decrease in the use of the subjunctive over time is significant. The results of the linear correlation statistical test applied to the data indicate that diachronic evolution explains 15.64% of the variation in the use of the subjunctive in the corpus, but these results are not statistically significant (R^2=0.1564, p>0.05).

5.2. *Results per discipline of the sample*

More substantial differences have been found when comparing the results according to the discipline of the sample. As can be seen in Table 5.19 below, both philosophy and life sciences texts present a distribution of uses similar to the general one, although in life sciences texts the proportion of uses of *past simple, would* conditionals is lower than in the average (shown in Table 5.16) whilst the proportion of *-ed participle, present simple* conditionals is higher. On the contrary, astronomy samples depart more from the average, as the most frequent combination of verb forms is *present subjunctive, will;* and *present simple, present simple* conditionals are used (proportionally) much less frequently than in the other disciplines. In any case, it is philosophy texts that show the highest level of variability with more different combinations than any other discipline.

Astronomy	Use	Philosophy	Use	Life sciences	Use
Present subjunctive, will	194	Present simple, present simple	297	Present simple, present simple	151
Past simple, would	187	Past simple, would	143	Present simple, will	92
Present simple, present simple	150	Present subjunctive, present simple	97	Past simple, would	58
Present subjunctive, present simple	148	Present simple, must	61	-ed participle, present simple	35
Present simple, will	111	Present simple, will	57	Present subjunctive, present simple	31
Present simple, must	33	Present simple, can	51	Verbless, present simple	26
Present subjunctive, must	32	Past simple, Could	42	Present simple, may	25
Verbless, present simple	29	Present subjunctive, must	39	Present subjunctive, will	18
Past simple, present simple	24	Past simple, present simple	34	-ed participle, will	14
Past simple, should	23	Verbless, present simple	33	Present simple, must	14
Other 125 combinations	514	Other 167 combinations	659	Other 109 combinations	313

Table 5.19: Use of conditionals per verb forms in their constituents per discipline of the text. Raw data.

These differences are also visible in Figure 5.45 below, showing the uses of the thirteen categories of verb combinations in the different disciplines. In the figure it is noticeable how Astronomy conditionals show a remarkably higher than average use of Type 1 conditionals, which account for 23.04% of the total uses (compared to an average of 14.78%), as well as a slightly higher use of Type 2 conditionals, which corresponds with a generally lower use of all the other types. Philosophy conditionals, on the other hand, show a clearly lower use of Type 1 (6.48% of the total uses) and a higher than average use of Present-Present and Present-Modal conditionals (26.24% and 15.27%, vs. an average of 23.48% and 11.75%, respectively). Life sciences texts are the ones showing proportions of use most similar to the average, but they have the lowest proportion of Type 2 conditionals (8.24%, vs. an average of 11.03%) and the highest proportions of Past-Present and Mixed Types 1, 2, 3, conditionals (5.02% and 6.44%, respectively, vs. 2.95% and 3.88% in the average for the whole corpus).

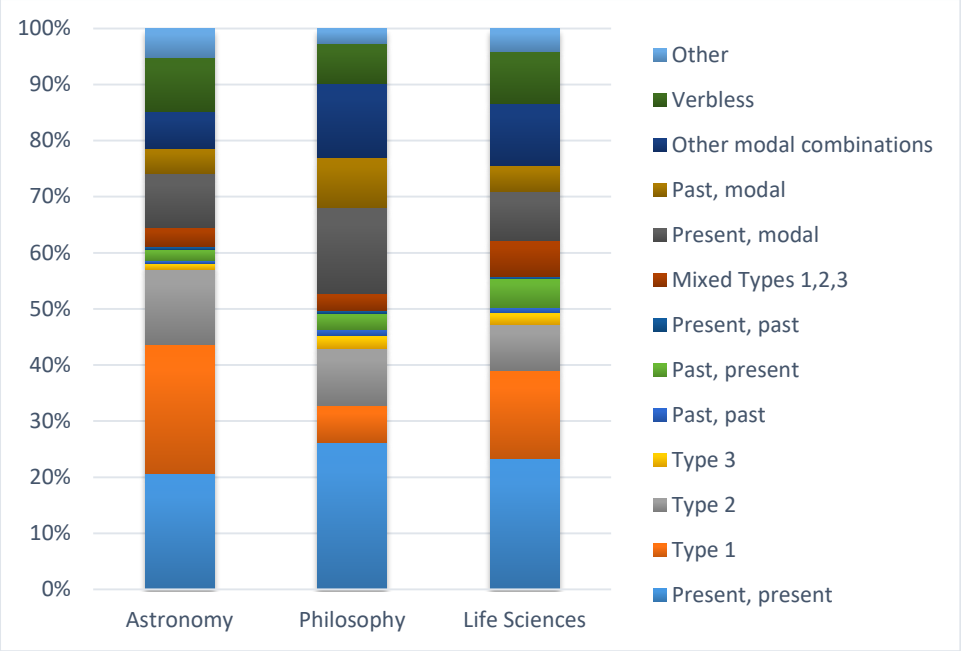

Figure 5.45: Proportion of use of conditional categories according to the verb forms in their constituents per discipline of the text.

The data obtained from the combination of the parameters of discipline and century of the sample (Figure 5.46 below) show diverging evolutions in the different disciplines. This contrasts with the stable distribution of verb-form combinations per century when it is the whole corpus that is considered, as shown in Figure 5.43 above.

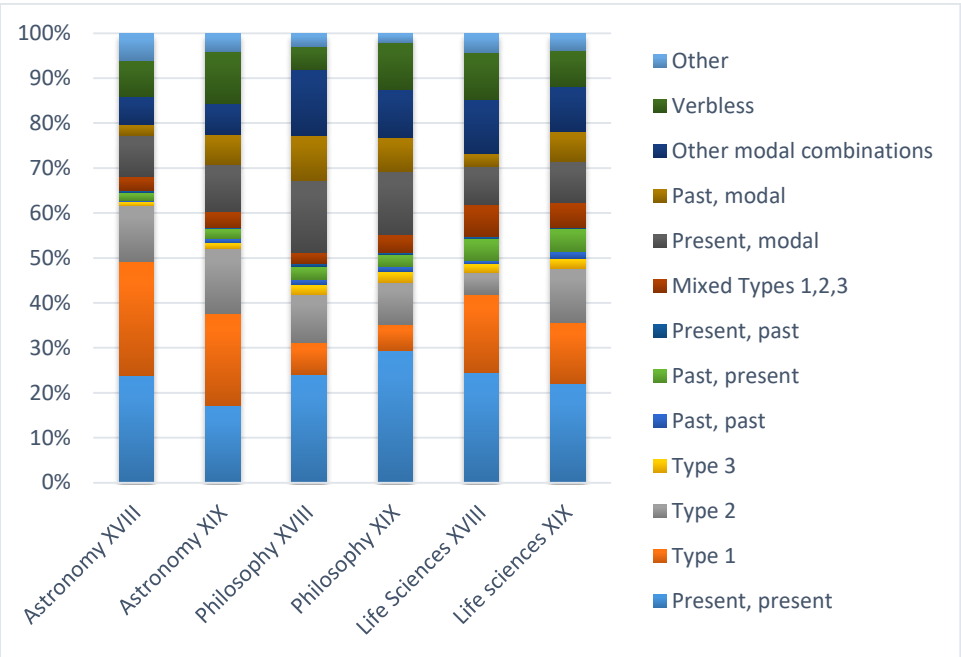

Figure 5.46: Proportion of use of conditional categories according to the verb forms in their constituents per discipline and century of the text.

As reflected in Figure 5.46, most of the categories show different behaviours between philosophy texts, on the one hand, and astronomy and life sciences texts, on the other. Astronomy and Life Sciences texts show a lower use of Present-Present conditionals in the nineteenth century, which allows for an increase in the use of, particularly, Type 2, Past-Past, Past-Present, Present-Modal and Past-Modal conditionals. On the contrary, philosophy texts present exactly the opposite distribution, with a higher use of Present-Present conditionals and a lower use of all the aforementioned categories in the nineteenth century. It is remarkable that six out of the thirteen categories, accounting for approximately half of the uses (an even higher proportion in philosophy texts) show such a clear group distribution, presenting exactly opposing evolutions between philosophy, on the one hand, and astronomy and life sciences, on the other.

Out of the other seven categories, four show a common evolution in all the three disciplines: three of them (Type 1, Present-Past and Other) decrease their use between the eighteenth and the nineteenth century, and another one (Type 3) increases it. Other two categories (Mixed types 1,2,3 and Verbless conditionals) show an increase in use in both astronomy and philosophy and a decrease in life sciences, whilst, finally, the category Other modal combinations shows an increase in use in astronomy and a decrease in both philosophy and life sciences texts.

5.3. *Results per genre of the sample*

The analysis of the results from the point of view of the genre to which the sample is ascribed shows a very uniform picture in which the main combinations of verb forms used in each genre coincides with those used in the corpus as a whole. These results are shown in Table 5.20 in the next page.

The main exception to the general uniformity in these results is the presence of *present subjunctive, will* conditionals as the most frequently used combination in textbooks. This particular combination was also the most common one in astronomy books, and both these results have to be considered as a whole, as fifteen out of the twenty textbooks included in the corpus are part of the astronomy subcorpus.

If these uses are grouped together in categories, as shown in Figure 5.47 below, four groups can be distinguished. Treatises and lectures show a distribution similar to that of the average of the whole corpus. Essays, articles and dialogues show a common lower than average use of Type 1 conditionals and a higher proportion of Present-Present conditionals.

Treatise	**Use**	**Textbook**	**Use**	**Essay**	**Use**	**Lecture**	**Use**
Present simple, present simple	289	Present subjunctive, will	91	Present simple, present simple	121	Present simple, present simple	42
Past simple, would	195	Present simple, present simple	78	Present subjunctive, present simple	49	Past simple, would	36
Present simple, will	133	Past simple, would	75	Past simple, would	38	Present subjunctive, present simple	25
Present subjunctive, present simple	113	Present subjunctive, present simple	59	Present simple, must	33	Present subjunctive, will	22
Present subjunctive, will	96	Present simple, will	53	Present simple, will	30	Present simple, will	20
Other 175 combinations	969	Other 76 combinations	238	Other 115 combinations	354	Other 66 combinations	176
Article	**Use**	**Letter**	**Use**	**Dialogue**	**Use**	**Others**	**Use**
Present simple, present simple	30	Present simple, present simple	17	Present simple, present simple	19	Present subjunctive, present simple	9
Past simple, would	20	Past simple, would	11	Past simple, would	11	Present simple, will	4
Present subjunctive, present simple	17	Present simple, will	10	Present simple, will	6	Present subjunctive, will	3
Past simple, should	10	Present simple, shall	6	Present subjunctive, present simple	4	Present simple, present simple	2
Verbless, present simple	9	-ed participle, present simple	5	Present simple, may	4	Past simple, would	2
Other 44 combinations	97	Other 33 combinations	54	Other 31 combinations	46	Other 4 combinations	4

Table 5.20: Use of conditionals per verb forms in their constituents per genre of the text. Raw data.

Essays also use Present-Modal and Other modal conditionals more frequently than in the average, whilst both articles and dialogues show a preference for the use of Past-Modal (and in the case of Articles also Verbless) conditionals. Textbooks present remarkably higher than average proportions of use of Type 1 conditionals and also show lower uses of the three categories of modal conditionals. Finally, Letters present lower levels of use of Present-Present and, particularly, Verbless conditionals, which are replaced by slightly more frequent uses of the other combinations of verb forms, most noticeably of conditionals showing other modal combinations and Mixed Types 1,2,3.

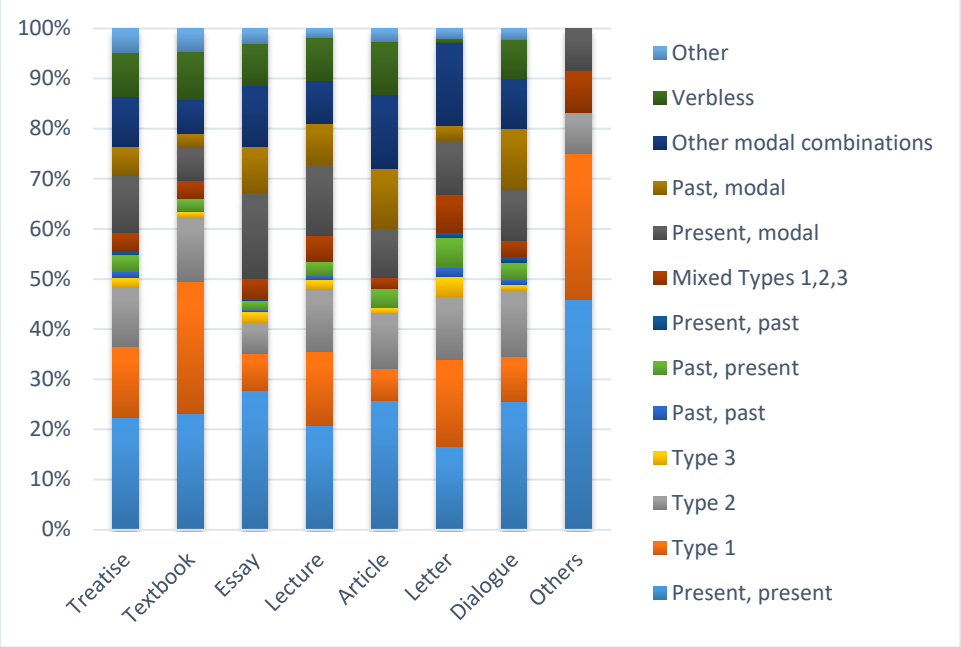

Figure 5.47: Proportion of use of conditional categories according to the verb forms in their constituents per genre of the text.

5.4. *Results per sex of the author*

The only appreciable differences in the distribution of verb-forms between male and female authors, shown in Figure 5.48 below, are a lower level of use of Present-Present and Verbless conditionals in female-authored texts (21.11% and 5.88%, respectively, compared to 23.68% and 8.82% in texts by their male counterparts).

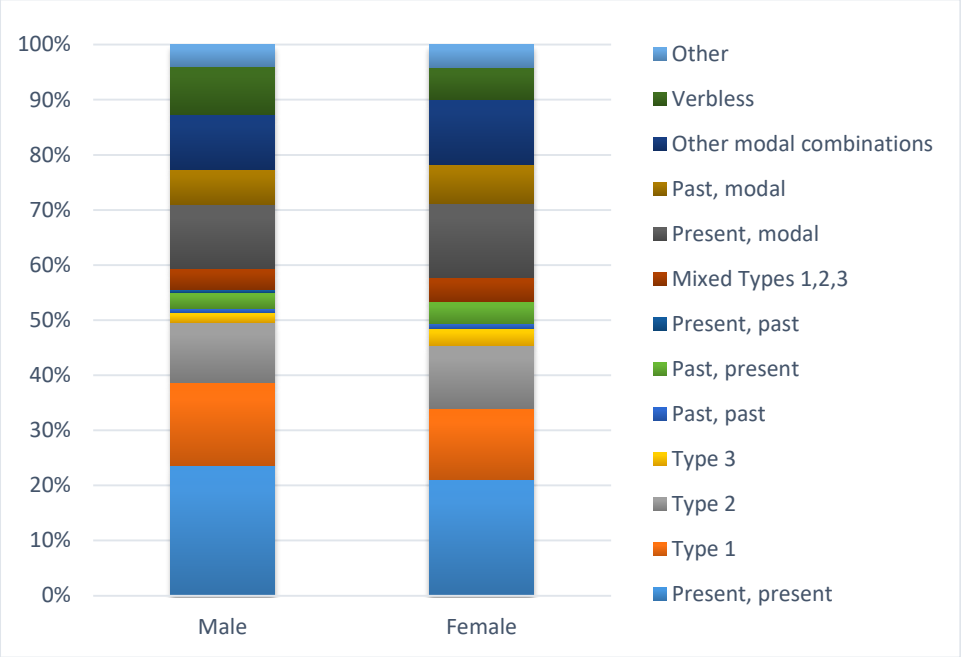

Figure 5.48: Proportion of use of conditional categories according to the verb forms in their constituents per sex of the author.

This correlates with a higher use of the three categories of verb forms combinations showing modals (32.18% for the three types combined, compared to 27.89% in male-authored texts), as well as of Type 3 conditionals (3.11% vs 1.68%).

The differences between male and female authors are also scarce when it comes to examine the particular uses of verb form combinations (see Table 5.21 below). Seven out of the ten most frequently used combinations, including the four most common ones, are the same in both male and female-authored texts.

Male	**Use**	**Female**	**Use**
Present simple, present simple	549	Present simple, present simple	49
Past simple, would	358	Past simple, would	30
Present subjunctive, present simple	265	Present simple, will	22
Present simple, will	238	Present subjunctive, present simple	11
Present subjunctive, will	227	Present simple, must	11
Present simple, must	97	Present simple, shall	10
Verbless, present simple	87	Present simple, can	9
Present subjunctive, must	72	Present simple, may	9
Present simple, can	66	Past perfect, would present perfect	8
Present simple, may	64	-ed participle, present simple	7
Other 206 types	1423	Other 71 types	123

Table 5.21: Use of conditionals per verb forms in their constituents per sex of the author. Raw data.

The main difference is that texts by male authors present higher uses of *Present subjunctive, will*; *Verbless, present simple*; and *Present subjunctive, must* conditionals, whilst female authors prefer *Present simple, shall*; *Past perfect, would present perfect*; and *-ed participle, present simple* conditionals.

5.5. *Results per origin of the author*

The last extra-linguistic parameter analysed is the one making reference to the author's provenance. The results, shown in Figure 5.49 below, present some differences. English authors show a distribution very similar to the average for the whole of the corpus, and Scottish authors present a remarkably lower than average proportion of use of Type 1 conditionals and a similarly higher than average use of the three modal categories. Irish authors' uses are exactly the opposite of their Scottish counterparts, featuring as well a higher use of Present-Present, Past-Present and Verbless conditionals and a lower than average use of Type 2 conditionals.

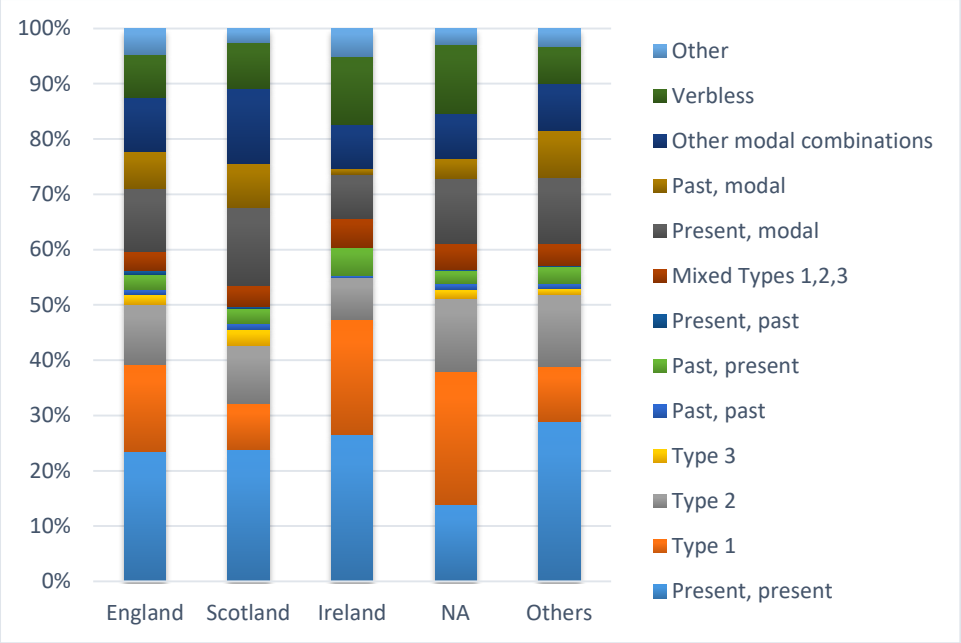

Figure 5.49: Proportion of use of conditional categories according to the verb forms in their constituents per origin of the author

Finally, North American authors show a higher than average use of Verbless, Type 2, and, particularly, Type 1 conditionals, and, contrastingly, a remarkably lower than average use of Present-Present conditionals, as well as a slightly lower than average use of the three categories with modals.

5.6. *Results per type of conditional*

The results on account of the first linguistic parameter, the type of conditional, can be found in Tables 5.22 and 5.23 below.

If	**Use**	**Unless**	**Use**
Present simple, present simple	536	Present simple, present simple	33
Past simple, would	283	Present subjunctive, can	14
Present subjunctive, present simple	258	Present simple, can	12
Present simple, will	238	Present subjunctive, present simple	11
Present subjunctive, will	223	Past simple, would	7
Present simple, must	98	-ed participle, present simple	7
Verbless, present simple	75	Verbless, present simple	7
Present subjunctive, must	71	Present simple, will	6
Present simple, may	70	Present subjunctive, will	6
Present simple, can	57	Past simple, Could	5
Other 195 combinations	1232	Other 34 combinations	43

Table 5.22: Use of conditionals per verb forms in their constituents in *if* and *unless* conditionals. Raw data.

The distribution of the different verb forms in *if* conditionals is similar to the average for the whole corpus, a situation scarcely surprising bearing in mind that, as explained in Section 2 above, *if* conditionals account for 84.10% of the total uses of these structures. The distribution of verb-form combinations in *unless* conditionals shows a high prevalence of the use of conditionals with *can* in the apodosis (second and third position, accounting for 9.27% and 7.95% of all *unless* uses, respectively) and a lower use of combinations with *will* in the apodosis.

Total Inversion	**Use**	**Total peripheral**	**Use**
Past simple, would	86	Present simple, present simple	27
Past simple, Could	27	Present simple, will	16
Past perfect, would present perfect	26	to infinitive present simple	16
Past simple, should	12	to infinitive will	13
Should, will	10	Past simple, would	12
Past simple, might	7	Present subjunctive, present simple	7
Past perfect, could present perfect	7	Present simple, can	6
Should, would	7	Present simple, must	6
Past perfect, past perfect	6	To infinitive, would	6
Past simple, present simple	6	Verbless, present simple	6
Other 27 combinations	64	Other 45 combinations	70

Table 5.23: Use of conditionals per verb forms in their constituents in inversion and peripheral conditionals. Raw data.

Peripheral conditionals show a high proportion of conditionals with *to* infinitive in the protasis, presenting three combinations with this verb-form among the ten most frequently used, whilst inversion conditionals show a total different set of uses, without any combination with present simple or subjunctive in the protasis among the ten most commonly used. This is, however, related to the fact that the possible combinations of verbs which can be used in each of the inversion operators are inherently constrained by the use of each of the particles, as they also function, obviously, as the verb form in the protasis.

If the results are grouped in categories as shown in Figure 5.50 below, *If*, and, to a certain extent, *Unless* conditionals show a similar distribution to the average for the whole corpus, as does *Unless*, which also favours the use of Present-Modal conditionals. However, Inversion and Peripheral conditionals show more differences.

Among inversion conditionals, the three main categories of combinations of tenses are Past-Would, Past-Modal, and Other Modal; and Type 3 conditionals are also used remarkably more frequently than in the average. In any case, it is noticeable that, when examining the real uses shown in Table 5.24 below, the most frequent verb form combination in the two more common inversion particles (*had* and *were*) is a canonical type.

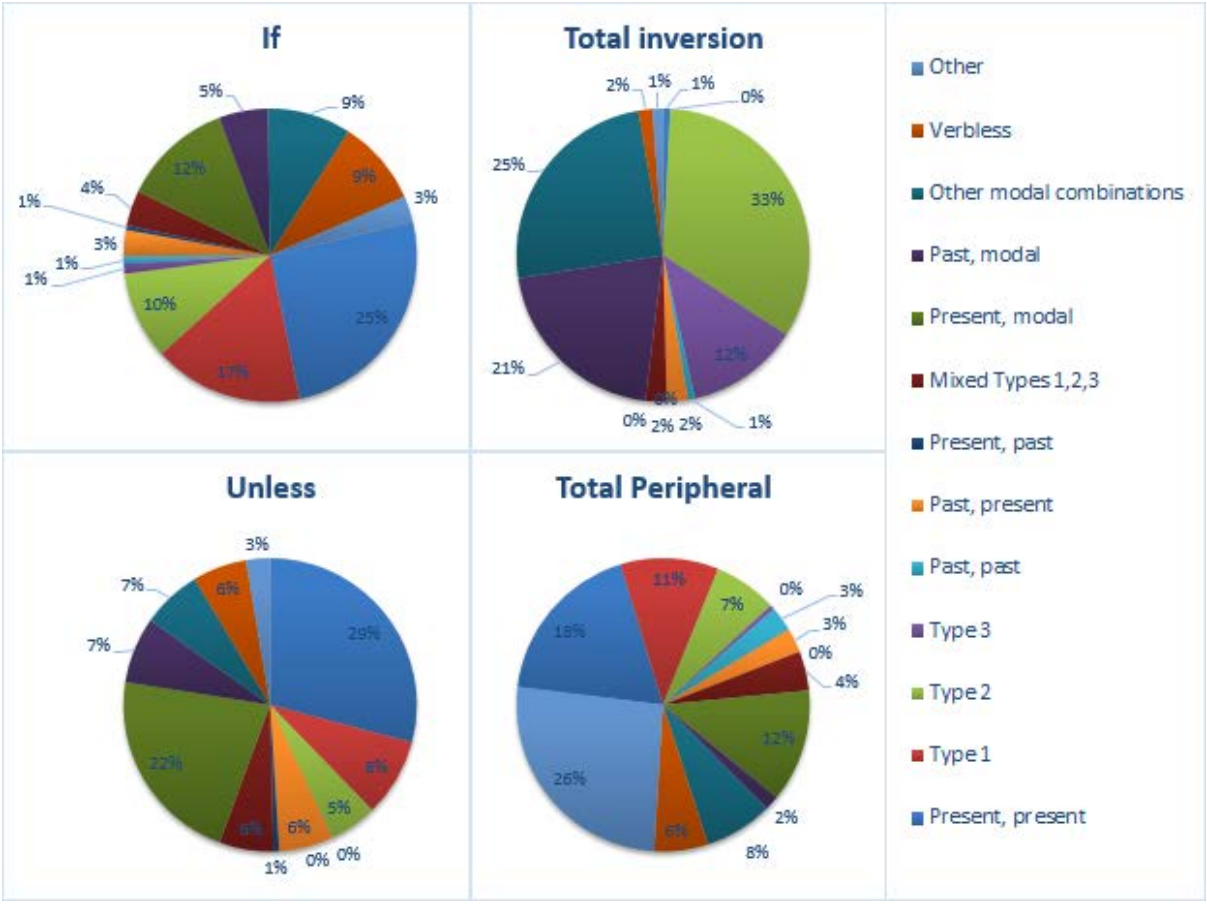

Figure 5.50: Proportion of use of conditional categories according to the verb forms in their constituents per type of conditional.

Had	**Use**	**Were**	**Use**
Past perfect, would present perfect	26	Past simple, would	74
Past perfect, could present p	7	Past simple, Could	21
Past perfect, past perfect	6	Past simple, should	10
Past perfect, might present p	6	Past simple, present simple	6
Past perfect, must present p	5	Past simple, might	5
Other 8 combinations	16	Other 6 combinations	13
Should	**Use**	**Could**	**Use**
Should, will	10	Could, should	5
Should, would	7	Could, might	2
Should, present simple	5	Could, would	2
Other 5 combinations	9	Other 3 combinations	3
Did	**Use**	**Is**	**Use**
Past simple, would	8	Present simple, present simple	2
Past simple, Could	5	**Would**	**Use**
Past simple, might	2	Would, present simple	1
Past simple, should	2		

Table 5.24: Use of conditionals per verb forms in their constituents in inversion conditionals. Raw data.

Among peripheral conditionals the most common categories are Present-Present, Type 1 and "Others" categories. These different types are related to the particular uses for the different particles (shown in Table 5.25 below) which in this case are not the product of inherent constraints of any sort.

As long as	**Use**	**In case**	**Use**
Present simple, will	3	Past simple, would	5
Present simple, present simple	2	Present simple, will	3
Past simple, past simple	2	Present simple, should	3
Present simple, can	2	Past simple, present simple	2
Present simple, must	2	Present simple, present simple	1
Other 3 combinations	3	Other 11 types	11
Provided	**Use**	**Supposing**	**Use**
Present simple, present simple	8	to infinitive present simple	15
Present subjunctive, present simple	6	to infinitive will	13
Present subjunctive, will	2	Past simple, would	6
Present subjunctive, may	2	To infinitive, would	6
Present simple, will	2	Verbless, present simple	6
Other 10 types	11	Other 28 combinations	37
So long as	**Use**	**Lest**	**Use**
Present simple, present simple	9	Should, may	2
Present simple, will	6	Should, must	1
Present simple, must	4	Should, ought to	1
Present simple, can	2	Should, verbless	1
Other 2 combinations	2		
Assuming	**Use**	**On condition**	**Use**
Present simple, present simple	2	Present simple, present simple	1
to infinitive present simple	1		

Table 5.25: Use of conditionals per verb forms in their constituents in peripheral conditionals. Raw data.

As can be seen, *As long as, So long as* and *Provided* conditionals favour *Present simple, present simple* and *Present simple, will* combinations (and their counterparts with Present subjunctive), which are included in Present-Present and Type 1 categories, as well as some Present-Modal uses. *In case* conditionals, however, tend to use *past simple, would* conditionals, whilst *lest* conditionals exclusively present uses with *should* in the protasis. *Supposing* conditionals, the most common type of peripheral conditional particle, favour the use of *to*-infinitives in the protasis, thus explaining the high presence of the "Others" type in the data.

5.7. *Results per function in discourse*

The analysis of the results on account of the different functions of conditionals in discourse, shown in Figure 5.51 below, reflects a panorama with clear and striking features in which each function presents a preference for particular verb-form combinations.

The most commonly used conditionals, those functioning as Hypothesizing, are also the ones that best reflect the average uses. The verb form combinations most commonly used among them are *Present simple, present simple* (accounting for 15,69% of the total uses); *Past simple, would* (12.36%); *Present subjunctive, present simple* (7.37%); *Present simple, will* (6.94%); and *Present subjunctive, will* (6.16%). These five combinations are also the five most frequently used combinations in the average of all conditional uses in our corpus, and precisely in that same order. When considered grouped in categories, the most frequent uses are Present-Present conditionals (23.17% of all uses in hypothesizing conditionals, compared to 23.48% in the average for all functions), Type 1 (14.70%, 14.78% in the average), Type 2 (13.07%, 11.03% in the average) and Present-Modal (12.26%, 11.75% in the average). Again, these results are very near to those for the whole set of conditionals, as these are also the four most common categories in the average, and the most important divergence is that Type 2 conditionals are used 2% more in hypothesizing conditionals than in the average.

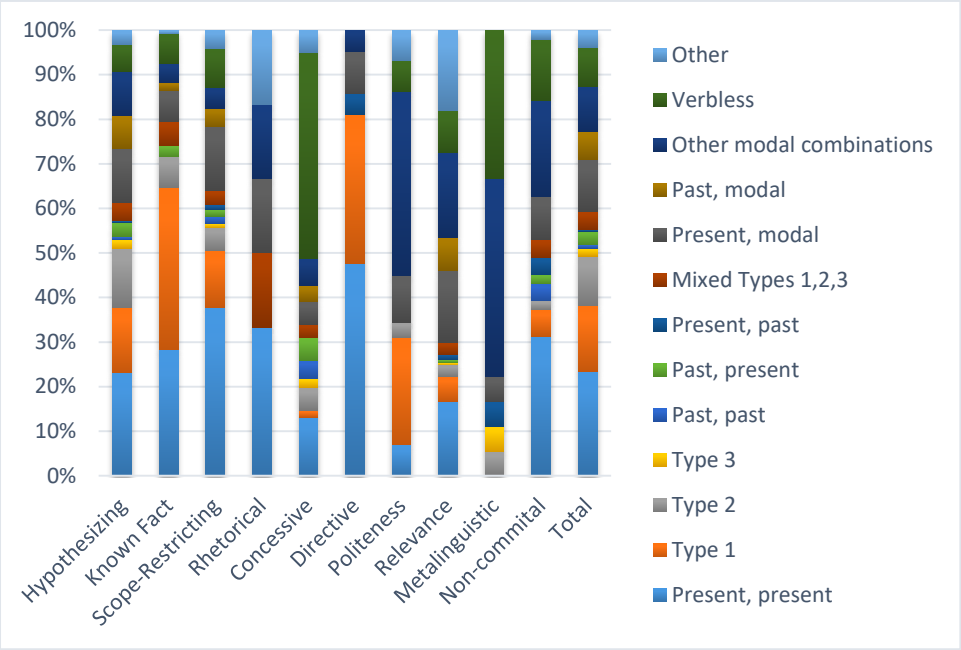

Figure 5.51: Proportion of use of conditional categories according to the verb forms in their constituents among the different functions of conditionals in discourse.

Known-fact conditionals emphasise the use of Present-Present and, particularly, Type 1 conditionals. The proportion of use of Type 1 combinations in known fact conditionals is 36.24%, more than double the average for all the different functions of conditionals, 14.78%. The higher proportion of Present-

Present conditionals is comparatively more modest (28.38%, vs. an average of 23.48%). All the other categories of verb-form combinations (but for Mixed Types 1,2,3 which shows a small increase) present a lower proportion of use. The particular combinations of verb-forms preferred in Known Fact conditionals are included in these categories: The most frequent combination is *Present subjunctive, will* (the most used in Astronomy texts and textbooks as well, as explained above), which accounts for 21.40% of the total cases. Next comes *Present simple, present simple* (19.21%); *Present simple, will* (13.54%); *Present subjunctive, present simple* (9.17%); and *Past simple, would* (6.55%).

In the case of scope-restricting conditionals the percentage of Present-Present conditionals is even higher, reaching a proportion of use of 37.63% of the total cases, with *Present simple, present simple* accounting for 21.65 percent of the total uses and *Present subjunctive, present simple* for a further 15.98%. The next most frequently used category is Present-Modal conditionals, accounting for 14.43% of the cases (compared with an average use of 11.75%), among which the most common combination is *Present simple, must*, accounting for 5.67% of the total uses. Contrasting with this high proportion of use, Type 2 conditionals are only found in 5.15% of the total cases, compared to an average of 11.03%.

Concessive conditionals are characterised by the high prevalence of Verbless conditionals, which account for 46.19% of the total cases. Among these, the most frequent combinations are *Verbless, present simple*, which account for 20.81% of the cases, and *Verbless, verbless*, which add a further 8.12%. The next most commonly used categories are Present-Present (and particularly *Present simple, present simple*, which account for 10.15% of the total uses), Type 2 and Past-Present conditionals.

Relevance conditionals are usually expressed with only four of the categories of verb combinations, which account, together, for 70.18% of the total uses. These are Other modal combinations (19.25%), Others (18.01%), Present-Present (16.77%, inferior to the average of 23.48% for the whole corpus) and Present-Modal (16.15%) conditionals. Among these, the most notorious particularity is the high use of Others conditionals. These include combinations such as *Present subjunctive, imperative*, which accounts for 5.59% of the total uses, or *Present simple, imperative*, accounting for 4.35%.

The rest of the functions appear much less frequently in the results, and, consequently, show a higher level of variability. In rhetorical conditionals a third of the uses are Present-Present conditionals, with Mixed Types 1,2,3; Present-Modal, Other Modals and Others conditionals splitting the rest of the uses in equal parts. Similarly, Directive conditionals show a higher (47.62%) use of Present-Present conditionals, followed by a third of Type 1 conditional uses and 9.52% of Present-Modal uses.

Politeness and metalinguistic conditionals are dominated by Other Modal combinations conditionals, which account for 41.38% and 44.44% of the total uses, respectively. In both types the most frequently used combination is *May, present simple*, which accounts for 24.14% of the total uses of politeness conditionals and 38.89% of metalinguistic conditionals. Politeness conditionals also use a high proportion of Type 1 conditionals (24.14%), with a higher prevalence of *Present simple, shall* (13.79%) than *Present simple, will* (10.34%). In metalinguistic conditionals, however, Verbless conditionals are a third of the total uses, with *may, verbless* being the most used combination, accounting for 22.22% of all uses.

Finally, Non-committal conditionals show a higher prevalence of Present-Present conditionals (31.37% of the uses), followed by Other modal combinations (21.57%) and Verbless (13.73%) conditionals. Among Other modal combinations, the high prevalence of *may, past simple* (5.88%) and *may, present simple* (3.92%) is also noticeable.

5.8. *Results per order of the constituents*

The analysis on account of the order of the constituents in the conditional structure, shown in Figure 5.52 and Table 5.26 below, shows that the distribution of verb form combinations in Initial conditionals is very similar to that in the average of the whole corpus, but the other three orders show special uses:

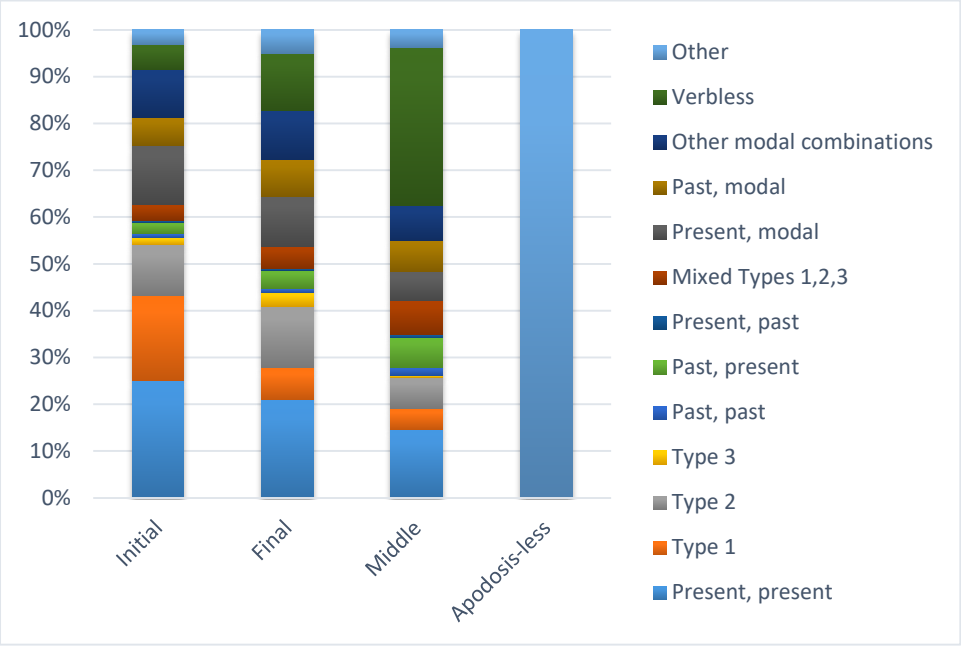

Figure 5.52: Proportion of use of conditional categories according to the verb forms in their constituents per order of the constituents of conditionals

Final conditionals are characterised by their lower proportion of use of Present-Present (20.99%, contrasting with an average of 23.48%) and Type 1 conditionals (6.83%, compared to the average of

14.78%). This correlates with a higher use of Type 2 (13.04%, vs. 11.03% in the average), Verbless (12.17%, vs. 8.59%), and, particularly, Type 3 conditionals, which almost double their use (3.11%, vs. 1.79% in the average). This higher use of Type 3 conditionals is also reflected in the distribution of particular verb combinations shown in Table 5.26 below, in which *Past perfect, would present perfect* are shown as the fifth most frequently used combination among Final conditionals.

Initial	**Use**	**Final**	**Use**
Present simple, present simple	453	Present simple, present simple	124
Past simple, would	282	Past simple, would	96
Present subjunctive, present simple	218	Present subjunctive, present simple	44
Present simple, will	218	Present simple, will	36
Present subjunctive, will	214	Past perfect, would present present	23
Other 177 combinations	1293	Other 129 combinations	482
Middle	**Use**	**Apodosis-less**	**Use**
Verbless, present simple	29	Present simple, A-less	5
Present simple, present simple	21	Present subjunctive, A-less	3
Present subjunctive, present simple	14	Past simple- A-less	2
Past simple, would	10	Could, A-less	1
May, Present simple	9	Will, A-less	1
Other 67 combinations	157		

Table 5.26: Use of conditionals per verb forms in their constituents per order of the constituents of conditionals

Middle conditionals show an even lower proportion of use of Present-Present conditionals (14.58%, vs. 23.48% in the average) as well as of the three canonical types, which account for 4.58%, 6.67% and 0.42% of the cases, respectively, compared to an average in the whole corpus of 14.78%, 11.03% and 1.79%, respectively. This correlates with a remarkably higher use of Verbless conditionals, which account for 33.75% of the uses, contrasting with their 8.59% proportion of use in the average. This can also be seen in the particular combinations which are most commonly used, shown in Table 29 above, in which *Verbless, present simple* conditionals are the preferred combination of verb-forms, accounting for 12.08% of the total uses.

Finally, apodosis-less conditionals show 100% of Others uses, as all apodosis-less conditionals were classified in that hodgepodge category. However, the few cases of apodosis-less conditionals show, nevertheless, a use of verb forms in the protasis which is comparable to that of the whole corpus, with *present simple* as the most frequently used verb-form, *present subjunctive* as the second most frequenly used and *past simple* as the third one.

Summary of the chapter

This chapter has presented the quantitative results of the analysis according to the parameters defined in the previous chapters.

The analysis of **the results considered as a whole** has shown that the use of conditionals tends to decrease over time, although there is not a statistically significant variation, and that astronomy and philosophy texts use conditionals twice as frequently as life sciences texts. The different disciplines show, however, different behaviours regarding their diachronic evolution: philosophy conditionals start with the highest proportion of use in their eighteenth century samples and show the sharpest decrease in use, whilst astronomy and life sciences present more moderate decreases.

According to the genre of the text, essays and dialogues show a noticeably higher use of conditionals, and letters a much less frequent use. In what regards the sex of the authors, male authors use more conditionals than female authors in general, although this depends on the discipline: female philosophers used more conditionals than their male counterparts, contrasting with a noticeably lower proportion in both astronomy and life sciences. Finally, there are less differences between the sets of samples on account of the origin of the authors, with English and Irish authors showing a slightly higher use of conditionals than their Scottish and American counterparts.

The analysis of the results **according to the type of conditional** being used has shown that *if* conditionals account for 84.1% of all uses, in line with the results for other corpora in the literature (80% in Gabrielatos 2010). The uses, however, vary according to extra-linguistic parameters. Throughout time, the use of *if* and inversion conditionals decreased, whilst the use of *unless* and peripheral conditional increased. At the same time, several inversion operators stopped being used, whilst new peripheral subordinators appeared.

All types of conditionals are more frequent in astronomy and philosophy than in life sciences texts, although astronomy authors seem to proportionally favour peripheral over inversion conditionals and philosophy authors prefer the use of inversion and *unless* over peripheral conditionals. *If* conditionals decrease their use in all disciplines, but the other types show an increase in their use in astronomy and life sciences and a decrease in philosophy texts.

If is the preferred type in all of the genres, but its frequency of use is not uniform: textbooks, lectures and dialogues emphasise the use of *if* (and in the latter two genres, of *unless* as well) with higher than average proportions, whilst essays and letters show a comparatively higher proportion of inversion conditionals. Articles show a significantly higher proportion of conditionals other than *if* (particularly inversions), combined with an average use of *if* conditionals.

Finally, all conditional types present a higher proportion of use in male authored texts than in female authored texts but for philosophy texts, in which all of the types appear more frequently in texts written by women. There are as well some differences according to the origin of the author, with Irish authors using proportionally more *if* conditionals and North American and Scottish authors using proportionally less.

The analysis of the results **according to the function they play in discourse** has shown that hypothesizing conditionals predominate, with 75.31% of all the uses, followed by known fact (6.31%), concessive (5.27%), scope restricting (5.17%), and relevance conditionals (4.31%). All the other functions present less than 2% of the uses.

Most conditional functions decrease their use over time, with the only exception of scope restricting and concessive conditionals, which increase it. However, once the general decrease in the use of conditionals over time is taken into account, it is known fact and hypothesizing conditionals that suffer the greatest proportional decrease, whilst speech act conditionals account for a similar proportion of all conditionals in both the eighteenth and nineteenth centuries.

There is a clear contrast in the proportion of use of the different functions between astronomy texts, on the one side, and philosophy and life sciences texts, on the other: astronomy texts use proportionally more relevance, scope restricting, and, particularly, known fact conditionals; and less hypothesizing, concessive, and non-committal conditionals than life sciences and philosophy texts. Regarding the different genres, articles, treatises, lectures, and essays show a lower than average use of known fact conditionals, whilst textbooks use those conditionals more frequently, with a corresponding lower use of hypothesizing conditionals. Dialogues and letters, however, are characterised by their higher than average use of certain speech act conditionals, such as politeness and directive ones, which may be in relation to their more interactive nature. Conditional functions are fairly uniformly distributed on account of the nationality of the authors, but regarding their sex, women use less known fact, scope restricting, and non-committal and more hypothesizing, rhetorical, directive and politeness conditionals than men.

Finally, there are some formal (quasi)restrictions of use of certain functions with particular conditional types: for instance, *lest* only introduces relevance conditionals, and directive, politeness, and metalinguistic conditionals appear only with *if*; whilst rhetoric and non-committal conditionals have a single case each with a conditional other than *if*. The distribution of functions shows that *if* conditionals perform the hypothesizing function less frequently than the other types do, perhaps as a result of its higher versatility, as it is the only type performing all functions.

The results **according to the parameter of order of the conditional constituents** shows that initial conditionals are the most common with 71.73% of the uses, whilst final conditionals are 21.53%, middle conditionals 6.43% and apodosis-less conditionals 0.32% only. This is in accordance with the literature. Initial and apodosis-less conditionals are used in the same proportion throughout time, whilst final conditionals become less frequent and middle conditionals increase their use. Genres also show a very uniform scenario in which the difference in use for all genres is less than 3%. The only exceptions are textbooks, which show a higher level of initial conditionals, and dialogues, in which apodosis-less conditionals are particularly more frequent and middle conditionals less so.

In what regards the discipline of the texts, conditionals in astronomy samples comprise more initial and less final conditionals, and show a relatively stable situation throughout the two centuries. However, philosophy and life sciences samples present less initial and more final conditionals, as well as a higher degree of diachronic evolution. Life sciences samples show the highest proportion of use of middle conditionals. In what has to do with the sex of the authors, women use less initial and more final conditionals than men in general and in all disciplines but life sciences, in which the situation is the opposite. Regarding the origin of the authors, however, it has been revealed that while European authors stick to the average uses, American authors use a particularly higher proportion of initial conditionals and a lower proportion of final ones.

Linguistic parameters show more noticeable differences. Regarding the type of conditional, there is a substantial majority (79.47%) of final conditionals among the uses of *unless*, seeming to point to a particular tendency of co-occurrence. Peripheral conditionals also show higher than average proportions of use of final conditionals (37%), which account for the majority of the uses of *as long as*, *on condition* and *provided*. On the contrary, inversion conditionals are much more restrictive in their uses. The proportion of use is similar to that of the average but with a higher use of initial conditionals and important restrictions for the use of apodosis-less conditionals (no single case was found) and middle conditionals, which appear exclusively with *were*.

Regarding the function in discourse, hypothesizing, scope-restricting, relevance, and directive conditionals conform to the average, and known fact and rhetorical conditionals seem to further reinforce the preference for initial conditionals. On the contrary, the rest of the functions present a noticeably lower use of initial conditionals. This is the case of non-committal conditionals, in which the middle position is favoured, even though initial conditionals are still the majority of the uses; concessives, which show the same proportion of use of both initial and middle conditionals; and politeness and metalinguistic conditionals, in which the initial position of the protasis is not the preferred order, but, the third, after middle and final conditionals, tied for the first position.

The results according to the different combinations of verb forms in the constituents of the conditional structure has shown some there are 225 different combinations of verb forms in the corpus analysed in this study. The most frequent combination is *Present simple, present simple*, which accounts for 16.01% of all the cases. As the number of different combinations is too high and would be unwieldy for the whole set of analyses, the combinations were grouped in thirteen categories. The results on account of these categories showed that Present-Present conditionals account for 23.48% of the cases, and that the use of the three canonical types of conditionals combined account for less than 27.60% of the cases. There are very few differences in the use of the different verb-form combinations in the corpora on account of the diachronic evolution. The most notorious difference is the decrease over time of the use of present subjunctive forms in the protases of conditionals. This is also the case with the sex of the authors, in which the main difference is that women authors used less Present-Present and Verbless conditionals and more conditionals with modal particles.

The distribution of the verb-forms per discipline shows a higher use of Type 2 and, particularly Type 1 conditionals in astronomy texts, whose single most frequently used combination is *Present subjunctive, will*; whilst philosophy and life sciences texts show a distribution of the proportions of use more in line with the average for the whole corpus. The analysis also shows important differences between disciplines in relation with diachronic evolution, with philosophy texts on the one hand, and astronomy and life sciences texts, on the other, showing the exact opposite evolution of use in the majority of the individual categories of verb-forms.

The distribution of the use of verb-form combinations is very uniform across the several genres, but four different groups can be distinguished once the results are grouped in categories: treatises and lectures show a distribution similar to the average; essays, articles and dialogues are characterised by a lower than average use of Type 1 conditionals; textbooks, on the contrary, are characterised by a remarkably higher use of those Type 1 conditionals; and, finally, letters show a lower than normal use of Present-Present and Verbless conditionals.

Regarding the origin of the authors, English authors reproduce the average results, Scottish authors avoid the use of Type 1 conditionals and prefer the use of Modal conditionals, and Irish authors show the exact opposite distribution of preferences. North American authors avoid the use of Present-Present conditionals, preferring Verbless, Type 2, and, particularly, Type 1 conditionals.

There are very remarkable differences in the combinations of verb-forms used with each conditional particle. The use of verb-forms in *If* conditionals has been shown to be very similar to that of the average, whilst *unless* conditionals favour Present-Modal ones and, particularly, uses with *can* in the apodosis. Peripheral and inversion conditionals show more important differences, with particular uses for each of the individual particles. Thus, inversion conditionals show almost no use with present simple or present subjunctive in the protasis, as the inversion particle is also the verb form of the protasis and there are only two cases of inversion conditional with present tense operators (in these examples, *is*) in the results. In peripheral conditionals, *as long as, so long as* and *provided* prefer Present-Present and Type 1 combinations, whilst *in case* uses more Type 2 combinations, *lest* only presents uses with *should* in the apodosis and *supposing* favours the use of *to*-infinitives.

These important differences appear as well with regard to the different functions of conditionals in discourse. These differences are so notorious, with each function presenting different characteristic combinations, that they will be devoted a specific section in Chapter 6 below.

Finally, it has also been found that each of the possible orders of constituents correlate with different proportions of use of the different verb-form combinations. Initial conditionals show a distribution of functions in line with the average for the whole corpus, whilst final conditionals use a lower proportion of Present-Present and Type 1 conditionals and a higher proportion of Type 2 and, particularly, Type 3 conditionals. Middle conditionals have the most divergent (compared to the average results) result as they show an even lower proportion of Present-Present conditionals and of each of the three canonical types as well as a higher proportion of Verbless conditionals. Apodosis-less conditionals are classified as Others, and consequently 100% of their results belong to that category.

CHAPTER 6:

Discussion

Introduction

The previous chapter has provided information about the use of the different conditional structures along a series of linguistic and extra-linguistic parameters. However, as explained in Biber & Conrad (2009), in order to analyse a register it is not sufficient to describe the use of the structure under study, it is also necessary to analyse the associations between the context in which the register is used (described in Chapter 1) and its linguistic features (the object of Chapter 5), in order to explain the distribution of the results and how they are representative of the nature of the register.

This chapter, then, is devoted to the discussion of the results in the analysis, trying to explain their distribution and making use of further analysis when needed. It is divided in five sections. Section 1 analyses the proportions of use of conditionals and of particular conditional particles on account of socio-historical variables. Section 2 focuses on the use of interpersonal and mitigating conditionals. Section 3 studies the proportion of canonical conditionals and their merits to be considered as a criterion for the classification of conditionals; and Section 4 reviews the correlations between the three formal linguistic parameters (type of conditional, order of the constituent and verb-form combination) and the functions conditionals fulfil in discourse. Finally, a closing section will recapitulate the findings.

1. Use of conditionals on account of socio-historical factors.

The analysis of the results in Sections 1, 2 and 3 in Chapter 5 have shown that four out of the five extra-linguistic parameters (diachronic evolution, discipline of the text, genre of the text, and sex of the author) present a distribution of results which shows important differences[114]. In this section, the influence of the different extra-linguistic parameters representing the socio-historical context of the period on the general use of conditionals will be examined, and a model capable of explaining the distribution of the results will be proposed. In order to do this, the four parameters examined will be divided in two blocks on account of the similarities observed in the results: first, the discipline of the texts, the sex of the authors, and the diachronic evolution will be analysed in conjunction and later the genre of the texts will also be considered.

1.1. *Use of conditionals on account of extra-linguistic parameters: Sex, discipline and diachronic evolution.*

1.1.1. *Three parameters with interrelated results*

As shown in Chapter 5 above, the parameters of discipline of the text, sex of the authors and diachronic evolution exert a considerable influence in the distribution of the results by themselves. However, the combined effects of the three parameters show much more important differences than any of them separately.

Thus, for instance, the sex of the authors determines some important differences in the use of conditionals, as male authors have been shown to use more conditionals in every type but inversion conditionals. However, more important differences are discovered after joining the parameters of sex and discipline: philosophy texts show higher proportions of use of conditionals both in general and of each type of conditionals (with the exception of *unless*) in female authored texts, whilst astronomy and life sciences texts show a higher proportion of use of all types of conditionals in male-authored texts.

The same happens with the parameter of diachronic evolution, which presents subtler differences between the uses in the eighteenth and nineteenth century when considered by itself than when considered in conjunction with the parameter of discipline of the text. The results show a general decrease in the use of conditionals over time, although *unless* & peripheral conditionals are used proportionally more frequently in the nineteenth century. However, when the diachronic evolution is

[114] The results of the remaining parameter, the geographical origin of the author of the text, have shown less differences, and, consequently, will be disregarded here.

considered in relation with the different disciplines of the samples it becomes clear that most of the general decreasing evolution in the use of conditionals in the whole corpus can be attributed to the sharp decrease occurring in philosophy samples only, contrasting with astronomy and life sciences texts, which are responsible for more modest decreases. Moreover, there are, as well, important discipline-based differences in the diachronic evolution in the use of the different types of conditionals, as *if* conditionals show a decreasing use in all disciplines, but the other types (*unless*, inversion and peripheral conditionals) showed differences dependent on the discipline of the text: in philosophy texts, all types of conditionals decreased their use, whilst in life sciences and, particularly, astronomy texts, uses of *unless*, inversion and peripheral conditionals increased from the eighteenth to the nineteenth century.

1.1.2. *A problem to measure the importance of the different parameters*

Regretfully, it is difficult to ascertain which of the different parameters contributes the most to explaining the combined variation. Part of the difficulty lies on the fact that, as explained in Chapter 4 above, the distribution of the variables across the samples in the corpus is not uniform. This is the case because the compilers of the *Coruña Corpus* gave priority to representativeness over balance when designing the corpus. In other words, this implies that even though the corpus, when considered as a whole, "broadly reflect[s] production at the time" (Moskowich 2012: 42, Görlach 2004: 1), the presence of the different variables among the samples is not balanced, this is, not all variables are equally well represented across all parameters, and sometimes it is difficult to compare the influence of the variables of a given parameter in relation with some other parameters.

This problem is particularly relevant for the analysis of the results of the use of conditionals in this dissertation. This is because, in the corpus under study, the highest proportion of uses of conditionals occurs among eighteenth-century female philosophers, and all female-authored texts on philosophy in the corpus are from the eighteenth century, whilst there is none from the nineteenth. This implies that the results of this group of authors cannot be compared with valid counterparts for all parameters, and thus the high proportion of uses cannot be easily attributed to any one of these parameters only. This makes it difficult to ascertain whether the results are most influenced by their being eighteenth century texts and not nineteenth century texts, their being philosophy texts and not astronomy or life sciences texts, or their being written by female rather than male authors.

This lack of balance also influences the possible use of statistical tests to examine the data: the scarce number of samples in each subset prevents the use of the most powerful statistical tests, such as logistic correlation tests, which could show the proportion of variation explained by each of the

parameters; whilst the non-balanced distribution of the samples also avoids the use of means-comparing statistical tests, in which each of the parameters is analysed on its own.

1.1.3. *Reconsidering the weight of the parameters: Further evidence*

In any case, several aspects of the data seem to point to a scenario in which, even though the three parameters under study (sex, discipline and diachronic evolution) show interrelated results, it is the variation on account of the discipline of the sample that is the most crucial parameter.

First, as can be seen in Sections 1 and 2 in Chapter 5, out of the three parameters considered in isolation, and even though the differences are not extraordinary (because of the unbalanced distribution of the samples according to the different parameters, as explained above), it is clear that the discipline of the text is the one showing the most important variation.

Second, the results on account of the diachronic variation and the sex of the authors show more important differences when considered in combination with the discipline of the texts than when considered by themselves, as already explained in detail above.

And third and most importantly, the use of the discipline of the texts as a parameter of analysis configures two groups which show a consistently diverging behaviour across the different parameters, distinguishing between, on the one hand, life science and astronomy texts, and, on the other hand, philosophy ones. This can be seen in Figure 5.5 in Chapter 5, in which one can see how women use more conditionals than men in philosophy texts, whilst men use more conditionals than women in astronomy and life sciences texts; or in Figures 5.17 and 5.18, in which it is shown how all types of conditionals present a lower proportion of use in nineteenth-century philosophy texts, whilst in astronomy and life sciences texts it is *if* only that diminishes its use.

Consequently, and lacking the necessary statistical tests which could support these conclusions, it is the discipline of the text that seems to be the factor creating the greatest variability, even though, as shown below, the parameters of sex and diachronic evolution influence the results as well.

1.1.4. *A model of explanation*

The analysis until now has just tried to ascertain the relative weight of each of the parameters in occasioning the existing variation. However, it is not sufficient to explain the importance of each of the parameters to cause the variation in the result. It is convenient, rather, to relate these results with the existing information about the relevant context, (this is, with the situation of science during the eighteenth and nineteenth centuries) and to put forward a model which can provide a credible explanation for this distribution of uses.

This model is mainly influenced by the different distribution of conditionals on account of the different disciplines in the two centuries under analysis: in the eighteenth century there are important differences among the disciplines, but in the nineteenth century these differences gradually diminish. This points to a possible model of explanation in which the distribution would reflect the paradigmatic evolution taking place in science and scientific discourse during the eighteenth and nineteenth centuries. As explained in Chapter 1 above, at the beginning of the eighteenth century, the process of formation of contemporary science and scientific language is still taking its first steps, and each discipline shows profound differences. These differences go well beyond the inherent, topic-based ones, affecting their style of writing as well: it could be said that at this stage there is not a single, but several scientific discourses, depending on the different disciplines (or, even beyond, on the different movements and schools in each discipline), and that this permeates the linguistic uses as well. The passing of time would then bring not only a standardisation of scientific practice and discourse, but also a tendency towards reducing interdisciplinary differences. This tendency could be considered to still continue until the present day, in which even though there are still particular ways and practices in the discourse used in each discipline, these seem to be much more subtle than in the eighteenth century, ever decreasing its influence, and, most frequently, occasioned by the very topic of the research.

At a deeper level of analysis, the differences among the disciplines could also be associated with the various processes taking place in each of them. Thus, the higher use of conditionals in philosophy texts, as well as their higher variability, their higher use in the eighteenth century and their steeper decline in the nineteenth century could be attributed to a still ongoing influence of scholasticism in eighteenth-century philosophy writers. This does not mean that eighteenth-century philosophers were still predominantly scholastics, but, rather, that even philosophers which were at the forefront against scholasticism were still influenced in their discursive practices by the formal characteristics of this paradigm.

This could be explained by a hypothetical process of evolution, in which the contribution of philosophy to the substitution of scholasticism would focus first on the systematic criticism of its foundational, rather than its formal, principles, and would thus undergo a phase during which works criticising scholasticism, but still being formally scholastic, were produced. Thus, eighteenth-century philosophy texts would appear to be less constrained by the rules and uses of the developing scientific writing in the period (which the other disciplines adopted from the first stages of the substitution of the scholastic paradigm), and would only evolve towards a more standardised scientific discourse, approaching that of the other disciplines, in the nineteenth century, but allowing, nevertheless, for

the intrinsically more rationalist way of writing in philosophy, as part of the influence of their very subject matter. On the contrary, the lower use of conditionals and their subtler diachronic evolution in astronomy and life sciences texts seems to point to the fact that these disciplines adopted the formal suggestions put forward as part of the process of criticism of scholasticism at an earlier stage, and thus were more advanced in their evolution towards Present Day scientific discourse.

This model also applies to the differences found on account of the sex of the authors. Thus, female authors, which showed a high variability on account of their discipline and a markedly higher proportions of use of conditionals in the eighteenth century compared to their male counterparts, move towards the norm and moderate their variability in the nineteenth century, showing a sharp decrease in the use of conditionals which approaches the level of use of male authors.

All in all, this model would be in accordance with the higher variability in eighteenth-century samples, and it also explains why philosophy texts showed a consistently different behaviour to that of astronomy and life sciences ones, with a higher use of conditionals overall, a higher variability both in types and in relation to the sex of the authors, the highest proportion of conditionals different to *if*, and the clearest diachronic evolution.

1.2. *Use of conditionals on account of extra-linguistic parameters: Differences per genre.*

However, this model must also take into account the considerable differences in the distribution of the uses among the different genres. As explained in Chapter 4, samples from several genres were included during the process of compilation of the *Coruña Corpus* as its inclusion could help discover linguistic differences within a single discipline (Moskowich 2012: 37), as well as particular uses reflecting the influence of the different types of readerships and mediums of publication of each text (Fortanet *et al*. 1998). The results according to this parameter, taking into account the definitions to categorise the genres as used by the compilers of the *Coruña Corpus*[115], show some particularities which could be attributed to the reality of scientific communicative practices at the moment.

For instance, as shown in Section 2.3 in Chapter 5, textbooks, lectures and dialogues use peripheral and inversion conditionals (and in the case of textbooks, *unless* conditionals as well) less commonly than average, whilst they use *if* conditionals more frequently. These uses could be explained because of the oral nature of lectures and dialogues and the inherent linguistic simplicity of textbooks, which would then influence their avoidance of linguistic variability and their preference for the most canonical types of conditionals. Regarding the order of conditionals, textbooks are also characterised

[115] As explained in Chapter 4, basically, those by Görlach (2004: 88) and the *Oxford English Dictionary*. This topic is covered in detail in Moskowich (2012b: 29-30).

by a higher than average use of initial conditionals, perhaps related with the use of drills and repeated structures of sentences, whilst dialogues show a high prevalence of apodosis-less conditionals which fits nicely with their oral, and perhaps more improvised, nature.

In the case of letters, it is inversion conditionals that are used more frequently than in the average. This could indicate a relation between two models then in decline: letters were one of the preferred genres for scientific communication in scholasticism and during the first stages of the evolution towards a new science (Atkinson 1996), but were being used less and less frequently with the passing of time. Similarly, inversion conditionals, once a very productive strategy of formation of conditionals, underwent a process in which their uses became less frequent and more specialised, and in which the number of operators capable of encoding conditional inversion and the contexts in which these inversions were allowed were reduced from the early eighteenth century, whilst conditionality expressed by means of a subordinator became more frequent and the number of particles used to encode it increased. This correlation would not only indicate the particular preferences of use in each genre (having to do with the relations between authorship, readership and medium of publication, as explained above), but it could also indicate a relationship between the evolution in the generic preferences and the evolution of linguistic choices in the use of conditionals, pointing at a model in which there is a complex process of substitution acting at several levels at once. However, other distributions, such as, for instance, the higher use of conditionals other than *if* in essays and articles, do not seem to have such a straightforward explanation.

However, when analysing the relation between these parameters it is necessary to remember that the distribution of the different parameters is not balanced, but tries to reflect production during the period under study, and that this could influence the results, showing spurious correlations. Articles, for instance, are rare in the eighteenth century and raise to prominence during the nineteenth century before acquiring their present status during the twentieth. In the corpus there is a single article from the eighteenth century (1774, towards the middle-end of the period) whilst six articles from the nineteenth century have been included. This could help explain the lower proportion of use of *if* conditionals in articles, as most of the articles sampled for the corpus are from the nineteenth century, in which the uses of conditionals other than *if* are proportionally more frequent[116].

[116] Although a good proportion of these "conditionals other than *if*" are inversions, which are indeed used less frequently in the nineteenth century, the more acute decrease in the use of *if* conditionals means that inversion conditionals, though being used actually less frequently, have a higher *proportion* of use of among all conditionals, as shown in Section 2.1 in Chapter 5.

Similarly, textbooks, which were very much used in astronomy works, were less used in life sciences and, especially, philosophy. This is reflected in their distribution in the corpus, in which, out of the twenty textbooks included, fifteen are from astronomy texts (ten out of the twelve total textbooks in the eighteenth century), four from life sciences and only one is an example of a philosophy textbook. In the same spirit, the results from the genre in which conditionals were most frequently used, dialogues, must be considered with caution, as the corpus contains only two samples of dialogues, thus presenting a situation in which authorial preference is not sufficiently diluted[117].

In any case, the level of interrelated variation in the parameter of genre is similar to that of the parameters explained in the previous section, and as explained above, it is difficult to ascertain which parameter has more weight in explaining the variation. However, it seems that the distribution partially reflects the reality of the uses of the scientific language of the period, with a certain tendency towards assimilation. Some of the uses left unexplained, as well as some possible incongruences, might be understood taking into account that the textual productions included under the tag of a given genre are suffering a constant transformation, i.e: although there is a continuity in naming the genres, the actual texts being considered examples of that given genre, as well as the practices associated with them, vary (at different rates among the different genres), and thus do not present a continuous set of characteristics for all the period. Thus, although being always referred to as "an article", an article in the eighteenth century can be very different from an article in the nineteenth century, and even more so from what it is understood as an article nowadays.

Consequently, it could be concluded that variation on account of the genre of the samples runs parallel to variation on account of the discipline of the text, the sex of the authors and the diachronic evolution, further explaining the individual variation in each text and, in combination, reflecting the evolution towards a more uniform and standardised scientific register.

2. Conditional functions, mitigation and interpersonal uses.

In Chapter 3 (Section 1.3), it was shown how the use of the concept "hedge" to refer to some of the functions of conditionals presented an important problem: there is an important number of different definitions of the concept, which are imprecise and do not always present the same scope, and, particularly, which do not always include conditionals as a member of the class of structures

[117] This is so despite the fact that dialogues are characteristic of the previous scholastic paradigm and could thus indicate a higher preference for conditionals in that paradigm, although the low use in letters, also characteristic of that paradigm, would seem to point otherwise.

characterised as hedges. Thus, it was decided that, instead of referring to functions in which conditionals are used by the author to tone down the force of a statement as manifestations of hedging, two different (but frequently interrelated) pragmatic functions would be distinguished in relation to the properties of conditionals: their mitigating and interpersonal functions.

Conditionals are considered to perform an *interpersonal* function when they are used by the author in order to influence readers and achieve a better reception for the claims made in the text. Thus, they help "establishing agreement between the writer and the reader of an academic text" (Warchal 2010: 142). They are related to the dialogic nature of scientific discourse, which implies that for one's claims to be considered science they have to be accepted by one's peers. Examples of interpersonal conditionals are those which are used to guide the readers' interpretation of a claim, to negotiate terms and concepts, to ward off possible criticism or to acknowledge others' points of view, among others. They also include conditionals which are used to emphasise the author's politeness or humility.

Conditionals are said to perform a *mitigating*[118] function when they are used to tone down the assertiveness of a claim, presenting it in a less categorical way and consequently improving its chances of being successfully accepted by the reader. Mitigation can be expressed through the use of the conditional alone or through a combination of some other linguistic devices, such as modality.

The different functions distinguished in the parameter of function of the conditional in discourse were also defined in Chapter 3 in relation with their mitigating and interpersonal nature, as shown in Table 6.1 below

Known fact		Not interpersonal, not mitigating
Hypothesizing		Sometimes interpersonal, not mitigating (per se)
Scope-Restricting		Interpersonal and mitigating
Method		Not interpersonal and not mitigating
Rhetorical		Interpersonal, not mitigating (Blatant/Reinforcers)
Concessive		Interpersonal, not mitigating
Directive		Interpersonal and mitigating
Speech act	Politeness	Interpersonal and mitigating
	Relevance	Interpersonal and mitigating
	Metalinguistic	Interpersonal and mitigating
	Non-committal	Interpersonal and mitigating

Table 6.1: Classification of conditional functions in discourse according to their interpersonal and mitigating nature. (Already presented as Table 3.11 in Chapter 3)

[118] Some authors (Gabrielatos 2010) argue that all conditionals express some kind of less-than-factual meaning, this is, according to him, all conditionals help mitigate the force of the claims by presenting them as non-factual.

As can be seen in Table 6.1, Known fact and Method conditionals are neither interpersonal nor mitigating. They are completely uncontroversial, stating universal relations or completed methodological procedures which do not need any mitigation.

Hypothesizing conditionals, as the function covering the greatest scope of conditionals, are as well the ones showing the most important variability. They do not normally feature a mitigating function per se, this is, just by their being conditional structures, but mainly express it through the use of modality in the protasis and the apodosis. They are not interpersonal either, but may be if they are used as a device to make readers follow the process of reasoning of the author and thus reach the conclusion the writer intends them to reach.

Concessive and rhetorical conditionals are interpersonal but not mitigating. Rhetorical conditionals are strong assertions (thus, not mitigating) interpreted by means of implicatures, as explained in Chapter 3. However, they need a shared base of knowledge to be correctly interpreted, thus presenting some interpersonal nature. Concessive conditionals are used to anticipate possible impediments for a claim which may be supposed, and thus they help authors guard off potential criticism, performing an interpersonal function. However, they do not mitigate the claim in the apodosis, rather otherwise, they emphasise that the apodosis would hold even in the case that the possible impediment were true.

Finally, all the other functions of conditionals show a combined interpersonal and mitigating nature. Scope-restricting conditionals are used to assure the correct interpretation of a claim by defining how a concept is to be understood or which elements it is mean to affect. They are both interpersonal, contributing to the shared conceptual basis between author and reader, and mitigating, as they make the validity of the claims conditional on their being interpreted as instructed. Directive conditionals present an instruction to the readership as if it were optional, mitigating its force. Finally, the four types of speech act conditionals are used to make the validity of the utterance of the apodosis conditional on the protasis. They depend on the interpretation of the reader, contributing to the interpersonal meaning, and they also mitigate the force of the claim by making its validity conditional on the fulfilment of the speech act.

2.1. *Results in the corpus*

The results in Section 3 of Chapter 5 showed a distribution of functions in which hypothesizing conditionals, which are mitigation-neutral, were the most frequently used function across all parameters and variables. Out of all conditional uses, 12.69% perform a mitigating function and

18.29% present an interpersonal one. However, there are important differences according to the different parameters of study of the results.

Regarding the diachronic distribution of the uses, the use of mitigating and interpersonal conditionals increases in the nineteenth century, with 13.99% of conditionals in the nineteenth century showing a mitigating function (11.64% in the eighteenth) and 20.80% showing an interpersonal function (16.25% in the eighteenth century). This growth, co-occurring with parallel decreases of the known fact and hypothesizing functions, is basically a reflection of the increase in the use of scope restricting conditionals, rather than a consequence of a higher use of speech act conditionals, whose use remains stable throughout the period.

In what has to do with the different disciplines and genres, it is noticeable that known fact conditionals (this is, conditionals with no mitigation whatsoever) are used much more frequently in eighteenth century Astronomy texts, as well as in Textbooks. This higher use also correlates with a higher use of *present subjunctive, will* conditionals. These uses may be related with the influence of Newtonian Astronomy, which imposed a more mathematical and logical apparatus in which the use of known fact conditionals would increase. However, as explained above, these results must be considered with caution, as fifteen out of the twenty textbooks sampled in the corpus are texts on astronomy, thus being related variables.

However, the most notorious difference appears in the parameter of sex, as women seem to avoid the use of known fact conditionals (1.04% of the total uses, against 6.56% in men-authored texts). This does not suppose an increase in the use of mitigating conditionals (in fact, women use less scope restricting ones than men), but correlates with a higher proportion of use of the hypothesizing function.

If, just as in the previous section, the effect of extra-linguistic parameters is analysed in conjunction, there seems to be a common pattern: known-fact conditionals, which show no mitigation and no interpersonal nature, are especially frequent in a very particular type of scientific writing: eighteenth-century (male-authored) texts on astronomy. All other types of scientific discourse used this type of conditionals much less frequently, preferring other functions which are at least capable of expressing mitigation. Women in particular preferred the use of hypothesizing conditionals, whilst the passing of time introduced a tendency towards a higher use of scope restricting conditionals.

This emergence of scope-restricting conditionals during the nineteenth century may be related with the evolution towards Present Day scientific register, as this type of conditionals provide a less blatant strategy (compared with speech act conditionals) to mitigate the force of statements and move

readers towards agreement, since this is done by means of the invocation of shared knowledge rather than the intervention of the author. Thus, scope restricting conditionals would be characteristic of a scientific language evolving towards a more standardised pattern, in which the quantity of information being supposed as known and shared between the participants in the act of scientific communication is higher.

Women authors' preference for hypothesizing conditionals could be interpreted following the position that, even though they avoided the use of the most categorical conditionals, they did not really use conditionals expressing direct mitigation much more often than men did, but preferred to mitigate their statements through the use of modality. This correlates with the results in Section 5.4 in Chapter 5, which showed how women use less Present-Present and Verbless conditionals than men (21.11% and 5.88%, respectively, compared to 23.68% and 8.82%, respectively) and prefer the use of Type 3 conditionals (3.11%, compared to 1.68% in male-authored texts) and conditionals with modal marking (32.18% for the three categories identified as such combined, compared to 27.89% in texts by male authors). However, this seems at odds with the fact that women authors use a much higher proportion of rhetorical conditionals as well (2.08% of all conditional uses, versus 0.17% in texts by male authors), a function which is very blatant and categorical in their statements.

Regarding the uses of other functions of conditionals, women use more directive and politeness and less non-committal conditionals than men. Both directive and politeness conditionals help the building of consensus between authors and audience by showing due deference towards the audience, as do non-committal conditionals. However, this latter function, although formally mitigating the claims, can also be used, in a deeper level of signification, to put into question other authors' contributions, and thus could be considered too risky for women to use.

In any case, it must be noted that it is not women only that avoided the use of categorical known fact conditionals or hypothesizing conditionals without modal marking. On the contrary, it was a behaviour also common among many male authors, which also avoided the use of known fact and preferred other types of conditionals. A possible explanation for this is that the use of mitigating and interpersonal conditionals, rather than just of women, could be characteristic of authors in a situation of lack of power in the epistemic community, including up-and-coming hopefuls, scientists being discriminated against and women.

3. Inadequacy of the three-type canonical model of conditionals and verb forms.

As already explained in Chapter 2, the combination of verb-forms in the constituents of conditionals was used as a criterion in traditional typologies, some of which are still in use in EFL grammars. Three main types, sometimes referred to as "canonical conditionals", are identified, on account of the use of different combinations of verb-forms and encoding an increasing degree of hypotheticality. Some authors (Graver 1971, Eastwood 1984) distinguished as well a further fourth type, featuring present simple in both constituents of the conditionals, which would be used to express universal truths or scientific facts, and would sometimes be referred to as "zero conditional".

These typologies have been heavily criticised, with several specific studies (Hwang 1979, Maule 1988, Fulcher 1991, Ferguson 2001, Jones & Waller 2010) highlighting two main problems. First, as has been explained, traditional typologies only consider conditionals expressing a relationship of likelihood between constituents, thus ignoring all the other functions of conditionals in discourse; and, second, they oversimplify the combinatorial richness of verb-forms, distinguishing just three or four types and ignoring all other existing combinations of tenses or modals in order to make conditionals easier to learn for students of English as a Foreign Language.

Traditional typologies have been found to ignore whole types of conditionals. The actual occurrence of canonical conditionals has been examined in two corpus-based studies on medical writing, Ferguson (2001) and Carter-Thomas & Rowley-Jolivet (2008). These works have shown that the three canonical types, combined, accounted for only 18% and 14.7%, respectively, of all the uses of conditionals in their corpora. The proportion of use of each verb form combination in these studies is shown in Table 6.2 below.

Combination of tenses	Carter-Thomas & Rowley-Jolivet (2008: 196)	Ferguson (2001: 70)
Canonical 1 (present+will)	7.5%	11%
Canonical 2 (past+would)	5.9%	6%
Canonical 3 (past perfect+ would perfect infinitive)	1.3%	1%
Total canonical	**14.7%**	**18%**
Present + Other modals	17.2%	28%
Past + Other modals	4.5%	6%
Present + Present	21.3%	21%
Past + Past	25.8%	10%
Other combinations	16.5%	17%
Total non canonical	**85.3%**	**82%**

Table 6.2: Proportion of use of different combination of tenses in conditional data, according to Ferguson (2001) and Carter-Thomas & Rowley-Jolivet (2008). (Already presented as Table 2.4 in Chapter 2)

As can be seen, Past-Past conditionals are the most frequently used type in Carter-Thomas & Rowley-Jolivet's (2008) results, and Present-Other modals[119] in Ferguson's (2001). These, as well as Present-Present, show a higher proportion of use than the three canonical types combined in either corpora.

The analysis on account of the uses of verb-form combinations in Section 5 of Chapter 5 has shown that there are 225 different combinations of verb forms in the corpus analysed in this study. Of these, the three canonical types account for a combined 18.79% of all conditional uses, in line with Ferguson's (2001) results, but with a higher use of Type 2 conditionals (Type 1: 6.96%, Type 2: 10.39%, Type 3: 1.44%[120]). The single most frequently used combination is *Present simple, present simple*, which accounts for 16.01% of all the cases.

As did Ferguson and Carter-Thomas & Rowley-Jolivet in their respective studies, the results were also grouped in categories. In them, verb-form combinations close to those in canonical types were considered as examples of that type of conditional (for instance, examples with present subjunctive in the protasis or *shall* in the apodosis were considered as variants of Canonical Type 1 conditionals). By doing this, the proportion of use of the three canonical conditionals combined amounts to 27.60% of the cases, and Present-Present conditionals continue to be the single most frequently used type, with 23.48% of all cases.

However, it must be taken into account that even though there is a sizeable proportion of conditionals conforming to the verb-form combinations defined in the canonical models, they do not always conform to the functions assigned to these types in those models, as explained in Chapter 2. For instance, it was shown that Known Fact conditionals, which include the functions traditional typologies identify with "zero conditionals", actually present a more frequent use of Type 1 conditionals, instead.

Thus, it is clear that even considering all Type 1, Type 2, Type 3, and Present-Present combinations as "canonical" there is a very important proportion (49.92%) of conditionals which are completely ignored by traditional typologies. The sheer number of different combinations (225, including non-finite and verb-less forms) highlights the enormous formal variability of conditionals and the insufficiency of traditional typologies. The existing literature had already shown that these typologies

[119] The use of other modals (mainly *may*, *might* and *must*) would allow for a more nuanced assessment of probability than if *will* and *would* were the only particles used.

[120] As already explained in Chapter 2, the scarcity of uses of Type 3 canonicals in scientific writing has been explained by Carter-Thomas & Rowley-Jolivet as a natural phenomenon, bearing in mind that the use of Type 3 conditionals would open any researcher's conclusions to criticism. In Carter-Thomas & Rowley-Jolivet's words: "the researchers would be doing themselves a disservice if they opened up other hypothetical spaces in which a different set of results might have been obtained, or a different approach seen to be more valid than the one they in fact chose" (2008: 199).

were inadequate to classify for Present-Day conditionals in the literature, and this study has found that they are also inadequate for eighteenth and nineteenth-century ones.

4. Correlations between form and function.

The final point of the discussion is concerned with the study of the interactions between the linguistic parameters used in the analysis of data, with the aim of finding particularly frequent or infrequent co-occurrences between types of conditionals, orders of the constituents, or verb form combinations, on the one hand, and functions in discourse, on the other.

The analysis of these correlations will be divided in two parts. The first one will focus on the combinations of particular formal variables as expressions of particular functions in the discourse, and explanations for the particular uses of these types will be provided. The second part will analyse the correlations between the use of the different types of conditionals and the parameters of order and verb form combinations.

The first correlation found has been the important use of *Present subjunctive, will* in Known Fact conditionals (this combination accounts for 21.40% of all Known Fact conditionals in the corpus). This is particularly frequent in Astronomy texts and textbooks, especially in the eighteenth century. The examination of the examples, such as (1) below, reveals that this combination is particularly frequent in explanations of known, inevitable consequences of potential or hypothetical actions, and thus seems to be particularly useful as a rhetorical resource in a discipline (astronomy) in which the influence of the Newtonian model, which emphasised certainty and mathematical notation, was in vogue at the period.

> (1) IF the periphery of a ſemi-circle be turned round its diameter as an axis, it will generate the ſurface of a globe or ſphere. [15 (8842)]

The results have also shown that 46.19% of the cases of concessive conditionals present one (or both) verbless constituents. Among these, the most frequent combination is that of *verbless, present simple* conditionals, which accounts for 20.81% of all concessive conditionals. These verbless conditionals are used to introduce a single phrase or word, as in (2) below, with the intention of suggesting that even though the idea in the protasis is conceivable, debatable, and possible, the idea in the apodosis is most certainly true, and would hold anyway.

> (2) THIS beautiful Bird is ſomewhat bigger than a large Sparrow; and is ſeldom, if ever, ſeen, except in the Months of December or January; and then generally in the moſt woody and eaſterly Part of the Iſland. [51 (4814)]

Thus, in (2) the author thinks that even though the idea that the bird is never seen except in December and January could be entertained, it cannot be ascertained. What can be ascertained is that it is *seldom* seen except in those months. These examples often appear in the middle of the apodosis (in fact, concessive conditionals present the same proportion of initial and middle conditionals), being inserted at the phrase, rather than the clause, level and, as they introduce a single phrase or word, they are verbless unless the word introduced is, precisely, a verb.

Among relevance conditionals, the most common verb-form combinations are those categorised as Other modal combinations (19.25%) or Others (18.01%). The latter type includes combinations with imperatives, such as *Present subjunctive, imperative*, which accounts for 5.59% of the total uses, or *Present simple, imperative*, accounting for 4.35%. These combinations are frequently used in a subtype of relevance conditionals known as "biscuit conditionals" (Ebert, Endriss & Hinterwimmer 2008) which are used to introduce suggestions of a course of action on the part of the addressee in relation to the actualisation of the contents of a protasis. For instance, in (3) below, the apodosis introduces a suggested course of events ("proceed as follows") and the protasis states the conditions under which this course of event is to be followed ("If you have a mind for an excellent Herring-Pye")[121].

> (3) If you have a mind for an excellent Herring-Pye, proceed as follows: [52 (8372)]

A final point is that all *lest* conditionals function as relevance conditionals and present *should* in the apodosis, although this combination, shown in (4) below, only accounts for 3.10% of all relevance conditionals.

> (4) It seems scarcely necessary to describe it botanically; but, lest it should be confounded with other species of the same genus, it may be well to say that it belongs to the family Campanulaceæ. [77 (4084)]

Finally, politeness and metalinguistic conditionals are frequently used with *may, present simple*, a combination which accounts for 24.14% of the total uses of politeness conditionals and 38.89% of metalinguistic conditionals. Examples of these uses are shown in cases (5) and (6) below, respectively.

[121] However, not all biscuit conditionals use an imperative, as shown in the example from which the name of this subtype was extracted: "If you're hungry, there's biscuits in the tin" (Ferguson 2001: 65)

(5) Reader, Dunton is thus refin'd (if I may be allow'd to praiſe my ſelf) and nothing will be found in my Double Courtſhips […] that will make me bluſh to own, or another to read. [84 (7873)]

(6) The tail, if it may be ſo called, is but little leſs than the body, and ends bluntly. [55 (4201)]

These combinations are particularly frequent in middle conditionals, as parenthetical interventions or asides in which the author communicates directly with the reader, asking for permission or making some comment on the wording of the sentence.

Regarding the formal types of conditionals, once the use of *lest* with relevance conditionals is allowed for, almost all other conditional types different from *if* (this is, *unless*, peripheral conditionals, and inversion conditionals) can only fulfil a very restricted set of functions, presenting a very high proportion of uses of hypothesizing conditionals. In fact, according to the results in the corpus, three functions (directive, politeness, and metalinguistic) can only be fulfilled with *if* conditionals, and two others (rhetoric, non-committal) show a single case each of a conditional other than *if*. As can be seen, whilst *if* can fulfil any function, the other types present a much more restricted distribution of uses.

Unless presents a majority (79.47%) of final conditionals, a fact which might be related to the use of final conditionals as afterthoughts, one of the environments prone for their use according to Ford & Thompson (1986: 360). *Unless* conditionals also favour the use of Present-Modal conditionals and, particularly, uses with *can* in the apodosis.

Peripheral conditionals show a higher than average proportion of final conditionals (37%), which appear in the majority of the uses of *as long as*, *on condition* and *provided*. Regarding verb-forms, *as long as, so long as* and *provided* prefer Present-Present and Type 1 combinations, whilst *in case* uses more Type 2 combinations.

Inversion conditionals show higher restrictions in their uses: verb-form combinations are inherently restricted by the nature of the inversion particle, and thus there are fewer appearances of present simple in the protasis than usual. However, it is with the parameter of order of the constituents that the most important restrictions appear: Inversion conditionals need the consequent to be syntactically present (Biezma 2011: 164-166), and thus, no case of inversion with apodosis-less conditionals has been found[122]. Moreover, the use of inversion implies that the protasis is understood as "given information" (Biezma 2011), and, consequently, the proportion of initial protasis among inversion

[122] This is also related with two other characteristics of inversion conditionals: that they cannot be clefted, and that they cannot act as free-standing answers to questions either (Iatridou and Embick 1994: 141).

conditionals is well higher than average, as shown in this analysis. The analysis has also shown that there are important restrictions in their use as middle conditionals, as the only inversion particle with which cases were found was *were*.

Finally, although these correlations provide an interesting number of specific co-occurrences of formal characteristics and microfunctions, it is evident that they only explain a small amount of the total variability, and most conditional functions, even though showing particular preferences for orders of constituents, types or verb-forms, are characterised by the fact that they can be used with *any* combination of verb forms or with *any* order of constituents. However, the results have shown that this is not the case in what regards the parameter of type of conditional, as it is *if* conditionals only that can fulfil any conditional function, and all the other types of conditionals present important restrictions in the array of functions they can fulfil.

A final question may arise, however, of whether it is the use of a given form that restricts the possible functions of conditionals or, vice versa, the particular functions are preferably encoded through the use of a particular form, as suggested by Facchinnetti (2001: 147), who claimed that "the choice of modals is strongly dependent on the macro speech-act conveyed in the text". This is a difficult question which will not be answered thoroughly here. However, it is noticeable that the results discussed here are largely compatible with Wason & Johnson-Laird's conception of conditionality. They considered that a conditional "is not a creature of constant hue, but chameleon-like, takes on the color of its surroundings; its meaning is determined to some extent by the very propositions it connects" (1972: 92). Thus, conditional meaning, as well as its function in discourse, would be determined by a combination of several factors, some of which, such as the selection of conditional particle, the order of the constituents or the combinations of verb forms, have been analysed here, showing their contribution to distinct conditional meanings. Others, such as the grammatical level at which the protasis is inserted or the very propositional meaning of the constituents of the conditional, have not been considered here but could also reveal interesting insights. In any case, it may be reasonable to consider conditionals as a composite structure on which each and every one of the factors blends together to provide the structure all its range of formal, functional and semantic variability.

5. Conclusion: The use of conditionals as a reflection of the evolution of scientific writing in the eighteenth and nineteenth centuries.

The results in this discussion suggest that the different uses of conditionals in scientific writing reflect the evolution of scientific discourse towards its present-day state. This evolution, however, must not be seen as a straightforward path, but as a complex, multifaceted process.

This process would start with the gradual disappearance of the previous model of scientific writing, a process beginning in the seventeenth and continuing during the eighteenth century. This seems to manifest in the differences in the use of conditionals between disciplines, which could be reflecting the different rhythms at which the process of substitution of scholasticism occurs. Philosophy, being still influenced by the practices of the ancient paradigm, shows a higher proportion of use of conditionals, whilst Astronomy, which appears among the first disciplines to react against these practices and adopt the new ways of writing proposed by New Science, is characterised by a lower use of conditionals in general but a high proportion of known fact conditionals, reflecting the influence of the mathematics-based Newtonian astronomy in the period. At the same time, inversion conditionals experiment a gradual decline, in which their proportion of use, as well as the number of operators available as particles triggering conditional inversion diminishes, appearing to suggest its gradual substitution as a strategy to express conditionality, mirrored by the emergence of new conditional subordinators and the increase in their use over time. A further manifestation of these changes is a simultaneous process of generic realignment, in which letters gradually disappear, whilst articles become more and more popular, as vehicles for the expression and dissemination of scientific knowledge.

The decline of the ancient paradigm of science co-occurs with the gradual popularisation of a new model of scientific writing. The transition between both paradigms was not direct, but a gradual process in which formal structures to express conditionality experiment a realignment in a two-step process: first, there is a contraction in the variability of conditionals (a reduction in the use of categorical conditionals, in the proportions of use of inversion conditionals and a lower number of possible verb-form combinations) and then there is a new process of expansion, introducing a series of new peripheral conditionals. This newly-increased variability corresponds with the emergence of scope-restricting conditionals as a more important function of conditionals in discourse. Scope-restricting conditionals allow authors to mitigate their claims through the use of the knowledge shared with their audience, thus avoiding the use of blatant strategies of mitigation in which authors make themselves present. At the same time, they also contribute to the cementing of the interpersonal

relationships needed in a new scientific discourse which is less collegial as a result of the greater size of scientific communities.

This process continues into the twentieth and twenty-first centuries, during which the dominance of the article as the vehicle for scientific communication and the emergence of the IMRD standard in the organisation of scientific discourse (Atkinson 1996) cause a series of restrictions in the uses of conditionals in discourse. These restrictions are basically the result of the fact that this standard model either causes a reduction in the use of some conditional functions (such as Speech Act conditionals, as shown in Warchal 2010), or makes them redundant altogether. An example of this latter phenomenon is the specialised use of directive conditionals as signpost devices, whose use is basically reduced to oral genres (such as conference presentations), as their use in written genres is unnecessary, since these signposting functions are now realised by the standardised framework itself.

In any case, the results have found that the distribution of conditional uses and functions throughout the period under study is not subject to a straightforward classification in which any single parameter explains all the distributions, but, on the contrary, shows that a series of linguistic and extra-linguistic parameters (including formal variability, discipline and genre of the study, and authorial preference or style) influence the use of a particular conditional in the discourse. This is in accordance with findings in the literature (Gray 2011), which have shown that variation in scientific writing does not occur along a single parameter, but is the result of the combination of multiple parameters instead.

Conclusions

The main objective of this study, as stated above in the Introduction to this dissertation, has been to describe the use and functions of conditionals in English scientific writing during the eighteenth and nineteenth centuries, with the help of the *Coruña Corpus,* examining both its functional and formal variability. This is done in an attempt to ascertain whether and how the use of conditionals reflects the general evolution of scientific register during the period, and, specifically, whether these structures are used as discursive strategies by authors to influence their audience and thus obtain a better reception. In order to achieve this aim, this dissertation has followed Biber & Conrad's (2009) three-step model, analysing the socio-historical context of the register, the pertinent linguistic data, and the associations between the two, as shown in Chapters 1 to 6 above. This final chapter summarizes the main findings of the dissertation, and provides some possible further lines of research to improve the results.

1. Findings in the results:

The findings discovered in this dissertation can be classified in three types. Findings from raw data, those obtained from the examination of the socio-historical context and those related to linguistic data.

1.1. *Findings from raw data*

The analysis of the results has shown that there are not radical differences between the uses in the eighteenth and nineteenth century scientific writing and contemporary English. *If* conditionals account for 84.1% of all uses in the corpus, in line with the results for contemporary corpora (80% in Gabrielatos 2010), inversion conditionals represent 6.91% of the uses, and peripheral (4.95%) and

unless (4.04%) show less frequent uses. On account of their order, conditionals with initial protases are the most frequent (71.73% of the uses), followed by final (21.53%), middle (6.43%) and apodosis-less conditionals (0.32%). The most frequently used function of conditionals in discourse is the hypothesizing function (75.31% of the uses), followed by known fact (6.31%), concessive (5.27%), scope restricting (5.17%), and relevance conditionals (4.31%). No other function is used in more than 2% of the cases.

However, important differences among parameters have been found: the use of conditionals decreases over time, philosophy and astronomy texts use twice as many conditionals as life sciences texts, and male authors use more conditionals than female authors, although the highest proportion of use is among female authors on philosophy. There are also important differences among genres, with essays and dialogues showing a noticeably higher frequency of use. These differences pervade all the linguistic parameters, as the various disciplines and genres show a preference for particular formal combinations and discursive functions.

225 different combinations of verb forms have been found in the corpus. The most frequent combination is *Present simple, present simple*, which accounts for 16.01% of all the cases. Once the different combinations were grouped in thirteen categories, the most frequently used has been found to be that of Present-Present conditionals (23.48%). The three canonical types of traditional typologies, even in the most favourable terms (formally related uses, such as examples with present continuous in the protasis or *shall* in the apodosis are considered as valid, and functional differences are disregarded) account for less than 27.60% of the cases. Present-Present conditionals account for a further 23.48% of the cases. Thus, an important proportion (49.92%) falls outside of the four-type model, and it is then clear that traditional three-type typologies are as inadequate for eighteenth and nineteenth-century conditionals as they have been found to be for twentieth century ones.

1.2. *Findings on account of socio-historical factors*

The analysis of the results from a socio-historical perspective has shown that the process by which the scholastic paradigm was replaced with contemporary scientific thought (which as explained in Chapter 1 is not straightforward and cannot be explained as a simple event) can also be evidenced in the use of conditional structures.

This process of change started in the seventeenth century and continued during the eighteenth century, but it did not affect all disciplines at the same rhythm. It also translated into the linguistic level, as the linguistic characteristics of scholasticism were substituted with those of New Science in a gradual process.

The examination of the results has helped propose a model which could explain part of the distribution of conditionals according to the parameters of the study. This distribution would be a reflection of the changes in science and scientific writing during the time because of the substitution of the scholastic paradigm.

According to this model, the differing formal and functional predominant uses in eighteenth-century disciplines can be attributed to the fact that, as explained in Chapter 1, philosophy was one of the disciplines in which scholasticism lived on the longest, whilst astronomy and, to a lesser extent, life-sciences, were part of the first disciplines to thoroughly adopt the proposals of the new scientific paradigm.

This would explain why philosophy samples presented consistently different results compared to both astronomy and life sciences samples, showing a slower adoption of the formal characteristics of the new scientific paradigm, such as a higher use of conditionals overall, a higher variability both in types and in relation to the sex of the authors, the highest proportion of conditionals different from *if*, and the clearest diachronic evolution over time. Contrastingly, Astronomy texts were shown to use a larger number of known-fact conditionals, a result consistent with the influence of the (post-scholastic) Newtonian model of astronomy, which imposed a mathematics-based method, during the period.

With the passing of time, the ancient paradigm was eventually substituted with a new model of scientific writing. As part of this process of standardization, interdisciplinary contrasts became gradually less important, a good evidence of which could be the more similar level of use of conditionals across disciplines in the nineteenth than in the eighteenth century.

However, the transition between the paradigms (besides not occurring at the same time in all disciplines) was also not direct, but occurred as a two-step process. During the first step, there was a general abandonment of scholastic features, which would be manifest in the general avoidance of the use of categorical conditionals (with the exception of astronomy texts, which opted to avoid the scholastic argumentative style by using mathematical notation instead of avoiding conditionals) as well as in a dramatic contraction in the variability of conditionals. During the second step, there is a process of expansion, which would correspond with new possibilities for the formal variability of conditionals and with the popularisation of scope-restricting conditionals in the nineteenth century, which allowed authors to avoid blatant mitigation strategies, as their mitigation was based on the shared knowledge of authors and audience. Thus, they could be considered characteristic of a scientific language evolving towards a more standardised pattern in which the quantity of information

being supposed as known and shared between the participants in the act of scientific communication is higher.

This transition can also be seen in the process of generic realignment, as letters and dialogues, characteristic of more ancient usages, give way to articles, which, moreover, present linguistic characteristics in keeping with their later emergence as the main format of scientific communication, such as a lower use of *if* conditionals. However, it is in the evolution of the different types of conditionals over time that this seems to be best seen. Over time, one of the strategies to encode conditionality, inversion, is seen to diminish its productivity: inversion conditionals are used less frequently, in more specialised environments and with a reduced number of possible operators. This ancient strategy is substituted by a new one, favoured by more modern codes of communication: conditionality by subordination. This new strategy increased its use, despite the fact that *if* conditionals are used less over time. In fact, the decrease in the use of *if* conditionals, the canonical conditional subordinator, is evidence of the vitality of the strategy, as this decrease leaves room for other conditional subordinators which present an increasing use over time, and even for the emergence of some new ones.

The influence of socio-historical factors could also help explain some sex-related differences. Female authors showed very different patterns of use depending on their discipline and, in the eighteenth century, they also used conditionals remarkably more often than their male counterparts. This could be explained by revisiting the evolution in the communities of science explained in Chapter 1, since, just as in the nineteenth century these communities became institutionalised and presented more important obstacles (both scientific and social) to join them, women had to move towards the norm and moderate their variability, thus losing part of their distinctive uses, in keeping with findings also shown in other analyses on the same register (Moskowich 2016b). However, women always had to fight reservations on the part of their male counterparts, and, consequently, generally avoided known fact conditionals. Women's preferred mode of mitigation were not speech act or scope restricting conditionals, but the use of modality in hypothesizing conditionals, which is 5% more frequent among women than among men.

1.3. *Findings on account of the linguistic environment*

The analysis of the results has also shown that the functions of conditionals are at least partly determined by their linguistic environment. The analysis has found correlations between the formal parameters under study (type of conditional, order of the constituents, verb form combinations) and the function conditionals play in discourse.

Among the correlations affecting verb-form combinations , it is interesting to note the high proportion of *Present subjunctive, will* in Known Fact conditionals (21.40%), of Verbless constituents in concessive conditionals (46.19%), of Others combinations (including imperatives) in relevance conditionals (18.01%), and of *may, present simple* in both metalinguistic (24.14%) and politeness conditionals (38.89%). These correlations hint at a preference for using particular verb form combinations to express particular functions. However, this must not be taken to support traditional verb-based combinations. The traditional typologies proclaiming canonical types of conditionals had already been widely criticised (Hwang 1979, Maule 1988, Fulcher 1991, Ferguson 2001, Jones & Waller 2010) as they ignore all conditionals not expressing a relation of likelihood between constituents and they pigeonhole all verb form combinations into just three or four types. The results in this study back this point of view, as there are 225 different combinations of verb forms and canonical conditionals account for a maximum[123] of 49.92% of all conditional uses.

In any case, these correlations between conditional functions and verb forms or order of the constituents can explain only a small amount of the variability. In fact, most conditional functions are characterised by the fact that they can be used with several combinations of verb forms (as well as with several orders of constituents). This, together with the sheer number of different combinations, makes it evident that conditionals cannot be simply analysed on account of their formal characteristics.

This is not the case, however, in what regards the type of conditional, as it has been found that most conditional particles can only perform a restricted set of functions, presenting a high proportion of hypothesizing uses, whilst it is *if* only that can fulfil any function. In fact, there are five functions (directive, politeness, metalinguistic, rhetorical and non-committal) which are only or almost only expressed with *if*.

The results in this study, then, seem to agree with Wason & Johsnon-Laird's model, who consider that a conditional "is not a creature of constant hue, but chameleon-like, takes on the color of its surroundings; its meaning is determined to some extent by the very propositions it connects" (1972: 92), rather than with Facchinnetti (2001: 147), who claimed that "the choice of modals is strongly dependent on the macro speech-act conveyed in the text". The results suggest that it is the conditional function that is determined by the linguistic environment and not viceversa.

[123] This percentage accounts for the uses of Type 1, Type 2, Type 3 and Present-Present conditionals after they were grouped together with similar uses, as explained in Chapter 5. The percentage of the three canonical conditionals in strict terms is 18.79%.

1.4. *Final findings*

The results, then, suggest that the distribution of the uses and functions of conditionals throughout the period and across the different parameters is dependent on both the linguistic and socio-historical parameters. The form and function of a conditional is influenced by the socio-historical context in which they are used, as the discipline and genre of the study, the circumstances of the author (sex, position in the scientific community, and origin), and the period in which it was written, configure a particular environment favouring or disfavouring particular uses. It is also influenced by its linguistic environment, as both the studied parameters (type of conditional, order of the constituents, verb form combinations) and other factors not studied in here (such as the grammatical level at which the protasis is inserted, or the propositional meaning of the words in the linguistic context) influence the function of the conditional. This follows other studies, such as Gray's (2011), whose findings showed that variation in scientific writing is the result of the combination of a series of multiple parameters acting together.

2. Possible further lines of research

There are several possible avenues for further research. Regarding the linguistic environment, the analysis could add some factors which have not been considered here, such as the grammatical level at which the protasis is inserted in the apodosis, so as to study conditionals acting at the word or phrase-level; or the propositional meaning of other words in the linguistic environment. Regarding this latter factor, it seems particularly interesting to study the co-occurrence of particular conditional functions with first and second person pronouns, as they could indicate further interpersonal traits.

On what has to do with the examination of extra-linguistic parameters, new parameters could take into account the section of the work each sample belongs to (this is, introductions, conclusions…) as well as the type of work, distinguishing, for instance, between theoretical, quantitative, and qualitative studies, as in Gray's dissertation (2011). This could be of particular interest to further identify the influence of particular schools and movements in each discipline, as was the case with the important influence of Newtonian astronomy in the eighteenth century.

The research could also be expanded to the examination of conditionals in other corpora, so that further differences could be found. This, moreover, could also make it possible to use other statistical tests with more guarantees of success.

Finally, different approaches, mainly statistical, such as classifying the texts in clusters or finding explicative models, could also provide further insights which could help confirm the results in this dissertation and explain the distribution of the data further.

References

Abir-Am, Pnina & Dorinda Outram. 1987. Introduction. In Pnina Abir-Am & Dorinda Outram (eds.) *Uneasy careers and intimate lives: Women in science (1789-1979)*. 1-16. New Brunswick, NJ: Rutgers University Press.

Allen, Bryce, Jian Qin & Frederik Wilfrid Lancaster. 1994. Persuasive Communities: A Longitudinal Analysis of References in the Philosophical Transactions of the Royal Society, 1665-1990. *Social Studies of Science, 24/2*: 279-310.

Alonso Almeida, Francisco. 2012. An analysis of hedging in eighteenth century English astronomy texts. In Isabel Moskowich & Begoña Crespo (eds.) *Astronomy "playne and simple". The Writing of Science between 1700 and 1900.* 199-220. Amsterdam: John Benjamins.

Athanasiadou, Angeliki & René Dirven. 1996. Typology of if-clauses. In Eugene H. Casad (ed.) *Cognitive Linguistics in the Redwoods: The expansion of a new paradigm in linguistics*. 609-654. Berlin: Mouton de Gruyter.

Athanasiadou, Angeliki & René Dirven. 1997. Conditionality, hypotheticality, counterfactuality. In Angeliki Athanasiadou & René Dirven (eds.) *On Conditionals Again*. 61-96. Amsterdam: John Benjamins.

Atkinson, Dwight. 1996. The Philosophical Transactions of the Royal Society of London, 1675-1975: A sociohistorical discourse analysis. *Language in Society, 25*: 333–371.

Atkinson, Dwight. 1999. *Scientific discourse in sociohistorical context: The Philosophical Transactions of the Royal Society of London, 1675-1975*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Austin, John L. 1961. Ifs and cans. In Austin, John L. (ed.) *Philosophical Papers*. 153-180. Cambridge: Cambridge University Press.

Bailey, Charles James. 1989. Classifying the English Conditionals. *American Speech, 64.3*: 275-280.

Bailey, Richard W. 1985. The Conquests of English. In Sidney Greenbaum (ed.) *The English Language Today*. 9-19. Oxford: Pergamon Institute of English.

Bailey, Richard W. 1999. *Nineteenth-century English*. Ann Arbor: The University of Michigan Press.

Bazerman, Charles. 1984. Modern evolution of the experimental report in physics: Spectroscopic articles in Physical Review, 1893-1980. *Social Studies of Science, 14*: 163-196.

Bazerman, Charles. 1988. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*. Madison: University of Wisconsin Press.

Bazerman, Charles. 1994. *Constructing experience*. Carbondale: Southern Illinois University Press.

Beal, Joan C. 2004. *English in Modern Times: 1700-1945*. London: Hodder Arnold.

Beal, Joan C. 2012. Late Modern English in its historical context. In Isabel Moskowich & Begoña Crespo (eds.) *Astronomy 'playne and simple'. The writing of science between 1700 and 1900*. 1-14. Amsterdam/Philadelphia: John Benjamins.

Bhatia, Vijay. 1993. *Analysing genre: Language use in professional settings*. London: Longman.

Bhatia, Vijay. 1996. Methodological issues in genre analysis. *Hermes, Journal of Linguistics*, 16: 39-59.

Bhatia, Vijay. 2002. Applied genre analysis: a multi-perspective model. *Ibérica, 4*: 3-19.

Bello, Iria. 2014. *On how "the motion of the stars" changed the language of science: a corpus-based study of deverbal nominalizations in astronomy texts from 1700 to 1900*. Unpublished PhD Dissertation. University of A Coruña

Biber, Douglas. 1988. *Variation across speech and writing*. Cambridge: Cambridge University Press.

Biber, Douglas. 1993. Representativeness in Corpus Design. *Literary and Linguistic Computing, 8/4*: 243-257.

Biber, Douglas & Edward Finegan. 1988. Adverbial stance types in English. *Discourse Processes, 11*: 1-34

Biber, Douglas & Susan Conrad. 2009. *Register, genre, and style.* Cambridge: Cambridge University Press.

Biber, Douglas; Susan Conrad & Randi Reppen. 1998. *Corpus linguistics: Investigating language structure and use*. Cambridge: Cambridge University Press.

Biezma, María. 2011. Conditional inversion and givenness. *Proceedings of SALT, 21*: 552-571.

Brown, Penelope & Stephen C. Levison. 1987. *Politeness: Some universals in language usage*. Cambridge: Cambridge University Press.

Burke, Peter. 2000. *Historia social del conocimiento, vol.1: De Gutemberg a Diderot*. Barcelona: Paidos Ibérica.

Cabre i Pairet, Montserrat. 2011. Las prácticas de salud en el ámbito doméstico: Las recetas como textos de mujeres (S.XIV-XVII). In Begoña Crespo, Isabel Moskowich & Inés Lareo (eds.) *La Mujer en la ciencia: historia de una desigualdad*. 25-41. Munich: Lincom Europa.

Camiña-Rioboo, Gonzalo. 2012. Accounting for the observations of the heavens in the 18th century: New nouns to explain old phenomena. In Moskowich, Isabel & Begoña Crespo (eds.) *Astronomy "playne and simple". The Writing of Science between 1700 and 1900.* 93-121. Amsterdam: John Benjamins.

Camiña Rioboo, Gonzalo. 2013. *Noun Formation in the Scientific Register of Late Modern English: A Corpus-based Approach*. Unpublished PhD Dissertation. University of A Coruña

Camiña-Rioboo, Gonzalo & Inés Lareo. 2012. Editorial policy in CETA. In Isabel Moskowich, Inés Lareo, Gonzalo Camiña & Begoña Crespo (comps.) *A Corpus of English Texts on Astronomy*. 43-61. Amsterdam: John Benjamins.

Camiña-Rioboo, Gonzalo & Inés Lareo. 2016. Editorial policy in the Corpus of English Philosophy Texts. In Moskowich, Isabel, Gonzalo Camiña-Rioboo, Inés Lareo & Begoña Crespo (eds.) *The Conditioned and the Unconditioned: Late Modern English Texts on Philosophy*. 45-60. Amsterdam: John Benjamins.

Carter-Thomas, Shirley & Elizabeth Rowley-Jolivet. 2008. If-conditionals in medical discourse: from theory to disciplinary practice. *Journal of English for Academic Purposes, 7*: 191-2057

Chafe, Wallace L. 1986. Evidentiality in English conversation and academic writing. In Wallace L. Chafe and Johanna Nichols (eds.) *Evidentiality and the linguistic coding of epistemology*. 261–272. Norwood, NJ: Ablex.

Claridge, Claudia; Josef Schmied & Rainer Siemund. 1999. The Lampeter Corpus of Early Modern English Tracts. In Knut Hofland, Anne Lindebjerg & Jørn Thunestvedt (eds.) *ICAME Collection of English Language Corpora* (CD-ROM), 2nd Edition. Norway: The HIT Centre, University of Bergen.

Closs Traugott, Elizabeth. 1997. *Unless* and *but* conditionals: a historical perspective. In Angeliki Athanasiadou & René Dirven (eds.) *On Conditionals Again*. 145-168. Amsterdam: John Benjamins.

Closs Traugott, Elizabeth; Alice ter Meulen, Judy Snitzer Reilly & Charles A. Ferguson (eds.) 1986. *On Conditionals.* Cambridge: Cambridge University Press.

Coates, Jennifer. 1995. The expression of root an epistemic modality in English. In Joan L. Bybee & Suzanne Fleischman (eds.) *Modality in Grammar and Discourse*. 55-66. Amsterdam: John Benjamins.

Comrie, Bernard. 1986. Conditionals: A typology. In Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 353-372. Cambridge: Cambridge University Press.

Coulston-Gillispie, Charles. (ed.) 1976. *Dictionary of Scientific Biography*. New York: Scribner.

Crespo, Begoña. 2004. The scientific register in the history of English: A corpus-based study. *Studia Neophilologica, 76 (2)*: 125-139.

Crespo, Begoña. 2011. Persuasion markers and ideology in eighteenth century philosophy texts. *Revista de Lenguas para Fines Específicos, 17*: 199-228.

Crespo, Begoña. 2012. Astronomy as scientific knowledge in Modern England. In Moskowich, Isabel & Begoña Crespo (eds.) *Astronomy "playne and simple". The Writing of Science between 1700 and 1900*. 15-34. Amsterdam: John Benjamins.

Crespo, Begoña. 2014. Female Authorial Voice: Discursive Practices in Prefaces to Scientific Works. In Gotti, Maurizio & Davide S. Giannoni (eds.) *Corpus Analysis for Descriptive and Pedagogic Purposes: English Specialised Discourse*. 189-202. Bern: Peter Lang.

Crespo, Begoña. 2015. Women writing science in the eighteenth century: some hints about their language use. *Anglica, 24*: 103-127.

Crespo, Begoña. 2016. Genre categorisation in *CEPhiT*. In Moskowich, Isabel, Gonzalo Camiña-Rioboo, Inés Lareo & Begoña Crespo (eds.) *The Conditioned and the Unconditioned: Late Modern English Texts on Philosophy*. 25-44. Amsterdam: John Benjamins.

Crespo, Begoña & Isabel Moskowich. 2009. CETA in the Context of the Coruña Corpus. *Literary and Linguistic Computing, 25/2*: 153-164.

Crespo, Begoña & Isabel Moskowich. 2015. Persuasion in English Philosophy Texts (CEPhiT). *Journal of Humanistic and Social Sciences, 6/2*: 87-101.

Crompton, Peter. 1997. Hedging in academic writing: some theoretical aspects. *English for Specific Purposes 16*: 271–289.

Culicover, Peter & Jay Jackendoff. 1997. Semantic subordination despite syntactic coordination. *Linguistic Inquiry, 28*: 195-217.

Curme, George O. 1931. *Syntax*. Boston: D.C. Heath.

Dancygier, Barbara. 1985. *If, unless* and their Polish equivalents. *Papers and Strudies in Contrastive Linguistics, 20*: 65-72.

Dancygier, Barbara. 1998. *Conditionals and Prediction: Time, knowledge and causation in conditional constructions.* Cambridge: Cambridge University Press.

Dancygier, Barbara & Ewa Mioduszewska. 1984. Semantico-Pragmatic classification of conditionals. *Studia Anglica Posnaniensia, 17*: 121-133.

Dancygier, Barbara & Eve Sweetser. 2005. *Mental Spaces in Grammar: Conditional constructions*. Cambridge: Cambridge University Press.

Declerck, Renaat & Susan Reed. 2001*. Conditionals: A comprehensive empirical analysis*. Berlin and New York: Mouton de Gruyter.

den Dikken, Marcel. 2005. Comparative correlatives comparatively. *Linguistic Inquiry, 36*: 497-532.

Dendale, Patrick & Liliane Tasmowski. 2001. Introduction: Evidentiality and related notions. *Journal of Pragmatics, 33*: 339-348.

Eastwood, John. 1984. *Oxford guide to English grammar*. Oxford: Oxford University Press.

Ebert, Christian; Cornelia Endriss & Stefan Hinterwimmer. 2008. Topics as Speech Acts: An Analysis of Conditionals. In Natasha Abner and Jason Bishop (eds.) *Proceedings of the 27th West Coast Conference on Formal Linguistics*. 132-140. Somerville, MA: Cascadilla Proceedings Project.

Facchinetti Roberta. 2001. Conditional Constructions in Modern English Legal Texts. In Maurizo Gotti and Marina Dossena (eds.) *Modality in Specialised Texts*. 133-150. Bern: Peter Lang.

Fauconnier, Gilles. 1994. *Mental Spaces*. Cambridge: Cambridge University Press.

Ferguson, Charles A., Judy Snitzer Reilly, Alice ter Meulen & Ford, Cecilia E. 1986. Overview. In Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 3-20. Cambridge: Cambridge University Press.

Ferguson, Gibson. 2001. If you pop over there: a corpus-based study of conditionals in medical discourse. *English for Specific Purposes, 20*: 61-82.

Ford, Cecilia E. 1997. Speaking conditionally: some contexts for *if*-clauses in conversation. In Angeliki Athanasiadou & René Dirven (eds.) *On Conditionals Again*. 386-413. Amsterdam: John Benjamins.

Ford, Cecilia, E. & Sandra A. Thompson. 1986. Conditions in discourse: A text-based study from English. In Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 353-372. Cambridge: Cambridge University Press.

Fortanet, Inmaculada; Santiago Posteguillo, Juan Carlos Palmer & Juan Francisco Coll. 1998. Disciplinary variations in the writing of research articles in English. In Inmaculada Fortanet Santiago Posteguillo, Juan Carlos Palmer & Juan Francisco Coll (eds.) *Genre Studies in English for Academic Purposes, 9*. 59-78. Valencia: Universitat Jaume I.

Fraser, Bruce. 1969. An analysis of concessive conditionals. In Robert I. Binnick, Alice Davison, Georgia M. Green and Jerry L. Morgan (eds.) *Papers from the Fifth Regional Meeting of the Chicago Linguistic Society.* 66-75. Chicago: Chicago Linguistic Society.

Fraser, Bruce. 1980. Conversational mitigation. *Journal of Pragmatics, 4*: 341-350.

Freeborn, Dennis. 1992. *From Old English to Standard English*. London: Macmillan

Fulcher, Glenn. 1991. Conditionals revisited. *ELT Journal, 45*: 164-168.

Gabrielatos, Costas. 2010. *A corpus-based examination of English if-conditionals through the lens of modality: Nature and types*. Unpublished PhD dissertation. Lancaster: Lancaster University.

García-Izquierdo, Isabel & Vicent Montalt. 2002. Translating into Textual Genres. *Linguistica Antverpiensia 1*: 135-143

Geis, Michael L. 1973. If and unless. In Braj B. Kachru, Robert B. Lees, Yakov Malkiel, Angelina Petrangeli & Sol Saporta (eds.) *Issues in Linguistcs: Papers in Honor of Henry and Renée Kahane*. 231-253. Urbana: University of Illinois Press.

Geis, Michael L. & Arnold M. Zwicky. 1971. On invited inferences. *Linguistic Inquiry, 2*: 561-566.

Görlach, Manfred. 1999. *English in Nineteenth-century England*. Cambridge: Cambridge University Press.

Görlach. Manfred. 2004. *Text Types and the History of English*. Berlin/New York: Mouton de Gruyter.

Gotti, Maurizio. 1996. *Robert Boyle and the Language of Science*. Milano: Guerini Scientífica.

Gotti, Maurizio. 2001. The experimental essay in Early Modern English. *European Journal of English Studies, 5 (2)*: 221-239.

Gotti, Maurizio. 2003. *Specialized discourse. Linguistic features and changing conventions*. Bern: Peter Lang.

Gotti, Maurizio. 2005. *Investigating specialized discourse*. Bern: Peter Lang.

Gotti, Maurizio & Marina Dossena. 2001. *Modality in specialised texts*. Bern: Peter Lang.

Graver, B. D. 1971. *Advanced English practice (2nd ed.)* Oxford: Oxford University Press.

Gray, Bethany. 2011. *Exploring academic writing through corpus linguistics: When discipline tells only part of the story*. Unpublished PhD Dissertation. Flagstaff: Northern Arizona University.

Grice, H. Paul. 1975. Logic and conversation. In Peter Cole and Jerry Morgan (eds.) *Syntax and Semantics 3: Speech Acts*. 41-58. New York: Academic press.

Haiman, John. 1978. Conditionals are topics. *Language, 54*: 564-89.

Haiman, John. 1986. Constraints in the form and meaning of the protasis. Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 215-228. Cambridge: Cambridge University Press.

Halliday, Michael A. K. 1988. On the Language of Physical Science. In Mohsen Ghadessy (ed.) *Registers of Written English: Situational Factors and Linguistic Features.* 162-178. London: Pinter.

Harder, Peter. 1996. *Functional Semantics: A Theory of Meaning, Structure and Tense in English*. Berlin/New York: Mouton de Gruyter.

Harper, William L.; Robert Stalnaker & Glenn Pearce. 1981. *Ifs, conditionals, belief, decision, chance and time.* Dordrecht, The Netherlands: Springer.

Herrero, Concepción. 2007. Las mujeres en la investigación científica. *Criterios, 8*: 73–96.

Hesabi, Akbar; Morteza Dehaghi & Mohammadtaghi Shahnazari. 2013. A comparative Analysis of the Frequency and Function of If-Clauses in Applied Linguistics and Chemistry Articles*. Journal of Language Teaching and Research, 4*: 186-191.

Hockett, Charles F. 1958. *A Course in Modern Linguistics*. New York: MacMillan

Hoey, Michael. 2000. Persuasive rhetoric in linguistics: a Stylistic study of some features of the language of Noam Chomsky. In Susan Hunston & Geoff Thompson (eds*.) Evaluation in text: Authorial stance and the construction of discourse* 28-37. Oxford: Oxford University Press.

Horn, Laurence. 1984. Toward a new taxonomy for pragmatic inference: Q-based and R-based implicature. In D. Schiffrin (ed.) *Meaning, form and use in context*. 11-42. Washington DC: Georgetown University Press.

Horn, Laurence. 2000. From *if* to *iff*: conditional perfection as pragmatic strengthening*. Journal of Pragmatics, 32*: 289-326.

Horsella, Maria & Gerda Sindermann. 1992. Aspects of scientific discourse: Conditional argumentation. *English for Specific Purposes, 11*: 129-139.

Huddleston, Rodney & Geoffrey K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.

Hunter, Michael C. 1989. *Establishing the new science: The experience of the early Royal Society*. New York: Boydell & Brewer.

Hwang, Myong Ok. 1979. *A semantic and syntactic analysis of if-conditionals*. Unpublished MA thesis. Los Angeles: University of California Los Angeles.

Hyland, Ken. 1994. Hedging in academic writing and EAP textbooks. *English for Specific Purposes, 13(3)*: 239-256.

Hyland, Ken. 1996. Writing without conviction? Hedging in science research articles. *Applied Linguistics, 17/4*: 433–454.

Hyland, Ken. 1998. *Hedging in Scientific Research Articles*. Amsterdam: John Benjamins.

Hyland, Ken. 1998b. Persuasion and context: the pragmatics of academic metadiscourse. *Journal of Pragmatics, 30*: 437-455.

Hyland, Ken. 2000. *Disciplinary Discourses: Social interactions in academic writing*. Harlow, Essex: Pearson Education.

Hyland, Ken. 2005. *Metadiscourse: exploring interaction in writing*. London: Continuum.

Iatridou, Sabine & David Embick. 1994. Conditional Inversion. *Proceedings of the North Eastern Linguistic Society, 24*: 133-147. Cambridge, MA: MIT Press.

Jackson, Frank. 1991. Introduction. In Frank Jackson (ed.) *Conditionals*. 1-7. Oxford: Oxford University Press.

Jackson, Frank. 1998. *Mind, Method and Conditionals*. London: Routledge.

Jacob, Margaret C. 1988. *The Cultural Meaning of the Scientific Revolution*. Philadelphia: Temple University Press.

James, Francis. 1986. Semantics and pragmatics of the word *if. Journal of Pragmatics, 10*: 453-480.

Jardine, Lisa. 1999. *Ingenious Pursuits: Building the Scientific Revolution*. London: Little, Brown and Company.

Jespersen, Otto. 1924. *The Philosophy of Grammar*. London: Allen and Unwin.

Johnstone, Barbara. 2002. *Discourse analysis.* Oxford: Blackwell.

Jones, Christian & Daniel Waller. 2010. If only it were true: the problem with the four conditionals. *ELT Journal, 65*: 24-32.

Jong Bok, Kim. 2011. English Conditional Inversion: A Construction-Based Approach. *Language and Information, 15*: 13-29.

Koutsantoni, Dimitra. 2004. Attitude, certainty and allusions to common knowledge in scientific research articles. *Journal of English for Academic Purposes, 3*: 163-182.

Kuhn, Thomas S. 1962. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.

Kytö, Merja; Juhani Rudanko & Erik Smitterberg, 2000. Building a Bridge between the Present and the Past: A Corpus of 19-century English. *ICAME 24*: 85-97.

Lakoff, George. 1972. Hedges: A study in meaning criteria and the logic of fuzzy concepts. *Chicago Linguistic Society Papers, 8*: 138–228.

Lakoff, Robin. 1973. The logic of politeness, or minding your p's and q's. *Chicago Linguistic Society 9*: 292-305.

Lareo, Inés & Isabel Moskowich. 2012. Coruña Corpus Tool Manual. In Isabel Moskowich, Inés Lareo, Gonzalo Camiña & Begoña Crespo (comps.) *A Corpus of English Texts on Astronomy*. Amsterdam: John Benjamins.

Latour, Bruno. 1987. *Science in action*. Cambridge, MA: Harvard University Press.

Leech, Geoffrey. 1971. *Meaning and the English Verb*. London: Longman.

Leech, Geoffrey & Jan Svartvik. 1975. *A Communicative Grammar of English*. London: Longman

Lewin, Beverly A. 2005. Hedging: an exploratory study of authors' and readers' identification of 'toning down' in scientific texts. *Journal of English for Academic Purposes, 4*: 163-178.

Lewis, David. 1976. Probabilities of conditionals and conditional probabilities. *The Philosophical Review, 85*: 297-315

Liddicoat, Anthony J. 1997. The function of the conditional in French scientific writing. *Linguistics, 35*: 767-780.

Lipták, Anikó. 2009. *Correlatives Cross-Linguistically*. Amsterdam/Philadelphia: John Benjamins.

Lyons, John. 1977. *Semantics.* Cambridge: Cambridge University Press.

Maule, David. 1988. "Sorry, but if he comes, I go": Teaching conditionals. *ELT Journal, 42*: 117-123.

McEnery, Tony & Andrew Wilson 1996. *Corpus Linguistics*. Edinburgh: Edinburgh University Press.

McEnery, Tony; Richard Xiao & Yukio Tono. 2006. *Corpus-based Language Studies: An Advanced Resource Book*. London: Routledge, 2006.

Moessner, Lilo. 2001. Genre, text type, style, register: A terminological maze? *European Journal of English Studies 5 (2)*: 131-138.

Monaco, Maria. Forthcoming. *A Multidimensional Analysis of Late Modern English Scientific Texts from the Coruña Corpus*. Doctoral Dissertation in Preparation.

Montgomery, Scott L. 1996. *The scientific voice*. New York; London: The Guildford Press

Moskowich, Isabel. 2001. Morfología flexiva del inglés moderno. In Isabel De la Cruz Cabanillas & Javier Martín Arista (eds.) *Lingüística histórica inglesa*. 624-654. Barcelona: Ariel.

Moskowich, Isabel. 2011. "The golden rule of divine philosophy" exemplified in the Coruña Corpus of English Scientific Writing. *Revista de Lenguas para Fines Específicos, 17*: 167-198.

Moskowich, Isabel. 2012. CETA as a tool for the study of modern astronomy in English. In Isabel Moskowich & Begoña Crespo (eds.) *Astronomy 'playne and simple'. The writing of science between 1700 and 1900.* 35-56. Amsterdam/Philadelphia: John Benjamins.

Moskowich, Isabel. 2012b. "A Smooth Homogeneous Globe" in CETA: Compiling Late Modern Astronomy Texts in English. In Nila Vázquez (ed*.) Creation and Use of Historical English Corpora in Spain*. 21-36. Newcastle upon Tyne: Cambridge Scholars Publishing.

Moskowich, Isabel. 2016. Philosophers and Scientists from the Modern Age: compiling the Corpus of English Philosophy Texts (CEPhiT). In Moskowich, Isabel, Gonzalo Camiña-Rioboo, Inés Lareo & Begoña Crespo (eds.) *The Conditioned and the Unconditioned: Late Modern English Texts on Philosophy*. 1-23. Amsterdam: John Benjamins.

Moskowich, Isabel. 2016b. When sex talks. Evidence from the Coruña Corpus of English Scientific Writing. In Francisco Alonso Almeida, Laura Cruz García, and Victor González Ruiz (eds.). *Corpus-based Studies on Language Varieties*. 233-248. Bern: Peter Lang.

Moskowich, Isabel & Begoña Crespo. 2012. *Astronomy 'playne and simple'. The writing of science between 1700 and 1900.* Amsterdam/Philadelphia: John Benjamins.

Moskowich, Isabel & Begoña Crespo. 2012b. Introduction to CETA. In Isabel Moskowich, Inés Lareo, Gonzalo Camiña & Begoña Crespo (comps.) *A Corpus of English Texts on Astronomy*. 1-42. Amsterdam: John Benjamins.

Moskowich, Isabel & Begoña Crespo. Forthcoming. Classifying communicative formats in CHET, CECHeT and others. *EPiC Series in Language and Linguistics*.

Moskowich, Isabel & Javier Parapar. 2008. Writing science, compiling science: The Coruña Corpus of English Scientific Writing. In María Jesús Lorenzo Modia (ed.), *Proceedings from the 31st AEDEAN Conference*. 531-544. A Coruña: Universidade da Coruña.

Moskowich, Isabel, Gonzalo Camiña-Rioboo, Inés Lareo & Begoña Crespo. 2016. *The Conditioned and the Unconditioned: Late Modern English Texts on Philosophy*. Amsterdam: John Benjamins.

Mourón Figueroa, Cristina. 2011. Mujeres en profesiones médicas y su reputación en la Inglaterra medieval: el caso de *Un Mundo sin Fin* de Ken Follet. In Begoña Crespo, Isabel Moskowich & Inés Lareo (eds.) *La Mujer en la ciencia: historia de una desigualdad*. 3-23. Munich: Lincom Europa.

Myers, Greg. 1989. The pragmatics of politeness in scientific articles. *Applied Linguistics, 10/1*: 1–35.

OED Online. 2014. Oxford: Oxford University Press. Accessed 21/12/2014. http://dictionary.oed.com

Palmer, Frank. R. 1986*. Mood and Modality*. Cambridge: Cambridge University Press.

Palmer, Frank. R. 1990. *Modality and the English Modals*. London: Longman.

Papafragou, Anna. 2000. *Modality: Issues in the Semantics-Pragmatics Interface*. Amsterdam: Elsevier.

Parapar, Javier & Isabel Moskowich. 2007. The Coruña Corpus Tool. *Revista del Procesamiento del Lenguaje Natural, 39*: 289-290.

Pearsall, Derek. (ed.) 1999. *Chaucer to Spenser: an anthology*. Malden: Blackwell Publishers.

Pledge, Humphrey Thomas. 1959. *Science since 1500: A short history of mathematics, physics, chemistry, and biology*. New York: Harper.

Puente-Castelo, Luis & Maria Monaco. 2013. Conditionals and their functions in Women's Scientific Writing". *Corpus Resources for Descriptive and Applied Studies. Current Challenges and Future Directions: Selected Papers from the 5th International Conference on Corpus Linguistics (CILC2013) = Procedia. Social and Behavioral Sciences, 95*: 160-169

Puente-Castelo, Luis. 2016. Conditional constructions and their uses in eighteenth-century philosophy and life sciences texts. In Francisco Alonso Almeida, Ivalla Ortega Barrera, Elena Quintana Toledo and Margarita Sánchez Cuervo (eds.) *Input a Word, Analyse the World: Selected Approaches to Corpus Linguistics*. 241-255. Newcastle Upon Tyne: Cambridge Scholars Publishing.

Quirk, Randolph; Sydney Greenbaum, Geoffrey Leech & Jan Svartvik. 1985. *A comprehensive grammar of the English language.* London: Longman.

Reppen, Randi; Susan M. Fitzmaurice & Douglas Biber. 2002. *Using corpora to explore linguistic variation*. Amsterdam: John Benjamins.

Rissanen, Matti. 1996. Genres, texts and corpora in the study of medieval English. In Jürgen Klein & Dirk Vanderbeke (eds.) *Anglistentag 1995 Greifswald. Proceedings*. 229-242. Tubingen: Max Niemeyer Verlag.

Rissanen, Matti. 1999. Syntax. In Roger Lass (ed.) *Cambridge History of English vol. 3*. 187-331. Cambridge: Cambridge University Press.

Salager-Meyer, Françoise. 1998. Language is not a physical object. *English for Specific Purposes, 17*: 295-303.

Sánchez Barreiro, Estefanía. Forthcoming. *Los elementos de prolongación de listas enumerativas en textos científicos ingleses del siglo XVIII*. Doctoral Dissertation in Preparation.

Schiebinger, Londa. 1987. The history and philosophy of women in science: A review essay. *Signs, 12 (2)*: 305 332.

Schiebinger, Londa. 1989. *The mind has no sex? Women in the origins of modern science*. Cambridge, MA: Harvard University Press.

Schiebinger, Londa. 2003. The philosopher's beard: Women and gender in science. In Roy Porter (ed.), *The Cambridge History of Science: Volume 4, Eighteenth-Century Science*. 184-210. Cambridge: Cambridge University Press.

Schwarzschild, Roger. 1999- Givennes, AVOIDF and Other Constraints on the Placement of Accent. *Natural Language Semantics, 7*: 141-177.

Shapin, Steven. 1984. Pump and Circumstance: Robert Boyle's Literary Technology. *Social Studies of Science, 14 (4)*: 481–520.

Solsona i Pairó, Nuria. 1997. *Mujeres científicas de todos los tiempos*. Madrid: Talsa Ediciones.

Sperber, Dan & Deirdre Wilson. 1986. *Relevance: Communication and cognition*. Cambridge, MA: Harvard University Press.

Sperber, Dan & Deirdre Wilson. 1993. Linguistic form and relevance. *Lingua, 90*: 1-25.

Sperberg-McQueen, Michael & Lou Burnard. 2002. TEI P4: Guidelines for electronic text encoding and interchange. In *Text Encoding Initiative Consortium*. XML Version: Oxford, Providence, Charllottesville, Bergen.

Sprat, Thomas. 1667. *History of the Royal Society of London*. London: Printed by T. R. for J. Martyn, and J. Allestry.

Subbiondo, Joseph L. 2001. Educational reform in seventeenth-century England and John Wilkins' philosophical language. *Language & Communication, 21*: 273–284.

Swales, John. 1990. *Genre analysis: English in academic and research settings*. Cambridge: Cambridge University Press.

Sweetser, Eve. 1990. *From Etymology to Pragmatics*. Cambridge: Cambridge University Press.

Taavitsainen, Irma. 1997. Genre conventions: personal affect in fiction and non-fiction in early Modern English. In Matti Rissanen, Merja Kytö and Kirsi Heikonnen (eds.) *English in transition. Corpus based strudies in linguistic variation and genre styles*. 185-266. Berlin: Mouton de Gruyter.

Taavitsainen, Irma. 1999. Dialogues in English Medical Writing. In Andreas H. Jucker, Gerd Fritz & Franz Lebsanft (eds.) *Historical Dialogue Analysis*. 243-268. Amsterdam: John Benjamins.

Taavitsainen, Irma. 2000. Science. In Peter Brown (ed.) *The Chaucer Companion*. 378-396. Oxford: Blackwells.

Taavitsainen, Irma. 2001. Changing conventions of writing: the dynamics of genres, text types, and text traditions. *European Journal of English Studies, 5/2*: 139-150.

Taavitsainen, Irma & Päivi Pahta 1998. Vernacularisation of medical writing in English: A corpus-based study of Scholasticism. *Early Science and Medicine, 3 (2)*: 157-185.

Tar Meulen, Alice. 1986. Generic information, conditional contexts and constraints. In Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 123-146. Cambridge: Cambridge University Press.

Tennyson, Alfred. 1859. *Idylls of the King*. London: Edward Moxon.

UNESCO. 1988. *Proposed International Standard Nomenclature for Fields of Science and Technology*. UNESCO/ROU257 rev. 1. Paris.

Van Canegem-Ardijns, Ingrid & William Van Belle. 2008. Conditionals and types of conditional perfection. *Journal of Pragmatics, 40*: 349-376.

Van der Auwera, Johan. 1985. Only if. *Logique et Analyse, 28*: 61-74.

Van der Auwera, Johan. 1986. Conditionals and speech acts. In Elizabeth Closs Traugott, Alice ter Meulen, Judy Snitzer Reilly, & Charles A. Ferguson (eds.) *On Conditionals.* 197-214. Cambridge: Cambridge University Press.

Van der Auwera, Johan. 1997. Pragmatics in the last quarter century: The case of conditional perfection. *Journal of Pragmatics, 27*: 261-274.

Veltman, Frank. 2005. Making counterfactual assumptions. *Journal of Semantics, 22*: 159-180.

Vihla, Minna. 1999. *Medical Writing: Modality in Focus*. Amsterdam; Atlanta: Rodopi.

Visser, Fredericus Th. 1964. *An Historical Syntax of the English Language*. Leiden: Brill

von Wright, Georg H. 1951. *An Essay in Modal Logic.* Amsterdam: North Holland

Warchal, Krystyna. 2010. Moulding interpersonal relations through conditional clauses: Consensus-building strategies in written academic discourse. *Journal of English for Academic Purposes, 9*: 140–150.

Wason, Peter C. & Philip N. Johnson-Laird. 1972*. Psychology of reasoning: Structure and content*. Cambridge, MA: Harvard University Press

Webster, Charles. 1975. *The Great Instauration: Science, Medicine and Reform 1626-1660*. London: Gerald Duckworth & Company

Werth, Paul. 1997. Conditionality as cognitive distance. In Angeliki Athanasiadou & René Dirven (eds.) *On Conditionals Again*. 97–114. Amsterdam: John Benjamins

APPENDIX 1:

Samples used in the dissertation

Text N	Text sampled	N. of Words
0	Curson, Henry. 1702. *The theory of sciences illustrated; or, the grounds and principles of the seven liberal arts: grammar, logick, rhetorick, musick, arithmetick, geometry, astronomy*. London: R. Smith. (337-400)	10246
1	Morden, Robert. 1702. *An Introduction to astronomy, geography navigation, and other mathematical sciences made easie by the description and uses of the cœlestial and terrestrial Globes*. London: R. Morden & R. Smith. (1-42)	10154
2	Whiston, William. 1715. *Astronomical Lectures*.Vol. I. London: R. Senex & W. Taylor. (1-37)	9939
3	Harris, John. 1719. *Astronomical Dialogues Between a Gentleman and a Lady.* London: T. Wood. (1-52)	9907
4	Gordon, George. 1726. *An introduction to geography, astronomy, and dialling. Containing the most useful elements of the said sciences, adapted to the meanest capacity, by the description and uses of the terrestrial and celestial globes. With an introduction to chronology*. London: J. Senex. (63-99, 101-123)	10437
5	Watts, Isaac. 1726. *The knowledge of the heavens and the earth made easy: or, the first principles of astronomy and geography explain'd by the use of globes and maps: with a solution of the common problems by a plain scale and Compasses as well as by the globe.* London: J. Clark, R. Hett and R. Ford. (1-50)	10407
6	Fuller, Samuel. 1732. *Practical Astronomy, in the description and use of both globes, orrery and telescopes*. Dublin: Samuel Fuller. (1-27)	10232
7	Charlton, Jasper. 1735. *The Ladies Astronomy and Chronology, in Four Parts*. London: T. Gardner. (13-53)	10358
8	Long, Roger. 1742. *Astronomy, in five books*. Book I. Cambridge: R. Long. (61-82)	10474
9	Hodgson, James. 1749.s *The theory of Jupiter's satellites, with the Construction and use of the tables for computing their eclipses*. London: W. and J. Mount and T. Page (83-111)	11106
10	Hill, John. 1754. *Urania: or, a compleat view of the heavens; containing the antient and modern astronomy, in form of a dictionary: Illustrated with a great number of figures*. London: T. Gardner. (1-17)	10044
11	Ferguson, James. 1756. *Astronomy explained upon Isaac Newton's principles and made easy to those who have not studied mathematics*. London: printed for, and sold by the author. (146-167)	10519

12	Stewart, Matthew. 1761. *Tracts, physical and mathematical: containing, an explication of several important points in physical astronomy and a new method for ascertaining the sun's distance from the earth*. London: A. Millar, and J. Nourse. (340-398)	12180
13	Costard, George. 1767. *The history of astronomy, with its application to geography, history, and chronology; occasionally exemplified by the globes*. London: J. Lister. (270-298)	10315
14	Wilson, Alexander. 1773. "Observations on the Solar Spots." *Philosophical Transactions (1683-1775),* Vol. XLIV. (1-19)	4240
15	Adams, George. 1777. *A Treatise describing the construction and explaining the use of celestial and terrestrial globes. Designed to illustrate, in the most easy and natural manner the phoenomena of the Earth and Heavens, and to shew that correspondence of the two spheres. With a great variety of astronomical and geographical problems.* London: printed and sold by the Author (1-57)	10566
16	Lacy, John. 1779. *The universal system: or mechanical cause of all the appearances and movements of the visible heavens: shewing the true powers which move the earth and planets in their central and annual rotations. With a dissertation on comets, the nature, cause, matter, and use of their tails, and the reasons of their long trajectories: likewise an attempt to prove what it is that moves the sun round its axis.* London: J. Buckland. (1-33)	5908
17	Nicholson, William. 1782. *An introduction to natural philosophy*. Vol. I. London: J. Johnson. (100-151, 154-156)	10268
18	Bonnycastle, John. 1786. *An Introduction to Astronomy in a Series of Letters*. London: J. Johnson. (19-68)	9975
19	Vince, Samuel. 1790. *A treatise on practical astronomy*. Cambridge: J. and J. Merrill, J. Nicholson and W. Lunn (6-31)	10540
20	Bryan, Margaret. 1797. *A compendious system of astronomy in a course of familiar lectures; in which the principles of that science are clearly elucidated, so as to be intelligible for those who have not studied the Mathematics. Also trigonometrical and celestial problems, with a key to the ephemeris, and a vocabulary of the terms of science used in the lectures, which latter are explained agreeably to their application in them.* London: M. Bryan. (91-122)	10263
21	Small, Robert. 1804. *An Account of the Astronomical Discoveries of Kepler: Including an Historical Review of the Sistems which Had Successively Prevailed before His Time.* London: J. Mawman. (70-105)	10435
22	Ewing, John. 1809. *A Plain Elementary and Practical System of Natural Experimental Philosophy; including Astronomy and Chronology*. Philadelphia, Hopkins and Earle. (492-523)	9985
23	Brewster, Sir David. 1811. *Ferguson's astronomy explained upon Sir Isaac's Principles: with notes and supplementary chapters*. Edinburgh: J. Ballantine and Co. (241-277)	9824
24	Phillips, William. 1817. *Eight familiar lectures on ASTRONOMY. An introduction to Science For the use of young persons and others not conversant with the mathematics*. New York: J. Eastburn & Co. (46-80)	10277
25	Gummere, John. 1822. *An Elementary Treatise on Astronomy in Two Parts. The First, Containing a Clear and Compendious View of the Theory. The Second, a Number of Practical Problems*. Philadelphia: Kimber and Sharpless. (200-237)	10507
26	Luby, Thomas. 1828. *An Introductory Treatise to Physical Astronomy*. London: Baldwin and Cradock. (1-34)	10704
27	Herschel, John F. W. 1833. *The Cabinet Encyclopedia. Conducted by the Rev. Dionysius Lardner... Assisted by eminent literary and scientific men. Natural Philosophy. Astronomy. A treatise on Astronomy*. London: Longman, Rees, Orme, Brown, Green & Longman. (205-208, 225-251)	10224
28	Garland, Landon C. 1838. "Address on the Utility of Astronomy". *Southern literary messenger; devoted to every department of literature and the fine arts*. Vol. 4, Issue 2. (123-130)	9608
29	Olmsted, Denison. 1841. *Letters on Astronomy, adddressed to a Lady.* Boston: Marsh, Capen, Lyon, and Webb. (312-339)	8742
30	Bradford, Duncan. 1845. *The Wonders of the Heavens, Being a Popular View of Astronomy, Including a Full Illustration of the Mechanism of the Heavens; Embracing the Sun, Moon, and Stars, Etc*. Boston: Otis, Broaders and Company. (82-95)	10268

31	Bartlett, W. H. C. 1855. *Elements of natural philosophy. IV Spherical Astronomy*. New York: A.S. Barnes & Burr. (1-33)	10858
32	Whewell, William. 1858. *The plurality of worlds. With an introduction by Edward Hitchcock*. New York: Sheldon, Blakeman & co. (17-51)	10079
33	Mitchel, Ormsby McKnight. 1860. *Popular astronomy. A concise elementary treatise on the sun, planets, satellites and comets*. New York: Phinney, Blakeman & Mason. (15-50)	10183
34	Loomis, Elias. 1868. *A Treatise on Astronomy*. New York: Harper (9-37)	10323
35	Chauvenet, William. 1871. *A manual of spherical and practical astronomy, embracing the general problems of spherical astronomy, the special applications to nautica astronomy, and the theory and use of fixed and portable astronomical instruments*. Philadelphia: Lippincott. (9-37)	9895
36	Steele, Joel Dorman. 1874. *Fourteen weeks in descriptive astronomy*. New York: A.S. Barnes (13-41, 45-64)	9979
37	Darwin, George Howard. 1880. "On the Secular Changes in the Elements of the Orbit of a Satellite revolving about a Tidally Distorted Planet". *Philosophical Transactions of the Royal Society of London for the Year MDCCCLXXX*. Vol. 171, Part II. (864-873)	5181
38	Young, Prof., LL. D., Ph. D. 1880. "Recent Progress in Solar Astronomy". *The Princeton review*. January-June. (88-104)	6454
39	Croll, James. 1889. *Stellar Evolution and Its Relation to Geological Time*. New York: Appleton &C. (12-52)	9390
40	Clerke, Agnes Mary. 1893. *A Popular History of Astronomy during the Nineteenth Century*. London: Adam & Charles Black (300-329)	10530
41	Lowell, Percival. 1895. "Mars: III Canals". *The Atlantic Monthly*. Vol. 76, (106-119)	8531

Table 1: Texts sampled in *CETA*

Text N	**Text sampled**	**N. of Words**
82	Astell, Mary. 1700. *Some Reflections Upon Marriage*. London: John Nutt (42-89)	10077
83	Cheyne, George. 1705. *Philosophical Principles of Natural Religion: Containing the Elements of Natural Philosophy, and the Proofs for Natural Religion, arising from them*. London: G. Strahan (1-58)	10060
84	Dunton, John. 1710. *Athenianism: or, the new projects of Mr. John Dunton*. London: printed by Tho. Darrack, in Peterborough-Court, in Little Britain (1-25, 330-334)	10059
85	Collins, Anthony. 1717. *A Philosophical Inquiry Concerning Human Liberty*. London: R. Robinson (45-115)	10012
86	Greene, Robert. 1727. *The principles of the philosophy of the expansive and contractive forces or an inquiry into the principles of the modern philosophy, that is, into the several chief rational sciences, which are extant. In seven books*. Cambridge: C.U.P. Book I (1-13)	9979
87	Kirkpatrick, Robert. 1730. *The Golden Rule of Divine Philosophy*. London: R. Kirkpatrick (7-37)	10045
88	Balguy, John. 1733. *The law of truth: or, the obligations of reason essential to all religion.* London: J. Pemberton (1-43)	10040
89	Butler, Joseph. 1736. *The analogy of religion, natural and revealed, to the constitution and course of nature.* London: Knapton (1-32)	10049
90	Turnbull, George. 1740. *The Principles of Moral Philosophy. An Enquiry into the Wise and Good Government of the Moral World*. London: John Noon (1-33)	9571
91	Hume, David. 1748. *Philosophical Essays Concerning Human Understanding*. London: A. Millar (1-50)	10019
92	Bolingbroke, Henry. 1754. *The Philosophical Works of the late Right Honorable Henry St. John, Lord Viscount Bolingbroke*. London: D. Mallet (5-45)	10023
93	Hutcheson, Francis. 1755. *A system of moral philosophy*. Vol. II. Book III. Glasgow: R. and A. Foulis (149-185)	9811
94	Reid, Thomas. 1764. *An Inquiry into the Human Mind, On the Principles of Common Sense*. Edinburgh: A. Millar (1-60)	10032
95	Ferguson, Adam. 1769. *Institutes of Moral Philosophy.* Edinburgh: Printed for A. Kincaid, J. Bell (50-154)	10064

96	Burke, Edmund. 1770. *Thoughts on the cause of the present discontents*. London: J. Dodsley (1-21)	10017
97	Campbell, George. 1776. *The philosophy of rhetoric.* London: W. Strahan and T. Cadell. Vol I. Book I (1-55)	10007
98	Macaulay Graham, Catharine. 1783. *A Treatise on the Immutability of Moral Truth*. London: A. Hamilton (1-54)	10059
99	Smellie, William. 1790. *The Philosophy of natural history*. Vol. I. Dublin: printed by William Porter (1-54)	9993
100	Wollstonecraft, Mary. 1792. *Vindication of the Rights of Woman: With Structures on Political and Moral Subjects*. London: J. Johnson (15-68)	10058
101	Crombie, Alexander. 1793. *An essay on Philosophical Necessity*. London: J. Johnson (1-66)	10047
102	Belsham, Thomas. 1801. *Elements of the Philosophy of The Mind, and of Moral Philosophy*. London: printed for J. Johnson by Taylor and Wilks (2-64)	10087
103	Stewart, Dugald. 1810*. Philosophical Essays*. Edinburgh: W. Creech, A. Constable and Co. (3-60)	10017
104	Kirwan, Richard. 1811. *Metaphysical Essays; Containing the Principles and Fundamental Objects of that Science*. London: J. Mackinlay. (348-395, 417-428)	10062
105	Brown, Thomas. 1820. *Lectures on the Philosophy of the Human Mind*. Vol. I. Edinburgh: W. and C. Tait (107-134, 158-171)	10066
106	Phillips, Sir Richard. 1824. *Two Dialogues between an Oxford Tutor And a Disciple of the Common-Sense Philosophy: Relative to the Proximate Causes of Material Phenomena*. London: Sherwood, Jones and Co. (5-51)	10084
107	Mackintosh, Sir James. 1830. *Dissertation on the progress of ethical philosophy, chiefly during the seventeenth and eighteenth centuries.* Edinburgh: Edinburgh Black. (5-28)	10079
108	Hampden, Renn Dickson. 1835. *A course of lectures introductory to the study of moral philosophy: delivered in the University of Oxford, in Lent Term, 1835*. London: B. Fellowes, Ludgate Street (1-55)	10040
109	Powell, Rev. Baden I. 1838*. The connexion of natural and divine truth: Or, the study of the inductive philosophy, considered as subservient to theology.* London: John W. Parker (1-47)	10098
110	Mill, John Stuart. 1845. *An Examination of Sir William Hamilton's Philosophy*. London: Longman's, Green, Reader, and Dyes (1-35)	9758
111	Combe, George. 1846. *Moral Philosophy, Or the Duties of Man Considered in his Individual, Domestic and Social Capacities*. Edinburgh: MacLachlan, Stewarrt & Co. (23-32)	10029
112	Lyall, William. 1855. *Intellect, the Emotions, and the Moral Nature.* Edinburgh: T. Constable and Co. (1-32)	10093
113	Slack, Henry James. 1860. *The philosophy of progress of human affairs*. London: Chapman & Hall. (1-65)	10006
114	Simon, T. Collyns. 1862. *On the Nature and Elements of the External World: Or, Universal Immaterialism fully Explained and newly Demonstrated*. London: J. Churchill (61-102)	10098
115	Mansel, Henry Longueville. 1866*. The Philosophy of the Conditioned*. London and New York: Alexander Strahan (1-89)	10072
116	Woodward, Thomas Best. 1874. *A Treatise on the Nature of Man, Regarded as Triune; With an Outline of the Philosophy of Life*. London: Hodder & Toughton (226-243, 246-270)	10070
117	Balfour, Arthur James. 1879. *A Defence of Philosophic Doubt Being an Essay on the Foundations of Belief*. London: Macmillam and Co. (154-200)	10101
118	Seth Pringle-Pattison, Andrew. 1885. *Scottish Philosophy. A Comparison of the Scottish and German Answers to Hume*. Edinburgh and London: W. Blackwood and Sons (33-96)	10085
119	Mackenzie, John Stuart. 1890. *An Introduction to Social Philosophy*. Glasgow: J. Maclehose & Sons (1-29)	10071
120	Bonar, James. 1893. *Philosophy and Political Economy in some of their Historical Relations*. London: Swan Sonnenschein & Co. New York: Macmillan & Co. (3-35)	10153
121	Hodgson, Shadworth H. 1898. *Metaphysic of Experience*. Book III, Chapter VI. The Foundation of Ethic. London/New York and Bombay: Longmans, Green, and Co. (3-39)	10038

Table 2: Texts sampled in *CEPhiT*

Text N	Text sampled	N. of Words
42	Douglas, James. 1707. *Myographiæ comparatæ specimen: or, a comparative deſcription of all the muscles in a man and in a quadruped*. London: printed by W. B. for G. Strachan (66-127)	10045
43	Sloane, Hans. 1707. *A Voyage to the Iſlands Madera, Barbados, Nieves, S. Chriſtophers and Jamaica, with the Natural Hiſtory of the Herbs and Trees, Four-Footed Beasts, Fiſhes, Birds, Inſects, Reptiles, &c. of the laſt of thoſe Islands*. London: Printed by B.M. (49-70)	10038
44	Keill, James. 1717. *Essays on Several Parts of the Animal Oeconomy*. London: Printed for George Strahan (95-168)	9812
45	Gibson, William. 1720. *The Farriers new Guide: containing first, the anatomy of a horse...* London: William Taylor (4-36)	9875
46	Blair, Patrick. 1723. *Pharmaco-botanologia: or, an alphabetical and classical dissertation on all the British indigenous and garden plants of the new London Dispensatory*. London: printed for G. Strahan; W. and J. Innys; and W. Mears (2-25)	10089
47	Boreman, Thomas. 1730. *A description of three hundred animals; viz. beasts, birds, fishes, serpents, and insects. With a particular account of the whale-fiſhery*. London: printed by J. T. for Rich. Ware; Tho. Boreman and Th. Game (2-63)	10013
48	Blackwell, Elizabeth. 1737. *A Curious Herbal, containing five hundred cuts, of the moſt uſeful plants, which are now uſed in the practice of Physick*. Vol. I. London: Printed for Samuel Harding (1-25)	10045
49	Brickell, John. 1737. *The Natural History of North-Carolina*. Dublin: James Carson (107-137)	10103
50	Edwards, George. 1743. *A Natural History of Uncommon Birds and of Some other Rare and Undescribed Animals*. London: printed for the author (1-23)	10028
51	Hughes, Griffith. 1750. *The Natural Hiſtory of BARBADOS*. Book III. London: printed for the author (61-88)	10044
52	Dodd, James Solas. 1752. *An essay towards a natural history of the herring.* London: printed for T. Vincent (23-79, 89-94)	10019
53	Borlase, William. 1758. *The Natural History of Cornwall*. Oxford: printed by W. Jackson (261-283)	9997
54	Pennant, Thomas. 1766. *The British Zoology. Class I. Quadrupeds. II. Birds. Vol. I.* London: printed by J. and J. March (1-26)	10037
55	Bancroft, Edward. 1769. *An essay on the Natural History of Guiana, in South America*. London: printed for T. Becket and P. A. Hondt (179-248)	10074
56	Goldsmith, Oliver. 1774. *An History of the Earth, and Animated Nature*. Vol. VIII. London: printed for J. Nourse (111-161)	10103
57	Withering, William. 1776. *A botanical arrangement of all the vegetables, naturally growing in Great Britain.* Vol. I. Birmingham: printed by M. Swinney (xvii-li, 31-33, 54, 93-94, 186, 193)	10091
58	Speechly, William. 1786. *A Treatise on the Culture of the Pine Apple and the Management of the Hot-house. Together with a Description of every Species of Insect that infest Hot-houses, with effectual Methods of destroying them*. Book I. Dublin: printed for Luke White (1-76)	10017
59	Bolton, James. 1789. *An History of Fungusses growing about Halifax. Wherein their varieties, and various appearances in the different stages of growth*. Vol. III. Huddersfield: printed by J. Brook (95-138)	10052
60	Donovan, Edward. 1794. *Instructions for collecting and preserving various subjects of natural history; as animals, birds, reptiles, shells, corals, plants, &c.* London: Printed for the Author (33-84)	10013
61	Smith, Sir James Edward. 1795. *English Botany*. Vol. IV. London: printed for the Author by J. Davis (223-266)	10048
62	Jacson, Maria Elizabeth. 1804. *Botanical Lectures by a Lady*. London: printed for J. Johnson by T. Bensley (1-58)	10051
63	Wilson, Alexander. 1808. *American Ornithology; or, The natural history of the Birds of the United States.* Vol. I. Philadelphia: Bradford and Inskeep (20-52)	10081
64	Wakefield, Priscilla. 1816. *An introduction to the natural history and classification of insects, in a series of familiar letters*. London: printed for Darton, Harvey and Darton (1-50)	9805

65	Lawrence, William. 1819. *Lectures on Physiology, Zoology, and the Natural History of Man*. London: printed for J. Callow (154-188)	10039
66	Jenner, Edward. 1824. "Some observations on the migration of birds." *Philosophical transactions of the Royal society of London* (12-44)	9775
67	Godman, John Davidson. 1828. *American Natural History.* Vol. III. Part I. Mastology. Philadelphia: Carey Lea (37-88)	10028
68	Lincoln, Almira Hart. 1832. *Familiar Lectures on Botany*. Hartford: F. J. Huntington (278-304)	10028
69	Jardine, Sir William. 1835. *The Naturalist's Library.* Mammalia Vol. III. Ruminantia Part I. Edinburgh: W. H. Lizards (83-139)	10026
70	Pratt, Anne. 1840. *Flowers and their associations*. London: Manning and Mason (161-232)	10023
71	Dalyell, Sir John Graham. 1848. *Rare and remarkable animals of Scotland.* Vol. II. London: John van Voorst (138-166)	10010
72	Agassiz, Elizabeth. 1859. *A First Lesson in Natural History.* Boston: Little, Brown and Company. London: Sampson Low, Son and Company. Second Edition (7-82)	12959
73	Darwin, Charles. 1859. *On the Origin of Species by means of Natural Selection*. London: John Murray, Albermarle Street (422-454)	10091
74	Huxley, Thomas Henry. 1863. *On the Origin of Species: Or, The Causes of the Phenomena of Organic Nature. A Course of Six Lectures to Working Men*. New York: D. Appleton and Company (80-113)	10059
75	Spencer, Herbert. 1867. *The principles of Biology*. Vol. II. London: Williams and Norgate (419-452)	10082
76	Macalister, Alexander. 1876. *An Introduction to Animal Morphology and Systematic Zoology*. Part I. London: Longmans, Green, and CO. Dublin: printed at the University Press (1-35)	10083
77	Lankester, Phebe. 1879. *Wild Flowers worth Notice: A Selection of some of our Native Plants which are most attractive from their Beauty, Uses, or Associations.* London: David Bogue (66-117)	10080
78	Balfour, Francis. 1880. *A treatise on comparative embryology*. Vol. I. London: MacMillan & co. (44-67)	10080
79	Galton, Sir Francis. 1889. *Natural Inheritance.* London: Macmillan & Co. (4-45)	10062
80	Marshall, Arthur Milnes. 1893. *Vertebrate Embryology. A Text-book for students and practicioners*. London: Smith, Elder &CO. (341-374)	10044
81	Packard, Alpheus Spring. 1898. *A text-book of entomology including the anatomy, physiology, embryology and metamorphoses of insects. For use in agricultural and technical schools and colleges as well as by the working entomologist.* New York/London: Macmillan (1-34)	10016

Table 3: Texts sampled in *CELiST*

APPENDIX 2:

Results per sample

Sample 0: Curson 1702 (Astronomy male England textbook)

38 cases

If 34, Unless 2, Inversion 1 (would), Peripheral 1 (so long as).

Known fact 9, Hypothesizing 16, Scope-restricting 2, Relevance 11

Initial 32, Final 5, Middle 1

Present-present 6, Type One 7, Type Two 1, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 3, Other modal combinations 5, Verbless 2, Other 12

Sample 1: Morden 1702 (Astronomy male Unknown textbook)

14 cases

If 10, Unless 1, Inversion 1 (should), Peripheral 2 (supposing).

Hypothesizing 7, Scope-restricting 1, concessive 4, relevance 2

Initial 6, Final 5, Middle 3

Type One 1, Type Two 1, Past-present 1, Present-modal 1, Other modal combinations 1, Verbless 8, Other 1

Sample 2: Whiston 1715 (Astronomy male England lecture)

31 cases

If 29, Inversion 1 (were), Peripheral 1 (so long as)

Known fact 3, Hypothesizing 22, Concessive 2, Relevance 2, Non-committal 2

Initial 17, Final 10, Middle 3, Apodosis-less 1

Present-present 5, Type One 6, Type Two 3, Present-modal 8, Past-modal 4, Verbless 4, Other 1

Sample 3: Harris 1719 (Astronomy male England dialogue)

33 cases

If 30, Unless 1, Inversion 2 (were)

Known fact 3, Hypothesizing 19, Scope-restricting 2, Concessive 1, Directive 4, Politeness 2, Relevance 2

Initial 20, Final 11, Middle 2

Present-present 9, Type One 7, Type Two 3, Past-present 1, Present-past 1, Present-modal 3, Past-modal 2, Other modal combinations 5, Verbless 1, Other 1

Sample 4: Gordon 1726 (Astronomy male Unknown treatise)

22 cases

If 20, Peripheral 2 (supposing)

Known fact 3, Hypothesizing 14, Scope-restricting 4, Relevance 1

Initial 18, Final 3, Middle 1

Present-present 5, Type One 9, Type Two 2, Past-past 1, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 1, Other 2

Sample 5: Watts 1726 (Astronomy male England textbook)

23 cases

If 22, Unless 1

Known fact 7, Hypothesizing 11, Scope-restricting 2, Relevance 3

Initial 17, Final 5, Apodosis-less 1

Present-present 5, Type One 5, Type Two 5, Mixed Types One-Two-Three 1, Past-modal 2, Other modal combinations 2, Verbless 2, Other 1

Sample 6: Fuller 1732 (Astronomy male Unknown textbook)

39 cases

If 37, Inversion 1 (did), Peripheral 1 (supposing)

Known fact 11, Hypothesizing 19, Scope-restricting 7, Relevance 2

Initial 34, Final 3, Middle 2

Present-present 16, Type One 6, Type Two 2, Mixed Types One-Two-Three 1, Present-modal 1, Past-modal 1, Other modal combinations 10, Other 2

Sample 7: Charlton 1735 (Astronomy male Unknown textbook)

31 cases

If 30, Unless 1

Known fact 4, Hypothesizing 25, Relevance 2

Initial 28, Final 2, Middle 1

Present-present 5, Type One 4, Type Two 8, Mixed Types One-Two-Three 1, Present-modal 7, Past-modal 1, Verbless 5

Sample 8: Long 1742 (Astronomy male England textbook)

73 cases

If 70, Peripheral 3 (Supposing 2, so long as 1)

Known fact 14, Hypothesizing 52, Scope-restricting 2, Relevance 5

Initial 63, Final 9, Middle 1

Present-present 31, Type One 20, Type Two 8, Past-present 1, Present-modal 5, Past-modal 1, Other modal combinations 2, Verbless 3, Other 2

Sample 9: Hodgson 1749 (Astronomy male England textbook)

66 cases

If 65, Peripheral 1 (provided)

Known fact 29, Hypothesizing 33, Scope-restricting 1, Relevance 3

Initial 62, Final 2, Middle 2

Present-present 12, Type One 44, Mixed Types One-Two-Three 1, Present-modal 2, Other modal combinations 3, Verbless 4

Sample 10: Hill 1754 (Astronomy male Scotland others: dictionary)

24 cases

If 21, Unless 1, Peripheral 2 (provided)

Known fact 16, Hypothesizing 7, Relevance 1

Initial 18, Final 6

Present-present 11, Type One 7, Type Two 2, Mixed Types One-Two-Three 2, Present-modal 2

Sample 11: Ferguson 1756 (Astronomy male England treatise)

43 cases

If 37, Unless 1, Inversion 4 (were), Peripheral 1 (supposing)

Known fact 3, Hypothesizing 37, Concessive 3

Initial 22, Final 18, Middle 3

Present-present 4, Type One 6, Type Two 24, Past-present 2, Mixed Types One-Two-Three 2, Past-modal 1, Other modal combinations 1, Verbless 3

Sample 12: Stewart 1761 (Astronomy male England essay)

11 cases

If 6, Peripheral 5 (supposing)

Known fact 1, Hypothesizing 10

Initial 8, Final 3

Present-present 1, Type One 1, Type Three 2, Other 7

Sample 13: Costard 1767 (Astronomy male Scotland textbook)

35 cases

If 30, Inversion 2 (had), Peripheral 3 (supposing).

Hypothesizing 32, Scope-restricting 2, Concessive 1

Initial 25, Final 6, Middle 4

Present-present 4, Type One 6, Type Two 9, Type Three 1, Past-present 1, Mixed Types One-Two-Three 3, Present-modal 6, Other modal combinations 1, Verbless 3, Other 1

Sample 14: Wilson 1773 (Astronomy male England article)

6 cases

If 4, Peripheral 2 (provided 1, so long as 1)

Known fact 1, Hypothesizing 2, Scope-restricting 1, Relevance 2

Initial 3, Final 3

Present-present 1, Type One 1, Type Two 1, Present-modal 1, Other modal combinations 2

Sample 15: Adams 1777 (Astronomy male Unknown textbook)

31 cases

If 29, Unless 2

Known fact 4, Hypothesizing 21, Scope-restricting 6

Initial 24, Final 7

Present-present 15, Type One 7, Type Two 1, Past-present 1, Mixed Types One-Two-Three 2, Present-modal 2, Other modal combinations 2, Verbless 1

Sample 16: Lacy 1779 (Astronomy male Scotland treatise)

23 cases

If 16, Inversion 7 (were 5, should 1, could 1)

Hypothesizing 15, Scope-restricting 2, Concessive 5, Relevance 1

Initial 12, Final 6, Middle 5

Present-present 1, Type One 3, Type Two 9, Mixed Types One-Two-Three 1, Present-modal 1, Other modal combinations 3, Verbless 5

Sample 17: Nicholson 1782 (Astronomy male England treatise)

47 cases

If 41, Unless 1, Inversion 1 (were), Peripheral 4 (supposing 2, provided 1, so long as 1)

Known fact 1, Hypothesizing 41, Scope-restricting 1, Concessive 4

Initial 38, Final 6, Middle 3

Present-present 6, Type One 15, Type Two 8, Past-present 1, Mixed Types One-Two-Three 3, Present-modal 5, Past-modal 3, Verbless 4, Other 2

Sample 18: Bonnycastle 1786 (Astronomy male England letter)

14 cases

If 13, Inversion 1 (had)

Known fact 3, Hypothesizing 8, Directive 3

Initial 11, Final 3

Present-present 1, Type One 3, Type Two 2, Type Three 2, Past-past 1, Present-modal 2, Other modal combinations 3

Sample 19: Vince 1790 (Astronomy male England treatise)

128 cases

If 121, Unless 1, Peripheral 6 (supposing 3, provided 2, lest 1)

Known fact 1, Hypothesizing 123, Relevance 4

Initial 105, Final 20, Middle 3

Present-present 36, Type One 31, Type Two 2, Type Three 2, Past-present 2, Present-past 3, Mixed Types One-Two-Three 3, Present-modal 16, Past-modal 3, Other modal combinations 4, Verbless 14, Other 12

Sample 20: Bryan 1797 (Astronomy female England textbook)

18 cases

If 14, Inversion 2 (were 1, should 1), Peripheral 2 (supposing)

Known fact 2, Hypothesizing 12, Concessive 1, Politeness 1, Relevance 2

Initial 12, Final 5, Middle 1

Present-present 4, Type One 2, Type Two 2, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 2, Other modal combinations 3, Verbless 1, Other 2

Sample 21: Small 1804 (Astronomy male Scotland treatise)

13 cases

If 11, Peripheral 2 (supposing 1, as long as 1)

Known fact 1, Hypothesizing 11, Concessive 1

Initial 9, Final 2, Middle 2

Type Two 3, Past-past 2, Mixed Types One-Two-Three 2, Past-modal 1, Other modal combinations 4, Verbless 1

Sample 22: Ewing 1809 (Astronomy male North America lecture)

46 cases

If 36, Unless 6, Inversion 3 (had 1, should 1, did 1), Peripheral 1 (supposing)

Hypothesizing 46

Initial 33, Final 12, Middle 1

Present-present 2, Type One 10, Type Two 8, Mixed Types One-Two-Three 2, Present-modal 6, Past-modal 3, Other modal combinations 4, Verbless 11

Sample 23: Brewster 1811 (Astronomy male Scotland treatise)

27 cases

If 22, Unless 1, Inversion 2 (had), Peripheral 2 (supposing)

Known fact 5, Hypothesizing 21, Scope-restricting 1

Initial 16, Final 9, Middle 2

Present-present 3, Type One 4, Type Two 8, Type Three 2, Past-present 2, Present-modal 1, Past-modal 4, Other modal combinations 1, Verbless 1, Other 1

Sample 24: Phillips 1817 (Astronomy male England lecture)

26 cases

If 23, Unless 1, Inversion 1 (were), Peripheral 1 (supposing)

Known fact 2, Hypothesizing 17, Scope-restricting 3, Concessive 1

Initial 18, Final 4, Middle 4

Present-present 6, Type One 2, Type Two 5, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 4, Past-modal 3, Other modal combinations 1, Verbless 2, Other 1

Sample 25: Gummere 1822 (Astronomy male North America textbook)

47 cases

If 39, Unless 2, Peripheral 6 (supposing)

Known fact 4, Hypothesizing 36, Scope-restricting 5, Relevance 2

Initial 39, Final 7, Middle 1

Present-present 9, Type One 16, Type Two 4, Type Three 1, Past-present 2, Mixed Types One-Two-Three 1, Present-modal 2, Verbless 6, Other 6

Sample 26: Luby 1828 (Astronomy male Ireland treatise)

75 cases

If 67, Unless 2, Inversion 1 (were), peripheral 5 (supposing 4, provided 1)

Known fact 11, Hypothesizing 60, Scope-restricting 2, Relevance 2

Initial 63, Final 9, Middle 3

Present-present 16, Type One 35, Type Two 6, Past-present 1, Mixed Types One-Two-Three 2, Present-modal 2, Other modal combinations 4, Verbless 4, Other 5

Sample 27: Herschel 1833 (Astronomy male England treatise)

38 cases

If 27, Unless 2, Inversion 5 (were 3, should 1, did 1), peripheral 4 (supposing 3, so long as 1)

Known fact 4, Hypothesizing 25, Scope-restricting 3, Concessive 3, Relevance 2, Non-committal 1

Initial 27, Final 7, Middle 4

Present-present 6, Type One 4, Type Two 7, Present-modal 6, Past-modal 3, Verbless 7, Other 5

Sample 28: Garland 1838 (Astronomy male North America article)

38 cases

If 27, Unless 3, Inversion 5 (had 2, should 2, were 1), peripheral 3 (provided)

Known fact 6, Hypothesizing 20, Scope-restricting 5, Concessive 4, Relevance 3

Initial 24, Final 13, Middle 1

Present-present 5, Type One 5, Type Two 5, Past-present 1, Present-modal 4, Past-modal 4, Other modal combinations 7, Verbless 6, Other 1

Sample 29: Olmsted 1841 (Astronomy male North America letter)

17 cases

If 6, Unless 1, Inversion 7 (had 4, were 2, should 1), Peripheral 3 (supposing 2, as long as 1)

Hypothesizing 12, Scope-restricting 1, Rhetorical 1, Relevance 3

Initial 10, Final 7

Present-present 1, Type One 1, Type Two 2, Type Three 2, Past-past 1, Present-modal 3, Past-modal 1, Other modal combinations 4, Other 2

Sample 30: Bradford 1845 (Astronomy male Unknown textbook)

54 cases

If 33, Unless 2, Inversion 15 (were 11, had 2, could 2), Peripheral 4 (provided 2, supposing 1, assuming 1)

Known fact 7, Hypothesizing 44, Scope-restricting 3

Initial 42, Final 10, Middle 2

Present-present 10, Type One 7, Type Two 13, Type Three 2, Past-past 1, Past-present 2, Mixed Types One-Two-Three 3, Present-modal 1, Past-modal 10, Other modal combinations 4, Verbless 1

Sample 31: Bartlett 1855 (Astronomy male North America textbook)

29 cases

If 34, Unless 1, Inversion 2 (were), Peripheral 2 (provided 1, assuming 1)

Known fact 8, Hypothesizing 16, Scope-restricting 1, Concessive 1, Relevance 3

Initial 23, Final 3, Middle 3

Present-present 1, Type One 8, Type Two 4, Mixed Types One-Two-Three 2, Present-modal 3, Verbless 11

Sample 32: Whewell 1858 (Astronomy male England essay)

37 cases

If 37

Known fact 1, Hypothesizing 23, Scope-restricting 3, Concessive 8, Relevance 1, Non-committal 1

Initial 30, Final 7

Present-present 11, Type One 3, Past-present 1, Present-past 1, Mixed Types One-Two-Three 2, Present-modal 9, Past-modal 2, Other modal combinations 4, Verbless 3, Other 1

Sample 33: Mitchel 1860 (Astronomy male North America treatise)

31 cases

If 12, Peripheral 19 (in case 18, provided 1)

Known fact 3, Hypothesizing 23, Scope-restricting 2, Concessive 2, Relevance 1

Initial 25, Final 4, Middle 2

Present-present 3, Type One 8, Type Two 6, Past-past 1, Past-present 2, Mixed Types One-Two-Three 2, Present-modal 2, Past-modal 3, Other modal combinations 3, Other 1

Sample 34: Loomis 1868 (Astronomy male North America textbook)

36 cases

If 34, Unless 1, Inversion 1 (were)

Known fact 5, Hypothesizing 27, Scope-restricting 3, Concessive 1

Initial 30, Final 3, Middle 3

Present-present 2, Type One 16, Type Two 9, Type Three 2, Mixed Types One-Two-Three 1, Present-modal 2, Past-modal 1, Other modal combinations 1, Verbless 2

Sample 35: Chauvenet 1871 (Astronomy male North America treatise)

43 cases

If 40, Unless 2, Peripheral 1 (in case)

Known fact 3, Hypothesizing 33, Scope-restricting 5, Relevance 2

Initial 40, Final 3

Present-present 13, Type One 15, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 9, Past-modal 1, Other modal combinations 1, Verbless 2

Sample 36: Steele 1874 (Astronomy male North America textbook)

16 cases

If 13, Unless 1, Inversion 2 (were 1, could 1)

Known fact 4, Hypothesizing 8, Scope-restricting 2, Concessive 1, Relevance 1

Initial 13, Final 3

Type One 4, Type Two 6, Mixed Types One-Two-Three 2, Present-modal 2, Other modal combinations 2

Sample 37: Darwin 1880 (Astronomy male England article)

28 cases

If 22, Unless 5, Peripheral 1 (so long as)

Hypothesizing 25, Relevance 3

Initial 22, Final 6

Present-present 17, Type One 1, Type Two 4, Present-modal 1, Past-modal 5

Sample 38: Young 1880 (Astronomy male North America article)

21 cases

If 19, Peripheral 2 (assuming, lest)

Known fact 1, Hypothesizing 13, Scope-restricting 2, Concessive 3, Relevance 1, Metalinguistic 1

Initial 13, Final 3, Middle 5

Present-present 2, Type One 1, Mixed Types One-Two-Three 2, Present-modal 4, Past-modal 1, Other modal combinations 2, Verbless 8, Other 1

Sample 39: Croll 1889 (Astronomy male Scotland treatise)

43 cases

If 31, Unless 3, Inversion 4 (were 3, had 1), Peripheral 5 (supposing 4, so long as 1)

Known fact 1, Hypothesizing 31, Scope-restricting 4, Concessive 5, Relevance 2

Initial 33, Final 6, Middle 4

Present-present 9, Type Two 5, Past-past 1, Past-present 2, Mixed Types One-Two-Three 1, Present-modal 5, Past-modal 4, Other modal combinations 5, Verbless 8, Other 3

Sample 40: Clerke 1893 (Astronomy female Ireland treatise)

10 cases

If 8, unless 1, Peripheral 1 (provided)

Hypothesizing 7, Concessive 2, Relevance 1

Initial 7, Final 2, Apodosis-less 1

Type Two 3, Present-modal 2, Verbless 4, Other 1

Sample 41: Lowell 1895 (Astronomy male North America article)

20 cases

If 16, Inversion 4 (had 2, were 2)

Hypothesizing 16, Scope-restricting 2, Relevance 1, Non-committal 1

Initial 15, Final 1, Middle 4

Present-present 4, Type One 2, Type Two 2, Past-present 1, Mixed Types One-Two-Three 2, Present-modal 4, Past-modal 1, Other modal combinations 1, Verbless 2, Other 1

Sample 42: Douglas 1707 (Life Sciences male Scotland treatise)

7 cases

If 7

Hypothesizing 6, Concessive 1

Initial 4, Final 2, Middle 1

Present-present 6, Verbless 1

Sample 43: Sloane 1707 (Life Sciences male Ireland treatise)

13 cases

If 13

Hypothesizing 8, Concessive 3, Non-committal 2

Initial 5, Final 8

Present-present 4, Past-present 3, Mixed Types One-Two-Three 2, Present-modal 1, Verbless 2, Other 1

Sample 44: Keill 1717 (Life Sciences male Scotland essay)

67 cases

If 59, Unless 2, Inversion 3 (had 2, were 1), Peripheral 3 (supposing)

Known fact 8, Hypothesizing 52, Scope-restricting 4, Concessive 3

Initial 47, Final 18, Middle 2

Present-present 10, Type One 13, Type Two 3, Type Three 7, Present-past 1, Mixed Types One-Two-Three 7, Present-modal 10, Past-modal 2, Other modal combinations 10, Verbless 4

Sample 45: Gibson 1720 (Life Sciences male England treatise)

7 cases

If 5, Inversion 2 (had 1, were 1)

Hypothesizing 7

Initial 3, Final 4

Type Two 2, Past-present 1, Mixed Types One-Two-Three 1, Past-modal 1, Other modal combinations 2

Sample 46: Blair 1723 (Life Sciences male Scotland treatise)

16 cases

If 14, Unless 1, Peripheral 1 (provided)

Hypothesizing 12, Politeness 4

Initial 9, Final 6, Middle 1

Present-present 7, Type One 3, Present-modal 3, Other modal combinations 1, Other 2

Sample 47: Boreman 1730 (Life Sciences male England textbook)

16 cases

If 15, Unless 1

Hypothesizing 13, Concessive 1, Non-committal 2

Initial 7, Final 7, Middle 2

Present-present 5, Type One 3, Past-present 2, Other modal combinations 4, Verbless 2

Sample 48: Blackwell 1737 (Life Sciences female Scotland treatise)

1 case

If 1

Hypothesizing 1

Final 1

Type Two 1

Sample 49: Brickell 1737 (Life Sciences male Ireland treatise)

29 cases

If 27, Inversion 1 (were), Peripheral 1 (provided)

Hypothesizing 29

Initial 24, Final 4, Middle 1

Present-present 12, Type One 4, Type Two 1, Past-present 2, Mixed Types One-Two-Three 3, Other modal combinations 3, Verbless 4

Sample 50: Edwards 1743 (Life Sciences male England treatise)

5 cases

If 4, Inversion 1 (had)

Hypothesizing 1, Concessive 2, Relevance 2

Initial 3, Final 2

Present-present 1, Mixed Types One-Two-Three 1, Other modal combinations 1, Verbless 1, Other 1

Sample 51: Hughes 1750 (Life Sciences male England treatise)

19 cases

If 17, Inversion 2 (had 1, should 1)

Hypothesizing 12, Concessive 5, Relevance 1, Metalinguistic 1

Initial 8, Final 6, Middle 5

Present-present 5, Type One 3, Type Two 1, Type Three 1, Past-present 1, Mixed Types One-Two-Three 1, Other modal combinations 2, Verbless 5

Sample 52: Dodd 1752 (Life Sciences male England essay)

26 cases

If 22, Unless 2, Inversion 2 (were 1, should 1)

Hypothesizing 16, Concessive 3, Relevance 4, Metalinguistic 1, Non-committal 2

Initial 15, Final 7, Middle 4

Present-present 6, Type One 3, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 1, Past-modal 2, Other modal combinations 6, Verbless 3, Other 3

Sample 53: Borlase 1758 (Life Sciences male England treatise)

11 cases

If 11

Hypothesizing 8, Concessive 1, Relevance 1, Non-committal 1

Initial 6, Final 4, Middle 1

Present-present 1, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 1, Past-modal 3, Verbless 4

Sample 54: Pennant 1766 (Life Sciences male England treatise)

14 cases

If 11, Inversion 3 (should 2, could 1)

Hypothesizing 14

Initial 11, Final 2, Middle 1

Present-present 3, Type One 1, Type Two 2, Past-past 3, Mixed Types One-Two-Three 1, Past-modal 1, Other modal combinations 3

Sample 55: Bancroft 1769 (Life Sciences male North America letter)

18 cases

If 16, Inversion 2 (had 1, did 1)

Hypothesizing 15, Metalinguistic 1, Non-committal 2

Initial 13, Final 4, Middle 1

Present-present 7, Type One 1, Type Two 1, Past-present 3, Present-past 1, Present-modal 1, Past-modal 1, Other modal combinations 3

Sample 56: Goldsmith 1774 (Life Sciences male Ireland treatise)

27 cases

If 25, Unless 1, Peripheral 1 (in case)

Hypothesizing 27

Initial 22, Final 5

Present-present 10, Type One 6, Type Two 1, Past-present 3, Mixed Types One-Two-Three 2, Other modal combinations 3, Verbless 2

Sample 57: Withering 1776 (Life Sciences male England treatise)

22 cases

If 21, Unless 1

Hypothesizing 22

Initial 21, Final 1

Present-present 9, Type One 8, Type Two 1, Mixed Types One-Two-Three 1, Present-modal 1, Verbless 1, Other 1

Sample 58: Speechly 1786 (Life Sciences male England treatise)

45 cases

If 33, Inversion 2 (should), Peripheral 10 (in case 5, provided 4, so long as 1)

Hypothesizing 44, Relevance 1

Initial 30, Final 13, Middle 2

Present-present 2, Type One 15, Type Two 1, Mixed Types One-Two-Three 5, Present-modal 9, Past-modal 1, Other modal combinations 5, Verbless 6, Other 1

Sample 59: Bolton 1789 (Life Sciences male England treatise)

1 case

If 1

Metalinguistic 1

Middle 1

Other modal combinations 1

Sample 60: Donovan 1794 (Life Sciences male Ireland treatise)

70 cases

If 61, Unless 4, Inversion 5 (did 2, should 2, were 1)

Known fact 1, Hypothesizing 58, Scope-restricting 2, Concessive 4, Politeness 1, Relevance 4

Initial 41, Final 23, Middle 6

Present-present 14, Type One 12, Type Two 6, Past-present 3, Mixed Types One-Two-Three 4, Present-modal 8, Other modal combinations 6, Verbless 8, Other 9

Sample 61: Smith 1795 (Life Sciences male England treatise)

1 case

If 1

Hypothesizing 1

Final 1

Past-modal 1

Sample 62: Jacson 1804 (Life Sciences female England lecture)

12 cases

If 11, Inversion 1 (should)

Hypothesizing 11, Concessive 1

Initial 7, Final 4, Middle 1

Present-present 3, Type One 2, Type Two 1, Past-present 1, Present-modal 2, Past-modal 1, Other modal combinations 1, Verbless 1

Sample 63: Wilson 1808 (Life Sciences male Scotland treatise)

10 cases

If 7, Inversion 3 (were 2, should 1)

Hypothesizing 4, Scope-restricting 1, Concessive 1, Non-committal 4

Initial 5, Final 2, Middle 3

Present-present 2, Type Two 2, Past-past 1, Present-modal 1, Other modal combinations 1, Verbless 3

Sample 64: Wakefield 1819 (Life Sciences female England letter)

19 cases

If 13, Unless 3, Inversion 2 (were), Peripheral 1 (lest)

Hypothesizing 15, Scope-restricting 1, Politeness 1, Relevance 2

Initial 12, Final 2, Middle 5

Present-present 6, Type One 2, Type Two 1, Past-present 3, Mixed Types One-Two-Three 3, Present-modal 1, Past-modal 1, Other modal combinations 2

Sample 65: Lawrence 1819 (Life Sciences male England lecture)

13 cases

If 12, Unless 1

Known fact 1, Hypothesizing 8, Concessive 3, Relevance 1

Initial 9, Final 3, Middle 1

Present-present 1, Type One 3, Type Two 5, Past-past 1, Past-present 1, Past-modal 1, Other modal combinations 1

Sample 66: Jenner 1824 (Life Sciences male England article)

34 cases

If 15, Unless 2, Inversion 14 (were 6, should 6, had 1, did 1), Peripheral 3 (supposing 2, as long as 1)

Hypothesizing 28, Scope-restricting 3, Directive 1, Relevance 1, Non-committal 1

Initial 20, Final 9, Middle 5

Present-present 2, Type One 2, Type Two 6, Type Three 1, Past-present 4, Past-modal 7, Other modal combinations 10, Other 2

Sample 67: Godman 1828 (Life Sciences male North America treatise)

11 cases

If 10, Peripheral 1 (as long as)

Hypothesizing 7, Concessive 3, Relevance 1

Initial 6, Final 5

Present-present 3, Type One 1, Type Two 1, Past-past 2, Present-modal 1, Other modal combinations 1, Verbless 2

Sample 68: Lincoln 1832 (Life Sciences female North America lecture)

10 cases

If 7, Inversion 3 (had 2, were 1)

Hypothesizing 10

Initial 9, Final 1

Present-present 3, Type One 2, Type Two 1, Type Three 2, Present-modal 2

Sample 69: Jardine 1835 (Life Sciences male Scotland treatise)

7 cases

If 6, Unless 1

Hypothesizing 7

Initial 5, Final 2

Type One 1, Past-present 1, Present-modal 1, Verbless 3, Other 1

Sample 70: Pratt 1840 (Life Sciences female England treatise)

7 cases

If 7

Hypothesizing 6, Relevance 1

Initial 5, Final 2

Present-present 3, Type One 1, Type Two 1, Verbless 2

Sample 71: Dalyell 1848 (Life Sciences male Scotland treatise)

18 cases

If 12, Unless 1, Inversion 4 (should 2, had 1, were 1), Peripheral 1 (provided)

Hypothesizing 11, Scope-restricting 2, Concessive 1, Relevance 2, Non-committal 2

Initial 11, Final 5, Middle 2

Present-present 3, Type Three 1, Past-past 1, Past-present 3, Present-modal 1, Past-modal 3, Other modal combinations 4, Verbless 1, Other 1

Sample 72: Agassiz 1859 (Life Sciences female North America letter)

35 cases

If 35

Hypothesizing 27, Concessive 1, Politeness 3, Relevance 4

Initial 28, Final 4, Middle 3

Present-present 2, Type One 11, Type Two 7, Mixed Types One-Two-Three 5, Present-modal 4, Other modal combinations 5, Verbless 1

Sample 73: Darwin 1850 (Life Sciences male England treatise)

25 cases

If 20, Inversion 2 (had), Peripheral 3 (as long as)

Hypothesizing 21, Scope-restricting 3, Non-committal 1

Initial 17, Final 5, Middle 3

Present-present 4, Type One 1, Type Two 6, Type Three 2, Mixed Types One-Two-Three 1, Present-modal 5, Past-modal 2, Other modal combinations 2, Verbless 1, Other 1

Sample 74: Huxley 1863 (Life Sciences male England lecture)

48 cases

If 45, Peripheral 3 (supposing 2, so long as 1)

Hypothesizing 38, Scope-restricting 5, Concessive 2, Directive 2, Politeness 1

Initial 34, Final 8, Middle 5, Apodosis-less 1

Present-present 12, Type One 12, Type Two 2, Type Three 2, Mixed Types One-Two-Three 3, Present-modal 5, Past-modal 2, Other modal combinations 5, Verbless 3, Other 2

Sample 75: Spencer 1867 (Life Sciences male England treatise)

28 cases

If 20, Inversion 2 (should 1, did 1), Peripheral 6 (supposing 4, on condition 1, as long as 1)

Hypothesizing 18, Scope-restricting 1, Concessive 3, Directive 3, Politeness 1, Relevance 2

Initial 18, Final 7, Middle 3

Present-present 15, Type One 1, Past-present 1, Present-modal 3, Past-modal 2, Other modal combinations 1, Verbless 1, Other 4

Sample 76: Macalister 1876 (Life Sciences male England textbook)

16 cases

If 16

Hypothesizing 8, Scope-restricting 7, Non-committal 1

Initial 11, Middle 5

Present-present 6, Type Two 2, Past-present 3, Mixed Types One-Two-Three 1, Verbless 4

Sample 77: Lankester 1879 (Life Sciences female England treatise)

11 cases

If 9, Inversion 1 (were), Peripheral 1 (lest)

Hypothesizing 7, Scope-restricting 1, Relevance 3

Initial 10, Final 1

Present-present 2, Type One 1, Type Two 1, Past-present 2, Present-modal 3, Other modal combinations 1, Other 1

Sample 78: Balfour 1880 (Life Sciences male Scotland treatise)

10 cases

If 7, Unless 2, Inversion 1 (were)

Hypothesizing 3, Scope-restricting 4, Concessive 1, Non-committal 2

Initial 7, Final 2, Middle 1

Present-present 3, Type Two 2, Mixed Types One-Two-Three 1, Past-modal 1, Other modal combinations 2, Verbless 1

Sample 79: Galton 1889 (Life Sciences male England treatise)

39 cases

If 34, Unless 2, Peripheral 3 (supposing 2, so long as 1)

Known fact 7, Hypothesizing 22, Scope-restricting 4, Concessive 4, Relevance 1, Non-committal 1

Initial 26, Final 8, Middle 5

Present-present 5, Type One 8, Type Two 6, Present-past 1, Mixed Types One-Two-Three 6, Present-modal 4, Past-modal 3, Verbless 4, Other 2

Sample 80: Marshall 1893 (Life Sciences male England textbook)

5 cases

If 4, Unless 1

Hypothesizing 4, Scope-restricting 1

Initial 2, Final 3

Present-present 3, Type One 1, Past-modal 1

Sample 81: Packard 1898 (Life Sciences male North America textbook)

4 cases

If 4

Hypothesizing 2, Concessive 2

Initial 2, Final 1, Middle 1

Present-present 2, Verbless 2

Sample 82: Astell 1700 (Philosophy female England essay)

79 cases

If 55, Unless 4, Inversion 18 (were 8, did 4, is 2, could 2, had 2), Peripheral 2 (provided)

Known fact 1, Hypothesizing 68, Scope-restricting 1, Rhetorical 4, Concessive 4, Relevance 1

Initial 45, Final 33, Apodosis-less 1

Present-present 24, Type One 5, Type Two 8, Type Three 1, Past-past 1, Past-present 1, Mixed Types One-Two-Three 4, Present-modal 9, Past-modal 7, Other modal combinations 10, Verbless 5, Other 4

Sample 83: Cheyne 1705 (Philosophy male Scotland treatise)

55 cases

If 42, Unless 5, Inversion 7 (had 3, were 2, should 2), Peripheral 1 (supposing)

Known fact 1, Hypothesizing 47, Scope-restricting 1, Rhetorical 1, Concessive 2, Relevance 1, Metalinguistic 1, Non-committal 1

Initial 44, Final 10, Middle 1

Present-present 12, Type One 1, Type Two 5, Type Three 3, Past-present 1, Mixed Types One-Two-Three 2, Present-modal 10, Past-modal 4, Other modal combinations 13, Verbless 3, Other 1

Sample 84: Dunton 1710 (Philosophy male England treatise)

67 cases

If 51, Unless 3, Inversion 13 (were 6, had 5, should 2)

Hypothesizing 47, Scope-restricting 1, Rhetorical 1, Concessive 4, Politeness 5, Relevance 3, Metalinguistic 2, Non-committal 4

Initial 46, Final 17, Middle 4

Present-present 20, Type One 4, Type Two 4, Type Three 4, Past-past 4, Past-present 2, Present-past 2, Present-modal 6, Past-modal 1, Other modal combinations 17, Verbless 1, Other 2

Sample 85: Collins 1717 (Philosophy male England treatise)

81 cases

If 71, Unless 4, Inversion 6 (were 5, had 1)

Known fact 2, Hypothesizing 69, Scope-restricting 5, Concessive 1, Relevance 3, Non-committal 1

Initial 61, Final 19, Middle 1

Present-present 21, Type One 3, Type Two 17, Past-present 3, Present-past 2, Mixed Types One-Two-Three 3, Present-modal 15, Past-modal 8, Other modal combinations 4, Verbless 4, Other 1

Sample 86: Greene 1727 (Philosophy male England treatise)

29 cases

If 26, Unless 1, Peripheral 2 (supposing)

Known fact 5, Hypothesizing 17, Scope-restricting 5, Directive 1, Non-committal 1

Initial 18, Final 9, Middle 1, Apodosis-less 1

Present-present 5, Type One 6, Type Two 4, Present-past 1, Present-modal 4, Past-modal 2, Other modal combinations 2, Verbless 3, Other 2

Sample 87: Kirkpatrick 1730 (Philosophy male Unknown treatise)

39 cases

If 38, Inversion 1 (had)

Hypothesizing 33, Concessive 2, Relevance 3, Metalinguistic 1

Initial 31, Final 8

Present-present 9, Type One 2, Type Two 8, Type Three 2, Past-present 2, Present-past 1, Mixed Types One-Two-Three 2, Present-modal 3, Past-modal 1, Other modal combinations 3, Verbless 2, Other 4

Sample 88: Balguy 1733 (Philosophy male England essay)

78 cases

If 66, Unless 2, Inversion 1 (should), Peripheral 9 (supposing)

Hypothesizing 62, Scope-restricting 6, Concessive 4, Relevance 3, Metalinguistic 1, Non-committal 2

Initial 58, Final 18, Middle 2

Present-present 19, Type One 2, Type Two 6, Type Three 1, Past-present 1, Mixed Types One-Two-Three 3, Present-modal 25, Past-modal 7, Other modal combinations 8, Verbless 6

Sample 89: Butler 1736 (Philosophy male England treatise)

33 cases

If 25, Unless 3, Inversion 3 (were), Peripheral 2 (provided 1, supposing 1)

Hypothesizing 28, Scope-restricting 2, Concessive 1, Relevance 2

Initial 21, Final 8, Middle 4

Present-present 8, Type One 4, Type Two 5, Past-present 3, Mixed Types One-Two-Three 1, Present-modal 3, Other modal combinations 6, Verbless 2, Other 1

Sample 90: Turnbull 1740 (Philosophy male Scotland treatise)

47 cases

If 29, Unless 7, Inversion 11 (were 8, had 2, did 1)

Known fact 7, Hypothesizing 35, Scope-restricting 1, Rhetorical 1, Directive 1, Relevance 2

Initial 34, Final 12, Apodosis-less 1

Present-present 8, Type One 3, Type Two 3, Past-past 1, Past-present 1, Present-modal 14, Past-modal 9, Other modal combinations 5, Verbless 1, Other 2

Sample 91: Hume 1748 (Philosophy male Scotland essay)

44 cases

If 36, Unless 1, Inversion 7 (were)

Known fact 1, Hypothesizing 32, Scope restricting 4, Concessive 4, Directive 1, Politeness 1, Relevance 1

Initial 26, Final 10, Middle 8

Present-present 6, Type One 7, Type Two 5, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 4, Past-modal 6, Other modal combinations 8, Verbless 6

Sample 92: Bolingbroke 1754 (Philosophy male England essay)

34 cases

If 28, Unless 4, Inversion 2 (could)

Hypothesizing 18, Scope-restricting 6, Rhetorical 1, Concessive 3, Politeness 3, Relevance 2, Non-committal 1

Initial 20, Final 13, Middle 1

Present-present 8, Type One 4, Type Two 2, Past-past 1, Past-present 1, Mixed Types One-Two-Three 2, Present-modal 1, Past-modal 5, Other modal combinations 8, Verbless 2

Sample 93: Hutcheson 1755 (Philosophy male Ireland/Scotland treatise)

35 cases

If 26, Unless 3, Inversion 6 (were)

Hypothesizing 33, Concessive 1, Non-committal 1

Initial 22, Final 11, Middle 2

Present-present 4, Type One 1, Type Two 7, Past-past 1, Past-present 2, Mixed Types One-Two-Three 1, Present-modal 7, Past-modal 8, Other modal combinations 3, Verbless 1

Sample 94: Reid 1764 (Philosophy male Scotland treatise)

40 cases

If 39, Peripheral 1 (supposing)

Hypothesizing 30, Scope-restricting 2, Concessive 2, Politeness 1, Relevance 3, Non-committal 2

Initial 35, Final 4, Middle 1

Present-present 6, Type Two 6, Type Three 2, Past-present 1, Present-modal 8, Other modal combinations 12, Verbless 1, Other 4

Sample 95: Ferguson 1769 (Philosophy male Scotland textbook)

3 cases

If 3

Hypothesizing 2, Concessive 1

Initial 2, Final 1

Present-present 1, Type Two 2

Sample 96: Burke 1770 (Philosophy male Ireland treatise)

32 cases

If 27, Peripheral 5 (as long as 3, provided 2)

Hypothesizing 30, Concessive 1, Non-committal 1

Initial 26, Final 6

Present-present 10, Type One 5, Type Two 1, Past-past 1, Mixed Types One-Two-Three 2, Present-modal 5, Past-modal 2, Other modal combinations 6

Sample 97: Campbell 1776 (Philosophy male Scotland essay)

17 cases

If 16, Unless 1

Hypothesizing 9, Concessive 2, Politeness 3, Relevance 1, Metalinguistic 2

Initial 7, Final 6, Middle 4

Present-present 5, Type One 2, Present-modal 1, Past-modal 1, Other modal combinations 3, Verbless 4, Other 1

Sample 98: Macaulay 1783 (Philosophy female England treatise)

35 cases

If 33, Inversion 1 (were), peripheral 1 (provided)

Hypothesizing 25, Rhetorical 1, Concessive 3, Directive 4, Politeness 1, Metalinguistic 1

Initial 17, Final 14, Middle 4

Present-present 5, Type One 7, Type Two 5, Type Three 3, Past-past 1, Present-modal 2, Past-modal 3, Other modal combinations 7, Verbless 2

Sample 99: Smellie 1790 (Philosophy male Scotland treatise)

9 cases

If 8, Peripheral 1 (as long as)

Known fact 1, Hypothesizing 7, Scope-restricting 1

Initial 8, Final 1

Present-present 6, Present-past 1, Past-modal 2

Sample 100: Wollstonecraft 1792 (Philosophy female England treatise)

52 cases

If 44, unless 2, Inversion 5 (had 3, should 1, could 1), Peripheral 1 (supposing)

Hypothesizing 39, Scope-restricting 5, Rhetorical 1, Concessive 4, Directive 1, Metalinguistic 1, Non-committal 1

Initial 33, Final 14, Middle 5

Present-present 9, Type One 4, Type Two 2, Type Three 3, Past-past 1, Past-present 3, Present-modal 12, Past-modal 8, Other modal combinations 5, Verbless 1, Other 4

Sample 101: Crombie 1793 (Philosophy male Scotland essay)

88 cases

If 70, Unless 2, Inversion 16 (were 11, did 4, had 1)

Hypothesizing 82, Scope-restricting 3, Concessive 2, Relevance 1

Initial 82, Final 3, Middle 2, Apodosis-less 1

Present-present 30, Type One 3, Type Two 6, Type Three 1, Past-present 3, Present-modal 15, Past-modal 16, Other modal combinations 11, Verbless 2, Other 1

Sample 102: Belsham 1801 (Philosophy male England lecture)

13 cases

If 12, Unless 1

Hypothesizing 11, Scope-restricting 1, Metalinguistic 1

Initial 9, Final 3, Middle 1

Present-present 5, Type One 3, Type Three 1, Other modal combinations 2, Verbless 1, Other 1

Sample 103: Stewart 1810 (Philosophy male Scotland essay)

20 cases

If 17, Unless 1, Inversion 1 (had), Peripheral 1 (provided)

Hypothesizing 10, Scope-restricting 4, Concessive 4, Relevance 2

Initial 9, Final 9, Middle 2

Present-present 4, Type Two 1, Type Three 2, Present-modal 3, Other modal combinations 5, Verbless 5

Sample 104: Kirwan 1811 (Philosophy male Ireland essay)

21 cases

If 18, Unless 3

Known fact 1, Hypothesizing 18, Scope-restricting 1, Concessive 1

Initial 13, Final 7, Middle 1

Present-present 9, Type Two 1, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 4, Verbless 5

Sample 105: Brown 1820 (Philosophy male England/Scotland lecture)

36 cases

If 34, Inversion 1 (were), Peripheral 1 (as long as)

Hypothesizing 30, Scope-restricting 3, Concessive 2, Relevance 1

Initial 24, Final 10, Middle 1, Apodosis-less 1

Present-present 3, Type One 1, Type Two 9, Past-present 2, Mixed Types One-Two-Three 3, Present-modal 7, Past-modal 5, Other modal combinations 5, Other 1

Sample 106: Phillips 1824 (Philosophy male England dialogue)

57 cases

If 49, Unless 5, Inversion 1 (had), Peripheral 2 (supposing)

Known fact 4, Hypothesizing 43, Scope-restricting 3, Rhetorical 1, Concessive 1, Relevance 1, Non-committal 4

Initial 46, Final 9, Middle 1, Apodosis-less 1

Present-present 14, Type One 1, Type Two 9, Type Three 1, Past-past 1, Past-present 2, Mixed Types One-Two-Three 3, Present-modal 6, Past-modal 9, Other modal combinations 4, Verbless 6, Other 1

Sample 107: Mackintosh 1830 (Philosophy male Scotland treatise)

26 cases

If 21, Unless 1, Inversion 4 (had)

Hypothesizing 14, Scope-restricting 3, Concessive 8, Relevance 1

Initial 15, Final 6, Middle 5

Present-present 1, Type One 2, Type Two 2, Type Three 2, Present-past 1, Mixed Types One-Two-Three 2, Present-modal 4, Past-modal 1, Other modal combinations 6, Verbless 4, Other 1

Sample 108: Hampden 1835 (Philosophy male England lecture)

24 cases

If 18, Unless 1, Inversion 5 (were 3, had 2)

Hypothesizing 16, Scope-restricting 4, Concessive 1, Politeness 1, Relevance 2

Initial 16, Final 5, Middle 3

Present-present 1, Type One 2, Type Two 4, Type Three 1, Mixed Types One-Two-Three 1, Present-modal 5, Past-modal 4, Other modal combinations 4, Verbless 2

Sample 109: Powell 1838 (Philosophy male England treatise)

12 cases

If 5, Unless 5, Peripheral 2 (so long as)

Hypothesizing 10, Concessive 1, Relevance 1

Initial 7, Final 3, Middle 1, Apodosis-less 1

Present-present 1, Type One 2, Type Two 1, Mixed Types One-Two-Three 1, Present-modal 2, Other modal combinations 1, Verbless 2, Other 2

Sample 110: Mill 1845 (Philosophy male England/Scotland treatise)

39 cases

If 33, Unless 1, Inversion 3 (were 2, had 1), Peripheral 2 (provided 1, supposing 1)

Known fact 1, Hypothesizing 27, Scope-restricting 6, Concessive 2, Relevance 2, Non-committal 1

Initial 30, Final 7, Middle 2

Present-present 16, Type One 1, Type Two 4, Mixed Types One-Two-Three 1, Present-modal 4, Past-modal 5, Other modal combinations 3, Verbless 5

Sample 111: Combe 1846 (Philosophy male Scotland lecture)

37 cases

If 34, Unless 2, Inversion 1 (had)

Hypothesizing 35, Concessive 1, Relevance 1

Initial 27, Final 8, Middle 2

Present-present 17, Type One 2, Type Two 2, Past-present 3, Mixed Types One-Two-Three 5, Present-modal 3, Past-modal 3, Other modal combinations 2

Sample 112: Lyall 1855 (Philosophy male England treatise)

25 cases

If 19, Unless 3, Inversion 3 (had)

Known fact 2, Hypothesizing 17, Concessive 4, Metalinguistic 1, Non-commital 1

Initial 15, Final 8, Middle 2

Present-present 5, Type One 1, Type Two 2, Type Three 3, Past-past 1, Past-present 3, Present-modal 3, Other modal combinations 3, Verbless 4

Sample 113: Slack 1860 (Philosophy male England treatise)

33 cases

If 28, Unless 2, Inversion 3 (were 2, had 1)

Known fact 5, Hypothesizing 28

Initial 25, Final 6, Middle 2

Present-present 4, Type One 5, Type Two 8, Type Three 2, Mixed Types One-Two-Three 2, Present-modal 3, Past-modal 3, Other modal combinations 4, Verbless 2

Sample 114: Simon 1862 (Philosophy male Ireland/England treatise)

46 cases

If 40, Unless 2, Inversion 3 (had), Peripheral 1 (lest)

Hypothesizing 34, Concessive 8, Relevance 4

Initial 38, Final 6, Middle 2

Present-present 20, Type One 4, Type Two 1, Type Three 1, Past-past 1, Past-present 1, Present-modal 5, Past-modal 2, Other modal combinations 5, Verbless 2, Other 4

Sample 115 Mansel 1866 (Philosophy male England article)

36 cases

If 28, Inversion 4 (were 3, had 1), Peripheral 4 (so long as)

Hypothesizing 29, Scope-restricting 1, Concessive 4, Relevance 1, Non-committal 1

Initial 28, Final 6, Middle 2

Present-present 16, Type Two 2, Type Three 1, Past-present 1, Present-modal 4, Past-modal 4, Other modal combinations 5, Verbless 3

Sample 116: Woodward 1874 (Philosophy male Ireland treatise)

22 cases

If 19, Unless 1, Inversion 1 (had), Peripheral 1 (so long as)

Hypothesizing 17, Concessive 3, Relevance 2

Initial 12, Final 7, Middle 3

Present-present 3, Type One 3, Type Two 3, Present-modal 3, Past-modal 1, Other modal combinations 3, Verbless 6

Sample 117: Balfour 1879 (Philosophy male Scotland/England essay)

67 cases

If 63, Unless 3, Peripheral 1 (supposing)

Hypothesizing 47, Scope-restricting 6, Concessive 6, Relevance 5, Non-committal 3

Initial 45, Final 13, Middle 9

Present-present 28, Type One 2, Type Two 3, Past-present 2, Mixed Types One-Two-Three 3, Present-modal 15, Past-modal 5, Other modal combinations 3, Verbless 5, Other 1

Sample 118: Seth 1885 (Philosophy male Scotland lecture)

25 cases

If 22, Unless 2, Peripheral 1 (as long as)

Hypothesizing 23, Concessive 1, Metalinguistic 1

Initial 16, Final 7, Middle 2

Present-present 9, Type One 2, Past-past 2, Past-present 1, Mixed Types One-Two-Three 1, Present-modal 4, Other modal combinations 3, Verbless 3

Sample 119: Mackenzie 1890 (Philosophy male Scotland essay)

36 cases

If 28, Unless 3, Peripheral 5 (so long as)

Hypothesizing 30, Scope-restricting 1, Concessive 2, Relevance 3

Initial 23, Final 9, Middle 3, Apodosis-less 1

Present-present 12, Type One 2, Type Two 3, Mixed Types One-Two-Three 1, Present-modal 10, Past-modal 4, Other modal combinations 1, Verbless 2, Other 1

Sample 120: Bonar 1893 (Philosophy male Scotland treatise)

21 cases

If 21

Hypothesizing 13, Scope-restricting 1, Concessive 5, Relevance 2

Initial 16, Final 4, Middle 1

Present-present 8, Type One 2, Type Two 2, Type Three 1, Past-past 1, Past-present 1, Present-modal 1, Other modal combinations 4, Verbless 1

Sample 121: Hodgson 1898 (Philosophy male England treatise)

20 cases

If 15, Unless 2, Peripheral 3 (supposing)

Hypothesizing 15, Concessive 2, Relevance 2, Metalinguistic 1

Initial 8, Final 4, Middle 8

Present-present 5, Type Two 2, Present-past 1, Mixed Types One-Two-Three 1, Present-modal 1, Other modal combinations 3, Verbless 6, Other 1

APPENDIX 3:

Resumo

O principal obxectivo desta tese é describir os usos das estruturas condicionais nos textos científicos en inglés dos ss. XVIII e XIX, coa axuda do *Coruña Corpus of English Scientific Writing*. O estudo analiza a variabilidade tanto formal como funcional das condicionais comprobando como o uso das condicionais reflicte a evolución xeral do rexistro científico durante o período e, particularmente, se estas estruturas son empregadas polos autores como estratexias discursivas de cara a influír na súa audiencia e conseguir unha mellor recepción do discurso.

Para conseguir este obxectivo, esta tese segue o modelo de Biber & Conrad (2009) para estudos de descrición de rexistro. Este modelo propón a división do traballo en tres obxectivos interrelacionados: a descrición do contexto sociohistórico do rexistro, a descrición dos datos lingüísticos estudados segundo foron atopados nos textos do corpus que representan o rexistro, e a análise das asociacións entre ambos aspectos.

O primeiro obxectivo, que ocupa o Capítulo 1 desta tese, consiste en describir o contexto socio-histórico no cal o rexistro é empregado, analizando todas as circunstancias que inflúen no desenvolvemento e uso deste rexistro. O período estudado, os séculos XVIII e XIX, representa o período principal de desenvolvemento tanto da ciencia moderna como do rexistro científico en inglés. Neste período, coincidindo coa popularización das ideas de Newton sobre a gravidade e a perda de control da Igrexa sobre a ciencia co nacemento das academias e sociedades científicas, chega ao punto álxido o proceso de substitución do rexistro científico medieval, o escolasticismo, pola ciencia contemporánea. Este novo modelo de ciencia pon a súa atención na vida real, e fai que a ciencia se converta nunha actividade social, xa que este novo paradigma basea o seu desenvolvemento na

descrición de observacións e experimentos por parte de membros das comunidades científicas perante os seus pares, moi maioritariamente integrantes das capas acomodadas da sociedade. Nun primeiro momento, mentres estas comunidades eran pequenas, estas narracións facíanse en persoa ou por medio de comunicacións como cartas, e en moitos casos a simple palabra de cabaleiro do narrador era garantía de veracidade, mais, a medida que as comunidades de ciencia medraron, xurdiu un novo modelo no cal os autores, ademais de aportar probas explícitas e un método sólido ao feito científico, teñen que persuadirse uns a outros da veracidade das súas afirmacións. Este proceso ocasionou o desenvolvemento dunha serie de prácticas e características que se volveron definitorias do rexistro científico, como son o recoñecemento doutros puntos de vista e do traballo alleo, ou o uso de elementos mitigadores, evitando as afirmacións categóricas e a confrontación. Estas prácticas á súa vez correspóndense co uso de estratexias lingüísticas determinadas, entre as cales están o uso das estruturas condicionais. Porén, hai que ter en conta que o rexistro científico non debe entenderse coma un ente monolítico, senón, ao contrario, coma unha entidade con múltiples facetas que presenta importantes variacións en función dunha serie de parámetros, como a disciplina e o xénero dos textos ou a orixe xeográfica e o sexo dos autores, ademais da evidente variación ao longo do tempo. Estas variacións son as que se pretenden estudar neste traballo.

O segundo obxectivo da tese, obxecto dos capítulos 2 ao 5, consiste en estudar a información lingüística atopada durante o estudo, unha información lingüística que conformará os datos de referencia ("baseline data") do uso do obxecto de estudo (nesta tese, as condicionais) en textos reais do rexistro estudado. Este segundo obxectivo foi dividido en catro etapas intermedias.

A primeira etapa ten a ver coa determinación do "scope", a identificación de que é unha condicional, para así poder discriminar os membros válidos da construción. Para identificar o que é unha estrutura condicional revisouse a literatura relevante e comparáronse as definicións tradicionais das condicionais, baseadas na noción lóxica de implicación, cos usos de condicionais reais, descubrindo que estas definicións non son válidas e que o principal criterio para identificar as estruturas condicionais é a presenza dunha partícula condicional na prótase. Consecuentemente, para identificar ese campo das condicionais válidas, é necesario identificar as partículas que podían funcionar como partículas condicionais durante o período, o que se fixo consultando tanto literatura sobre partículas condicionais como monografías sobre a historia da lingua inglesa. A lista de partículas condicionais (e, consecuentemente, os límites da noción de condicionalidade) no período amósanse na Táboa 2.3 do Capítulo 2.

A segunda etapa serviu para determinar os parámetros de estudo en función dos cales vai ser realizada a análise lingüística da estrutura. Esta tese emprega nove parámetros, dos cales catro son lingüísticos e cinco son extralingüísticos. Os cinco parámetros extralingüísticos, que veñen determinados pola selección de mostras dos compiladores do corpus, repásanse no capítulo 4. Son a variación diacrónica, a disciplina e o xénero dos textos e o sexo e a nacionalidade dos autores.

Os catro parámetros lingüísticos son obxecto dos capítulos 2 e 3. Estes catro parámetros inclúen o tipo de condicional, a orde dos constituíntes, as combinacións de formas verbais e a función da condicional no discurso. De acordo co parámetro de tipo de condicional, distínguense catro variables: *if*, *unless*, condicionais periféras e condicionais por inversión (cos seus subtipos). Tamén son catro as variables en relación co parámetro de orde dos constituíntes: distínguese entre condicionais de prótase inicial, de prótase final, de prótase media, e condicionais sen apódose. A análise de acordo coas combinacións de formas verbais presenta dous niveis: nun primeiro nivel, os resultados analízanse segundo aparecen, e nun segundo nivel estes resultados agrúpanse en trece tipos, que tamén se empregan para a análise.

Mención aparte merece o parámetro da función das condicionais no discurso, cuxa determinación ocupa todo o capítulo 3. Este parámetro non clasifica as estruturas de forma obxectiva, senón que, ao contrario, determina as categorías que serán empregadas para facer unha clasificación pragmática. Como para un parámetro deste tipo poderíanse distinguir infinitas variables, realizouse un exame da literatura en dúas etapas para determinar que variables distinguir. Na primeira etapa, descubriuse que as numerosas funcións das condicionais no rexistro científico poden agruparse en dous tipos: os usos que axudan a facer avanzar os argumentos sobre a materia de estudo, e os usos relacionados coa natureza social da comunicación científica, isto é, aqueles que serven para obter unha mellor recepción do texto por parte doutros membros da comunidade epistémica. Na segunda etapa, examináronse as diferentes tipoloxías de condicionais existentes, testando a súa adecuación para representar as funcións das condicionais no rexistro científico dos séculos XVIII e XIX. Porén, descubriuse que ningunha das tipoloxías existentes é totalmente axeitada, e que, polo tanto, debe proporse unha nova tipoloxía.

Esta nova tipoloxía presenta once categorías: *known fact conditionals*, que serven para afirmar feitos amplamente aceptados ou verdades matemáticas; *hypothesizing conditionals*, que serven para facer argumentos de probabilidade; *scope restricting conditionals*, que describen os escenarios ou crean o espazo argumentativo no cal unha afirmación pode ser sostida mediante a definición dun concepto dun xeito particular ou a especificación do universo ao que afecta a afirmación; *method conditionals*, que se usan para explicar decisións procedimentais ou para introducir instrucións; *rhetorical*

conditionals, afirmacións fortes que toman a forma de condicionais e transmiten esa mensaxe mediante o uso da ironía; *concessive conditionals*, que introducen información sobre un impedimento para a realización da apódose que, porén, sostense de todos os xeitos; *directive conditionals*, que se usan para suavizar un proceso obrigatorio presentándoo como se fose opcional; *politeness conditionals*, que introducen expresións convencionais de cortesía; *relevance conditionals*, que expresan as circunstancias baixo as cales o enunciado da apódose é relevante; *meta-linguistic conditionals*, que serven para comentar sobre a forma da expresión; e, por último, *non-committal conditionals*, que serven para os autores se distanciaren de afirmacións doutros.

A terceira etapa deste obxectivo consiste na descrición do corpus, explicando como a súa compilación reflicte as particularidades do rexistro a estudar, o que tamén é o obxectivo do capítulo 4. O corpus empregado é o *Coruña Corpus*, un corpus de rexistro científico dos séculos XVIII e XIX, organizado en varios subcorpus, cada un deles dunha disciplina diferente. Cada subcorpus está organizado de xeito que, salvo excepcións, presente dúas mostras de en torno a dez mil palabras por cada década e disciplina, sumando así *c*.400.000 palabras en cada subcorpus. O estudo nesta tese emprega os subcorpus de Astronomía, Filosofía e Ciencias Naturais, sumando así *c*.1.200.000 palabras.

Finalmente, unha vez determinados os diferentes parámetros e localizados os exemplos de uso, pódese proceder a analizar os resultados, o cal ocupa a totalidade do Capítulo 5. A análise de resultados amosou que o uso de condicionais decrece co paso do tempo, que aparecen dúas veces máis condicionais en textos de astronomía e filosofía ca en textos de ciencias naturais, e que os autores homes empregan máis condicionais cás mulleres, aínda que a maior proporción absoluta de uso aparece nos textos de mulleres filósofas. Hai tamén importantes diferencias entre os xéneros, cos ensaios e os diálogos amosando unha frecuencia de uso particularmente alta.

De acordo co parámetro do tipo de condicional, as condicionais con *if* representan o 84.1% dos caos, mentres que as condicionais por inversión son o 6.91%, as periféras o 4.95% e as condicionais con *unless* o 4.04%. Estes usos, porén, non permanecen estables, xa que as dúas primeiras van perdendo uso co paso do tempo e as dúas últimas increméntano. Ademais, varios operadores que permitían expresar condicionais por inversión deixan de facelo, mentres que novos subordinantes condicionais aparecen co paso do tempo.

En relación coas funcións das condicionais no discurso, a máis habitual é a *hypothesizing* (75.31%), seguido de *known fact* (6.31%), *concessive* (5.27%), *scope restricting* (5.17%) e *relevance* (4.31%). Ningunha outra función presenta máis do 2% dos usos. Todas as funcións perden usos co paso do tempo, salvo as condicionais *concessive* e *scope restricting*. No tocante ás disciplinas, os textos de

astronomía presentan particularidades, especialmente un uso acusadamente maior de condicionais *known fact*. O mesmo tamén ocorre cos libros de texto. Non todos os tipos de condicional, porén, poden expresar todas as funcións. O único tipo que pode expresar todas as funcións é *if*, mentres que outros só teñen unha posible función, como é o caso de *lest*, que sempre introduce condicionais *relevance*.

No tocante á orde dos constituíntes, as condicionais con prótase inicial son as máis frecuentes (71.73%), seguidas das condicionais con prótase final (21.53%), media (6.43%), e, finalmente, condicionais sen apódose (0.32%). As maiores diferencias entre os diferentes parámetros amosan que as condicionais finais van sendo substituídas polas medias co paso do tempo, así como preferencias particulares polas condicionais iniciais en textos de astronomía e por condicionais finais entre as mulleres. *Unless* e algúns tipos de condicionais periféricas, como *as long as*, *on condition* e *provided*, presentan unha maioría de usos finais, o que contrasta coas condicionais por inversión, que presentan un uso particularmente alto de condicionais iniciais.

Finalmente, no relativo ao parámetro de combinación de tempos verbais, a análise simple amosa que hai 225 combinacións diferentes no corpus, e que a máis común é *present simple, present simple*, que representa un 16.01% de todos os usos. Unha vez que as combinacións foron agrupadas, o grupo máis numeroso é o de *Present-Present* (23.48%), mentres que os tres tipos canónicos (empregados frecuentemente no ensino do inglés como lingua estranxeira) só representan o 27.60% dos casos. Amósase unha certa preferencia polo uso de condicionais *Tipo 1* en textos sobre astronomía e libros de texto, aínda que as principais variacións paramétricas teñen a ver cos parámetros lingüísticos, xa que as combinacións de formas verbais presentan co-ocorrencias moi salientables cos diferentes tipos, ordes e funcións.

Por último, o terceiro obxectivo consiste en relacionar a descrición do contexto e os datos lingüísticos e analizar as súas asociacións, tentando explicar a distribución dos resultados en relación cos diferentes parámetros e relacionalos coa información sobre o contexto obtida previamente. Isto foi o obxectivo do Capítulo 6.

Este proceso amosou que o uso das condicionais en xeral e das súas diferentes funcións no discurso en particular están motivados tanto por factores socio-históricos como polo contexto lingüístico.

No que ten a ver cos factores sociohistóricos, a análise dos resultados do uso das condicionais ao longo do tempo amosa que estes usos poderían estar reflectindo o longo proceso de substitución do

paradigma escolástico pola ciencia moderna, que afectou ás diferentes disciplinas dun xeito gradual e non uniforme, tanto no plano epistemolóxico como no retórico e no lingüístico.

Do exame dos resultados proponse un modelo que explica como as diferencias no uso das condicionais entre as diferentes disciplinas no século XVIII estarían causadas pola pervivencia da influencia escolástica na filosofía durante máis tempo do que o fixo nas outras dúas disciplinas, que foron, particularmente a astronomía, das primeiras en adoptar as propostas do novo paradigma científico. Isto permitiría explicar as particularidades dos textos filosóficos con respecto aos textos de astronomía e ciencias naturais, como son o maior uso de condicionais en xeral, a maior variabilidade de tipos e en relación co sexo dos autores, a maior proporción de condicionais sen *if* e a evolución diacrónica máis clara, todas elas consistentes cunha adopción máis lenta das características do novo paradigma científico. Esta influencia dos cambios paradigmáticos tamén se deixa sentir na astronomía, cuxa maior presenza de condicionais *known-fact* pode explicarse pola influencia da escola de Newton, que impuña un método baseado na expresión matemática dos achados.

Co paso do tempo, o proceso de adopción do novo paradigma implicou unha maior estandarización entre as diferentes disciplinas, un proceso consistente cos resultados da análise, que amosan un uso das condicionais máis uniforme durante o século XIX. Porén, esta transición entre o escolasticismo e o novo paradigma, ademais de afectar de forma diferente ás distintas disciplinas, semella non ocorrer de forma directa, senón como un proceso con dous pasos. Nun primeiro momento, houbo un abandono xeral de características escolásticas, o que se manifesta no escaso uso de condicionais categóricas (coa excepción dos textos de astronomía, que as manteñen nas descricións co seu estilo matemático), así como na redución dramática da variabilidade formal das condicionais, coa desaparición de varios operadores de condicionais por inversión. Durante un segundo momento, prodúcese un proceso de expansión, que se corresponde con novas posibilidades formais e coa popularización das condicionais *scope-restricting*, que permiten aos autores mitigar a forza das súas afirmacións dun xeito menos obvio que outras estratexias. Este tipo de estratexias de mitigación, menos obvias, correspóndense mellor cun rexistro científico que está a evolucionar cara á estandarización, no cal a cantidade de información que se supón compartida entre os participantes é maior, e no que o seguimento de métodos establecidos ten unha maior importancia.

Este proceso de transición tamén se pode ver no realiñamento dos xéneros, coa diminución do uso das cartas e os diálogos, característicos do vello paradigma, e a aparición gradual dos artigos, que ademais presentan características lingüísticas que están de acordo coa súa emerxencia tardía, coma o uso menor de condicionais con *if*. A evolución histórica tamén explicaría algunhas diferencias entre os sexos, como a maior variabilidade nos textos escritos por mulleres no século XVIII e un movemento

cara á estandarización no XIX, manifestando a maior importancia dos obstáculos, tanto científicos como sociais, que as mulleres tiveron que afrontar durante o século XIX, e que supuxo a perda de parte dos seus usos máis distintivos. De todos os xeitos, outros usos distintivos femininos, como evitar as condicionais máis categóricas, si permanecen no tempo, xa que as mulleres sempre tiveron que loitar contra as reservas dos científicos homes. Para faceren isto, as mulleres non prefiren o modo de mitigación mediante o uso das diferentes funcións das condicionais, senón o uso da modalidade, que é un 5% máis frecuente do que entre os homes.

No tocante ao contexto lingüístico, o estudo atopou correlacións entre as características formais das condicionais e certas funcións das condicionais, como a alta proporción de *Present subjunctive, will* entre as condicionais *known fact* (21.40%), de constituíntes sen verbo nas concesivas (46.19%), ou de combinacións incluíndo imperativos nas condicionais *relevance* (18.01%). Tamén é importante a presenza de *may, present simple* en condicionais *metalinguistic* (24.14%) e *politeness* (38.89%). Isto suxire unha preferencia por certas combinacións verbais para expresar certas funcións, aínda que isto non debe ser tomado como un respaldo ás tipoloxías tradicionais baseadas en combinacións verbais, que se vén sobardadas polas 225 combinacións diferentes atopadas neste corpus, e que, aínda que fosen consideradas de xeito laxo, non explicarían máis que a metade das combinacións atopadas, deixando a outra metade das estruturas condicionais sen explicación.

Estas correlacións formais, porén, só explican unha pequena cantidade da variabilidade. A maioría das funcións condicionais caracterízanse pola súa liberdade formal, o que, considerado conxuntamente coa enorme cantidade de diferentes combinacións, imposibilita as clasificacións baseadas nas características formais. Porén, si hai restricións importantes no tocante ao parámetro do tipo de condicional, xa que só *if* pode realizar calquera función, mentres que a maioría dos restantes tipos só pode realizar un conxunto restrinxido das mesmas. Estes resultados semellan concordar co modelo proposto por Wason & Johnson-Laird (1972), que consideran que o significado ou a función discursiva das condicionais está polo menos parcialmente determinada polo contexto lingüístico.

Pódese concluír, polo tanto, que os resultados suxiren que a distribución de usos e funcións das condicionais durante o período estudado e nos diferentes parámetros depende tanto do contexto socio-histórico como do lingüístico. A forma e a función das condicionais está influenciada polo contexto sociohistórico no que se usan, xa que a disciplina e o xénero do estudo, as circunstancias do autor (sexo, orixe, posición de maior ou menor poder na comunidade científica...) e o período no que foron escritos configuran un contexto particular que favores ou desfavorece usos particulares. Tamén está influenciado polo contexto lingüístico, xa que tanto os parámetros estudados (tipo de condicional, orde dos constituíntes e combinacións de verbos) coma outros non estudados aquí (nivel

gramatical ao que se inserta a prótese, significado proposicional) influencian a función que realiza a condicional. Isto, polo tanto, concorre cos resultados doutros estudos sobre o rexistro científico (Gray 2011), que amosan que a variación na linguaxe científica é o resultado da acción de múltiples parámetros traballando ao mesmo tempo.