

Conditionals in Eighteenth and Nineteenth century scientific writing

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Science and scientific writing underwent deep transformations starting in the seventeenth century. Escaping from the introverted medieval scholastic paradigm, the scientific register used during the first stages of the process of transformation towards contemporary science was characterised by the narration of real life discoveries or experiments, often in first person narratives in which the position of the author in the scientific community was sufficient proof of veracity of the events narrated. This started to change from the late seventeenth and early eighteenth century, with an evolution towards a higher importance of proof and method.

However, as scientific communities grew bigger and authors started having to persuade their peers of the veracity of their accounts, a parallel phenomenon appeared: scientific writing started to develop a series of features to convey modesty, humility, and politeness (Atkinson 1996, 1999; Hyland 1996, 1998, 2000), such as the use of modal verbs, and expressions of probability, evaluation, or attribution; which are used by authors to avoid controversy and achieve a better reception of their work. Conditional structures play an important role among these strategies. Conditionals are frequently used in scientific writing to advance the arguments put forwards by the author, expressing the relationship between phenomena and its consequences, as well as to speculate on possible outcomes and to state hypotheses and proposals. However, conditionals also perform a number of persuasive roles: they are used to define shared assumptions and thus narrow the scope of claims, to tone down claims and mitigate their force, or to directly express politeness or uncertainty, among others (Carter-Thomas & Rowley-Jolivet 2008, Warchal 2010).

This paper's aim is to study the uses and functions of conditionals in eighteenth and nineteenth century scientific writing, and to show how conditional uses reflect the general evolution of scientific writing during the period, as well as the differences between the different disciplines in the study.

This research has been carried out using the Coruña Corpus of English Scientific Writing (henceforth Coruña Corpus or CC) (Crespo & Moskowich, 2010; Moskowich 2011). The Coruña Corpus is a corpus of late Modern English scientific writing covering the period between 1700 and 1900. It is divided in a series of twin subcorpora, all of them sharing the same structure and principles of compilation, and one for each different discipline. Each of these subcorpora contains forty samples approximately 10,000 words long, at a rate of two samples per decade, so that each subcorpora contains c.400,000 words. Three full subcorpora have been used in this study: CETA (the subcorpus on Astronomy), CEPHiT (the subcorpus on Philosophy), and CELiST (the subcorpus on Life Sciences). All of them together add up to c.1,200,000 words.

These corpora have been searched with the help of the Coruña Corpus Tool (Moskowich & Parapar 2008) for selected conditionals particles, obtained adapting Quirk et al.'s (1985) and Declerck & Reed's (2001) classifications so that they reflect the uses in the period. Each of the results obtained has been manually

disambiguated so as to eliminate non-conditional uses, such as interrogative if uses, leaving 3,735 occurrences in the corpus.

Each of these occurrences has then been recorded with sufficient context, and classified according to nine different parameters: five of these are socio-historical or extra-linguistic (the period of the text, its discipline, its genre, the sex of the author, and their geographical origin) and four are linguistic (the type of conditional particle, the order of the constituents, the verb-form combinations, and the function conditionals play in discourse; this latter parameter being classified with the help of a new, specific typology). The results show that there are important differences both in the number and the types of conditional used.

In what has to do with the general frequency of use of conditionals, there are differences in their use across disciplines during the eighteenth century, with a higher use in philosophy (particularly among women) and a lower use in both astronomy and life sciences. During the nineteenth century, these differences became less important. The differences found regarding the different types of conditionals are interpreted as a reflection of the different stages of popularisation of the new paradigms of science and scientific writing in each of the disciplines. Thus, during the eighteenth century, the high number of conditional uses in philosophy, as well as the general greater variability, the starker differences among male and female philosophers, and the greater use of conditionals other than if point to a scenario in which the influence of the old scholastic paradigm is still present in philosophy texts. This contrasts with the lower and more standardised use of conditionals in both astronomy and life sciences during the period, although there are also some particularities in these disciplines, such as the high number of non-mitigating conditionals in astronomy texts, which shows the influence of Newton's preference for the mathematical expression of reality. During the nineteenth century, however, the differences among disciplines are less important, thus reflecting the evolution of philosophy towards the practices of the new scientific paradigm, and a more standardised scientific register in which the differences between disciplines are less important.

There are as well some important differences according to the parameter of sex, as women tend to avoid the most blatant types of mitigating conditionals, preferring to mitigate their claims with the use of modality instead. This may be related to the pressures on women scientists, which could have made them select the less salient types of mitigation.

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