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From connectives to argumentative markers: a quest for markers of argumentative moves and of related aspects of argumentative discourse¹

Assimakis Tseronis
Laboratoire Communication et Politique, CNRS
20, rue Berbier du Mets
75013 Paris
France
assimakis.tseronis@lcp.cnrs.fr

ABSTRACT:

In this paper, I explore the potential of systematically studying the linguistic surface of discourse for the purposes of identifying markers of argumentative moves and other related categories, such as types of arguments and argumentative strategies. Such a list of argumentative markers can prove useful for the (semi-)automatic treatment of a large corpus of texts. After reviewing literature on the linguistic realization of argumentative moves as well as literature on the subject of discourse markers, it becomes clear that the search for representative items of argumentative markers cannot be restricted to those elements marking relations but that they should also include elements that signal a certain function that is of pertinence to argumentative analysis. In this view, argumentative markers can be any single or complex lexical expression as well as a discursive configuration whose presence in a given utterance marks that utterance or the one preceding/following it, or a larger piece of discourse as having a certain argumentative function (as an argumentative move, a type of argument or an argumentative strategy). Examples taken from a French corpus on the controversy surrounding the development and applications of nanotechnology currently under study are used to illustrate the different types of argumentative markers proposed.

KEYWORDS: argumentative markers, pragmatic markers, discourse markers, corpus analysis, computer-assisted methods for argumentative analysis, argumentation studies

1. Introduction

Despite the varying theoretical perspectives that argumentation scholars take when studying argumentative discourse and despite their different research goals, almost all have shown, in one way or another, interest in the linguistic realisation of argumentative moves and of other argumentative aspects that fall under their object of study. Such an interest may be seen as satisfying at least two goals. The first is a purely utilitarian one. Argumentation scholars are interested in those linguistic elements that can help them

¹ The article is a revised and extended version of a paper presented at the 7th ISSA Conference in Amsterdam. It originates in the work that is being carried out within the framework of an interdisciplinary project called: "Chimères nano biotechnologiques et post-humanité: sociologie des controverses sur les mutations du genre humain annoncées par les nanosciences", funded by the National Research Agency (ANR) of France. I would like to thank Marianne Doury and Francis Chateauraynaud for their comments and suggestions as well as for the lively research group within which the ideas presented in this article have grown.

identify the units they are studying and subsequently help them to justify their proposed analyses on some linguistic grounds. The second goal that one may have is to reach a better understanding of what language users do when they argue by studying the way they use language. These two goals are not necessarily self excluding. As a matter of fact, the better the understanding of how language users use language when they argue, the more useful the tools for the identification of the units of argumentative analysis based on these linguistic observations can be.

In this paper, I seek to propose a systematic way of taking into account the linguistic realisation of argumentative discourse, one that can prove useful for the search and identification of argumentative moves and other aspects of argumentative discourse through the use of corpus tools. The discussion is based on some preliminary results and observations from an ongoing study of a large corpus of texts (in French) on the controversies surrounding the application and development of nanotechnology. Given the large number of texts and the different sources from where these texts come, a software is used that allows a semi-automatic treatment of the data. To this endeavour, words and expressions appearing on the surface of texts that can point to the argumentative aspects of discourse in which we are interested can be highly useful. At the same time, this endeavour gives the opportunity for a theoretical discussion concerning argumentative markers, as a preliminary step to the identification, description and classification of various linguistic elements that may represent one or another type of marker. It is to this latter point, that is the theoretical preliminaries for a systematic account of argumentative markers, that I focus on in this paper. Working towards refining the categories and the tools used by a software for the argumentative analysis of text corpora is a unique opportunity to ponder on the theoretical categories and concepts that one needs to have recourse to when analysing argumentative discourse.

I first discuss three main approaches in argumentation studies that can provide useful insights to the study of argumentative markers. Then, I briefly present the project within which the interest in argumentative markers has arisen, and the software that is used for the analysis. In the final section, I present a working definition of argumentative markers and discuss its main elements with the use of examples taken from a part of the corpus. In addition, I present a first draft of a typology of argumentative markers that can be of use in the search for argumentative moves and other argumentative aspects in a large corpus of texts.

2. From "connectives" to "operators" to "indicators"

In the argumentation studies literature, one can identify three main approaches that provide a fruitful and rich background against which one can try to describe argumentative markers and the role they play for the analyst and/or the language users.²

² Outside the field of argumentation studies, connectives and/or discourse markers have been studied in detail from a variety of theoretical approaches and with varying theoretical and practical interests. For an overview, see the volume edited by Fischer (2006). The three approaches presented here fall within the field of argumentation studies and share an interest in providing a more general theoretical frame, within which the study of independent linguistic elements can be subsumed, something which I consider a necessary step before studying each element separately.

These are the so-called Geneva School animated by Eddy Roulet among others, the theory of Argumentation within Language developed by Jean-Claude Anscombre and Oswald Ducrot, and finally the pragma-dialectical approach to the study of argumentation developed by Frans van Eemeren and Rob Grootendorst.

2.1 The Geneva School on "pragmatic connectives"

In the 80's, the Geneva School, with Eddy Roulet, Antoine Auchlin, Jacques Moeschler among its members, produced a significant amount of studies on the subject of markers and connectives (about French language) in their attempt to describe the means by which various relationships between acts can be made explicit in discourse. In a comprehensive study (Roulet et al. 1985), the authors distinguish three main types of markers/connectives, which correspond to the three levels of units that compose the structure of discourse, according to the Geneva School's approach, namely exchanges, moves and acts. These are: a) markers of the organisation of conversation, the use of which guarantees the continuous development of discourse while it provides indications about the actual state of its structure; b) markers of illocutionary function, that concern the relations between acts,³ and c) markers of interactive function. Leaving the first class of markers aside, Moeschler and Roulet refer collectively to the other two classes as "pragmatic connectives" and define them as follows:

A pragmatic connective is any lexical item of a particular natural language which connects two (or more) propositions realised in utterances, in a non-truth-functional manner. (Moeschler 1989, p.323)

The relationship between the constituents which form a discourse at different levels may be indicated by markers of illocutionary or interactive function which we call 'pragmatic connectives' since they serve to articulate discourse units. (Roulet 1984, p.32)

Within the group of interactive markers, the following three sub-groups are distinguished: a) those that mark the relationship between the arguments and the master act. These can be further divided into those markers that appear in the subordinated act ("connecteurs argumentatifs"), such as: *car, parce que, en effet, du fait que*, and those that appear in the master act ("connecteurs consécutifs"), such as: *donc, par conséquent, aussi, ainsi, alors*. b) Those that mark the relationship between the counter-arguments and the master act ("connecteurs contre-argumentatifs"): *bien que, mais, quand même, alors que, malgré que, cependant, néanmoins, pourtant*. c) Those that mark a certain reformulation /re-evaluation of the acts that precede ("connecteurs réévaluatifs"), which are distinguished between those that have a recapitulating function ("récapitulatifs"), such as: *bref, en somme, au fond, décidemment, en fin de compte, finalement, de toute façon*, and those that have a corrective function ("correctives"), such as: *en fait, en tout cas, enfin*.

³ A sub-group in this class are the so-called "meta-discursive markers", which include expressions that are used to signal to the interlocutor the illocutionary function of the utterance that follows (or precedes) them, such as "I have a question to ask", "Let me tell you something", "this is not a critique", "I was just asking".

The studies carried by the members of the Geneva School focus on real discourse and provide a detailed analysis of a varied number of elements that indeed go beyond the study of the grammatical class of conjunctions. However, their interest is in the relations that these elements mark between the various units of discourse. Such a view implies that the argumentativity of discourse lies (exclusively) in the coherence relations and the structural organisation of various discourse units. While this may be true to a certain extent, it risks neglecting those cases where the standpoint-argument relation, to take one example, is not explicitly marked, as well as cases in which the argumentative nature of a piece of discourse is not revealed by a standpoint-argument relation but rather by the use of a figure of speech or by the use of a strategy that accompanies the argumentative move performed (see more below). Moreover, Roulet et al. (1985, p.114) consider as markers only those elements that are part of the constituents of the phrase, ignoring thus independent phrases that can be used to signal the function of a preceding or following sentence in the discourse.

2.2 "Operators" in the Argumentation within Language Theory

Even though the theory of argumentation developed by Anscombe and Ducrot (1983) has been a source of inspiration for the study of pragmatic connectives carried out by the members of the Geneva School, I discuss it in this order because I believe that it preserves an interest in the semantics of the linguistic elements that may function as argumentative markers, which lacks in the study of pragmatic connectives by the Geneva School. Ducrot's study of the "discourse words" ("les mots du discours") emanates from his interest in describing the instructions that such words as "mais [but]", "d'ailleurs [moreover]", "justement [exactly]", "donc [so/therefore]", among others, give to the interlocutor for recovering the argumentative orientation of the utterance in which these words appear and thereby for understanding the meaning of that utterance (Ducrot et al. 1980).

To my knowledge, there is no general classification of connectives proposed in the works of Ducrot except for studies of individual words or phrases. Nevertheless, two distinctions have been proposed that can provide useful insights in the search for argumentative markers. The first is between "argumentative connectors" and "argumentative operators" (Ducrot 1983). Argumentative connectors serve as articulators of two or more propositions. They ascribe to each proposition a certain argumentative function, as is the case with "donc". The proposition introduced by this conjunction functions as the conclusion, while the proposition that precedes it has the function of argument in support of this conclusion. Argumentative operators, on the other hand, which are words like "Presque" or expressions like "ne...que", function within the boundaries of a proposition, changing the argumentative potential of that proposition.

The second distinction proposed by Ducrot is between "realising" and "de-realising" modifiers (Ducrot 1995). This distinction concerns modifiers (like adverbs and adjectives) that can accompany the predicates of a phrase (a verb or a noun) and result in changing the argumentative force of that predicate: the "realising" ones by increasing that force, and the "de-realising" ones by decreasing it. In the following two sentences, "difficult" is a realising modifier for the noun "problem", while "easy" is a de-realising one for the same noun:

There is a problem, and it is even difficult. [RM]

There is a problem, but it is easy. [DM]

Although the original focus of Ducrot and his colleagues has been mainly on functional words such as conjunctions and particles and not so much on words and expressions with full lexical meaning, the insights that can be gained from their studies can be useful in considering evaluative words, for example, as playing the role of markers of argumentative aspects that are pertinent to the study of controversies. Along these lines, the use of nouns like "revolution" to refer to "nanotechnology" and verbs like "enhance" and "improve" to refer to the applications of these technologies can be considered as markers of a positive representation of the object of controversy, to be found in the discourse of those favouring its development rather than in the discourse of those supporting a moratorium on its development.

2.3 The pragma-dialectical approach to "argumentative indicators"

Given the definition of argumentation as a social, rational and dialectical activity (van Eemeren and Grootendorst 1992, 2004), the interest of the pragma-dialectical approach in the linguistic surface of argumentative discourse goes well beyond the study of conjunctions and discourse connectives. As van Eemeren, Houtlosser and Snoeck Henkemans (2007, p.2) state:

we do not consider argumentative indicators to be merely words and expressions that directly refer to argumentation, but consider argumentative indicators to include all words and expressions that refer to any of the moves that are significant to the argumentative process.

The authors take the ideal model of a critical discussion as their starting point and seek to identify the elements of actual discourse that are pertinent to the units of analysis proposed in the pragma-dialectical model. They thus identify lexical items that can contribute to the identification of argumentative moves that are to be carried out at all four stages of the ideal model of a critical discussion, such as indicators of standpoints (confrontation stage), indicators of challenge to defend a standpoint or indicators of proposal to accept a proposition as a starting point (opening stage), indicators of argument schemes and of related criticisms (argumentation stage), and indicators of maintaining or withdrawing a standpoint or doubt (concluding stage), to name a few.

An asset of this approach to argumentative indicators, as Kienpointner (2010) rightly observes, is that the authors "do not restrict the notion of "indicator" to one type of expression (e.g. to one word class, for example, nouns or adverbs; or to one level of language, such as morphology)". Another useful insight for the search of argumentative markers that the study by van Eemeren et al. provides is that the reactions of the other party can also be used as indicators of what the argumentative function of the speaker's move is, something which acknowledges the dialogicality of argumentative discourse to the fullest.

Nevertheless, the aspects that are identified by means of the proposed indicators are at times too analytic and too theory-dependent to be pertinent to the (computer-aided) study of actual argumentative discourse. It is not evident, for example, whether the distinction between one-sided and two-sided burden of proof, or the difference

between unrestricted acceptance and acceptance with restrictions of a proposition as a starting point can be linguistically marked. Moreover, a number of the items listed as argumentative indicators rely heavily on the assumption that argumentative discourse is reconstructed in the form of a dialogue, something which is not very helpful for the analyst who also seeks to identify the respective moves in written monological argumentative discourse.⁴ Finally, a number of linguistic elements that may help the analyst identify certain argumentative strategies rather than specific argumentative moves tend to be overlooked by the definition of argumentative markers as "words and expressions that may refer to argumentative moves".⁵

3. The need for argumentative markers

The lists of lexical expressions that can mark argumentative functions as well as argumentative relations between various segments of discourse proposed by argumentation scholars so far have been composed on the basis of the study of a small number of texts and can serve the analyst who is linearly processing a specific text, reading it through from beginning to end. When it comes to the (semi-)automatic processing of a large number of texts, with the aim of identifying those fragments in which an argument is advanced or a certain standpoint is criticised, for example, relying on words such as "therefore" and "but" cannot be the most efficient way. This is because it can at best help one to trace those fragments where an argument is advanced in the sentence preceding "therefore" but it risks missing all those other fragments in which an argument is advanced without a connective such as "therefore" being present.⁶ A systematic list of argumentative markers compiled on the basis of the study of a large corpus of texts and informed by certain theoretical considerations can prove a more useful tool to this endeavour.

In the fields of computer science and artificial intelligence, the modelling of the linguistic surface of discourse is a prerequisite for the efficient automatic processing of natural language. To this direction, attention has been paid to the use of connectives and discourse markers, among other lexical items, that can help researchers propose algorithms on the basis of which the discourse structure of texts can be automatically extracted (see for one such example, Marcu 1997). At the same time, the fields of computer science and artificial intelligence have been paying growing attention to argumentation studies in particular, by applying theories of argument and rhetoric in natural language processing. The presence of connectives explicitising argumentative relations between segments of discourse has thus been exploited in order to provide a diagram of the argument structure of short texts (for an overview of studies that fall within the interdisciplinary field of argumentation and computation, see Reed and Grasso 2007). The interest of computer sciences in the field of argumentation has been

⁴ See, for example, the many indicators in interrogative form that the authors identify, such as "what do you mean exactly?", "isn't it true that..?", "do you agree that..?", etc.

⁵ For instance, one can think of indicators of dissociation that van Rees discusses in her book (van Rees 2009, Chapter 3).

⁶ Taboada (2006), working within the Rhetorical Structure Theory, concludes after examination of the rhetorical relations in two corpora that it is not always the case that these rhetorical relations are indeed marked, and that signalling, when present, is never sufficient to identify one particular relation either.

growing in the last years and it seems to have been benefiting the research carried out in artificial intelligence and natural language processing. Nevertheless, it is hardly the case that the results of the modelling of argumentative discourse proposed by these fields and the tools for automatic treatment of argumentative texts are fruitfully exploited by argumentation scholars back in their own theoretical or empirical studies of argumentative discourse.

Such a need for the exploitation of tools for the treatment of large corpus of texts with the aim of producing an argumentative analysis of it has arisen in the framework of an interdisciplinary project that seeks to provide a sociological analysis of the controversy surrounding the development and application of nanotechnology in France. In the following two sub-sections, I briefly present the project and the software used for the analysis, which have exposed the need for a systematic and empirically plausible list of argumentative markers.

3.1 The *Chimères* project

The research project *Chimères* is carried out by a team of sociologists, anthropologists and argumentation theorists in Paris.⁷ One of the aims of the project is to describe in a systematic way the positions that the various parties assume and the arguments they bring forward as well as the criticisms exchanged in the controversy surrounding the challenges, risks and promises related to the development and applications of nano and biotechnologies.⁸ Questions that are raised in the *Chimères* project include: How are the boundaries between legitimate expectations and irrational projects constructed and discussed upon by the stakeholders? How do those expressing their opinions in this controversy elaborate on their argumentation and react to the arguments advanced by the other participants? How do arguments come about, are transformed, receive consensus and eventually die out? The interest of the *Chimères* project lies in understanding how controversies arise in the public sphere and how they develop over time, constructing and transforming the public's common sense.⁹

For this project, a large number of texts is collected from different sources (news articles, scientific articles, media reports, official reports, interviews, etc.), mainly from the Internet, in which the analyst is invited to look for the arguments and the positions advanced or the criticisms that are put forward. As a result, the texts collected cannot be reconstructed straightforwardly as representing positions in one main discussion over

⁷ The three partners of the project are the Groupe de Sociologie Pragmatique et Réflexive (GSPR) of the Ecole des Hautes Etudes en Sciences Sociales, the Laboratoire Sport et Culture of the University of Paris Ouest Nanterre La Défense, and the Laboratoire Communication et Politique (LCP) of the CNRS.

⁸ Foresight Institute (<http://www.foresight.org/>), the first organisation founded in 1989 with the aim to educate society about the benefits and risks of nanotechnology, describes it as follows: "Nanotechnology is a group of emerging technologies in which the structure of matter is controlled at the nanometer scale, the scale of small numbers of atoms, to produce novel materials and devices that have useful and unique properties. Some of these technologies impose only limited control of structure at the nanometer scale, but they are already in use, producing useful products. They are also being further developed to produce even more sophisticated products in which the structure of matter is more precisely controlled".

⁹ For a presentation in English of the pragmatic and reflexive approach to sociology within which public controversies are studied, see Chateauraynaud (2009).

one specific difference of opinion. Moreover, given their different types, it cannot be guaranteed that these texts are argumentative from beginning to end. Finally, the questions that the particular project seeks to answer require one to focus more on the content of the discourse and of the arguments exchanged in it rather than on the formal and structural relations that can be identified between these arguments. At the same time, however, the need of studying a large number of texts produced over a certain period of time in order to answer these questions calls for an automatic or semi-automatic treatment of the corpus, treatment which resides mainly on the linguistic surface of the texts under study.

3.2 *Prospéro*: a software for socio-informatics

An integral part of the project is the use of a software called *Prospéro*. The name is an acronym of "PROgrammes de Sociologie Pragmatique Expérimentale et Réflexive sur Ordinateur". The software is being developed since 1995 by the sociologist Francis Chateauraynaud and the informatics engineer Jean-Pierre Charriau to respond to the demand for computer-aided analysis of large numbers of written texts of public debates and controversies (Chateauraynaud 2003). Angermüller (2005), in an overview of the various approaches in contemporary French sociology, writes with respect to *Prospéro*:

Prospéro is a software utility that processes "complex files" and generates conceptual dictionaries. This software produces intermediate layers of codes and categories between the level of the text and the sociological model. The research procedure can be called "qualitative" in that the human interpretive act plays a crucial role in the constitution and codification of the corpus. .. The codification takes place in close interaction with the computer which stores and accumulates the coding routines so as to codify new texts of the corpus more or less automatically. Since the researcher is constantly forced to develop new categories and to confirm or modify older ones the research design is more flexible than much of the software coming out of the tradition of automated discourse analysis established by Pêcheux (1969).

The software serves as a search engine providing the analyst with a variety of tools that he can use in order to access the texts collected in the corpus under study. The various tools proposed by *Prospéro* have been conceived of in such a way that they allow a treatment of the corpus that takes into account jointly the content (what is said), the mode (the way of saying it) and the context in which it is said (Chateauraynaud 2003). Seven levels of representation and description are proposed which allow for different entrance points into the corpus. These are: 1) the representation of authors and dates, which helps contextualise the information regarding the texts under study; 2) the representation of themes that takes into consideration the entities, the list of names and the list of actors that are present or discussed upon in the corpus; 3) the representation of thematic networks and the qualifications applied to themes and actors; 4) the representation of categories (see following paragraph) and collections; 5) the representation of the arguments exchanged by the actors; 6) the representation of the

modalities, markers and connectives used in the texts; 7) and the representation along the time axis.¹⁰

In addition, the software can represent the content of the texts on the basis of seven categories, namely: entities (which correspond roughly to the grammatical class of nouns and noun phrases), qualities (which correspond roughly to adjectives and adjectival phrases), processes (which correspond roughly to verbs), markers (which correspond roughly to adverbs), auxiliary words (which correspond roughly to the classes of articles, pronouns and conjuncts), numbers, and finally undefined elements (which include the elements that cannot be recognised automatically as belonging to any of the above categories, and which the analyst should manually assign to one of them).

A software such as Prospéro invites the analyst to take a reflexive stand towards the data under analysis (Chateauraynaud 2003). Contrary to other software for computer-aided text analysis, Prospéro does not provide ready-made and fixed categories with a finite list of representatives of each. The dictionaries that include lists of the items representing each category can be modified at any time and other dictionaries developed by other users can be incorporated in order to provide a different entrance point into the same corpus of texts. As a result, the analyst is constantly invited to reconsider the proposed categorisations as well as the lists of the lexical items that may represent them. In addition, it should be noted that the software recognises the linguistic surface of the various texts without however coding these elements grammatically or morphologically.¹¹ It thus becomes a challenge for the argumentation theorist to find ways in which he could search for those passages of the corpus that are pertinent for him, based on the linguistic realisation and configuration these may have. It is to this direction that the use of argumentative markers can prove useful.

4. Towards a working definition of argumentative markers

The quest for argumentative markers can benefit to a great extent from the issues treated in the numerous studies that have been devoted to words and lexical expressions known as discourse markers (for an overview of the various approaches and representative literature on the subject, see Fischer 2006).¹² Despite the varying views held on the matter, discourse markers can be broadly defined as those words or expressions that are used to indicate various features of discourse structure.

Among the most famous representatives of discourse markers are words and phrases such as: "you know", "I mean", "actually", "but", "and", "so". Fraser (1990, 1996) in a series of articles takes discourse markers to be only one of the linguistic units that encode the non-propositional part of sentence meaning, the different aspects of which can be signalled by what he calls "pragmatic markers" (Fraser 1996). These

¹⁰ See the paper on "désormais [from now on]" by Chateauraynaud and Doury (2011).

¹¹ It should be emphasized that Prospéro is not a software developed by linguists that seeks to provide an accurate description of a certain linguistic phenomenon based on a corpus search but a software developed by sociologists who are interested in describing social phenomena, such as controversies in the fields of science and technology, by paying close attention to the linguistic properties of the discourse that social actors produce. As a result, the texts treated with this software are not linguistically tagged.

¹² For studies on French discourse markers, see the works by Paillard (2010), Charolles (2005) and Rossari (2000), and the literature therein.

include: "basic markers", lexical or structural elements (such as the declarative mood and performative verbs) that signal the type of message (illocutionary force) the speaker intends to convey; "commentary pragmatic markers", lexical expressions that add a comment on some aspect of the propositional content; and "parallel markers" that signal an entire message in addition to the basic message of the sentence. The fourth type of markers of non-propositional meaning (that is, of pragmatic markers) are "discourse markers", which Fraser (1999, p.938) defines thus:

Whether they are called discourse markers, discourse connectives, discourse operators, or cue phrases (I shall use the term 'discourse marker'), the expressions under discussion share one common property: they impose a relationship between some aspect of the discourse segment they are a part of, call it S2, and some aspect of a prior discourse segment, call it S1. In other words, they function like a two-place relation, one argument lying in the segment they introduce the other lying in the prior discourse. I represent the canonical form as <S1. DM+S2>.

Among the questions that scholars studying pragmatic and/or discourse markers ask are those concerning the nature of these markers (do they constitute a semantic, syntactic or functional class or no class at all?), their many different functions and the context sensitivity of their meanings (Fischer 2006). Discourse markers have been mainly studied in terms of their potential to frame and manage conversation and oral interactions, and as mechanisms of creating or enhancing cohesion in written discourse. Though it is granted that oral discourse differs from written text, and that there may be different words and expressions that fulfil the function of a pragmatic marker in each of these modes of communication, for the purposes of this article, I do not intend to go into the details of these differences. In fact, I am primarily interested in markers of argumentative aspects of written discourse, but I take the conceptual distinctions proposed to equally hold for the argumentative markers of spoken discourse.

A point that needs to be raised with respect to the light that Fraser's definition of discourse markers can shed on the quest for argumentative markers is that the function of the latter, unlike that of discourse markers, is not exclusively one of connecting or relating segments of discourse. Considering the specificity of the Chimères project and the technical characteristics of the Prospéro software, the argumentative markers that one is interested in identifying should be those words and expressions that can be expected to lead the analyst to fragments of the corpus in which a certain argumentative activity is to be traced. Such markers are to be found not only among the lexical expressions that are used to relate two segments of discourse but also among lexical expressions that signal a certain argumentative function of a segment of discourse, which precedes or follows them. Starting from a formula such as the following: '*Marker (M) marks a unit X as Y*', two main questions can be posed: 'What can an argumentative marker be like?' and 'What does an argumentative marker mark?'. I address these questions in the following two sub-sections. In the third sub-section, I provide a working definition of argumentative markers and a tentative typology illustrated by some examples from the corpus.

4.1 What can an argumentative marker be like?

Argumentative markers do not constitute a finite class and are not to be identified with one specific grammatical class either. Any lexical item, single or complex, can be an argumentative marker.¹³ Such lexical items can be a single word (see examples 1-2), a phrase (see 3-4) or a whole sentence (see example 5):¹⁴

(1) Les nanotechnologies sont *assurément* au cœur de la Convergence
 Technologique actuelle. (AFT)
 [Nanotechnologies are *undoubtedly* in the heart of the actual Technological
 Convergence]

(2) *Paradoxalement*, on connaît très peu l'impact sur la santé et l'environnement des
 nanomatériaux utilisés pour mettre au point les nanomédicaments. (ETC)
 [*Paradoxically*, we know very little about the impact that the nanomaterials used in
 nanomedicines may have on health and environment]

(3) Que ce soit dans l'industrie pharmaceutique, l'agroalimentaire, le nucléaire ou
 l'informatique pour ne citer que ceux là, *tout le monde convient* qu'il y a des
 risques et que des mesures ont été prises pour protéger les citoyens en général et
 les salariés qui participent à la production de ces produits et services. (CFE-
 CGC)
 [Be it in the pharmaceutical industry, the food-processing industry, the nuclear or the
 informatics industry, to mention only a few, *everyone agrees* that there are risks and
 measures have been taken to protect the citizens in general and the employees who are
 involved in the production of these products and services]

(4) Le désir de réaliser des profits et de gagner une certaine compétition scientifico-
 économique tue, chez les scientifiques, les industriels et les élus, toute
 conscience morale sans laquelle, *comme chacun sait*, il n'y a « point de science
 », mais « ruine de l'âme » (Rabelais, 1550)! (SEPANSO)
 [The desire to make profit and to win the competition at the scientific and financial
 levels kills any moral conscience that scientists, industrialists and politicians may have,
 without which, *as everyone knows*, there is "no science" only "ruins of the soul"
 (Rabelais, 1550)!]

(5) Que les nanotechnologies tendent à modifier au fond la Nature, l'Humain et
 l'Humanité nous *est montré par de multiples exemples*. (AFT)
 [That nanotechnologies tend to deeply modify Nature, Humans and Humanity *is shown*
to us by a multitude of examples]

It may also be the case that a certain discursive configuration functions as an
 argumentative marker. This is a combination of elements that appear in a certain order

¹³ Non-lexicalised items such as prosodic features as well as gestures could eventually be
 considered as argumentative markers. However, given the lack of detailed studies in this area
 and the difficulty of coding such features for a software-aided analysis, I am not considering
 them here. Similarly, grammatical aspects such as tense, mood or number may also be
 considered as candidates for argumentative markers, but they cannot be coded separately from
 their phonological realisation, something which renders their use as markers impossible, given
 the technical characteristics of the particular software at hand.

¹⁴ The examples are taken from a part of the corpus that consists of the leaflets that various
 groups engaged in the public deliberation on the issue of the development of nanotechnology in
 France have published between 2009 and 2010. The abbreviations in parenthesis refer to the
 names of these groups. The translation in English is the author's.

over a number of utterances (or within the same utterance), as the following example illustrates:

- (6) *Il est compréhensible de mener des débats thématiques là où sont les experts de la question et de les inviter à intervenir. Néanmoins, est-ce que ces experts ne risquent pas de défendre le domaine qui les rémunère pour leurs recherches?* (FSC)

[*It is understandable to carry out thematic debates on topics on which one can invite the ones who are specialists. Nevertheless, isn't there a risk that these experts are going to defend the field that finances their research?*]

In the case of single words or phrases functioning as an argumentative marker, a further distinction can be made between those that are part of the main constituents of the phrase (playing the syntactic role of the verb, the subject or object, for example) and are thus integrated into the propositional content of the sentence, and those that are semantically and syntactically detached. The latter ones are more flexible and can occupy sentence initial or final position or even have a parenthetical position. See, for instance, examples 1 and 3 where the marker is integrated in the propositional content, compared to examples 2 and 4 where the marker is semantically and syntactically detached. The element that the marker targets ('unit X' in the formula) may be a constituent of the sentence (as in example 1), a whole sentence (as in examples 2-4) or a larger unit of discourse. In the first two cases, the argumentative marker functions at a local level, within the boundaries of a sentence or between adjacent sentences. In the case where the marker targets a larger segment of discourse or sentences further apart, it can be said to function at a global level. This is the case in example 5, which is a sentence that appears at the beginning of a paragraph. Given its content and position, it can be said to mark the text that follows as being the justification of the claim made in that sentence.¹⁵

4.2 What does an argumentative marker mark?

In the literature on discourse particles and discourse markers, as Fischer (2006) discusses it, the question is raised whether the lexical items under study indeed *mark* a certain relation between segments of discourse (or a function of these), or they actually *create* such a relation, or the conditions for the proper interpretation of it. Fraser (2006, p. 195) maintains that discourse markers do not create the relationship between two segments of discourse but rather help to make clear what that relationship is. He takes the following sequence, where the relation between the two sentences does not become explicit:

The flight takes 5 hours. There's a stop-over in Paris.

It is left to the context and the processing of the one who reads these two sentences to calculate what the relationship is. On the contrary, had the second sentence been

¹⁵ The case of such "global argumentative markers" is similar to what the authors of the Geneva School refer to as "meta-discursive markers" (see note above) and to what Fraser (1996) labels as "parallel markers".

introduced by a discourse marker such as "so" or "after all", the relationship between the two sentences would have been made explicit.

Following Fraser, I take an argumentative marker to be a lexical item whose presence in a given utterance marks that utterance or the one preceding/following it, or a larger piece of discourse as having a certain argumentative function (see the 'as Y' element in the formula and 4.3 below). Whether the actual lexical expression that functions as an argumentative marker happens to serve as a linking element between two segments of discourse or as a prefacing, parenthetical or after-thought comment plays no role in its identification as an argumentative marker for our purposes.¹⁶

In this view, an argumentative marker does not necessarily connect two elements/segments of discourse. An item that marks a certain piece of discourse as the expression of a standpoint that needs to be supported by arguments, for example, may either be one that makes explicit the relation that this piece of discourse has with another piece that precedes (or follows) it, or one that signals the function of this piece of discourse without necessarily indicating a relation between two units. Compare the two examples below:

- (7) En outre, certains nanomatériaux chimiquement « inertes » constituent du fait, notamment de leur caractère non soluble et biopersistant, un risque pour la santé humaine et l'environnement. Il est *donc* indispensable d'adapter le règlement REACH à cette donnée. (CFTC)

[Moreover, certain nano-materials that are chemically "inert" constitute already, mainly because of their insoluble and bio-persistent properties, a risk for human health and the environment. It is *therefore* indispensable to adapt the REACH regulation to these facts]

- (8) *Il nous paraît important* qu'un débat public soit mené sur ce sujet, et qu'y soit envisagé une approche plus large de l'information des consommateurs en matière de risque, ne se limitant pas aux nanotechnologies. (Sciences et Démocratie)

[*It seems to us important* that a public deliberation take place on this subject and that a more encompassing approach be sought that informs the consumers about the risks, without being limited to nanotechnology]

In (7) the standpoint is to be identified thanks to the conjunction "donc [therefore]" that relates the sentence in which it appears with what precedes it, marking the former as a consequence/result of the latter. In (8), however, the standpoint is identified thanks to the impersonal construction "it seems to us important that..", which signals that the utterance expresses the speaker's point of view. In the first case, the argumentative marker relates two units to each other and has a 'connecting' function, while in the second case it refers to a unit X (that follows it, in this case¹⁷) and has what I would call

¹⁶ It is worth noting that Fischer (2006, p. 7) observes that even in the literature on discourse markers and particles (which tend to be defined as elements marking relationships and discourse structure) there is reluctance by certain scholars to accept that it is relationships that these elements create or mark. These authors remind that stance marking or hesitation markers and interjections, which may function as discourse markers, do not necessarily involve relationships between units.

¹⁷ An utterance such as "And that is what I think about it" can be used to mark the discourse that precedes it as being the speaker's standpoint.

a 'commenting' function. The two functions, however, may at times be confused, as is the case with certain stance adverbs like "unfortunately" or "actually", for example, which can also have a linking function. This is also the case with sentence initial noun phrases in apposition, as the following example illustrates:

(9) *Annonciatrices de progrès considérables selon les uns, sources de risques imprévisibles pour les autres*, les nanotechnologies restent pour la plupart des citoyens mal connues. (CLCV)

[*Announcing a considerable progress according to the ones, sources of unforeseeable risks for the others*, nanotechnologies remain for the majority of the citizens unknown]

The phrases "announcing a considerable progress" and "sources of unforeseeable risks" in the above example refer to nanotechnologies and add a qualifying comment. At the same time, the content of these phrases comes into a contrastive relation with the verb of the sentence, which could be rendered explicit by the use of a contrastive connective like "nevertheless" following immediately after the verb "remain".

The decision to consider the connecting function of markers as only one of the possible functions and not as essential for the definition of argumentative markers is driven not only by theoretical considerations but also by methodological ones. As Charaudeau (1992, p.782) rightly observes:

Argumentation cannot be reduced to the identification of a series of phrases or propositions that are linked together by logical connectors. [my translation]¹⁸

First of all, relations between phrases or propositions are not always explicitly marked by the use of connecting words, and when they are, these relations are not necessarily argumentative.¹⁹ Second, connecting words are not the only means by which such relations can be made explicit on the linguistic surface of discourse. Use of words with full lexical meaning, such as verbs like "cause", "lead", and nouns like "problem", "consequence" or prepositional phrases introduced by "due to", "because of", "despite of", among others, can also mark relations of cause-consequence and opposition, for example.²⁰ Focusing exclusively on connectives and conjunctions when searching for argumentative fragments in a large corpus of texts with the use of the Prospéro software would risk giving a faulty representation of argumentative activity in that corpus. Moreover, as suggested earlier, for the purposes of the Chimères project (see above) one is interested not only in identifying argumentative moves that the parties contribute in the discussion concerning nanotechnology but also, and maybe more importantly, one is interested in identifying the ways in which the actors seek to reinforce the acceptability of their positions and to weaken the plausibility of the positions of their adversaries. That is, one is interested in identifying markers of argumentative moves as well as markers of argumentative strategies. One would expect that the latter are marked by more complex linguistic elements than merely connecting words.

¹⁸ « L'argumentation ne peut pas se réduire au repérage d'une suite de phrases ou de propositions reliées par des connecteurs logiques ».

¹⁹ See also note 6 above.

²⁰ It is worth noting that van Eemeren et al. (2007) indeed consider such linguistic elements, in particular when presenting indicators of argument schemes (Chapter 6).

4.3 Which typology for argumentative markers?

I now turn to the question about the moves and strategies that one may be interested in tracing by making use of argumentative markers in a corpus of texts, such as the one on the controversy regarding the development and applications of nanotechnology. To answer this question, one should strike a balance between the conceptual categories proposed in existing argumentation models and the specific practical and analytic goals set by a project such as the Chimères project.

To this direction, the study by van Eemeren et al. (2007) may provide a good starting point. From the great number of argumentative moves that the authors identify, following the conceptual distinctions of the various tasks accomplished at the stages of the ideal model of a critical discussion, a selection needs to be made of the moves that seem most pertinent. These can be: the positions assumed, the doubt/criticism advanced, the representation of the common ground, the representation of the difference of opinion, and the types of arguments used. With respect to the latter, a further elaboration of markers that can signal the use of the various sub-types that go beyond the three main argument schemes distinguished within Pragma-dialectics will be required. For this purpose, markers of various types of arguments need to be identified, for both the constructive and their fallacious counterparts.

In addition, markers need to be identified which do not fall under the lists of "argumentative indicators" presented by van Eemeren et al., namely argumentative markers of the use of rhetorical figures and strategies, such as dissociation, metonymy, and others to be discovered in the corpus under study. Finally, special attention should be paid to markers of counter-arguments and strategies of refutation. Since counter-arguments allude to an existing or potential criticism (as well as to old standpoints that may have already been defended and which can further be used to counter new standpoints or arguments), they can provide valuable clues for the circulation and the trajectory of arguments among the various stakeholders in a controversy. For the same reason, attention to the way the authors judge the discourse of their interlocutors should also be paid.

Three main groups of argumentative markers can thus be distinguished on the basis of a purely functional and utilitarian criterion, namely whether they can help (in the most efficient way possible) to trace argumentative moves and other aspects of argumentative discourse that are pertinent in an argumentative analysis of a corpus of texts. These are a) markers of argumentative moves, b) markers of types of arguments, and c) markers of argumentative strategies. For each one of these main groups, further sub-groups can be distinguished.

Within the group of markers of argumentative moves, one can further distinguish markers of a standpoint (further sub-divided into markers of advancing a descriptive, an evaluative, or a prescriptive standpoint), markers of advancing an argument²¹, markers of expressing doubt (towards a standpoint or an argument), and

²¹ The expression "est montré par de multiples exemples" in example (5) above or an expression such as "et ceci pour plusieurs raisons" can serve as markers of advancing an argument, just as the connectives "car" and "puisque" do.

markers of common ground.²² To give one example, connectives such as "donec [therefore]" and "car [because]" can help identify prospectively (in the case of "donec") and retrospectively (in the case of "car") a unit of discourse that expresses the speaker's standpoint. While such words can be quite unambiguous markers of an argumentative move, they may not necessarily come so often in naturally occurring discourse. Besides, other lexical expressions, such as "je considère comme+adjective de", in the following example, can help us trace a standpoint and, what is more, signal that it is an evaluative type of standpoint:

(10) *Je considère comme irresponsable de laisser commercialiser des nano-produits à usage alimentaire ou cosmétique sans étiquetage.* (FNE)
 [I find it irresponsible to allow the commercialisation of nanoproducts for use in the food and cosmetics industry without labelling]

In the group of markers of types of arguments, it is of importance to have as nuanced as possible a view of the types of arguments employed by the language users, arguing in favour of their views or countering those of others on the matter of the development and application of nanotechnology. For this purpose, it is useful to seek for lexical expressions and discursive configurations that more likely than not accompany one type of argument rather than another.²³ For a similar reason, it is of interest to identify potential argumentative markers also for types of arguments that are traditionally classified as fallacies, such as the slippery slope, the ad hominem and the ad verecundiam fallacies.²⁴ In the following excerpt, the expression "ouvrir des perspectives" marks the argument advanced as being an argument from consequences:

(11) Comme la langue d'Esope ou plus récemment comme l'énergie nucléaire, les nanotechnologies peuvent être la meilleure ou la pire des choses, selon les précautions que l'on prendra pour les manier. La meilleure des choses, car elles *ouvrent des perspectives* immenses dans des secteurs d'actualité : les économies d'énergie : des nanomatériaux peuvent être utilisés pour le transport d'électricité et permettre des gains de l'ordre de 20%. (AFOC)
 [As is the case with Aesop's language or more recently as is the case with nuclear energy, nanotechnologies can be the best or the worst of things, depending on the precautions that one will take in order to control them. The best of things, because they *open up* immense *prospects* in sectors of everyday life: the energy economy: nanomaterials can be used for the transportation of electricity allowing profits at the rate of 20%]

²² The expressions "tout le monde convient qu(e)" and "comme chacun sait" in examples (3) and (4) respectively can be quite an unambiguous marker for the common ground that the speaker takes to be shared.

²³ The work of Doury (2004, 2005, 2009) on the subject of lexical expressions accompanying various types of arguments and of the meta-comments that arguers make regarding the argumentative moves of their interlocutors is of great relevance here.

²⁴ It remains to be verified by an empirical study on a corpus of texts whether the theoretical difference between an "appeal to authority" and an "argument ad verecundiam" can also be marked at the level of the linguistic realization of these arguments.

It should be noted, however, that there is nothing intrinsic to the use of the expression "ouvrir des perspectives", or of the related expression "ouvrir la voie", that guarantees that the segment of discourse in which it appears is one that functions as an argument in support of a standpoint. It is therefore not an unambiguous argumentative marker since it may also constitute the propositional content of a standpoint that requires to be justified. In the above example, however, this is not the case because the sentence in which this lexical expression appears is introduced by the connective "car". Having said that, one should also note that the mere presence of a connective such as "car" can by no means signal the *type* of relationship between the standpoint and the argument in the specific fragment.

As far as the markers of argumentative strategies are concerned, their usefulness lies in helping to identify strategies that arguers employ either in the realization of their argumentative moves or in addition to these moves, as a means to enhance or diminish the effects of such moves (or of those of the other party) in the discussion.²⁵ In this view, lexical expressions and discursive configurations that mark concession,²⁶ refutation, reformulation and dissociation, to name but a few strategies, are of interest here. The search of the corpus for the configuration "ce n'est pas X ... mais Y", for example, could help us trace the following interesting example of dissociation:

- (12) Il n'existe pas encore d'accord entre chercheurs sur une nomenclature universellement reconnue pour l'identification des nanoparticules. *Ce n'est pas un problème* d'incertitude sur ce qu'est une nanoparticule (toute particule dont au moins deux des trois dimensions sont nanométriques, entre le nanomètre et la centaine de nanomètres) *mais une question de convention*, qui pourrait servir notamment dans le cadre de la réglementation des produits mis sur le marché. (Académie des Technologies)

[There is still no agreement among researchers on a universally recognized nomenclature for the identification of nanoparticles. *This is not a problem* of uncertainty regarding the nature of a nanoparticle (every particle with at least two of the three dimensions being nanometric, between one nanometer and one hundred nanometers) *but a matter of convention*, that could be of use in the frame of the regulation of products offered in the market, for example.]

In the above excerpt, the authors of the Academy of Technology seek to diminish the consequences that one can draw from the fact that there is disagreement regarding the labeling of nanoparticles. They thus introduce a dissociation between this acknowledgement being a problem that proves there is uncertainty even among researchers and a mere question of convention as to the labeling of products containing nanoparticles that circulate in the market. However, when one compares this view with the one advanced by the groups opposed to the development of nanotechnology, one realizes that such dissociation is cancelled.

²⁵ The latter is the case with such lexical expressions as "assurément" and "paradoxalement" in examples (1) and (2) respectively, where their presence does not help to identify the argumentative move as being the advancement of a standpoint, but helps to reinforce the standpoint advanced in the first case, and to contextualize it with respect to what is taken to be the case up to that moment in the second example.

²⁶ In example (6) above, the discursive configuration "Il est compréhensible ... Néanmoins" can be an unambiguous marker for the deployment of a concessive strategy.

In the light of the foregoing discussion, I wish to propose the following working definition of argumentative markers:

An argumentative marker is any single or complex lexical item or any configuration of these, whose presence in a text can be a (more or less reliable) sign that a certain argumentative move is performed or that a certain argumentative strategy is at hand.

Ideally, one would wish to have unequivocal markers of this or the other argumentative move or strategy that one is looking for in a corpus of texts. However, given the polyvalence of the elements that constitute good candidates for such markers and the fact that argumentative analysis pertains to a higher textual level (than a mere syntactic or semantic analysis), it becomes almost impossible to have such unequivocal markers. Moreover, it may be the case that certain markers are successful in leading us to pertinent fragments in a certain corpus of texts but not in another. Van Eemeren et al. (2007, pp.188-189) are also aware of these complications when they write:

In order to reach a justifiable reconstruction, it would be insufficient to rely on just one of the discussed indicators. The first thing to do is establish whether the text or speech is argumentative. Many of the discussed indicators occur in non argumentative language use. (...) Even in case of argumentation, the discussed indicators do not always give a definitive answer taken on their own.

One can imagine that in a large corpus of texts that have not been collected on the criterion of their argumentative nature, the effectiveness of these markers in leading the analyst to fragments that are pertinent for an argumentative analysis can be greatly compromised. Nevertheless, one should keep in mind that these markers are to be used in combination with other categories and filters for the semi-automatic treatment of a corpus and that by no means do they substitute for the considerable human input that such an interpretative endeavour requires.

5. Concluding remarks

In this paper, I have presented some preliminary steps towards an empirically plausible identification and classification of argumentative markers. Such markers are going to be of use to the search, identification and analysis of argumentative fragments in a large corpus of texts produced by a number of different actors concerning the controversies related to the development and applications of nanotechnology in France. In view of the interests of the particular project and the technical specificities of the software that is used for the collection and analysis of these texts, argumentative markers are not identified exclusively with connectives but include lexical expressions and discursive configurations that may appear before or after the segment of discourse that they mark, as well as be integrated into the propositional content of the segment that they mark, or be semantically and syntactically detached from it. Such simple or complex lexical expressions can potentially help identify passages in a corpus of texts where an argumentative move is advanced, a type of argument is used or a certain argumentative strategy is employed.

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