ADVERSATIVE FUNCTION IN SCIENTIFIC ABSTRACTS

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▪ ABSTRACT: The adversative function, despite being frequent in the abstracts of scientific articles, is not described in detail in the literature. In addition to the basic rhetorical structure of academic abstracts (Swales, 1990), signaling, through contrast, either the motivating context of the research or the comparison/discussion of its results, is recurrent in this textual genre, regardless of the area of study. With the objective of describing the use and distribution of operators that establish an adversarial relationship in scientific abstracts, based on the Rhetorical Structure Theory (RST), this research analyzes a corpus composed of 28,121 abstracts, totaling 4,350,415 words. The results indicate that the 'adversative' argument (1) is rhetorically complex; (2) appears in different rhetorical movements of the abstract; and (3) it is used with high frequency, in particular to problematize the phenomenon under investigation as well as to support the presentation of results.

▪ KEYWORDS: Adversative function; RST; abstract; argumentation; corpus.

Introduction

The *adversative function*, in Brazilian Portuguese, can be encoded through different grammatical resources, traditionally[1] known as adversative conjunctions (but/however): *'mas', 'porém', 'contudo', 'entretanto', 'no entanto', 'todavia', 'não obstante'*. These are different ways to express the same function (Freitag; Gonçalves, 2011), given the semantic equivalence between these units, as evidenced in occurrence (I), extracted from an abstract:

⊢➔(porém, contudo, entretanto, no entanto, todavia, não obstante)

(I) Regarding perinatal⏐care, the presence of a companion and skin-to-skin contact were appropriate, **but** breastfeeding in the first hour of life was inadequate. (NETEC Sample, 2023).

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[1] Bechara (2004, p. 321-322) argues that 'mas' is an adversative conjunction par excellence, and the other units are adverbs, which were included in the list of coordinating conjunctions by grammatical tradition due to their semantic equivalence with 'mas'.

The adversative function in this occurrence allows the replacement of the conjunction 'but' *(mas)* with the other operators[1] without affecting the meaning of adversity between the two textual segments. In this study, we seek to investigate this function of adversity in abstracts of scientific articles from different areas of academic knowledge. This is a frequent phenomenon in this textual genre, but it is still little explored. The focus is on textual sequences whose relationship are explicitly marked by one of the operators mentioned. The study is based on the Rhetorical Structure Theory (RST), proposed by Mann and Thompson (1988), with emphasis on multinuclear contrast propositions. There are three questions:

1. What are the ways to express adversity in abstracts?
2. Is there an association between the area of knowledge and the prototypical way of expressing adversity, in order to constitute a style in the area?
3. In the expression of adversity, do adverbial operators have a different syntactic behavior than the conjunction 'but' (mas)?

Rhetorical structure of an abstract

The rhetorical structure of abstracts has already been widely studied (Swales, 1990; Bittencourt, 1995; Holmes, 1997; Araújo, 1999; Rodrigues, 1999; Hendges, 2001; Motta-Roth; Hendges, 2010). In general, the research focuses on the central rhetorical movements of the abstracts, which seek to reflect the 'backbone' that structures the textualization process of a research activity, which is summarized as*: research problem; objective(s); literature review; methodology; results* and *discussions/conclusions*. The academic abstract, therefore, function as a miniature 'snapshot' of this 'backbone', with the purpose of presenting, in its entirety, the basic stages of research, allowing the reader to have a brief and, at the same time, broad view of the entire study. Abstract (1), from the Biology area, is an example of this classic rhetorical structure:

(1)

[a] In the literature, many advantages of teaching based on socio-scientific issues (QSC) have been highlighted. [b] However, recognizing and evaluating content mobilized by students is a challenge in the context of Science-Technology-Society-Environment (CTSA) education, as there are still few studies on learning assessment methods consistent with the objectives of the CTSA education perspective. [c] In this empirical and qualitative work, we aim to analyze the presence of conceptual, procedural and attitudinal dimensions of the content mobilized by students on a Biology degree course, based on an activity involving the analysis of a case that exposed a QSC about bacterial

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[1] The term 'operators' is being used only to refer to the group of cohesive elements under analysis, without any intention of recategorizing these items.

resistance to antibiotics. [d] Data were collected from arguments produced by teams of students, using Toulmin's argumentation model. [e] The students were able to mobilize some of the content foreseen in the teaching planning using the QSC, especially scientific knowledge. Social, ethical and political aspects were not sufficiently mobilized, which points to the need for greater emphasis on them in science education. [f] In this sense, we suggest guidelines for the research and practice of science education based on the concept of critical scientific literacy, which considers the relevance of understanding the relationships between science, technology, society and environment involved in QSC, leading to the achievement of sociopolitical actions.

Source: NETEC Sample (2023)

The abstract (1) presents the following rhetorical movements: (a) *Contextualization*, which points to previous studies on the topic; (b) *Problematization*, marked by 'however' (contudo), which introduces an argument that problematizes the topic by stating that the modes of learning assessment are still little explored; (c) *Objective*, duly signaled by the metadiscursive marker 'aim' (objetivo), which records the researcher's goal of 'analyzing' the topic in a Biology course; (d) *Methodology*, as it indicates the means of data collection, which is a research criterion; (e) *Results*, although non-numeric, refer to the participants' performance (satisfactory/unsatisfactory), presented in two blocks of information; (f) *Conclusions*, in which the researchers suggest guidelines for research and practice in science education based on the results achieved.

This abstract could be schematized, from a textualization point of view, as follows:

(contextualization). (problematization). (objective/aim). (methodology1). (result1). (result2). (conclusion).

The full stop is the main punctuation mark used in the rhetorical organization of academic summaries. Furthermore, the normative parameters of periodicals (number of words, use of syntactic constructions, mandatory rhetorical movements, etc.) also influence the textualization process. There are summaries that do not present 'contextualization' and/or 'problematization' (movements considered optional) or, due to the theme, are restricted to objective and results, objective and methodology, among other variations. The abstract (2), partially reproduced, ignores movements such as contextualization and problematization, in addition to being an example of a textualization process in which rhetorical movements are explicitly marked (very common in the health area as it constitutes the journal's regulations):

(2)

OBJECTIVE To carry out the cross-cultural adaptation of the Prenatal Diagnostic Procedures questionnaire [...].
METHODS The translation and back-translation processes followed internationally accepted criteria. [...]
RESULTS Cronbach's alpha for the total instrument was 0.886 [...]

> **CONCLUSIONS** The Brazilian version is reliable and valid for use in the diagnosis of. [...] Source: NETEC Sample (2023)

Source: NETEC Sample (2023)

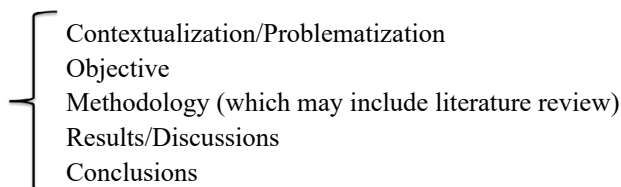The abstract (3), from the Social Service area, presents an even more concise rhetorical structure:

(3)

> [a] The article addresses the topic of disasters and Social Work. [b]Aims to contribute to the inclusion of the topic in the profession's research and intervention agenda. [c] Argues that Social Services has a central role in managing vulnerabilities to disasters, but discusses the issue little. [d]To this end, it presents research results on the theoretical debate and recent production of Social Work in the area of disasters in Brazil.

Source: NETEC Sample (2023)

The blocks of text separated by a full stop allow us to identify at least two rhetorical movements: (I) *objectives*, presented in segments (a), (b), and (c); and (II) *methodology*, in segment (d). Despite the use of the metadiscursive marker 'results' (resultados), it is understood that they (coming from previous research) constitute a criterion adopted to achieve the proposed objectives.

The broader rhetorical structure normally present in the academic abstract can be summarized as:

> Contextualization/Problematization
> Objective
> Methodology (which may include literature review)
> Results/Discussions
> Conclusions

The difference between results and conclusions is not clear. There is a lack of studies that analyze the textual composition of these two rhetorical movements in order to establish clear boundaries. Movements of presenting numerical data (percentage, etc.), followed by their discussion, are typical of *results*; and those that concern a more general evaluation of the study are considered *conclusive*. In the abstract (4), it is possible to visualize these two movements, *results* (blocks d and e) and *conclusion* (block f):

(4)

> [a]This study investigated the use of health services according to social determinants [...]. [b]The sample consisted of 416 diabetics registered in the Family Health Strategy of a city in the Northeast of Brazil. [c]Data analysis included descriptive, bivariate and multivariate statistics [...]. [d]There was significant use of public health services

(80.7%). [(e)]Regular use of the public health service involved individuals with low or medium education (p < 0.001), employed or retired and/or pensioners (p = 0.019), with a high impact of diabetes on quality of life (p = 0.032), and who performed the recommended number of fasting blood glucose tests per year (p < 0.001). [(f)]The use of health services could be explained by differences related to social determinants, health behaviors and the impact of diabetes on users' quality of life.

Source: NETEC Sample (2023)

The textualization of the abstract, therefore, is made up of macrostructure[2] (objective, methodology, etc.) and microstructure, which are smaller textual portions that form the macrostructural rhetorical movement. The adversative function, for example, has 'traces' within two main rhetorical movements: *problematization* and *results/conclusions*. Within these movements, Bittencourt (1995) highlights the occurrence of a set of subfunctions, including: a) counter-arguing previous research; and b) indicating gaps in previous research. Motta-Roth and Hendges (2010, p. 159) also emphasize that there are several textual structures that make up the rhetorical movement of contextualization/ problematization, including adversative structures:

> (a) **Problem definition** – As a teacher/instructor/researcher of x, we must know y, however this question is difficult due to z; This last decade has brought us a significant intensification in the study of x, <u>however no consensus has been reached regarding y</u>; (Motta-Roth; Hendges, 2010, p. 159).

The following diagram allows you to visualize these two levels (macro and microstructural):

Contextualization/Problematization → macro
Adversative function → micro
Objective
Methodology (which may include literature review)
Results/Discussions → macro
Adversative function → micro
Conclusions

At the interface between the macro and microstructural portion, this study focuses on the microtextual structures that perform an adversative function, to describe the

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2 Macrostructure refers solely to the blocks of text that make up a section or even a rhetorical movement, in the terms of Motta-Roth and Hendges (1998, p. 127). Microstructure, on the other hand, refers to the textual sequences that make up these larger blocks of information, namely, the rhetorical movement.

regularity of linguistic items in this context, in light of the Theory of Rhetorical Structure.

About Rhetorical Structure Theory (RST)

RST is a functional theory of text organization, characterizing its structure in terms of relationships between parts of the text (Mann; Thompson, 1988). Its focus is to describe functions and structures that result in effective and understandable texts in human communication (Mann; Thompson, 1987). RST is made up of three main mechanisms: relationships, schemas and structure. For Mann, Matthiessen and Thompson (1989, p.11), relations and spans (textual segments) are the key elements of RST. Textual segments (spans) are understood as a portion of the text that has functional integrity, sometimes equivalent to sentences or, in Chafe's terms (1984), to an informational unit made up of a single jet of language. Relations, in turn, concern specific relationships between non-overlapping textual segments (core and satellite). Relations consist of two fields: the constraints (on the core, the satellite, or both) and the effects (the plausible effect the writer tries to produce by employing the relation). Structure is the network of relationships between textual segments (spans).

In this study, the analysis is restricted to the multinuclear contrast relationship, since the focus is on the description of adversarial constructions in scientific abstracts. Mann, Matthiessen and Thompson (1989, p.57) present the following description for the contrast relationship:

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CONTRAST

Restriction on the nucleus: multinuclear.
Restriction on the combination of cores: no more than two cores: the situations presented in these two cores are (a) understood as the same in many aspects; (b) understood as differentiated in a few aspects; and (c) compared in terms of one or more of these differences.
**Effect:** The reader recognizes the comparability and differences produced by the comparison being made.

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Source: Mann, Matthiessen and Thompson (1989, p. 57)

According to Mann and Thompson (1987), RST recognizes five types of schemes. The contrast scheme, due to its multinuclear nature and restricted to just two portions of the text (just two nuclei), has the following representation:
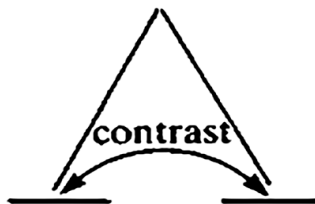
contrast

The arrows point out the relationships between the segments represented by the horizontal lines. The vertical lines signal that the two segments are nuclear. Despite the contrasting name for this relationship, in this research, this label is equivalent to the adversative one, since the semantic nuances of this textual organization will be addressed in this text.

The textual demarcation of the adversative structure

To study this adversarial organization, the first challenge that arises is the demarcation of the textual block in which the adversative function operates through one of the connectors presented previously. As mentioned in the previous section, the adversative relationship (contrast) in RST is restricted to the interaction between only two nuclear textual segments. For RST, the cutting of these textual segments, in dialogue within the text, requires the analyst to judge plausibility (Mann; Matthiessen; Thompson, 1989, p. 18), given that he (the analyst) is aware of the context of text production as well as shares cultural conventions of the interlocutors of the communicative act, even though he is 'barred' from direct access to the producer and receiver of the text. The identification of relationships by the analyst takes place through subjective judgments, however anchored in functional and semantic decisions, which allow capturing the function of each textual segment and pointing out the expected effect of meaning on the receiver/reader. The effect, although presupposed, results from plausible knowledge about the producer, receiver and propositional content (Fuchs; Giering, 2008). Mann, Matthiessen and Thompson (1989, p. 18) explain that, in practice, these judgments are necessarily subjective because they are made exclusively by human beings who communicate based on what they know about their culture, society and language. The authors admit that texts are complex objects, with also complex functional descriptions. Although the textual relationship analyzed here is explicitly marked by a conjunction (or adverbial unit), which effectively indicates a relationship of adversity between two

textual segments, the limit of these segments requires the analyst to judge the intentions of whoever produced the text, in order to identify the textual portions that, in fact, are in dialogue in the structured excerpt with an adversative function.

Freitag et al (2021) argue that structural, subjective, cognitive and social aspects function as important contextual clues for criteria for generalization and reproducibility of research results. In this study, the selection of textual segments is based on the reader/analyst's intuition to ensure that each span has sufficient information to identify the adversity intended by the text producer. Therefore, the limits may vary considering the linguistic elements that, in fact, are in an adverse relationship.

Thus, according to Neves (2000, p. 755), the adversative conjunction (or adversative adverbial unit) marks a relationship of inequality between the coordinated segments, and, due to this characteristic, there is no recursiveness[3] in the construction, which is, therefore, restricted to two textual segments. These segments are of different grammatical natures (from an atomic element - such as a letter - to larger portions of the text – such as paragraph(s)). Diagram 1 outlines the main possible relationships:

Diagram 1 – Argumentative relationship of operators with adversative function
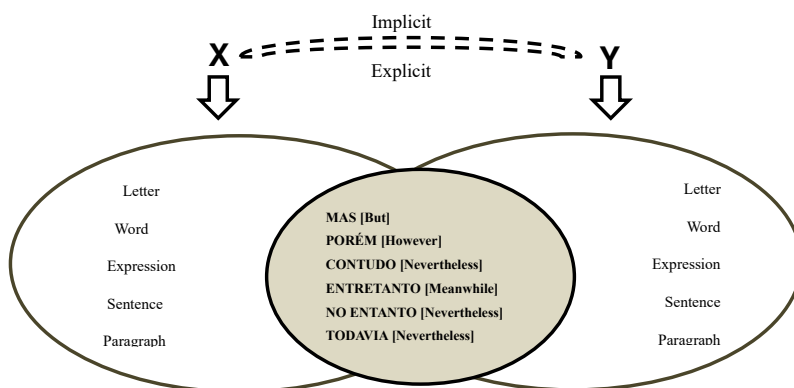
The relationship in diagram 1 is treated as argumental because the operators place two textual segments in 'dialogue' in the text. Adam (2019, p. 146) explains that argumentative speech aims to intervene in the interlocutor's opinions and attitudes, therefore having an illocutionary bias. The argumentative unit is made up of a chain of textual segments. In this sense, an isolated textual segment, *a priori*, does not constitute an argument. Thus, isolated x and y do not have argument status, however, once linked by an adversative operator, they become (or are reinterpreted as) an argumentative unit, since the operator forces y to affect x in an adverse, contrary way. Therefore, in addition

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[3] I note that, in Brazilian Portuguese, the absence of recursion is questionable since a list of arguments can be inserted into an adversative sequence, especially when the aim is to contrast differences.

to simple textual segments, x and y, related by operators, form an argumentative unit, equivalent to arguments.

Diagram 1 also highlights that the relationship can be implicit (without the presence of the connector) or explicit. Although, in this study, the analysis is restricted to the explicit relationship, excerpt (II) highlights this difference:

> (II) […] [in English there are also terms designating the cardinal points, but only on large spatial scales. We would not say, for example: "They placed the dessert forks southeast of the large forks.]x" **[...]But** [in kuuk thaayorre the cardinal points are used in all scales. This means you end up saying things like "the glass is southeast of the plate" or "the boy standing south of Mary is my brother."]y

The arguments x and y, delimited by '[]', are in an adversative argument relationship, marked by the operator 'but'(mas), in bold. The omission of the operator 'but' (mas) in no way affects the argument relation of adversity. This analysis raises the question whether the cohesive element is responsible for 'marking' the semantic relationship or whether it merely confirms it, a topic that will not be discussed in more detail here[4].

The limits of x and y result from the analyst's subjective judgments, according to the plausibility criteria highlighted previously. Both x and y are textual segments, *a priori*, independent and coordinated, that is, they are two nuclei in the RST approach, which confirms that the adversative argument relationship is multinuclear.

The semantic spectrum of the adversative relationship

The conjunction 'but' (mas) is an adversative operator par excellence. Its semantic value has specifications according to its distribution among the arguments (Neves, 2000, p.756). Ducrot (2009, p. 21) explains that discourse is composed of statements, made up of two related segments so that one does not produce meaning without the other. Koch et al (2007, p. 29) say that the use of language is essentially argumentative, that is, the speaker, in some way, seeks to imprint some argumentative force in his or her utterances. To do so, the speaker uses operators, which are elements of grammar that operate at the level of the argument relationship of the segments. In this case, the conjunction 'but' (mas) links two statements that oppose each other. The sense of opposition is only possible through dialogue between the two segments, which takes

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[4] For a more detailed discussion of chaining by juxtaposition or by connection, see Koch (2006).

place within the linguistic information itself, without dependence on factors external to the language.

Some grammarians (Rocha Lima, 1994; Bechara, 2004; Neves, 2000; Perini, 2016) and dictionaries (Glosbe *online*; Faria, 1962; Houaiss *online*; Michaelis, 1998[5]) demonstrate that they have a tacit agreement that the first and most accepted meaning is that 'but' (mas) establishes a relationship of opposition/contrast. Neves (2000)[6], however, is the one who is most dedicated to describing the semantic gradient of the adversity relationship established by this operator. It is noteworthy, however, that the proposed relationships do not always directly oppose/contrast linguistic units. The interpretations of dictionaries and grammarians are, in a way, intuitive. There was also no more detailed description of the information in the statements that, in fact, establish an adversarial relationship. In the following subsection, I seek to capture these semantic nuances in scientific abstracts.

Semantic spectrum of the adversative function in scientific abstracts

Based on the meanings of the previously mentioned grammarians and dictionaries, I propose a list (without any intention of exhausting it) of the most common semantic relations that can be established by adversative operators in scientific texts. The analysis proposed here considers the notion of polarity and validity of arguments, bearing in mind the possibility of the 'but' (mas and its adverbs countenparts) operating in the elimination of arguments or merely contrasting, restricting, strengthening, or weakening the arguments it introduces. The identification of arguments boils down to the variables x and y, which will be assigned + or – signs regarding their semantic polarity and validity (argument destruction relation) within the argument relation. As the adversative structure is restricted to two textual segments, the referents can be the same in both arguments or different (as normally occurs in the contrast relationship).

List of semantic relations[7]
Opposition - Marks an argument relationship in which one of the arguments is eliminated/invalidated. A typical case is with statements that contain a subordinate conditional.

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[5]   Due to page limitations, a table with the definitions from grammarians and lexicographers was not included.

[6]   Given that the author lists a vast array of meanings, we have refrained from reproducing the list of this semantic gradation with its respective examples here.

[7]   The examples in the list that do not have a source citation in a footnote were taken from the NETEC sample (2023). All examples have been translated into english.

[8][The candidate who has the exemption granted]x, **but** [who has made another paid registration, will have the exemption cancelled.]y

The conditional clause, highlighted in argument Y, is decisive for the validity of argument X. Argument Y was introduced in order to conditionally operate X. If the registration has been paid, Y eliminates X, otherwise, X is valid. In this way, the value (+ or -)The conditional clause, highlighted in argument Y, is decisive for the validity of argument X. Argument Y was introduced in order to conditionally operate X. If the registration has been paid, Y eliminates X, otherwise, X is valid. Thus, the value (+ or -) X depends on the validation of Y. The opposition relation is always in the direction of destroying one of the arguments, whose relation can be summarized as: X or Y.

Corrective - Indicates a correction of a statement, definition, in which one argument is denied and another affirmed.

[[...] our hypothesis shares the Thomasian view that law would not be a metaphysical or substantial reality]x **but** [would function through artifices and fictions, which allows us to think of law as an authentic biopolitical device.]y

In this example, X is valid (+) and has negative polarity (-). Y, in turn, is valid (+), with positive polarity (+), given that Y constitutes the argument to which the author adheres as it represents a better definition for the notion of 'right'. In this example, X is valid (+) and has negative polarity (-). Y, in turn, is valid (+), with positive polarity (+), given that Y constitutes the argument to which the author adheres as it represents a better definition for the notion of 'right'.

Caveat - Indicates compensation for the negative polarity of X.
[The increase in density reduced the average and dry bulb mass, percentage of class 2 and 3 bulbs]x, **but** [increased non-commercial productivity, percentage of class 1 bulbs (refuse) and bulb shape ratio.]y

X is valid (+) and has negative polarity (-). Y is a reservation for the polarity of X, that is, it adds an argument that compensates, in some way, for X. The reservation is restricted to changing characteristics of X in a way that the referents are the same in both arguments. In summary we have: -X + Y.

Counter-reservation - As the name suggests, it is the inverse operation of the reservation.

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8   Source: https://conhecimento.fgv.br/sites/default/files/concursos/edital_1_retificado_em_29.09.2022_assinado.pdf. Access: 13/10/2022.

[The increase increased non-commercial productivity, percentage of class 1 bulbs (refuse) and bulb shape ratio]x, **but** [reduced the average and dry bulb mass, percentage of class 2 and 3 bulbs]y

X is valid and has positive polarity (+), unlike Y which, although valid, has negative polarity. In this case, Y offsets X. In short: +X – Y.X is valid and has positive polarity (+), unlike Y which, although valid, has negative polarity. In this case, Y offsets X. In short: +X – Y.

Restriction - Indicates a restriction for argument X, limiting it. Typically, the Y argument is modified by operators such as only, etc.

[9][In English, there are terms designating the cardinal points]x, **but** [only on large spatial scales.]y

Both X and Y are valid (+). As for polarity, X is positive (+) and so is Y. Although Y restricts the universe in which X occurs in that language, it does not negatively affect X. Y only describes the reality in which X occurs in English. The following diagram illustrates this constraint relationship:
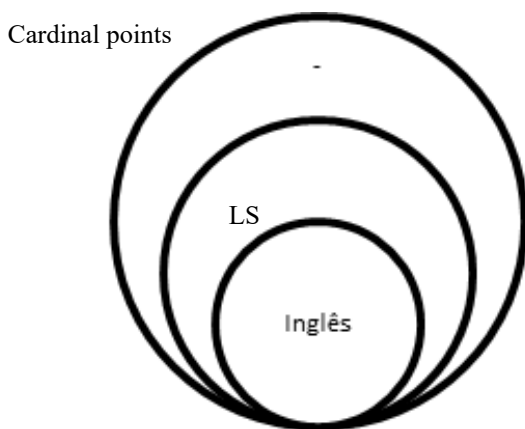
Caption: LS – large scales
Source: Prepared by the author.

Evaluative - Indicates an evaluation/consideration/comment for the statement in X.

[Composting the organic fraction of urban solid waste is one of the treatments considered appropriate in Brazil]x, **but** [the adoption of which is insignificant.]y

Evaluation is an argument relationship in which Y presents itself as a comment to X. Argument X, in itself, is an evaluative statement, a judgment. Y introduces a comment, an explanation for this judgment. The two arguments are valid (+) and have opposite polarity (+-), given that X has a positive meaning (adequate) and Y is negative, as this argument introduces a comment in which it judges the adoption of the method to be insignificant.

Contrast - It only serves to show that two realities are distinct. Normally, the contrast relationship occurs with different referents in each argument.

[10] [Of course, in English there are also terms designating the cardinal points, but only on large spatial scales. We would not say, for example: "They placed the dessert forks southeast of the large forks.]x **But** [in kuuk thaayorre the cardinal points are used in all scales.]y

In the contrast relationship, both arguments are valid (+) and have positive polarity (+). Argument Y only has the function of contrasting X, presenting a different reality. X and Y have the same argumental status, that is, one does not stand out in relation to the other. The Kuuk language is not inferior to English nor vice versa. They are just different. In summary, we have: +X +Y in a relationship in which X is equal to Y (X = Y) in terms of argument validity. This is a curious argument relationship, as it favors the deletion of the 'but', since the contrast is easy for the reader to deduce. Rewriting the following excerpt, with the deletion of the 'but', in no way compromises the interpretation of the contrast:

[Of course, in English there are also terms designating the cardinal points, but only on large spatial scales. We would not say, for example: "They placed the dessert forks southeast of the large forks.]x Ø [In kuuk thaayorre the cardinal points are used in all scales.]y

Strengthening - Introduces an argument that strengthens Y, causing inequality between segments X and Y. In general, empowerment is signaled by expressions such as mainly, especially, among others.

[[...] the implementation was perceived by nurses as a path to be built in the stages of the Nursing Process, in handling classifications]x, **but** [mainly in articulation with the National Mental Health Policy.]y

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[10]   Source: http://euler.mat.ufrgs.br/~viali/estatistica/estatistica/outros/Linguagem.pdf. Access: 06/01/2023.

Both arguments are valid (+) and have positive polarity (+). The term *mainly* gives Y greater importance in relation to X. In short, we have: +X +Y in a relationship in which X is less relevant than Y (X<Y).

Weakening - Introduces an argument that disfavors Y, also causing inequality between segments X and Y. As with strengthening, weakening is identified by words such as eventually, minimally, weakly, etc.

[11] [The intragroup analysis revealed that all questions and FSFI scores were associated] x, **but** [weakly correlated for the same group during the two collections.]y

Both arguments are valid (+) and have positive polarity (+). The term *weakly* attributes less relevance to Y in relation to X. In short, we have: +X +Y in a relationship in which X is more relevant than Y (X>Y).

Problematization - Often used in scientific texts, problematization introduces an argument that, in short, creates a problem for argument X.

[12] [The cell has a meaning]x, **but** [in the students' view it appears as outside of reality.]y

In this statement, X and Y are valid (+). X states that the cell has meaning, but Y signals that X is still unsatisfactory in the students' view. In this case, Y has negative polarity (-), in that it seeks to affect X negatively. X has, a priori, positive polarity (+), as it indicates that the cell already has meaning. This argumentative structure is quite common in scientific texts because the researcher needs to problematize what has already been investigated in previous research, demarcating gaps that justify its study.

The list presented here does not represent all the possibilities of semantic features of the adversative function under analysis nor does it have clear boundaries. *Problematization*, for example, can overlap with the notion of counter-qualification. The *problematization* was thus highlighted given its relevance in the textualization of scientific discourse. As can be seen, there are many semantic relations under the adversative label that operators can establish. Each communicative universe, textual genre, will select those that correspond to the author's intentions. In the case of scientific texts, some are more common: *problematization, contrast, restriction, strengthening, weakening, (counter) reservation.* The network of meanings described so far will serve as a basis for analyzing its productivity in an empirical context, that of abstracts.

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[11]   Source: Twitter. Access: 06/01/2023.

[12]   Source: https://periodicos.utfpr.edu.br/rbect/article/view/8474. Access: 06/01/2023.

Survey sample

The research involved abstracts of 18 areas of knowledge[13]: a) 4 engineering areas (agronomic, civil, production, and computing); b) Physical Education; c) Nursing; d) Biology; e) Physiotherapy; f) History; g) Journalism; h) Linguistics; i) Literature; j) Mathematics; k) Pedagogy; l) Psychology; m) Advertising and Propaganda; n) Chemistry and o) Social Work. See table 1:

Table 1 – Quantity of scientific abstracts by area of knowledge

Áreas	Res	% Res	Types	Tokens	Nr. words
Bio	512	1,82	12425	87020	83140
Edufis	1726	6,14	18465	273941	260762
Enf	8082	28,74	33751	1312463	1237327
Engagr	10	0,04	689	1988	1894
Engciv	47	0,17	2579	9169	8715
Engcom	21	0,07	1406	3781	3623
Engpro	511	1,82	9578	96038	90910
Fis	1364	4,85	16052	295948	280029
His	4081	14,51	38488	598355	567752
Jor	209	0,74	5888	29213	28079
Lin	1961	6,97	24548	304061	290718
Lit	2945	10,47	34563	517265	488651
Mat	1047	3,72	15348	169489	162890
Ped	722	2,57	12391	108270	103457
Psi	2213	7,87	21862	328789	308366
Pubpro	32	0,11	1797	5204	5024
Qui	1453	5,17	21606	282045	266060
Sersoc	1185	4,21	15258	170700	163018
Total	**28121**	**100,00**	**286694**	**4593739**	**4350415**

Source: Prepared by the author

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[13] The areas were named according to the NETEC Data Management file, which guides the center's data collection and storage policy. To this end, initiatives from CLARIN - Common Language Resources and Technology Infrastructure - were partly adopted for the data collection used in this research: https://www.clarin.eu/content/about-clarin. Accessed on 02/05/2023. It should also be noted that the SciELO platform has the Creative Commons – CCBY – license, which allows the distribution, adaptation, and creation from the work of others, even for commercial purposes. https://creativecommons.org/licenses/?lang=pt_BR. Access: 02/05/2023.

28,121 scientific abstracts were collected semi-automatically on the Scielo Brasil platform. Table 1 computed both the number of tokens (4,593,739) and the number of words (4,350,415) in the corpus, followed by the number of types (286,694). It should also be noted that the platform returned an unbalanced number of abstracts depending on the area of knowledge: Nursing (28%), History (14%) and Literature (10%) represent around 50% of the sample. Agricultural Engineering (0.04%) and Computer Engineering (0.07%) were the areas with the lowest return. These areas received different searches, with words such as 'agronomy' and 'computer science'. Even so, the return was considerably low. The sample was restricted between the years 2010-2022. New collections will be made to form a monitor corpus. The filter applied was the same for all areas of knowledge. The corpus has been annotated according to the semantic spectrum of the adversative constructions[14] analyzed here. The annotation decisions were made in accordance with NETEC's data annotation policy[15], which provides for the identification of the conjunction[16] as coordinative (COC), adversative (A), semantic relationship (PR, problematization), resulting in the COCAPR label. It should also be added that the syntactic position of the operators was also noted (I-initial, M-medial, F-final). The initial position records the cases in which the unit heads the argument y, a typical position for the conjunction 'but' (mas). The medial position records the cases in which the adverbial unit neither heads nor ends the argument y, as discussed in section 8. The final position records the cases in which the adverbial unit appears after the argument y. Thus, an adversative conjunction or adverbial unit that establishes a semantic relationship of problematization in a medial position would have the following label: M-COCAPR. The conjunction 'nevertheless' (não obstante), despite its very uncommon use, also establishes a concessive relationship. Specifically for this conjunction, this function was noted with the label COSCON – Concessive Subordinating Conjunction. The multinuclear relationship diagrams were created with the help of the RSTTool tool, version 3.45 (June/2004) by Mick O'Donell[17].

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[14] Because the annotation process is in its initial phase, only cases of semantic *problematization* were identified.

[15] NETEC – Center for the Study of Scientific Texts, coordinated by the professor, researcher, and author of this article. The center develops its own policies that guide the collection, storage, and annotation of the data that constitute the center's corpora.

[16] Regardless of whether it is the word 'mas' or adverbial units that establish a relationship of 'contrast', the same label was used, that is, CO.
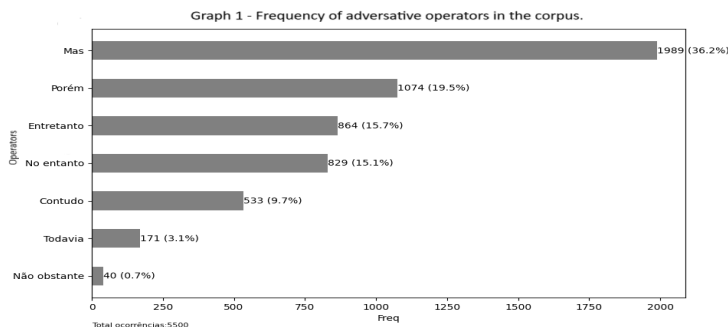
[17] Avaiable: hppt:/www.wagsoft.com/RSTTool/. Access: 17/10/2023.

Productivity of the forms of the adversative function

Productivity in academic abstracts

Graph 1 – Shows the frequency, in percentage, of operators in the corpus
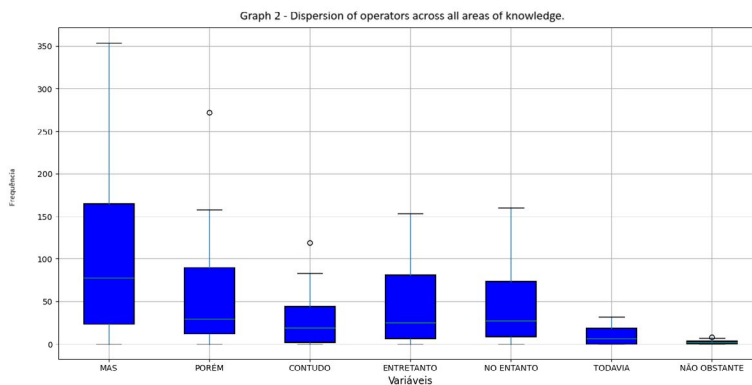

Source: Prepared by the author

In total, there are 5,500 occurrences. The conjunction 'but' (mas) was the most frequent (35.9%), followed by 'however' (porém) (19.4%). This evidence refutes the hypothesis that 'mas' would be falling into disuse to the detriment of other forms, considered more prestigious in Brazilian portuguese. The operators 'contudo' (9.6%), 'todavia' (3.1%) and 'não obstante' (1.3%) were the least frequent respectively, below 10%. There were 409 occurrences of 'but also' (mas também), however, this construction adds arguments instead of 'contrasting' them and, therefore, was not considered. The occurrences of 'não obstante' in an adversative function total 40 units and, in a multinomial regression test, its comparison with 'mas' was statistically relevant (p<.001). In other words, in adversative function, 'não obstante' is disfavored in the corpus.

Graph 2 records the dispersion of conjunctions in the data set. Highlight is the conjunction 'mas', which occurs more than 100 times in at least 50% of the data. The operators 'porém', 'entretanto' and 'no entanto' have a similar distribution, in addition to being the most used alternatives after 'mas'. 'Contudo' and 'todavia' were rarely used in relation to competitors, followed by 'não obstante'.

**Graph 2 –** Dispersion of operators across all areas of knowledge

Graph 2 - Dispersion of operators across all areas of knowledge.

The low occurrence of an operator may also be related to the fact that, in a given area, the abstracts do not present the adversarial rhetorical movement (normally *problematization*), as is seen in computer, civil and agricultural engineering.

Graph 3 shows the dispersion of the adversative function across the areas of knowledge under analysis. It is observed that the adversarial function permeates all areas, with a notable disadvantage in engineering (perhaps due to the smaller number of publications in these areas in the sample period considered or the absence of the adversative microstructure in their abstracts). This is a very common microstructure in academic abstracts.

Graph 3 – Dispersion of the adversative function across knowledge areas

Graph 3 - Dispersion of the adversative function across knowledge areas.
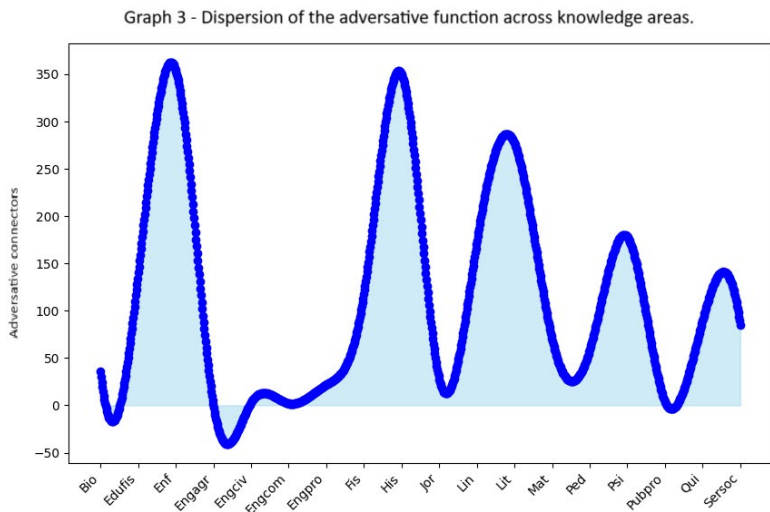
Table 2 answers the question about the association between areas of knowledge and ways of expressing adversity. Note that the areas of Engineering (Civil, Computing and Agronomy) alongside Advertising are those that most disadvantage the phenomenon. For the other areas, the adversative function occurs with a statistically significant frequency in the latter. Although there is greater concentration in certain areas of the adversative function, it cannot be said that this function constitutes a specific style of an area or group of areas.

Table 2 – Linear regression of the adversative function regarding areas of knowledge

Preditor	Estimatives	Standard error	Z	p
Intercepto	1.946	0.378	5.148	<.001
A:				
Bio – Pubpro	3.010	0.387	7.774	<.001
Edufis – Pubpro	4.070	0.381	10.678	<.001
Enf – Pubpro	5.049	0.379	13.316	<.001
Engciv – Pubpro	0.251	0.504	0.499	0.618
Engcom – Pubpro	-0.336	0.586	-0.575	0.566

Engpro – Pubpro	2.727	0.390	6.990	<.001
Fis – Pubpro	4.312	0.380	11.332	<.001
His – Pubpro	4.632	0.380	12.196	<.001
Jor – Pubpro	2.024	0.402	5.034	<.001
Lin – Pubpro	3.862	0.382	10.113	<.001
Lit – Pubpro	4.742	0.380	12.493	<.001
Mat – Pubpro	3.196	0.386	8.287	<.001
Ped – Pubpro	2.689	0.391	6.884	<.001
Psi – Pubpro	4.068	0.381	10.671	<.001
Qui – Pubpro	4.123	0.381	10.820	<.001
Sersoc – Pubpro	3.247	0.385	8.429	<.001
Engagr – Pubpro	-0.560	0.627	-0.893	0.372

Source: Prepared by the author

Productivity in the problematization function

The corpus was annotated regarding the semantic functions/relations established by the operators, with 150 occurrences of the operator 'mas', all establishing a semantic relation of *problematization*. Diagram 2, generated by RSTTool, shows one of the excerpts from the annotated corpus. Argument y, introduced by 'mas', problematizes argument x as it points to the need for new studies on 'pacing'. The label 'I_COCAPR' refers to the place where the conjunction occurs: I: heads/introduces the argument Y; COCAPR: adversative coordinating conjunction of problematization.
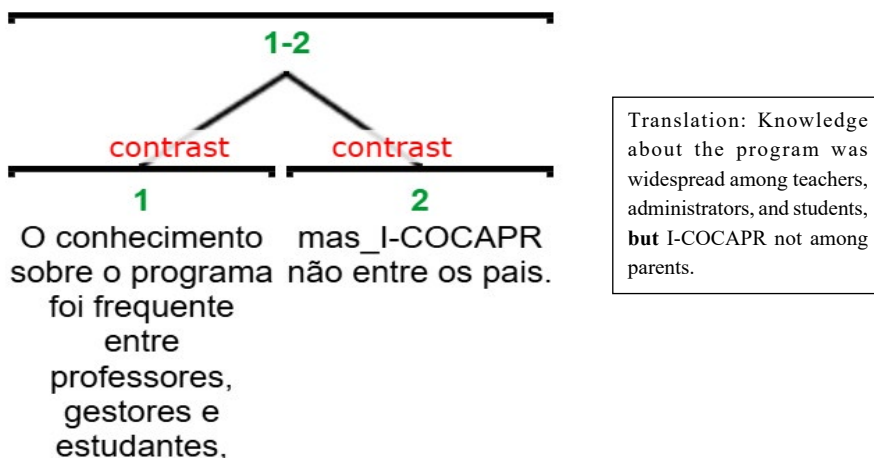
Diagram 2 – Multinuclear contrast relationship

Translation: Choosing the right pacing is crucial for athletic success, **but I-COCAPR** analyzing small changes in pacing requires further study.
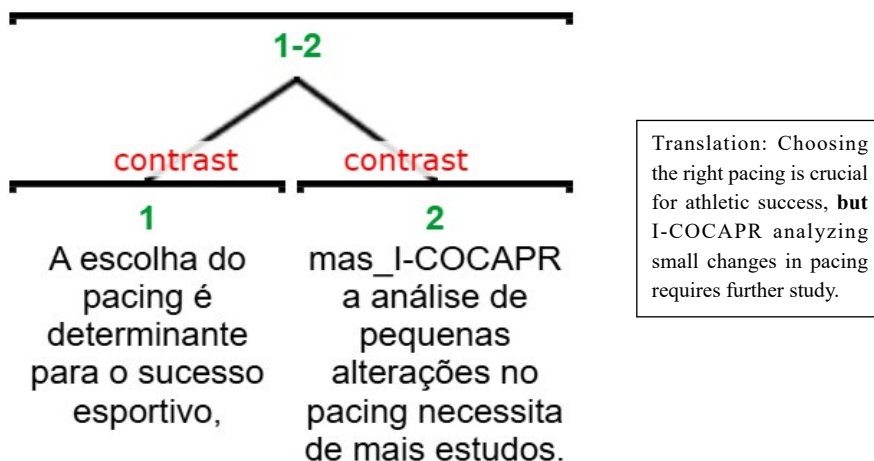
Source: RSTTool (Elaborated by the author)

Diagram 3 is another multinuclear instance of contrast.

Diagram 3 – Multinuclear contrast ratio

Translation: Knowledge about the program was widespread among teachers, administrators, and students, **but** I-COCAPR not among parents.

Source: RSTTool (Elaborated by the author)

The relationship contains an argument y that points out a gap (problem) in the scope of knowledge about the teaching program, which was restricted to teachers, managers and students. In this relationship of adversity, the negation operator 'not' immediately after the conjunction 'mas' draws attention. This conjunction was the only one that favored the phenomenon, totaling 205 occurrences. All were considered to have a problematizing effect. This view corroborates the position of Vieira & Faraco (2022, p. 147) when they state that, in the university environment, the confrontation of ideas reigns, which results, in academic writing, in the presentation of different points of view, often marked by the adversarial operators analyzed here. Diagram 4 shows an occurrence with the operator *only* (apenas)[18], which had a high frequency in the corpus, especially in the rhetorical movement of presenting the results:

Diagram 4 – Multinuclear contrast ratio

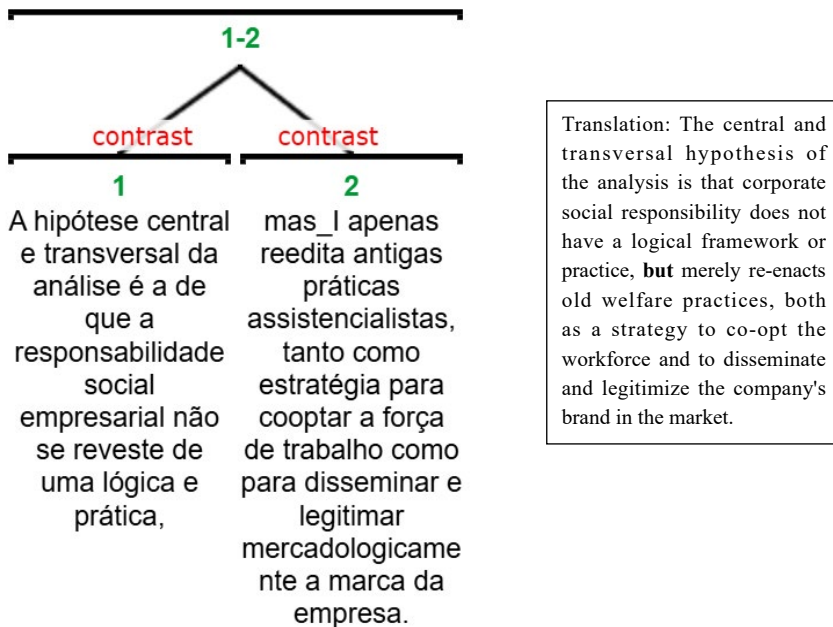| Translation: (…) Both therapeutic approaches showed improvements in the variables analyzed, **but** only neural mobilization demonstrated significant results (…) |
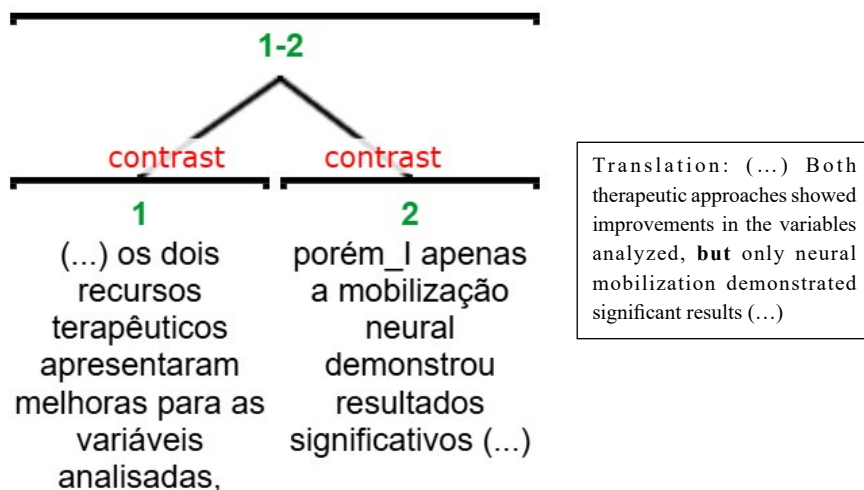
Source: RSTTool (Elaborated by the author)

This is an occurrence that presents results in which the modulator *only* (*apenas*) restricts the resources that presented significant results. This modulator can, however, be used with *problematization* effect:

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[18]   he modalizer *apenas* ocorred in the *corpus*, immediately after the adversative, 42 times (mas:22; porém:11; contudo:2, no entanto:2, entretanto:5).

Diagram 5 – Multinuclear contrast ratio.

Translation: The central and transversal hypothesis of the analysis is that corporate social responsibility does not have a logical framework or practice, **but** merely re-enacts old welfare practices, both as a strategy to co-opt the workforce and to disseminate and legitimize the company's brand in the market.
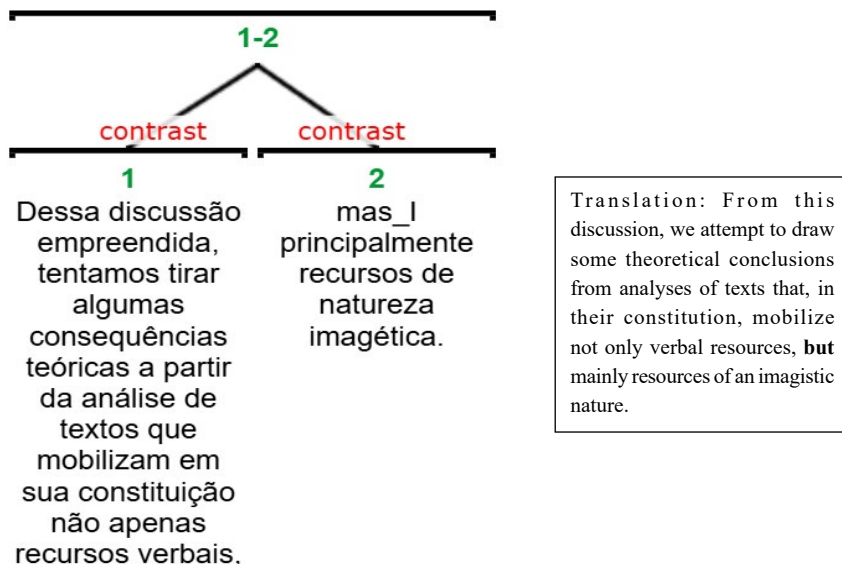
Source: RSTTool (Elaborated by the author)

The occurrence is the research hypothesis being presented in an adversarial structure, to point out that the problem of the study is to show that social responsibility reissues old practices. In this way, the semantic gradation of the adversarial relationships discussed so far forms a *continuum* in which one can overlap the other, in this case, a restriction functioning to problematize.

Modulators are extremely important functional items for the interpretation of adversative semantic bias. It is very common for adversative articulators to be accompanied by words ending in –ly (-mente in Brazilian Portuguese): especially (especialmente), weakly (fracamente), strongly (fortemente), mainly (principalmente), essentially (essencialmente), etc.), particularly when the intention is to strengthen or weaken arguments. In these cases, the word em –ly (–mente) reinforces the argument being introduced by the articulator.
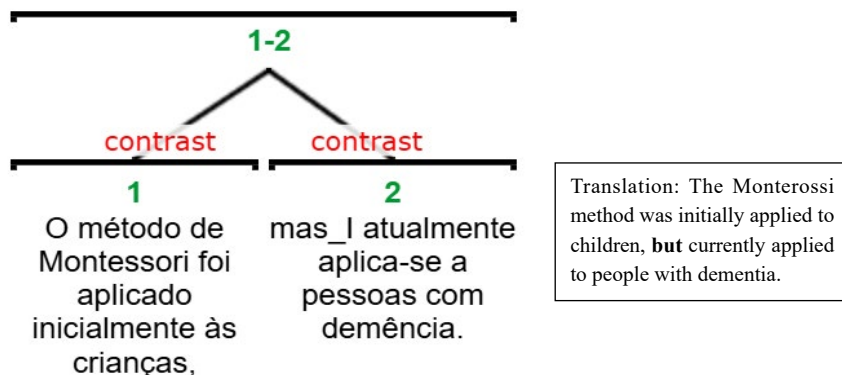
Diagram 6 – Multinuclear contrast relationship

Translation: From this discussion, we attempt to draw some theoretical conclusions from analyses of texts that, in their constitution, mobilize not only verbal resources, **but** mainly resources of an imagistic nature.

Source: RSTTool (Elaborated by the author)

In (6), the modalizer 'mainly' (principalmente) serves to unbalance two valid arguments (analyzing verbal and imagery resources), so that the imagery receives greater relevance. Sometimes, the modalizer in –ly (–mente) does not even operate on the argument with an unbalancing effect, but only signals circumstantial information, as in (7):

Diagram 7 – Multinuclear contrast relationship

Translation: The Monterossi method was initially applied to children, **but** currently applied to people with dementia.

Source: RSTTool (Elaborated by the author)

In (7), the modifier 'currently' (atualmente) is merely circumstantial, with no semantic scope of reinforcement for the argument of which it is part. In any case, modalizers constitute an important linguistic clue for the interpretation of adversative relations[19].

Note on operator 'não obstante'

The word *obstante* originates from the Latin verb [obstare], which means to oppose, prevent, hinder (Michaelis, 1998, p. 1476). The word is normally used in Brazilian Portuguese preceded by the particle 'não' (not), forming the phrase 'não obstante', which has a concessive meaning and can be replaced by despite. Concessive subordinate conjunctions (Bechara, 2004, p. 327) begin a textual segment or clauses that express an obstacle that will not prevent or modify the main statement. In other words, the main statement remains valid even if something happens. Adversative operators, in turn, link independent textual segments, to mark an opposition/contrast between them. The difference between concessive and adversative clauses is widely debated in the literature (Garcia, 2007; Pauliukonis, 2014; Neves, 2018; Neves, 2000; Passos, 2019). In general, the authors admit that the two structures indicate opposition/contrast, with the concessive being a subordinate structure and the adversative, coordinated. It is as if the adverse relationship could be marked by one structure or another, in an indistinct or very similar way. Koch (2006, p. 173) goes so far as to state that adversative and concessive articulations perform the same function and that the difference would be in the type of argumentative strategy and not in the semantic relationship itself. For the author, the adversarial allows the speaker to put the suspense strategy into action, delaying the moment of explaining the argument defended by the speaker. The concessive, in turn, allows the anticipation of the argument that the speaker intends to destroy, or that, in his opinion, is possible, but not valid. It is added that concessive, as it is subordinate, allows it to be moved to the beginning of the period, anticipating the less relevant/not valid argument. In the concessive, regardless of the displacement, the argument being defended is always the main clause. In the adversative, coordinated structure, the most relevant argument is always introduced by the adversative articulator, that is, it is always to the right of the latter (except for cases in which the articulator takes other positions in argument y). The alternation of arguments in the coordinated structure causes a change of focus in relation to the argument that one wants to defend. Although a concessive-adversative mix can be admitted (Garcia, 2007, p. 45), the adversative structure enables alternation in relation to the point of view to which one wishes to attribute greater relevance. On the other hand, the concessive sets, in the main sentence, the argument to which the speaker adheres, with the difference of enabling the anticipation of the (possible) argument that one wishes to invalidate.

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[19] The mapping and annotation of modalizers that operate alongside adversative articulators is currently underway.

Therefore, the operator 'não obstante' can perform this dual concessive-adversative function. Excerpts (i) and (ii) show this ambiguous behavior of 'não obstante'.

> **Excerpt (i):** The transition to sustainability is urgent. **Regardless_I-COCAPR**, the University continues to train agronomists who see the continuity of the dominant and unsustainable system of agriculture as the only possible path. (NETEC Sample, 2023).

Diagram 8 – Multinuclear contrast relationship

Translation: The transition to sustainability is urgent. Regardless_I-COCAPR, the University continues to train agronomists who see the continuity of the dominant and unsustainable system of agriculture as the only possible path. (NETEC Sample, 2023).
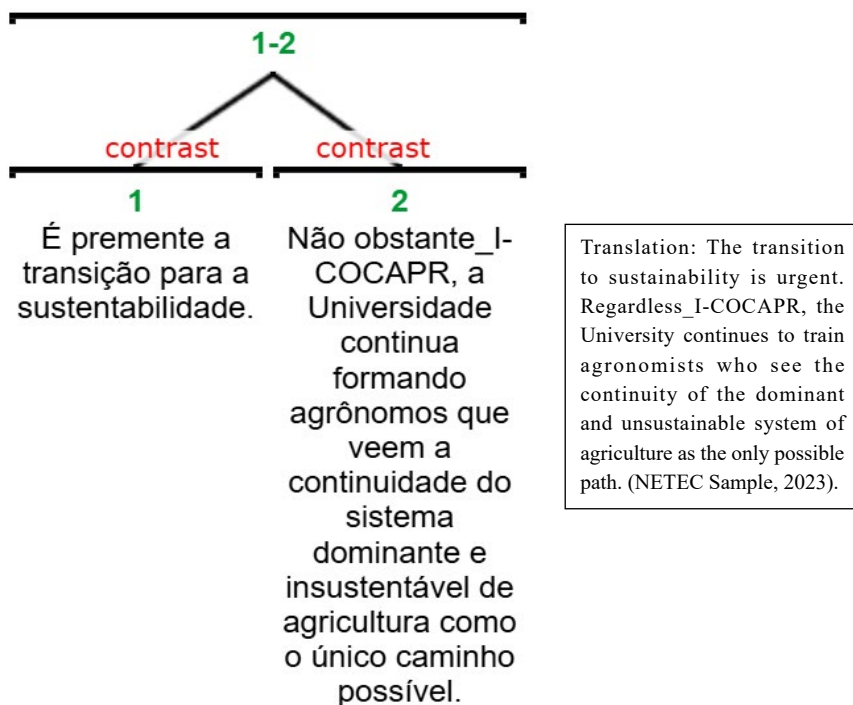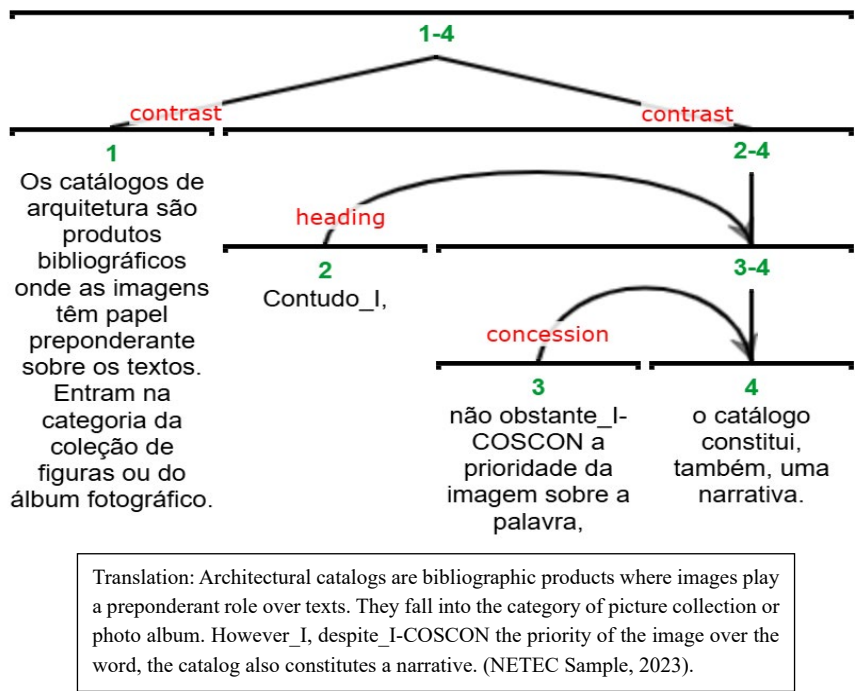
Source: RSTTool (Elaborated by the author)

In excerpt (i), the conjunction appears right after a full stop, introducing an argument that has an adversarial relationship with the previous period. This occurrence was labeled (COCAPR) as an adversarial *problematization*, given that the final point breaks with the possibility of interpreting a subordinate period and the argument introduced by the articulator is the most relevant, as it problematizes the role of the university in relation to the moment of transition to sustainability. The concessive never introduces an argument that is intended to be validated or given greater relevance.

Excerpt (ii): Architectural catalogs are bibliographic products where images play a preponderant role over texts. They fall into the category of picture collection or photo album. However_I, **despite_I-COSCON** the priority of the image over the word, the catalog also constitutes a narrative. (NETEC Sample, 2023).

Diagram 9 – Concession core-satellite relationship

Translation: Architectural catalogs are bibliographic products where images play a preponderant role over texts. They fall into the category of picture collection or photo album. However_I, despite_I-COSCON the priority of the image over the word, the catalog also constitutes a narrative. (NETEC Sample, 2023).

Source: RSTTool (Elaborated by the author)

In excerpt (ii), the conjunction 'não obstante', labeled as concessive (COSCON), introduces an argument in a concessive subordinate structure. The evidence of this interpretation is justified by the use of the adversative operator 'contudo', which introduces the most relevant argument (catalog constitutes narrative) in opposition to the initial argument that images play a preponderant role. The argument introduced by the operator 'contudo' has a concessive subordinate, which weakens the priority of the image over the word given the fact that the catalog constitutes a narrative. In this case, it is possible to exchange it with other concessive conjunctions: despite (porém), although (entretanto), etc. It is also noted the possibility of moving the concessive to the position to the right of the main clause, without prejudice to the argumentative focus, which remains the catalog constituting narrative. In the adversative, as explained previously, the alternation of statements alternates the focus.

The corpus received annotation of 100% of the occurrences of 'não obstante' regarding the adversative or concessive relational nature. There were 40 uses establishing an adversarial relationship and 33, a concessive one. The uses were more concentrated in the area of Human and Social Sciences (table 2) but were spread throughout the corpus.

Adversative structure and punctuation marks

The limits of the adversative structure can vary, so that textual segments (spans) can transcend the limits of a sentence, composing paragraphs, etc. This is what happens in cases where the operator is used right after the period, signaling an adverse relationship between larger portions of the text (paragraphs) or, for stylistic effect, smaller segments where a comma could also be used. Look:

> The average pain intensity of frail elderly people was 6.98, of pre-frail people, 6.38, and of non-frail people, 5.85. **However**, these differences were not significant (p=0.150). (NETEC Sample, 2023)

The 'however' (porém) was used right after a full stop, but, as a rule, operators relate segments (normally smallers) with comma:

> The way of teaching sports in school physical education has changed over the last few decades, **but** in Brazil this pedagogical transformation is still recent [...]. (NETEC Sample, 2023)

Given the limits imposed by punctuation marks, we sought to verify whether any form is favored after a full stop in the data set. Table 3 shows the number of occurrences:

Table 3 – Number of occurrences per punctuation mark

Punctuation	Operators							
	Mas	Porém	Contudo	Entretanto	No entanto	Todavia	Não obstante	Total
FS	5	19	28	53	37	12	4	158
C	1984	1055	505	811	792	159	36	5342
Total	1989	1074	533	864	829	171	40	5500

Test X² → valor=123; gl=6; p<.001
Source: Prepared by the author

The data confirms the prevalence of the use of commas in separating adversarial segments for all operators. Table 4 shows that the 'mas' operator is disadvantaged after the full stop in relation to its peers.

Table 4 – Log-linear regression of the use of scores in the adversative relationship

Preditor	Estimatives	Standard error	Z	p
Intercepto	1.609	0.447	3.599	<.001
A ✳ B:				
(Porém – Mas) ✳ (V – P)	-1.967	0.504	-3.901	<.001
(Contudo – Mas) ✳ (V – P)	-3.091	0.488	-6.333	<.001
(Entretanto – Mas) ✳ (V – P)	-3.255	0.470	-6.931	<.001
(No entanto – Mas) ✳ (V – P)	-2.920	0.478	-6.104	<.001
(Todavia – Mas) ✳ (V – P)	-3.399	0.539	-6.311	<.001
(Não obstante – Mas) ✳ (V – P)	-3.786	0.692	-5.475	<.001

Source: Prepared by the author.

It is concluded that adverbial units (all operators except 'mas'), perhaps because they enjoy greater prestige in Brazilian Portuguese, are preferred in the corpus for segmenting textual units in an adversative relationship separated by a full stop.

Semantic equivalence or variation?

So far, we have seen that the adversative function can be encoded in different forms in Brazilian Portuguese: mas, porém, contudo, entretanto, no entanto, todavia, não obstante. Superficially, we are faced with overlapping forms to perform a single function (Freitag; Gonçalves, 2011, p. 89). In fact, in the initial position of argument Y, the exchange of one form for another does not cause noise for the adversity relation:

> [Students partially understood the concept of feedback]x, **but** [did not recognize internal feedback]y. (NETEC Sample, 2023)

In the statement, the exchange of 'but' (mas) for other forms, semantically equivalent, keeps the adverse relationship between arguments x and y constant. The alternation between forms may impact on the style, given the formal prestige of one unit in relation to the other. It should be noted, however, that this exchange is restricted to the initial syntactic position, which heads the argument y. In this case, it is questionable whether we would be facing a phenomenon of variation. Freitag (2009, p. 117) argues that, beyond the phonological level, the definition of sociolinguistic variants at higher grammatical levels is still problematic. Milroy and Gordon (2003) point out that the factors that determine the semantic equivalence between forms that can be considered

variants are unclear. Despite the interchangeability verified in the statement above, the alternation between 'but' (mas) and other adverbial units encounters syntactic barriers.

Camara Junior (1979, p. 182-188) explains that, in archaic Portuguese, 'porém' was an explanatory particle, equivalent to 'por isso', corresponding to the Latin phrase 'per inde' or 'pro inde' (hence). The syncopated form 'porende', according to the author, existed for a long time and invaded classical literary Portuguese. In Câmara Junior's terms, a constellation of adverbs operated as coordinating particles, such as *no entanto, entretanto, todavia, não obstante*, among others. Coutinho (1976, p.269-270) argues that Portuguese inherited few conjunctions from Latin, which led the language to resort to other classes of words to fill this gap. This brief etymological explanation reveals that these linguistic units originate from different categories. 'Mas' is a conjunction par excellence in comparison to its adverbial pairs (porém, contudo, no entanto, entretanto, todavia), which preserve, to a certain extent, the status of adverbs. Bechara (2004, p.323) highlights that, due to semantic equivalence, the grammatical tradition chose to include these adverbs in the category of conjunctions. In fact, they are interchangeable in the initial position of the Y argument, however, 'mas' suffers restrictions in relation to other units because it has a fixed syntactic locus between two linguistic segments. To better exemplify this notion, I reproduce modified diagram 1:
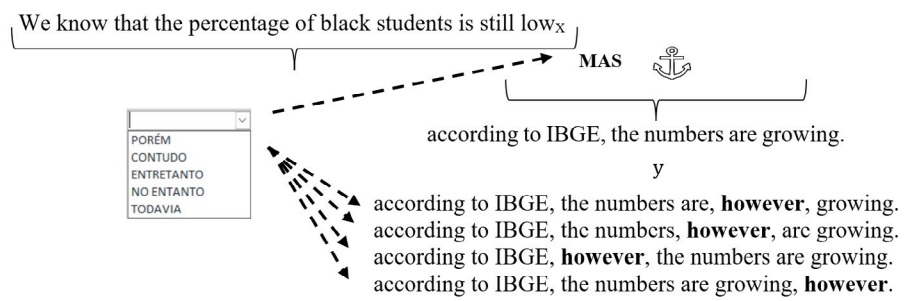
Caption: X and Y represent the two segments in an argument relationship
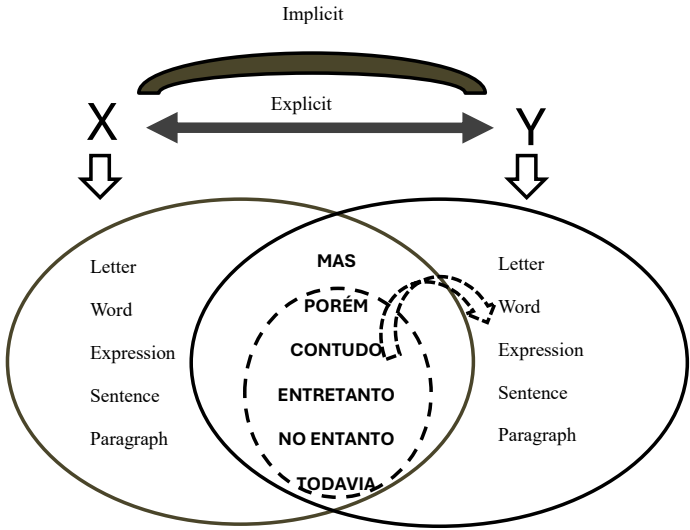
Source: Prepared by the author

The main difference between 'mas' and adverbial units is that items with adverb status (inside the dashed circle) can migrate to the interior of argument Y, assuming different positions within that argument. This characteristic is typical of adverbs due

to the high freedom of movement of these items within the statements they introduce. Occurrence (III) explains this notion:

We know that the percentage of black students is still low$_X$

MAS

PORÉM
CONTUDO
ENTRETANTO
NO ENTANTO
TODAVIA

according to IBGE, the numbers are growing.

y

according to IBGE, the numbers are, **however**, growing.
according to IBGE, the numbers, **however**, are growing.
according to IBGE, **however**, the numbers are growing.
according to IBGE, the numbers are growing, **however**.

Source: NETEC Sample (2023)

This scheme shows that 'mas', as it is a prototypical conjunction in the terms of Rocha Lima (1994) and Abreu (2003), assumes a fixed position, anchored between two textual segments. Returning to Neves (2000), this conjunction does not allow recursion, being restricted to two segments. In fact, the items (*porém, contudo, entretanto, no entanto, todavia, não obstante*) have semantic equivalence, considering the substitution in the anchor position. In the other statements, in which the operators migrate to the interior of the argument Y, the 'mas' is not capable of operating as it does not have an adverbial nature. In addition to the grammatical barrier, due to the principle of iconicity (different form = different meaning), it is questionable whether the meaning is maintained in other occurrences in which operators can assume different positions within the argument. The impression is that the further to the right the adverb takes a position within argument Y, the greater the disapproval or dissatisfaction (of the speaker) with the IBGE data. Note that argument Y maintains a positive meaning (numbers growing), but, discursively, in the extralinguistic universe, it is as if the speaker disapproves of this fact. Table 5 records the number of occurrences of forms of expression of adversity and the variation in terms of syntactic position:

Table 5 – Variation in the syntactic position of conjunctions in argument Y

Pos.	Mas	%	Porém	%	Contudo	%	Entretanto	%	No entanto	%	Todavia	%	Não obstante	%	Total
I	1989	100	1067	99,35	528	99,06	858	99,31	822	99,16	166	97,08	40,00	100,00	5470
M	0	0,00	7	0,65	5	0,94	6	0,69	7	0,84	5	2,92	0,00	0,00	30
F	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0,00	0,00	0
Total	1989	100	1074	100	533	100	864	100	829	100	171	100	40	100	5500

Test X² → valor=32.4; gl=6; p<.001
Source: Prepared by the author

The forms of expression of adversity were classified according to three syntactic positions: a) I – initial, when the conjunction introduces the argument y, fixed in the intermediate position between the two textual segments; b) M – medial, when the conjunction appears within the argument y, in any position that is neither the initial (introductory to the argument) nor the final, after the end of the segment that constitutes the argument y; c) F – final, when the conjunction occupies the last position of the segment that constitutes the argument y.

The operator 'mas' appears to be a prototypical conjunction, corroborating the statement of the grammarians investigated about the fixed position that 'mas' occupies between textual segments in an adversative relationship. The other operators (*contudo, entretanto, no entanto, todavia*) presented variation between I and M. The final position is disadvantaged for all forms. The initial syntactic position (I) is statistically relevant in relation to the medial one, which shows that the use in the 'anchor' position is favored for all occurrences. The syntactic position factor reveals that the grammatical status of 'mas' is different from other adverbial units, which prevents treating these forms as sociolinguistic variants. This interpretation has consequences for the automatic processing of the language, given that an algorithm would need to overcome the challenge of correctly identifying argument Y, which is not always headed by the adversative operator.

Final Words

The research encouraged reflection on the adversative function in scientific abstracts, which is expressed through a continuum of semantic relations under the adversative label. The results confirm the hypothesis of the high incidence of adversarial constructions in scientific texts, particularly in academic abstracts. In addition to the adversarial semantic relation of *problematization* that normally heads scientific abstracts from different areas of knowledge, the data reveal that the structure is also used in argumentative processes in the presentation of *results*, whether to contrast, restrict or reinforce informational units. It was also observed that there is a functional pairing between the adversative and concessive structures, so that the language reserves different resources to deal with the validation of arguments, as per the discussion on the operator 'nevertheless' (não obstante). It is also noteworthy that, unlike the conjunction 'mas', the other operators, as they have adverbial origin, have mobility within the argument y, encouraging debates regarding the impact of iconicity on the interchangeability of adversative units. It was also found that the adversarial function does not constitute a style of area, as it was identified, with different and statistically relevant frequencies, in all courses investigated.

The discussion undertaken so far on the adversative function sheds light on the various effects of meaning under the label of adversity. Also, it brings up debate about adverbial units that, when assuming different positions in argument Y, suffer from

semantic noises of an extralinguistic nature. Furthermore, the ways of expressing the function of adversity are not variants, which requires the reader to correctly segment the portions of the text that are in adversarial dialogue. The portions depend on plausibility criteria for their proper identification, as well as competing with each other when the segments are limited by a full stop. In this way, the research greatly contributes to the teaching of adversative function in the final years of basic education as well as in higher education.

One question still remains open: is the adversarial structure typical of rhetorical movement 1 of the academic abstract, where the *problematization* of the research occurs? This mapping has not yet been done on the dataset in its entirety. As we have seen, the rhetorical movement of *contextualization/problematization* often favors adversarial structures. On the other hand, there is a high incidence of this structure in the rhetorical movement of the *results*, when normally adversative articulators are accompanied by modalizers ending in –mente (ly). Look:

> [...] of the 596 surveyed, 86% perceived the Systematization of Nursing Care as important, **but** only 60.9% used it in their care practice.. (NETEC Sample, 2023)

Modalizers such as 'only' (somente) and 'statistically' (estatisticamente), in the data set, were the most frequent in the presentation of this rhetorical movement. The research agenda is to map the occurrence of adversarial structure according to the rhetorical movement of the academic abstract, however, it is said that the privileged movements are the moment of *problematization* and the presentation of *results*.

Thanks

BATISTA, Hadinei Ribeiro. Função adversativa em resumos científicos. **Alfa**, São Paulo, v. 69, 2025.

▪ RESUMO: A função adversativa, apesar de frequente em resumos de artigos científicos, não é descrita com detalhes na literatura. Para além da estrutura retórica básica de resumos acadêmicos (Swales, 1990), a sinalização adversativa é recorrente nesse gênero textual, independentemente da área de estudo. Com o objetivo de descrever o uso e a distribuição de operadores que estabelecem relação adversativa em resumos científicos com base na Teoria da Estrutura Retórica (RST), a pesquisa analisa um corpus composto por 28121 resumos, totalizando 4350415 palavras. Os resultados apontam que a argumentação "adversativa": (1) é retoricamente complexa; (2) aparece em diferentes movimentos retóricos do resumo acadêmico; e (3) é empregada com alta frequência, em especial, para problematizar o fenômeno em investigação bem como para argumentar a apresentação dos resultados.

▪ PALAVRAS-CHAVE: Função adversativa; RST; resumo científico; argumentação; corpus.

Data Availability Statement

All datasets supporting the findings of this study have been published within the article itself.

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