THEORY OF DESCENT WITH SLOW MODIFICATION IN DARWIN'S *ON THE ORIGIN OF SPECIES*: A SEMANTIC ANALYSIS

André Campos Mesquita*

▪ ABSTRACT: This study aims to analyze the meanings of the term *descent with slow modification* in the book *On the origin of species by means of natural selection* by the british naturalist Charles Darwin through its Semantic Domain of Determination (SDD). This term was replaced by the expression *theory of evolution* in the sixth and final edition of the work, marking the only point where the word *evolution* replaces another term in the entire production of the English naturalist. The analysis of descent with slow modification and its replacement makes it possible to understand the determinations of meaning attributed to the *Theory of Evolution* in the book. Additionally, we will analyze the terms descendant, modification, and slow in the exact text to verify how these expressions function independently. The proposed analysis method is based on the Event Semantics, as developed by Eduardo Guimarães in his book *Semântica do acontecimento* (2002). In order to elucidate the slowly changing meanings of the term descent in the work, the intention is to examine its semantic-enunciative functioning and its relationship with other terms throughout the work.

▪ KEYWORDS: Descent with slow modification; Theory of evolution; *On the origin of species*; Charles Darwin; Semantics of the event.

Introduction

This article analyzes the meaning of *descent with slow modification* in Charles Robert Darwin's *On the origin of species by means of natural selection, or the preservation of favored races in the struggle for life*[1] (hereafter *The origin of species*). It examines and understands the meanings associated with these expressions when they are used in relation to the theory of evolution. The focus on *descent with slow modification* stems from its replacement by *evolution* in the sixth edition of the book.

* Universidade Estadual do Rio de Janeiro (UERJ), Rio de Janeiro, RJ, Brasil. Professor Adjunto. acmesq@gmail.com. ORCID: https://orcid.org/0000-0001-9896-9378

[1] The name of Darwin's *On the Origin of Species* changed after the sixth edition. The original title of the first edition, published in 1859, was *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* In the 1872 sixth edition, *On* was omitted.

Scientific development is inextricably linked to language and the creation of specific terminologies to describe new theories, discoveries, or concepts. According to Bakhtin (1986, p. 60), "All the diverse areas of human activity involve the use of language". The variety of human activities corresponds to the diversity of linguistic uses associated with them. This theory does not imply that a corresponding language is immediately created whenever a new human activity emerges. Human activity and the use of language related to it arise simultaneously in a unique and indissoluble intertwining. Humans cannot generate anything without using some form of language (Bakhtin, 1986).

This intrinsic relationship between language and human activity reveals that language not only communicates ideas—or, in this case, scientific discoveries—but also shapes the creation and development of those ideas. Through language, complex concepts are expressed, analyzed, and debated within the scientific community, forming the foundation of human knowledge.

According to Benveniste (1974, p. 247), "[…] the specific history of a science is summarized in the history of its own terms."[1] The organization and creation of unique terminology marks a definitive moment in the history of a specific science. Scientific theories, as well as various human activities, define their objects by assigning them specific names. Pre-existing words and expressions are adopted and reinterpreted to denote scientific innovations. An example that supports this claim is the word *evolution*, which was employed in general contexts to describe Charles Darwin's theory of the origin of species through natural selection. Darwin's theory gained widespread acceptance as concepts such as *evolution*, *natural selection*, *struggle for survival*, and *descent with modification* became established in the scientific lexicon of the late 19th century. "To name, that is to create a concept, is the first and last operation of a science"[2] (Benveniste, 1974, p. 247).

Development

Darwin's written work evolved throughout its editions, reflecting the maturation and refinement of his ideas. With each new edition, he refined concepts and restructured the content, introducing new terms, removing sections, and even modifying the book title. Introducing the term *evolution* in the book *The Origin of Species* exemplifies the dynamic alteration of a text that gradually develops a specific vocabulary. Initially absent throughout the entire text of the first edition in 1859 and absent in the subsequent five editions, the word *evolution* was incorporated only in the sixth and final edition, published in 1872. Despite this initial absence, the term eventually became established as the principal designation of Darwin's theory.

---

1 In the original: *"[...] l'histoire propre d'une science se résume en celle de ses termes propres".*

2 In the original: *"Dénommer, c'est-à-dire créer un concept, est l'opération en même temps première et dernière d'une science".*

Although *evolution* appears only seven times in the entire text of the sixth and final edition, its presence represents a change worthy of study. In one specific instance, it replaces *descent with slow modification*. This fact illustrates the development of vocabulary and the search for more precise terminology and reflects evolutionary theory's consolidation and growing acceptance.

This article aims to analyze the term *evolution* through a semantic approach based on the utterance and the relationship that language has to interdiscourse (the implicit or explicit relations a discourse has to other discourses). The proposed analysis will be grounded in the semantics of the event, as formulated in Eduardo Guimarães' book *Semântica do Acontecimento*[3] (2002). To understand the meanings of *descent with slow modification* within Darwin's work, we intend to analyze its semantic-enunciative function within the passage where the term appears. We will observe the semantic determinations that the terms receive in the textual movements of rewriting (rephrasing the word), and of articulation (local contiguity).

The expressions analyzed in this article are part of the terminology in Darwin's *On the Origin of Species*. In this context, terminology is defined as the "set of terms representing a system of concepts within a specific subarea"[4] (ISO Standard 1078 *apud* Alves, 1998, p. 26).

Terms play a semantic and enunciative role within a specific terminology. By analyzing the relationships between terms in context—the connections they establish with surrounding words and expressions—we can understand the meanings acquired in the specific instance of their use. Terminology constitutes the linguistic foundation of a scientific discipline, comprising a unique set of expressions. These expressions, frequently employed within the scientific domain, serve as a specialized vocabulary shared by experts in a particular field of knowledge. This vocabulary is crucial in facilitating communication among scientists and collectively striving to achieve precision and consistency in discussions, investigations, and the dissemination of knowledge within the scientific community.

The analyses in this article are based on event semantics theory. Within this theory, the studies by Guimarães (2002, 2007, 2010, 2012) are noteworthy and provide a valuable tool for addressing semantics in written texts. Specifically, in this corpus, the focus is on the text of a scientific work.

The semantic determinations that a term receives in the textual movements of rewriting will be analyzed, including how a word is reiterated and the articulation it establishes with other expressions in local contiguity; that is, the semantic relations an expression has with others in the utterance.

According to Guimarães (2007, p. 84), "Rewriting is the procedure by which the enunciation of a text insistently reiterates what has already been said by interpreting

---

[3] Semantics of the Event.

[4] In the original: *"[...] conjunto de termos que representa um sistema de conceitos de uma subárea específica".*

a form as different from itself. This procedure attributes (predicates) something to the rewritten text."[5] As Guimarães (2007, p. 84) states:

> [...] articulation procedures concern the relationships inherent in local contiguities, illustrating how the functioning of certain forms affects others without reducing them. These enunciative procedures are specific to relations within or between utterances. For example, relations of predication and reference (within the utterance), presupposition, and argumentative relationships. In other words, this is much of what sentence semantics has sought to achieve. The difference for me is that these articulations must be related to rewritings and are not limited to the limits of the utterances, but also to their articulations.[6]

In a semantic analysis of a specific word used in a text, it is necessary to find points that connect the linked utterances that make up this text. Observing how the term is rewritten or reiterated in the utterances is essential.

In the context of the noun + adjective group, for example, the adjective can play both an explanatory and specific role. Suppose we want to analyze the meaning of the expression "enormous sedimentary rocks" in a specific sentence. In this case, the adjective "enormous" has an explanatory function, as it does not create a smaller class within the category of sedimentary rocks; it merely expresses properties inherent to the rocks in the utterance. On the other hand, "sedimentary" is a specifier adjective, as it distinguishes a specific type of rock from others. Both are elements that would function as determinants of the meaning of "rocks" in the utterance analyzed.

To establish a Semantic Domain of Determination (SDD) for the term "descent with slow modification," we delineate expressions that establish semantic relationships with this term. The SDD is done through contiguity relations in the text, which play a crucial role in establishing the semantic connections. Next, we analyze the textual rewriting movements, that is, how these words are articulated, reiterated, predicated, adjectivized, etc., within the text.

For the term "descent with slow modification," we define an SDD by identifying expressions that establish semantic connections. Contiguity relations in the text play a crucial role in establishing these connections. Furthermore, we analyze the textual rewriting movements, which include how these words are articulated, reiterated, predicated, and adjectivized within the text.

---

[5] Rewriting is the procedure by which the enunciation of a text insistently rewrites what has already been said, making it interpret a form as different from itself. This procedure attributes (predicates) something to the rewritten.

[6] In the original: *"[...] procedimentos de articulação diz respeito às relações próprias das contiguidades locais. De como o funcionamento de certas formas afetam outras que elas não redizem. Estes procedimentos enunciativos são próprios de relações no interior dos enunciados ou na relação entre eles. Por exemplo, as relações de predicação e referência (no enunciado), a pressuposição, as relações argumentativas. Ou seja, aqui aparece boa parte do que as semânticas da frase têm procurado fazer. A diferença para mim é que as articulações têm que ser reportadas às reescriturações, assim como não se reduzem ao limite dos enunciados, mas também às suas articulações".*

This theory makes it possible to connect points from one text with points from another text within the work. Textual movements produce meanings as they resume, rephrase, qualify, affirm, or contrast expressions with each other, making them mean differently (Guimarães, 2002). Guimarães' methodological approach offers the ability to navigate between the excerpts analyzed, allowing the observation of rewriting movements, such as the insertion and exclusion of new terms, the substitution of one term for another, as well as the deletion of expressions. This methodology provides an understanding of the semantic relationships in the textual developments that words undergo in enunciative events.

According to Guimarães (2007, p. 126), the meaning of a term is constituted within an utterance, and in the relationship between that utterance and the text; it is established to the extent that the event constitutes the speaker as the enunciator. For this reason, in order to establish its SDD, one must also consider the speaker's characterization and social position, as they are socially signified in the utterance as the one who utters. Sentences should be regarded as relative to the conditions of production in which they were uttered; in other words: taken as part of a socio-historical process. This field of study on meaning focuses not on the author but on the subject of discourse. The subject is not an individual who omnisciently takes the floor to say what they want. Pêcheux (1995) argues that the subject is constituted in and by discourse, meaning it is not a pre-existing entity with total control and mastery over its sayings. Pêcheux emphasizes that discursive and ideological formations traverse the subject, and their subjectivity is shaped by these influences.

This perspective considers the speaker and the broader context in which the utterance occurs or takes place. This includes not only Darwin's identity as a scientist, but also the scientific and social environment of his time. In this context, Darwin is understood as the speaker and, at the same time, as a historically situated subject, who expresses himself through the utterances of his scientific work.

From this perspective, enunciation is a symbolic fact. In other words, social position of the speaker is crucial in analyzing meaning as socially constituted in the enunciation event. This event makes sense because it reveals language in operation, exposing it to its exteriority as a significant and historical, rather than physical, phenomenon.

According to Guimarães (2007), it is possible to construct graphs—referred to here as SDD—from the relations of meaning present in the utterances using specific signs. In the center of this graph, the analyzed term will appear in bold, surrounded by its determinants of meaning. The signs used are:

- Symbols like ├, ┤, ┴, or ┬, which indicates "determines." For example, x ├ y means x determines y; and x ┤ y means x is determined by y.
- A dash like ─ between two words horizontally indicates synonymy. For example, x ─ y means that x and y are in a synonymic relation.
- A dash like —— between two words vertically indicates antonymy. This dash separating x and y (like) means x has an antonymic relationship with y.

The SDD of *the theory of descent with slow modification*

In this section of the article, a specific excerpt from *The origin of species* will be analyzed, in which the term *evolution* appears for the first time, from the sixth edition onwards. As mentioned, the term *evolution* does not appear in the first five editions; it is introduced only in the sixth edition.

The modifications in *The origin of species* reflect the dynamics of Darwin's intellectual process. He showed a meticulous zeal for the continuous improvement of the work, going far beyond simple revision to make substantial modifications. He did not hesitate to cut and insert entire paragraphs, reformulating the content to accurately reflect his ideas. His approach was not limited to presenting his own perspectives, but incorporated a dynamic interaction with contemporary scientific objections and debates. He incorporated refutations to criticisms of his theory, transforming each edition into a living, evolving record of the scientific discussions of his time.

In the sixth edition, the term *evolution* will appear seven times throughout the book. On six occasions, these are new excerpts from studies that have been added to this edition.

Table 1 – The word *evolution* and its derivatives in the sixth edition of (On) The Origin of Species (highlighting the excerpt to be analyzed in this section)

Pg. Ed. 1872	1872 edition	1859 edition
189	It is admitted by most *evolutionists* that mammals are descended from a marsupial form.	new paragraph
201	At the present day, almost all naturalists admit *evolution* under some form.	new excerpt
201	That species has a capacity for change will be admitted by all *evolutionists*; but there is no need […]	new excerpt
201	Everyone who believes in slow and gradual *evolution* […]	new excerpt
202	This difficulty, as in the case of unconscious selection by man, is avoided on the theory of gradual *evolution* […]	new excerpt
215	Mr. Hudson is a strong disbeliever in *evolution* […]	new excerpt
282	**[…] the fact would be fatal to the theory of *evolution* through natural selection.**	**[…] the fact would be fatal to the theory of descent with slow modification through natural selection.**
424	I formerly spoke to very many naturalists on the subject of *evolution* […]	new excerpt line 7
424	It is probable that some did then believe in *evolution* […]	new excerpt line 9
424	[…] almost every naturalist admits the great principle of *evolution*.	new excerpt line 12

Source: Darwin (1859, p. 302); Darwin (1872, p. 282)

In this article, we will conduct a comparative analysis of the first edition of 1859 and the sixth edition of 1872. We will highlight passages excluded in the later edition using strikethroughs and emphasize passages inserted using underlines. Our analysis will focus on a specific substitution, highlighted in bold:

Excerpt 1

> The abrupt manner in which whole groups of species suddenly appear in certain formations, has been urged by several palæontologists – for instance, by Agassiz, Pictet, and ~~by none more forcibly than by Professor~~ Sedgwick, – as a fatal objection to the belief in the transmutation of species. If numerous species, belonging to the same genera or families, have really started into life ~~all~~ at once, the fact would be fatal to the theory of ~~**descent with slow modification**~~ ***evolution*** through natural selection. For the development by this means of a group of forms, all of which ~~have~~ are descended from some one progenitor, must have been an extremely slow process; and the progenitors must have lived long ~~ages~~ before their modified descendants. But we continually ~~over-rate~~ overrate the perfection of the geological record, and falsely infer, because certain genera or families have not been found beneath a certain stage, that they did not exist before that stage (Darwin 1859, p. 302; Darwin, 1872, p. 282).

In Excerpt 1, Darwin replaces *descent with slow modification* with *evolution*. Notably, this is the only instance in his book where *evolution* substitutes an existing expression.

Furthermore, the table below offers a comprehensive analysis of the variations between the first edition of *On the Origin of Species*, published in 1859, and the sixth edition in 1872. The first column presents the original text, while the second column showcases the modifications made in the sixth edition. Lastly, the third column provides insightful explanations for these observed changes.

Table 2 – Comparison of the texts from *Excerpt 1* between the 1st ed. and the 6th ed.

1st ed. 1859	6th ed. 1872	Changes between editions
[…] for instance, by Agassiz, Pictet, **and by none more forcibly than by Professor** Sedgwick […]	[…] for instance, by Agassiz, Pictet, and Sedgwick […]	Removal of the phrase **and by none more forcibly than by Professor**
For the development of a group of forms, all of which **have** descended from some one progenitor […]	For the development **by this means** of a group of forms, all of which **are** descended from some one progenitor […]	Inclusion of the phrase **by this means** and replacement of the verbal phrase **have descended** with **are descended**
[…] the progenitors must have lived long **ages** before their modified descendants. But we continually **over-rate** the perfection of the geological record […]	[…] the progenitors must have lived long before their modified descendants. But we continually **overrate** the perfection of the geological record […]	Removal of the word "**ages**" and the word "**overrate**" is now spelled without a hyphen.

Source: Darwin (1859, p. 302); Darwin (1872, p. 282)

According to Guimarães's (2002) "Semantics of the Event", the central aspect of signification lies in the sense of relationships formed during the act of enunciation. In other words, signification is linguistically constructed through the enunciation event, as Guimarães emphasizes: "signification is produced in and by the enunciation event"[7] (2007, p. 77).

In *The Origin of Species*, the relationships between words and scientific terms sometimes lead us to consider them synonyms, homonyms, antonyms, hyponyms, or hypernyms. Within the same text, we may also find relationships between terms that lead us to understand them as ambiguous or polysemous.

The study of semantic relations must be taken in reference to the event of enunciation. However, this does not exclude the consideration of reference, that is, the relationship of words with what is outside them. In this case, when analyzing the previous passage, we could be led to understand the expression *theory of evolution* (used in the 1872 edition) as synonymous with *theory of descent with slow modification* (from the 1859 edition), when—and only when—the latter was replaced by the former for the first time.

Table 3 – Substitution from the sixth edition of The Origin of Species

[...] the theory of ~~descent with slow modification~~ *evolution* through natural selection [...]

Source: Darwin (1859, p. 302); Darwin (1872, p. 282)

[7] In the original: *"[...] a significação é produzida no e pelo acontecimento da enunciação [...]".*

Once we assume that the SDD is established through local contiguity relations and, as demonstrated in Table 2, there are no terminological changes in the passage beyond the substitution mentioned in Table 3, we can affirm that the SDD for the expression *descent with slow modification* is the same for the term *evolution*. However, they are not synonymous, as we cannot say that they have the same meaning.

Frege (1978, p. 214) states that "If we now replace one word of the sentence by another having the same referent, but a different sense, this can have no influence upon the referent of the sentence". For Frege, the reference of a sentence is its truth condition (true or false). The change made in Figure 1 would not affect the sentence's reference itself, as it does not alter its truth value. However, Frege warns that, in this case, the thought would change. He cites two sentences about the planet Venus as an example. In one, the expression "Morning Star" is used to designate the planet; in the other, the "Evening Star". Both expressions refer to the same celestial object, so they do not alter the sentence's reference. However, the sentences have a different sense.

The change in sense becomes apparent when someone unaware that the Morning Star and the Evening Star refer to the same object might regard one of the sentences as true and the other as false. What changes in this scenario is not the sentence's reference, which remains constant regardless of individual beliefs about its truth. For Frege, what changes is the thought. The thought behind the sentence "the Morning Star is a body illuminated by the sun" differs from that behind "the Evening Star is a body illuminated by the sun." (Frege, 1978, p. 214)

This distinction underscores the difference between reference and sense in language. The central idea is that although the two expressions in the mentioned sentences refer to the same entity in the world, they have different senses. Frege argues that this difference in sense is crucial for understanding the role of thought in language.

The substitution made by Darwin, illustrated in Figure 1, initiates a shift in meaning within the text. Although the expressions *descent with slow modification* and *evolution* establish the same contiguity relations with other terms in the passage and consequently share the same SDD, they are not synonymous. Referring to Frege, the thought that arises from engaging with these sentences may differ. From an enunciative perspective—and in line with Frege's logic—having the same SDD does not equate to having the same sense, as sense is realized in the event of enunciation. Therefore, the substitution should not be understood as a modification within the same utterance; it must be seen as a new enunciative event since the conditions of the utterance's production are determined within the socio-historical process.

The expression *theory of descent with slow modification through natural selection* does not reappear in any other part of the text in the first five editions of *The origin of species* except in Excerpt 1, as previously shown. This expression no longer appears in the work from the sixth edition onward.

Let's consider two statements that are part of Excerpt 1, considering that the elements composing these statements function due to their integration with the text:

(1) The abrupt manner in which whole groups of species suddenly appear in certain formations, has been urged by several palæontologists [...] as a fatal objection to the belief in the transmutation of species
(2) If numerous species, belonging to the same genera or families, have really started into life all at once, the fact would be fatal to the theory of descent with slow modification [...]

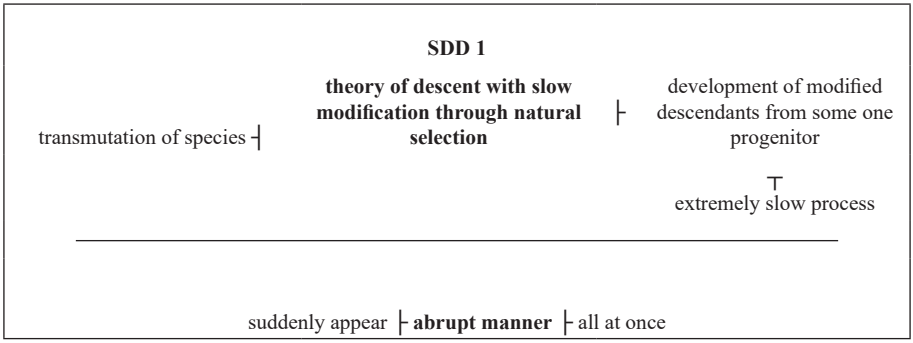
The two sequences present similar arguments: *An event x is fatal to a certain belief or theory y*. Just as the *abrupt manner in which whole groups of species suddenly appear* is fatal *to the belief in the transmutation of species*, the *numerous species [...] have really started into life all at once* is fatal to *the theory of descent with slow modification through natural selection*.

Therefore, it is possible to assert that *the theory of descent with slow modification through natural selection* is determined by *the transmutation of species*. These two expressions are antonymous to the expressions: *abrupt manner in which whole groups of species suddenly appear* and *numerous species [...] have really started into life all at once*.

In the following statement, the conjunctive phrase *by this means* refers to the *theory of descent with slow modification through natural selection*. In the same excerpt, *group of forms [...] descended from some one progenitor* is rewritten as *modified descendants* in the sequence of the statement, allowing me to propose the following paraphrase:

(3) The development of modified descendants from some one progenitor is (must be) an extremely slow process.

The expression *development of modified descendants from some one progenitor* is determined by the predicate *an extremely slow process*. Since the statements are integrated into a larger unit of meaning, I understand that the *theory of evolution* or *theory of descent with slow modification* are also determined by the *development of modified descendants from the same progenitor*. Based on what has been previously discussed, we have the following SDD:



In this context, *the theory of descent with slow modification through natural selection* is the development of a gradual process of transmutation where descendants are modified from *some one progenitor*. This idea contrasts with the sudden emergence or abrupt appearance. In SDD 1, we could replace the central expression with *the theory of evolution* without altering the sense determinations, though the thought of the sentence would change. This substitution became feasible once the term *evolution* was accepted in academic circles (Richards, 1992).

To help readers understand Excerpt 1's relationship to the rest of the book, it is essential to explain Darwin's critique of those who interpreted fossil records as evidence of simultaneous species emergence. These critics argued that the abundance of the same species in specific soil layers and the absence of related species in lower layers supported the belief that all species had emerged or appeared at once, reinforcing religious doctrines about the origin of life.

However, Darwin highlighted the imprecision of fossil records, emphasizing that modifications do not occur instantaneously, just as species do not appear abruptly. Evolution is an exceptionally slow process, making it imperceptible when comparing an individual to its immediate progenitor. Instead, changes in a population's characteristics transpire gradually over numerous generations. Consequently, it is natural to encounter only individuals of the same species within the same soil layer.

The SDD for the Verb *To Descend*

In this section, we will analyze the verb *descend*. We hypothesize that the semantic relations established by the verb with contiguous expressions will reveal meanings that express a slow and gradual process.

According to Guimarães (2007), it is possible to analyze the semantic relations between words within the same or related texts. We should understand that if these relations occur, they are a construction of language itself; it is only possible to think of the affinity between a word and what it means or designates by its relation to another word.

To analyze the meanings of the expression maintained by Darwin—*descent with modifications*, without the word *slow*—we selected Chapter VI of *The origin of species*, where Darwin (1859, p. 171) presents the difficulties of the *theory of descent with modifications*, addressing the objections raised by its opponents. In the subsection of this chapter titled "Difficulties on the theory of descent with modification", the naturalist lists some objections from opponents of the theory and proposes to debate them.

On page 172, in the fourth and fifth paragraphs, we find:

> **Excerpt 2:**
>
> Hence, if we look at *each species as descended from some [other]*[8] *unknown form*, both the parent and all the transitional varieties will generally have been exterminated by the very *process of formation and perfection of the new form*.
>
> But, as by this theory innumerable *transitional* forms must have existed, why do we not find them embedded in countless numbers in the crust of the earth? (Darwin, 1872, p. 172, our emphasis).

The verb *to descend* appears here in its nominal form: *descended*. The expression *descended* is used in the very first sentence of the excerpt and establishes a sense relationship with the expression *each species*. The sentence follows the logical formula $p \rightarrow q$ (if p then q), which can be paraphrased as: "*If each species is descended from some unknown form, then both the progenitor and the intermediate varieties must have already been exterminated.*" In this case, *each species being descended from some unknown form* is the sufficient condition p, and *the progenitor and intermediate varieties having already been exterminated* is the necessary condition q. If the statement p is true, statement q must also be true.

Let's analyze the sense relationships present in p. The indefinite pronoun *each* quantifies the noun *species*. This quantifier refers to individual elements or groups within a set, series, or totality of species in general. The use of this quantifier implies an individualized approach, suggesting that the statement applies to each element within the specific context mentioned. This quantifier is employed here to express a generalization applicable to all set members, emphasizing the comprehensive inclusion of all considered elements. It can be understood as functioning as a universal quantifier ($\forall$). It is possible to replace *each* with *every* without altering the statement's truth.

The expression *each species* functions as a noun phrase (NP), with *species* as the head noun. The verb *is* indicates the necessary identity relation between *species* and *descended*. The noun *form* is modified by the particular quantifier *some other* and the adjective *unknown*. Thus, we have the proposition: $\forall x$ is descended from $\exists y$, $x \neq y$, such that y is unknown. If we isolate x, we can paraphrase it as x is descended from

[8] A term inserted in the sixth edition.

some other unknown form. In this case, we can assert that there is a sense-determining relationship between *each species* and *descended from some other unknown form*.

SDD 2

all **species** ┤ descended from some unknown form

The SDD 2 indicates that there is no species that does not descend from another form; descent is thus a necessary condition for all species, according to the statement.

We will now analyze the necessary condition q: "*The parent and the transitional varieties have already been exterminated*." The term *some unknown form* from the previous sentence is replaced by *parent*.

The expressions *transitional varieties* and *transitional forms* also articulate meanings with the term *descendant*. The expressions *transitional varieties* and *transitional forms* are synonymous and represent stages between the parent and the new form. In Excerpt 2, both the parent and the transitional varieties are forms that are exterminated during the process of forming and perfecting the new form. We have the expressions parent and new form in the singular and transitional varieties in the plural. In the process of forming and perfecting the *new form* between the *parent* and the *new form*, there are not just one but several transitional varieties. This indicates that the process is slow and gradual.

In this case, we can identify a synonymy relationship between *intermediate varieties* and *intermediate forms*, and that both, along with *new form*, are hyponyms of *descendant*, as all are modified individuals from the progenitor. The word *parent* thus has an antonymous relationship with *descendant with modifications*, leading us to consider:

SDD 3

each **species** ┤ descended
⊤
new form

transitional varieties ─ transitional forms

parent ─ other unknown form

The expressions *transitional varieties* and *transitional forms*—unlike *new form*—do not yet constitute a new species, as described in the first lines of Excerpt 2. It can be observed that the text relates *parent* and *transitional varieties* as synonyms and *new form* as an antonym. In other words, through paraphrase, we can have: "*the process*

of forming and perfecting new forms is related to the extermination of parents and transitional varieties."

In the same chapter, the expression "transitional forms" is articulated with the term *species* in another statement:

> **Excerpt 3**
>
> [...] why, if species have descended from other species by [insensibly] fine gradations, do we not everywhere see innumerable transitional forms? (Darwin, 1859, p. 133).

In this passage, we observe the distinction between other species and transitional forms. This difference arises because transitional forms are small, imperceptible gradations but not to the extent of being considered another species. Transitional forms are part of the process of generating a species through a series of small, imperceptible gradations.

The SDD of the Term *Modification* in Its Relation to the Expression *Slow*

In *On the Origin of Species*, the expression *descent with modification*, without the word *slow*, is found in all editions. It appears ten times throughout the text of the sixth edition of 1872. If Darwin's substitution of *descent with slow modification* for *evolution* in the sixth edition had a real purpose, it can be inferred that the retention of the expression *descent with modification* is also not without reason. After analyzing the verb *to descend*, it would be appropriate to delineate the difference that the term *slow* adds to the overall meaning of *theory of descent with slow modification*, which was omitted in the sixth and final edition in favor of the term *theory of evolution*. To now demonstrate what the word *slow* means within the text, let's consider the following excerpt:

> **Excerpt 4:**
>
> These several facts accord well with my theory, I believe in no fixed law of development, causing all the inhabitants of a country to change abruptly, or simultaneously, or to an equal degree. The process of modification must be extremely slow. The variability of each species is quite independent of that of all others (Darwin, 1859, p. 314).

This passage is Darwin's criticism of the French naturalist and zoologist Georges Cuvier, who argued that the extinction of fossil animal species had been caused by a series of global catastrophes that had periodically destroyed the living species of each geological epoch, allowing God to create new species. This theory was challenged by the geologist Charles Lyell, an influence on Darwin's early works, who proposed the

thesis that the current state of the Earth is not due to a series of catastrophes but to the slow, gradual, and imperceptible action of causes that continuously operate before our eyes (Abbagnano, 2004, p. 121).

The passage presents two distinct theses, characterized by the semantic differences between the two highlighted terms: *to change* and *modification*. The objective is to understand how these two terms are signified through their contiguity relations with other terms in the excerpt and to develop an SDD for each term.

First, let's evaluate the sense relations between the two terms. *Each term* directs opposing and antagonistic ideas:

a) Fixed law of development, which causes all the inhabitants of an area to change abruptly, simultaneously, or to an equal degree.
b) Extremely slow process of modification, in which the variability of each species is entirely independent of that of all others.

These two sentences allow us to understand that the expressions *change* and *modification* are in an antonymy relation.

The expression *to change* is introduced in the text by what the speaker does not believe in (*I believe in no*), followed by what *must be* in the statement *modification*.

There is a deliberate choice to use the first-person singular pronoun "I." According to Guimarães (2002, p. 23), the "*enunciative places are specific configurations of the enunciative arrangement for the one who speaks and the one to whom one speaks. In the enunciative scene, the one who speaks or the one to whom one speaks are not people, but a configuration of the enunciative arrangement*[9]." In other words, the one who speaks and the one to whom one speaks should be understood as positions constituted by discourse, not as individuals "owners of their speech."

In this case, the Speaker (with a capital "S") is the enunciative position that, according to Guimarães (2002, p. 23), "*represents itself in the very act of speaking as the source of this speech.*[10]" The social position of the speaker, the speaker-x, is the role of a scientist or naturalist who proposes a scientifically based theory.

When the speaker enunciates from the social position of a scientist, *to change* is related to belief—specifically disbelief—through the expression *I believe in no*; in contrast, "must be" relates to the term *modification*, where the speaker's belief is not in question. In this context, the verbal phrase *must be* reinforces the imperative nature of a particular condition: "*The process of modification must be extremely slow*." The expression used conveys the idea of necessity or emphasizes the imperative importance of something occurring.

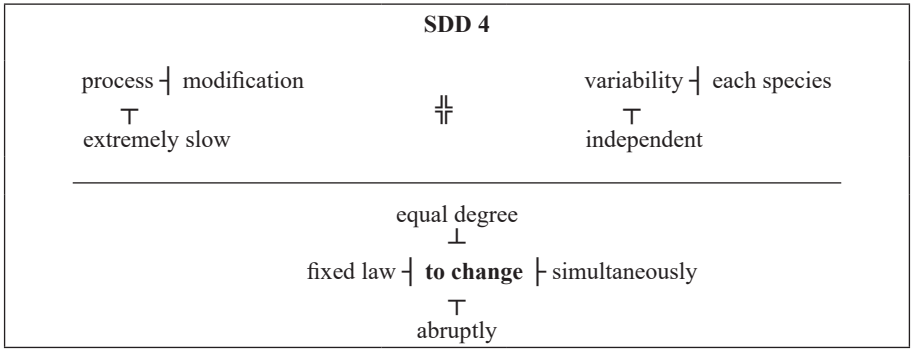
---

[9] In the original: *"[...] lugares enunciativos são configurações específicas do agenciamento enunciativo para aquele que fala e aquele para quem se fala. Na cena enunciativa aquele que fala ou aquele para quem se fala não são pessoas, mas uma configuração do agenciamento enunciativo".*

[10] In the original: *"[...] se representa no próprio dizer como fonte deste dizer".*

In the matrix of meanings that conditions the discourse of the scientific field, belief is associated with personal, subjective, and emotional convictions. The use of the first person is a textual marker of this subjectivity. These markers disappear when the text refers to the modification process; here, expressions related to belief and the personal stance of the speaker are omitted and not stated. There is no *I believe that*, *I think that*, or *I feel that*. Instead, it uses the impersonal form: *It must be*.

To change is qualified and determined by the following adverbs and adverbial phrases: abruptly, simultaneously, or to an equal degree. In contrast, modification is described as an extremely slow process. This slowness in the modification process implies that evolutionary modifications are gradually accumulated over extensive periods. The expression modification establishes a sense relationship with the expression variability. This is not a relationship of rewriting one term by another; there is no homonymy, synonymy, hyponymy, or hyperonymy. The text states that the variability of one species is not correlated with or influenced by the variability of other species. Each species follows its independent evolutionary course without being directly affected by modifications in different species. There is a correlation (marked in the SDD as ⫫) because there would be no variability without modification. This idea opposes the discredited proposal in the text that transformation would occur simultaneously for all region inhabitants.



SDD 4 allows us to state that *variability* and the *process of modification* are elements that align with the concept of *descent with slow modification*. *Variability* relates to the diversity within a population, while the *modification process* involves gradual modifications over time.

In general, SDD 4 allows us to understand that the terms descend, modifications, and slow have semantic determinations similar to the term replaced by *evolution*: descent with slow modification.

Conclusion

Referring to Excerpt 1, presented at the beginning of the analysis, where the *theory of evolution* replaces the *theory of descent with slow modification*, we can observe an evident opposition between the concepts of abrupt and slow. *The theory of evolution* is described in the text as a slow process, contrary to the prevailing idea in catastrophism that progenitor generated descendants abruptly. In the same passage, Darwin asserts that it would be fatal for the *theory of evolution* if species had emerged all at once (as seen in Excerpt 1).

Continuing the analysis of the terms, we can further infer that the *theory of evolution* and the *theory of descent with slow modification* are linked to the emergence of species, unlike the *theory of descent with modification*, which does not necessarily result in a new species but sometimes a *transitional form*. The *theory of descent with slow modification* describes a process that occurs slowly and gradually. At the same time, the *theory of descent with modification* can also refer to an event where a progenitor generates a slightly modified descendant, which does not necessarily constitute a new species.

Based on what has been discussed previously, we may assert that the term *theory of descent with slow modification* conveys a series of meanings that align with the *theory of evolution*, such as the idea of generating a new species from a progenitor through a gradual and imperceptible process. This process, in turn, may be related to the *slow* and *gradual* extinction of the *progenitor*.

Substituting one term for another should not be understood merely as a relationship of synonymy. We cannot claim that the *theory of evolution* is simply a rewriting of *the theory of descent with slow modification*. When one term replaces another in the revision of a text, it signifies a new enunciative event, marked and determined by unique and specific socio-historical conditions.

The expression *descent with slow modification* aligns with the notion that evolutionary changes occur gradually and continuously over generations without abrupt jumps. This approach is consistent with Darwinian *evolution*, which emphasizes the importance of the gradual accumulation of slight modifications over time as the driving force behind biological diversity.

Therefore, by associating *variability* and the *modification* process with the idea of *descent with slow modification*, we reinforce the understanding of a gradual and progressive evolutionary process.

MESQUITA, André Campos. Teoria da descendência com lentas modificações em *A origem das espécies* de Darwin: uma análise semântica. **Alfa**, São Paulo, v. 69, 2025.

▪ *RESUMO: Este estudo visa analisar os sentidos do termo "descendência com lentas modificações" na obra A origem das espécies por meio da seleção natural, do naturalista britânico Charles Darwin, em seu domínio semântico de determinação. O referido termo foi*

substituído pela expressão "teoria da evolução" na sexta e última edição da obra, marcando o único ponto em que a palavra "evolução" substitui outro termo em toda a produção do naturalista inglês. A análise de descendência com lentas modificações e de sua substituição possibilita compreender as determinações de sentido atribuídas à teoria da evolução na obra. Será feita ainda uma análise dos termos descendente, modificação e lenta na mesma obra com o objetivo de verificar como essas expressões funcionam independentemente. O método de análise proposto baseia-se na Semântica do acontecimento, conforme desenvolvida por Eduardo Guimarães em seu livro homônimo (2002). Para elucidar os sentidos do termo descendência com lentas modificações na obra, a intenção é examinar seu funcionamento semântico-enunciativo e sua relação com outros termos do livro.

- *PALAVRAS-CHAVE: Descendência com lentas modificações; Teoria da evolução; A origem das espécies; Charles Darwin; Semântica do Acontecimento.*

REFERÊNCIAS

ABBAGNANO, N. **Dicionário de filosofia**. 4. ed. São Paulo: Martins. Fontes, 2000.

ALVES, I. M. Neologia e tecnoletos. *In*: OLIVEIRA, A. M. de; ISQUERDO, A. N. (org.). **As ciências do léxico**: lexicologia, lexicografia e terminologia. Campo Grande: Ed. UFMS, 1998. p. 23-29.

BAKHTIN, M. M. **Estética da Criação Verbal.** São Paulo: Martins Fontes, 1992.

BENVENISTE, E**. Problemas de Linguística Geral II**. Campinas: Pontes, 1989.

DARWIN, C. **On the Origin of Species by Means of Natural Selection, or the preservation of favoured races in the struggle for life**. London: John Murray, 1859.

DARWIN, C. **The Origin of Species by Means of Natural Selection, or the preservation of favoured races in the struggle for life**. London: John Murray, 1872.

DARWIN, C. **A origem das espécies.** Tradução Eugênio Amado. Belo Horizonte: Itatiaia; São Paulo: USP, 1985

DUCROT, O. Enunciação. *In:* **Enciclopédia Einaudi**, Volume 2, Lisboa, Imprensa Nacional – Casa da Moeda, 1984. p. 368-393.

FREGE, G. **Lógica e filosofia da linguagem**. São Paulo: Cultrix – EDUSP, 1978.

GUIMARÃES, E. R. J. **Semântica do acontecimento**: um estudo enunciativo da designação. Campinas: Pontes, 2002.

GUIMARÃES, E. R. J. Domínio semântico de determinação. *In*: GUIMARÃES, E. R. J.; MOLLICA, M. C. **A palavra. Forma e sentido**. Campinas: Pontes, 2007. p. 79-96.

GUIMARÃES, E. R. J. **Os limites do sentido. Um estudo histórico e enunciativo da linguagem**. Campinas: Editora RG, 2010.

GUIMARÃES, E. R. J. **Análise de Texto. Procedimentos, análises, ensino**. 2. ed. São Paulo: Hucitec, 2012.

LALANDE, A. **Vocabulário técnico e crítico da Filosofia.** 3. ed. São Paulo: Martins Fontes, 1999.

PÊCHEUX, M. **Semântica e discurso**: uma crítica à afirmação do óbvio. Campinas: Editora da UNICAMP, 1995.

RICHARDS, R. J. **The Meaning of Evolution**: The Morphological Construction and Ideological Reconstruction of Darwin's Theory. Chicago: University of Chicago Press, 1992.

Received on March 10, 2024

Approved on May 27, 2024