

THE MARGINALITY OF LINGUISTICS IN SCI-FI: A CRITIQUE FROM THE STORY OF HEPTAPODS IN THE WORKS OF CHIANG AND VILLENEUVE

A MARGINALIDADE DA LINGUÍSTICA NA SCI-FI:
UMA CRÍTICA A PARTIR DA HISTÓRIA DOS HEPTÁPODES NAS OBRAS DE CHIANG E
VILLENEUVE

LA MARGINALIDAD DE LA LINGÜÍSTICA EN LA CIENCIA FICCIÓN:
UNA CRÍTICA A PARTIR DE LA HISTORIA DE LOS HEPTÁPODES EN LAS OBRAS DE CHIANG
Y VILLENEUVE

Luiz Henrique Milani Queriquelli¹
Universidade do Sul de Santa Catarina
UNIASSELVI

ABSTRACT: Inspired by Ted Chiang's novel *Story of Your Life* (1999) and its cinematographic counterpart, Denis Villeneuve's *Arrival* (2016) (scripted by Eric Heisserer under the supervision of linguists Jessica Coon and Morgan Sonderegger), this essay has a twofold intention. Firstly, it intends to carry out a brief analysis of such works, highlighting some of its merits and weaknesses. Secondly, based on the arguments presented throughout the analysis, it aims to reflect upon the marginality of the science of language in the sci-fi genre, and on science fiction itself, as a solution to escape that condition.

KEYWORDS: Linguistics. Science fiction. Philosophy of linguistics.

¹ PhD in Linguistics (Ufsc), researcher in the area of romance and historical linguistics, professor at Uniasselvi and Unisul universities - luizqueriquelli@yahoo.com.br

RESUMO: Inspirado pela novela *História da Sua Vida* (1999), de Ted Chiang, e sua contraparte cinematográfica, o filme *A chegada* (2016), de Denis Villeneuve, roteirizado por Eric Heisserer, sob a supervisão dos linguistas Jessica Coon e Morgan Sonderegger, este ensaio pretende oferecer, em sua primeira parte, uma breve análise de tais obras, destacando alguns de seus méritos e fragilidades; e, complementarmente, em sua segunda parte, com base nas considerações ensaiadas ao longo da análise, apresentar uma reflexão sobre a marginalidade da ciência da linguagem no gênero *sci-fi* e sobre a própria ficção científica como alternativa para sair dessa condição.

PALAVRAS-CHAVE: Linguística. Ficção científica. Filosofia da linguística.

RESUMEN: Inspirado en la novela *La historia de tu vida* (1999), de Ted Chiang, y su contraparte cinematográfica, la película *La Llegada* (2016), de Denis Villeneuve, con guión de Eric Heisserer, bajo la supervisión de los lingüistas Jessica Coon y Morgan Sonderegger, este ensayo pretende ofrecer, en su primera parte, un breve análisis de tales obras, destacando algunos de sus méritos y fragilidades; y, complementariamente, en su segunda parte, con base en las consideraciones ensayadas a lo largo del análisis, presentar una reflexión sobre la marginalidad de la ciencia del lenguaje en el género *sci-fi* y sobre la propia ficción científica como alternativa para salir de esa condición.

PALABRAS-CLAVE: Lingüística. Ciencia ficción. Filosofía de la lingüística.

1 INTRODUCTION

Most specifically in cinema but also in literature, *sci-fi* tends to be principally explored for entertainment. However, some authors of the genre are able to contribute significantly to the critique of theories and even of a whole scientific paradigm by projecting fictitious realities from certain theoretical principles and propositions. Exceptional examples in cinema - among many others worthy of mention - are *Clockwork Orange* (1971), by Stanley Kubrick, based on the novel by Anthony Burgess; *Mindwalk* (1990), with an original screenplay by Bernt Amadeus Capra; and *Nemo Nobody* (2009), with an original screenplay by Jaco Van Dormael. Good science fiction has the power to show the virtues and vices of a theory (or even of a whole scientific field) by radicalizing its possibilities in a serious exercise of prediction inherent in the very dynamics of science. This is what Ted Chiang's novella *Story of Your Life* (1999) and its film counterpart, the film *Arrival* (2016), by Denis Villeneuve - edited by Eric Heisserer, under the supervision of linguists Jessica Coon and Morgan Sonderegger - manage to do.

Due to their quality, this essay intends to offer a brief analysis of these works by Chiang and Villeneuve, highlighting some of their merits and weaknesses. Complementarily, based on the arguments addressed throughout the analysis, this essay will reflect on the marginalization of the science of language in the genre of *sci-fi* and on *sci-fi* as a possible solution escape that condition.

2 THE HEPTAPOD LANGUAGE B

The plot of the stories by Chiang and Villeneuve can be summarized as follows: a linguist who is summoned by the US Army to translate the sounds emitted by aliens who have just landed their ships on Earth, and thus communicate with them to discover the purpose of their visit. Upon accepting the job, Dr Louise Banks quickly realizes that trying to decode the spoken language of the visitors would be counterproductive, and attempts to establish communication with graphic signs. She hopes they would have a written version of their spoken language, that is, a glottographic language (a constant in the case of human languages), but she is surprised to discover that their writing system is independent of their spoken language; it is ultimately another language, not the written version of the first language. This other language, which she calls the Heptapod B, is semasiographic. Heptapods are therefore bilingual subjects since they proficiently use two fundamentally different linguistic systems. This fact is in line with interesting contemporary discussions, such as the suggestion that proficient users of the written standard of a language are ultimately bilingual (SIGNORINI, 2002, p. 109); or Derridean debate on written languages as autonomous systems, independent of spoken languages (MOTA 1997, p. 291).

The Heptapods - thus named because they are seven-limbed creatures similar to an octopus - communicated visually by means of semagrams similar to mandalas. In Chiang's novel the linguist explains what are semagrams as follows:

In the next report I submitted, I suggested that the term “logogram” was a misnomer because it implied that each graph represented a spoken word, when in fact the graphs didn't correspond to our notion of spoken words at all. I didn't want to use the term “ideogram” either because of how it had been used in the past; I suggested the term “semagram” instead. It appeared that a semagram corresponded roughly to a written word in human languages: it was meaningful on its own, and in combination with other semagrams could form endless statements. We couldn't define it precisely, but then no one had ever satisfactorily defined “word” for human languages either. (CHIANG, 2000, p. 15-16).

In the film, aliens project the semagrams with body fluids into a kind of mirror while in the novel Chiang explains that the semagrams are woven by the Heptapods in a manner similar to a spider web. After all, it makes no difference: what are cobwebs but the result of body fluids projected in the form of a textile structure? Speculation aside, this is the first strong point of the narrative: the B language of the Heptapods is not a system of signs formed by the concept and acoustic image, but of signs formed by ideas and graphic image, reproduced by body fluids that protrude in the air. At first glance they do not differ too much from a written word, an ideogram, an icon, or a symbol but upon a second examination one understands that a single semagram can represent complex thoughts through combining innumerable propositions, as in a sentence replete with dependent clauses, which appreciably differentiates it from these other types of sign. Terminologies and classifications aside, this is at the same time a compliment to Saussure's structuralism and a critical insinuation to the common-sense phonocentrism and the Saussurean tradition itself.

The praise for Saussurean structuralism originates in the fact that the author constructs a fictitious reality, more specifically a language, which corroborates the principle that any language is, in essence, a system of signs that is organized by oppositions, no matter how these signs are represented (whether by acoustic signals, manual gestures or, perhaps, body fluids).

The critical insinuation of phonocentrism is more subtle but no less acute. According to Derrida (2008), phonocentrism presupposes the privilege of speaking over writing with respect to representing meaning. That is to say, meaning is essential, and both speech and writing ultimately misrepresent it, although speech expresses it more clearly and with less “noise,” while writing would misrepresent it more often. Therefore, in the Derridean view, Western tradition tends to attribute to speech the role of a more transparent vehicle of reason, implying that writing would affect the clarity of meaning. In this way, the graphic sign assumed peripheral status in the representation of sense, while the phonic sign has always enjoyed some centrality, hence the name of the phenomenon. According to Derrida, “phonocentrism [implies] absolute proximity of voice and being, of voice and the ideality of meaning” (DERRIDA, 2008, p. 14).

If the Western phonocentric tradition underestimates writing in the benefit of speech, it does not even consider non-phonetic languages. More than just disregarding non-phonetic languages in the construction of linguistic intelligence, it subjugates them, many times considering them inferior. This is portrayed in the narrative when the military inadvertently assume that the sounds produced by aliens are their only language and, at first, disregard any alternative. The linguist also initially falls into this fallacy but soon becomes aware of their misconception.

In reality, there are many more regrettable cases of phonocentrism. Early approaches to deaf sign languages, for example, considered them to be precarious forms of language, the result of the efforts of individuals supposedly incapable of developing proper language (phonic of course). While this issue has marked the historical debate between oralists and gesturalists (LACERDA, 1998), fortunately, it has already been overcome. In the story under analysis, the protagonist alludes to this when, immersed in the Heptapod B, she realizes that she is thinking in graphic images, not acoustic images, and then remarks that she had heard of deaf-dumb people doing the same with their gestures:

The idea of thinking in a linguistic yet non-phonological mode always intrigued me. I had a friend born of deaf parents; he grew up using American Sign Language, and he told me that he often thought in ASL instead of English. I used to wonder what it was like to have one's thoughts be manually coded, to reason using an inner pair of hands instead of an inner voice. With Heptapod B, I was experiencing something just as foreign: my thoughts were becoming graphically coded. (CHIANG, 2000, p. 26).

Chiang's narrative emphasizes linguistics. And it does so not only by alluding to Saussurean structuralism and phonocentrism but also with other allusions and direct mentions, as to gerativism (when Louise plans to approach the alien language in search of linguistic universals), and Austin's theory of speech acts (when she begins to realize the performativity of Heptapod B). However, the literary text also gives much prominence to physics, embodied by Dr Gary in Chiang's novel (Dr Ian in Villeneuve's film), the romantic pair of Dr Louise: they meet during the Heptapod's mission. Specifically, the emphasis on physics translates as the importance given to the "Fermat principle," according to which a ray of light chooses either the fastest way to achieve its goal or the longest path, but never an intermediate alternative. This suggests, among other things, that a ray of light is governed by a teleological principle (that is, its purpose directs its behavior), rather than a causal principle (the cause dictates the effect), as traditional physics tends to analyze physical phenomena in general. This would be present, according to Dr Gary and the debaters of the Fermatian principle, in various other physical phenomena, which suggests that one can analyze a physical phenomenon both from the point of view of its purpose and from the point of view of its causality. The phenomenon is the same, but perspective changes everything: it changes essentially the way one orients themselves in relation to time. If one orients themselves based on the purpose of an action, then one has to foresee their development in time and situate themselves within a much wider temporal spectrum. This implies some ability to predict the future or to extend one's temporal vision. It is an attitude certainly different from a temporal orientation based on a linear sequence of events, as implies the causal approach of traditional physics. In other words, physical nature is the same, but the way one understands it (their thinking and behavior towards it) can change their experience in the world.

This digression to the temporal implications of a physics ruled by a teleological principle is essential for the narrative since the Heptapod B reflects this perspective that widens the vision of time. The Heptapods already know everything they are going to say when they begin to scribe (or weave) a semagrama, no matter how complex and full of verbal phrases it is. They never interrupt the production of a sentence. They never interrupt their turn of the conversation in order to reformulate a statement *because* of some event that has intervened. This supposedly happens because the way they face the physical world gives them the advantage of anticipating part of the future. It so happens that when Dr Louise begins to become proficient in Heptapod B, she begins to experience this enlarged view of time that Heptapod thought allows. This explains the title and diegesis of the novel since the narrative progresses with Louise going back and forth in the *Story of Your Life*, suggesting that she already knows herself in full ever since she learned the new language (although her predictive ability gives her no ability to change anything in the past). The alien language induces a new manner of thinking. Anyone who is familiar with the idea has already noticed that this is the strong version of the Sapir-Whorf hypothesis, which in essence states the same: "language shapes thought" (SAPIR, 1949; WHORF, 1956).

This is not the first time this theory has been explored in fiction, for example in George Orwell's classic *1984*. In it, a totalitarian government creates the "newspeak" believing that, by seizing control over the language, it would be able to control the thoughts of its people, thus preventing undesirable ideas from arising. The appropriation is satirical and even ridicules the Sapir-Whorf hypothesis. That is the opposite of Chiang's and Villeneuve's works, where the hypothesis is taken seriously, as a redemptive possibility. It is worth mentioning that Chiang's novella leaves this hypothesis - absolutely central to the plot - only implied (hidden for the laity), whereas in Villeneuve's film it is made explicit, becoming the topic of one of the main dialogues between Louise and Ian halfway through the film:

Ian: "I was doing some reading about this idea that if you immerse yourself into a foreign language, then you can actually rewire your brain." Louise: "The Sapir-Whorf hypothesis." Ian: "The theory that the language you speak determines how you think." Louise: "Yes, it affects how you see everything." Ian: "I'm curious. Are you dreaming in their language?" Louise: "I may have had a few dreams, but I don't think that that makes me unfit to do this job." Ian: "Did you sleep?" Louise: "A little." Ian: "Do you know Mandarin? The voice you're about to hear belongs to a Chinese military chief."

This aspect – the explication of the theory behind Louise's predictive ability – is one of the many (and positive) differences in Heisserer's script in relation to the literary text, and it is very likely to be an influence of the linguists who have assisted in its elaboration. Additionally, in the film, it is clear that Heptapod B - which shapes thought in a way that broadens one's view of time - is itself the gift they have to offer humans, and Louise uses it instinctively to avoid world military catastrophe. In the novella, the question of the exact nature of the gift is left open, and the protagonist only experiences lapses of vision of the future while being immersed in the linguistic interaction with the Heptapods; the story leaving the impression that there is some loose end in the narrative plot.

Returning to the Sapir-Whorf hypothesis: praising the fact that the film had explicitly and efficiently used it to close the plot does not attest to its veracity. On the contrary, *Arrival* only proves that the strong version of this theory is unsustainable, as many critics have done for decades since its proposition (see SEUREN, 2013; KAY, KEMPTON, 1984). To quote the classic example of Whorf, it is not because the Inuit Eskimo tongue has dozens of words for snow that they become able to distinguish these many varieties of snow, but the opposite: it is the ability they develop to discern an object that is marked in this lexical diversity. The same would apply to the Heptapod B: it is not because the language adapts to a broad view of the time that the Heptapods have such a vision, but the contrary: this perspective inherent in their thought is reflected in the language. For example, in Brazilian Portuguese, there are not dozens of words for snow because Portuguese-speaking people have little or no experience with this natural phenomenon, what only reinforces the antithesis under discussion: it is the language that fundamentally reflects our cognition, not the opposite.

Paradoxically, the emphasis on the Sapir-Whorf hypothesis accentuated in the film is both its damnation and its salvation: the damnation of verisimilitude and the salvation of the box office. Although it belongs to the sci-fi genre, the film sustains an impressive verisimilitude for most of its two-hour duration, something that is only broken at the end when, in a cathartic moment, the protagonist uses the predictive superpowers conferred by the Heptapod language to save the planet. To use Chiang's own technical terms to represent the interchange between humans and aliens in the story, it is a "non-zero sum game" in which both sides win: Hollywood wins by staging a fantastic end inspired by the strong version of Sapir-Whorf, appropriate to the expectations of a blockbuster; and science gains by seeing the caricature of a promising strong version of theory being falsified spontaneously by fiction - let us remember: a non-falsifiable theory is not a scientific theory, as Popper (1959) would say.

If, on the one hand, Villeneuve's film overcomes Chiang's text by unfolding the implications of the Sapir-Whorf hypothesis in the narrative, on the other, he omits the physical foundations of the Heptapod cosmology that resulted in this powerful B language (the Fermat principle question). Those who watch the film remain unsure as to why such a language transforms thought in that way, except for a remark made in passing by Louise in which she claims that the Heptapods have a non-linear understanding of time. Thus, in the cinematographic version, the scale is frankly unbalanced in favor of linguistics, whereas one of the merits in Chiang's novel is precisely the balance between the sciences that underlie the plot. In addition to linguistics and physics, which are most notable, it also introduces notions of anthropology, by demonstrating awareness of the theory of the gift (which refers to Mauss and Malinowski), and chemistry, when he discusses the elements that make up the atmosphere of the Heptapod planet and about inconsistencies of our periodic table. This balance is indeed worthy of applause: there is no predominance of exact sciences over human ones (something rare in sci-fi), and the author shows that he is very well-informed about the scientific notions he uses, making precise use of them.

3 CONSIDERATIONS ON THE MARGINALITY OF LINGUISTICS IN SCI-FI AND ON THE SCI-FI AS ALTERNATIVE TO LEAVE THAT CONDITION

In addition to the points already mentioned, Villeneuve's work (more than Chiang's) deserves attention for at least two other reasons: it places linguistics at the top of the sciences (something unheard of in Hollywood blockbusters) and personifies science in a female character (something very rare). It is touching to see such a major production, with a millionaire budget, receiving an Oscar nomination for best picture, betting the farm in a marginalized science, historically ignored by the genre. Sci-fi movies have always valued nuclear physics, among other "bombast" sciences, so to speak. *Arrival* shows the lay public that all cutting-edge science can be as complex and interesting as any supposedly exact science. In one of the film's scenes (non-existent in the original novel), the

physicist Ian, played by Jeremy Renner, praises the linguist Louise, played by Amy Adams, by saying that she analyzes the language as if she were a mathematician. She mocks him by saying that she would regard his comment as a compliment – a clear critique of the peripheral position to which exact science scholars usually relegate linguistics, assuming it to be a human science, in spite of the fact that in some places it is studied as a natural-biological science, and in others, as an exact science. In Chiang's text, this resentment over the low status and over the general public's ignorance to what linguistics and its sophisticated methods are is timidly expressed by the character Louise when she states: "My mother could never understand why I could not be just one English teacher in high school."

Instead of joining the chorus of this resentment, it is more profitable to reflect on the reasons for this marginality of linguistics. The mere fact of celebrating the prominence of the science of language in a Hollywood sci-fi film is already a warning sign: we would not do so if it were consolidated and if it had already been able to diffuse and dispel the myths that still hinder its communication with the society. Why is it not yet fully consolidated and why one must still introduce linguistics every time someone asks a linguist what they do? It is possible to say that there is no consensus on the definition of the object of our science and that this greatly hinders its consolidation and, consequently, its dissemination. I prefer, however, to focus on another problem: the linguist's academic endogeneity, something observed decades ago by Jean-Claude Milner (2012 [1978], 113-115):

What of the linguist? [...] Linguistics in and of itself creates no social bond; it succeeds in doing so only and through the University. In this sense, there is no linguistic discourse, but only a special case of academic discourse. [...] The linguist, by definition, studies and teaches: whence for him the importance of academic recognition.

Milner's warning still applies today, and it will continue to so long as linguists do not come out of their academic cocoon. Linguists are still as exotic beings as the Heptapods to the general public. It is not every day that a benevolent Ted Chiang (computer-training scientist) lend himself to a thorough study of linguistics to bring it to the forefront of one of his stories.

It is out of the scope of the present essay to offer the solution to this problem. There is not a single solution, but it is necessary to create a "social bond" - as Milner (2012, p. 113) would say - and for creating it there are many paths. Popular publications of scientific propaganda, systematic presence in the press, and societies for the dissemination of the field are some strategies, according to Couzinet (2009). There is already some effort in this direction here in Brazil, such as linguists who are engaged in scientific dissemination, producing materials for the lay public, including Rodolfo Ilari, Sírío Possenti, Ataliba de Castilho, Gabriel de Avila Othero, Mário Perini, Marcos Bagno, Kanavillil Rajagopalan, among others. Such researchers have published exhaustively on linguistics inside and outside the academic walls, and this is a commitment that could be upheld with more engagement by all. Yet another strategy is to promote science fiction, which is promising for at least two reasons: for placing its appraiser into a reality that theory projects, and for providing alternatives to construct the future with scientific information.

The first of these reasons can be illustrated by the following analogy of Franknoi (2002, p. 113): "It is one thing to understand in principle that the day and night on the Moon are about two Earth weeks long, and quite another to read about a future astronaut stranded on the Moon for whom this becomes a life-or-death issue." To paraphrase Franknoi with regard to the history of Heptapods, one can say: it is one thing to understand that, in theory, a language can reprogram someone's thought; it is quite another to follow the experience of Dr Louise who, as she immerses herself in the B language, begins to have visions of the future. As previously stated, this effect can have different uses: either to raise someone's awareness to a theoretical problem or to make them realize the absurdity of a hypothesis. In both cases, it is useful.

The second reason echoes in this reflection permeated by the postmodern optimism of Isaac Asimov (1978, p. 6):

It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be. Science fiction writers foresee the inevitable, and although problems and catastrophes may be inevitable, solutions are not. Individual science fiction stories may seem as trivial as ever to the blinder critics and philosophers of today – but the core of science fiction, its essence has become crucial to our salvation if we are to be saved at all.

In spite of the overstatement, Asimov draws attention to something that is in itself a commitment to science: predicting the future and considering alternatives for it. Going back to linguistics, to its need to create social ties and to the perspectives of sci-fi in this task, we can conjecture innumerable scenarios. One that immediately comes to mind refers to one of today's fashionable theories: the so-called “minimalist program.” Imagine a future when the minimalist program has proven to be true, and researchers have been able to trace the specifications that make the language device access different parts of the brain and integrate them. How many scenarios could one imagine from that? A robotic race to reproduce this device; engineers of language speculating improvements; catastrophes and aberrations arising on this account; the humanity reviving ethical dilemmas. Another scenario that I can conjecture is related to historical linguistics and its related areas (variational linguistics, sociolinguistics, grammatical studies, philology, etc.). Imagine a film set in Brazil in the year 2120. Based on the linguistic change trends shown by the current studies, in what condition will the Portuguese language exist around this time? Will the pronominal system already be transformed; simplified in terms of personal pronouns? What about the demonstrative pronouns? Will the verbal morphology be transformed? Will new morphemes of time, for example, have arisen or been consolidated? How will the discourse markers be? Will some dialect marks have gained prestige in the standard language? Will some linguistic contact have induced any change? What probable changes in society will have affected the language? How will gender marks be? The forms of treatment? What lexical innovations will be most salient? Where will they have come from? What a wonderful task it will be for a linguist who is called upon to advise a sci-fi author or who ventures to write in that genre themselves? What an advertisement for linguistics would such a work be, and what benefits would it bring to the community of the area?

To conclude the reflection, let us return to the argument that opened this essay: although science fiction is usually considered mere entertainment, it is also capable of contributing to the critique of science by projecting scenarios. As argued, good science fiction has the power to show virtues and deficiencies of a theory by radicalizing its possibilities, in a serious exercise of prediction. Moreover, in the case of marginalized sciences, such as with linguistics, fostering science fiction can be a way for consolidating itself and thus sensitizing the general public to their problems.

REFERENCES

- ASIMOV, I. Forward. In: HOLDSTOCK, R. (ed.). *Encyclopedia of Science Fiction*. London: WH Smith Pub., 1978. p. 10-15.
- COUZINET, V. Transmitir, difundir: formas de institucionalização de uma disciplina. *Perspect. ciênc. inf.*, Belo Horizonte, v. 14, n. spe, p. 5-18, 2009.
- DERRIDA, J. *Gramatologia*. Trad. Míriam Chnaiderman e Renato Janine Ribeiro. São Paulo: Perspectiva, 2008.
- FRAKNOI, A. Teaching astronomy with science fiction: a resource guide. *Astronomy Education Review*, Tucson, v. 1, n. 2, p. 112-119, jul. 2002/jan. 2003.
- KAY, P.; KEMPTON, W. What is the Sapir-Whorf-hypothesis? *American Anthropologist*, n. 86, p. 65-79, 1984.
- MILNER, J.-C. *O amor da língua*. Trad. Paulo Sérgio de Souza Jr. Campinas: Unicamp, 2012 [1978].

MOTA, S. B. V. da. A Gramatologia, uma ruptura nos estudos sobre a escrita: a Disruption on Written Language Studies. *DELTA*, São Paulo, v. 13, n. 2, p. 291-313, ago. 1997.

POPPER, K. *The logic of scientific discovery*. New York: Basic Books, 1959.

SAPIR, E. *Language, culture and personality*. Berkeley: University of California Press, 1949.

WHORF, B. L. *Language, thought, and reality*. Boston: Technology Press of Massachusetts Institute of Technology, 1956.

SEUREN, P. *From Whorf to Montague: explorations in the theory of language*. Oxford: Oxford University Press, 2013.

SIGNORINI, I. Por um teoria da desregulamentação linguística. In: BAGNO, M. (org.). *Linguística da norma*. São Paulo: Edições Loyola, 2002. p. 93-127.



Recebido em 16/05/2018. Aceito em 10/10/2018.