

New Paths for Science: A Contrastive Discourse Analysis of Modifications in Popularizing Science through Digital Media / *Novos percursos da ciência: as modificações da divulgação científica no meio digital a partir de uma análise contrastiva*

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ABSTRACT

This article investigates how oral utterances in science dissemination are modified in digital media, specifically on YouTube, to achieve their main goal of developing a scientific culture among the viewing public from their apperceptive background of responsive understanding and from within the discursive culture with which they identify. To this end, we analyze the transmission of alien discourse on the Brazilian channel *Nerdologia* and the American channel Scishow. The analysis is based, on the one hand, on the theoretical precepts of the Bakhtin Circle, and, on the other hand, on the theoretical-methodological proposal of contrastive discourse analysis. Based on this framework, we found relationships between the quantitative and qualitative occurrences of forms of transmission of alien discourse in the corpus. In both cases, they highlight similarities between the two channels, outlining a general spectrum of changes made by this discursive modality in digital media and point to their differences, related to the different discursive cultures actualized by the utterances.

KEYWORDS: Contrastive discourse analysis; Bakhtinian theory; Science Divulgarion; Utterances in digital media; Transmission of alien discourse

RESUMO

Este artigo investiga a forma com que enunciados orais de divulgação científica se adaptam ao meio digital, especificamente ao YouTube, para realizar sua função principal: criar em seu interlocutor uma cultura científica a partir do seu fundo aperceptível de compreensão responsiva e da cultura discursiva com que este se identifica. Para tanto, analisa-se a transmissão do discurso alheio em um canal brasileiro, Nerdologia, e um americano, Scishow, baseando-se, por um lado, nos preceitos teóricos do Círculo de Bakhtin, e, por outro, nas propostas teórico-metodológicas da análise contrastiva de discursos. A partir disso, encontramos no corpus relações entre as ocorrências quantitativas e qualitativas dos modos de transmissão do discurso alheio, que, ao mesmo tempo, ressaltam semelhanças entre os dois canais, traçando um espectro geral das adaptações sofridas por essa modalidade discursiva no meio digital, e apontam suas diferenças, que se relacionam com as diferentes culturas discursivas que os enunciados materializam.

PALAVRAS-CHAVE: *Análise contrastiva de discursos; Teoria bakhtiniana; Divulgação científica; Enunciado no meio digital; Transmissão do discurso alheio*

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Introduction

The objective of this article is to show that the popularization of science (heretofore PS), as a mode of dialogical relationships, is modified through digital media – it adapts to their general configurations and conveys and actualizes the discursive culture to which their presumed interlocutors (in this case ‘viewers’) are associated, from their apperceptive background of responsive understanding.

This objective is achieved through a comparative analysis of YouTube channels from two countries, focusing on the analysis of the forms of transmission of alien discourse. In other words, we examine the way in which each utterance incorporates and represents the voice of science and the scientists – an extremely productive issue for arriving at an understanding of this scenario – demonstrating how the utterance presents the scientific voice to the presumed viewer, aiming to educate them in scientific culture (VOGT, 2006), and to fulfill its social goal. Grillo and Glushkova (2016, v.11, n.2, pp.77-78) define this goal as the attempt to “broaden the knowledge base of the viewers, by , on the one hand, providing them with values, knowledge, and visions of the world from the scientific universe itself, and, on the other hand, coming under the influence of the higher strata of the ideology of daily life.”¹

Digital media is specifically interesting with regard to this issue, in that it constitutes an important ‘redefiner’ of current means of language production, influencing and modifying genres and modalities in dialogical relationships through characteristics particular to its functioning. Some of these are: the characteristically informal style of language; the availability of diverse means of organized material expression (audiovisual, for example); and a peculiar configuration of the presumed viewer, who is characteristically undefined and indistinct, which enables the simultaneous encompassing of a broad and varied social spectrum.

¹In the original Portuguese: “ampliar o estado de conhecimentos dos destinatários, dotando-os, por um lado, de valores, saberes, visões de mundo próprios do universo científico e, por outro, sofrendo a influência dos estratos superiores da ideologia do cotidiano” (GRILLO; GLUSHKOVA, 2016, v.11, n.2, pp.77-78).

We propose that PS, when carried out through digital media, is modified, on the one hand, to these general criteria – adopting an informal style, using a variety of means of organized expression and addressing a wide range of themes that may be treated in conjunction, side by side. On the other hand, it is actualized diversely, mainly in function of the presumed viewer. We perceive that the generalized and indistinguishable characteristic of the audience of digital utterances creates the need for each utterance to appeal to an average representative of the specific social group in this mass polymorphism, which constitutes its presumed viewer. Therefore, the PS utterance must rely on the presumed viewer's apperceptive background of responsive understanding, or rather, the discursive culture to which the viewer belongs and in which he or she constructs an identity for himself or herself, adopting preferences and inclinations to some genres or spheres in relation to others. This discursive culture, however, is also in a dialogical relationship to the other discursive cultures within a historical-geographical-social paradigm. Consequently, this causes the social group's concrete situation, which will constitute the presumed viewer – its time period, location, economic-social situation, ideological positioning –, to influence taking up a position in relation to the possible discursive cultures, and, thus, to how the utterance itself incorporates these questions.

The theoretical basis for our investigation is formed by concepts of the Bakhtin Circle, seeking to align definitions of utterance, dialogic relations, speech genres² and the transmission of alien discourse, fundamental to the analysis of PS utterances. In addition, we use the methodology developed by researchers in contrastive discourse analysis, mainly those who comprise the group *Syled-Cediscor – axe sens et discours*, and who propose important procedures and results for the analysis of non-literary utterances.

² Translator's Note: here and elsewhere, 'speech genres' is adopted for the translation of '*gêneros de discurso*' according to the norm established by the McGee translation in *Speech Genres and other late essays* (1986). Full reference - BAKHTIN, M. *Speech Genres and Other Late Essays*. Translated by Vern McGee. Austin, Texas: University of Texas Press, 1986.

1 Notes on the Concept of PS

It behooves us to linger for a minute on one of the central definitions in the analysis of our proposed object, which is the PS, with its main characteristics and its positioning within the general discursive chain. Without intending to carry out an exhaustive examination on the theme, in this section we delimit our focus to the comparison of three perspectives we deem pertinent to our research, by three researchers in the field: Authier-Revuz (1998[1982]), Zamboni (2001) and Grillo (2013). Presented with this ample range of perspectives on the subject, our analysis is aligned to Grillo's (2013) definition, which makes extensive use of Bakhtinian concepts to see PS as a modality of dialogic relations between the scientific sphere and other spheres of human activity (including, here, the quotidian ideology – the ideology of daily life) actualized in different speech genres.

Grillo (2013) differs from the two previously cited researchers by considering PS not merely a relation to both quotidian and scientific discourse, of which it would act as a mediator, as Authier-Revuz affirms, but as a movement of the exteriorization of science to other spheres of human activity, with the goal of creating a scientific culture in the viewer. It uses, for this reason, the dialogical interaction of other spheres, such as journalistic (where Grillo concentrates her studies), didactic-pedagogical, and artistic, among others. Grillo differs from Authier-Revuz also for situating the popularizing author not only as the erased mediator of the discourse, but as an author who participates extensively in the construction of the utterance when selecting and producing the PS by means of considering the apperceptive background of responsive understanding of the viewer, that is, everything that s/he supposedly knows and does not know.

Grillo even establishes differences between the behavior of the PS in instances of circulation and reception and in the instance of production, in which the heterogeneity produced by the interaction of the PS utterance would play out within diverse spheres: “[t]he diversity of the spheres of production will be responsible for the choice of the speech genres and even for the different features that any one genre can assume due to the sphere

of circulation and reception” (GRILLO, 2013, pp.91-92).³ She distances herself, in this way, from Zamboni, on observing that the PS actualizes in different speech genres, once it proposes dialogue among various spheres of human activity and, therefore, cannot be constituted in one isolated genre.

The perspective adopted is coherent with the intended analysis, given that our corpus presents characteristics that can be interpreted as belonging to diverse spheres of human activity, which requires that the analysis we are proposing consider discourse not merely as a translation from a scientific discourse to a daily discourse, as in Authier-Revuz (1998 [1982]), or as a genre, as in Zamboni (2001). Instead, we must look to the PS as a modality of dialogue between diverse spheres, which is the base of the constitutive plurality that it presents. Simultaneously, the perception of the PS as the exteriorization of science to other spheres of human activity, seeking to develop a scientific culture in the viewer, foments researching the diverse ways in which this objective is carried out, specifically in the transmission of reported discourse.

2 Methodology for Defining the Corpus and Methods of Analysis and Interpretation: Contrastive Discourse Analysis Aligned to the Theory of the Bakhtin Circle

The contrastive analysis that aligns concepts of the Bakhtin Circle to the concrete analyses already conducted by the Syled-Cediscor – *axe sens et discours* – constitutes, as we previously mentioned, the theoretical-methodological basis of this research. Our point of departure is the definition by von Münchow (2004), for whom comparative discourse linguistics examines the *manifestation of a single discursive genre in at least two languages/cultures, seeking to describe and interpret discursive regularities*.

Beginning with this premise, we need a central concept for our analysis: the discursive culture, defined by the author as discursive manifestations of social representations circulating in a given community about the objects in a broad sense, on the one hand, and about the discourses made about these objects, on the other. Transposing this

³ In the original Portuguese: “A diversidade de esferas de produção será responsável pela escolha dos gêneros do discurso e mesmo pelas diferentes feições que um mesmo gênero pode assumir em razão da esfera de circulação e recepção.”

to Bakhtinian theory, we have chains of ideological utterances connected in diverse ways and strongly linked to the historical-social situation in which they were produced. These reflect and refract thought from particular epochs, of social groups, or of individuals. As an example, can we think about which chains of utterances are associated to youth currently involved in digital media: do they associate more strongly to the entertainment sphere, seeking genres associated to fun on the internet; or to the educational sphere, through digital research about various branches of knowledge, for academic purposes or not; or to the sphere of journalism, seeking news items and current affairs; or, finally, a complex combination of these various cultural-discursive associations?

In addition to this, we can contemplate Bakhtinian meanings with regard to the contrastive discourse analysis, as Grillo and Glushkova (2016) do on identifying a comparative base of phenomena in distinct cultures and languages, using a Bakhtinian method of analysis. This theoretical-methodological perspective draws on the Circle of Bakhtin's literary studies that promote comparisons between novels from different cultures to better understand how the novel functions as a genre. Likewise, it draws on his latest works, in which he affirms more clearly the advantages of this approach: "It is only in the eyes of *another* culture that foreign culture reveals itself fully and profoundly" (BAKHTIN, 1986, p.7).⁴ This also is found in the definition of the very basis of Bakhtinian theory, since, according to the authors, the dialogic relations between utterances, works and discourses are based precisely on the contrast between cultures.

Next, we define the corpus and the criteria for choosing it, from a question central to contrastive discourse analysis: *tertium comparationis*, the invariant that unites the texts of different languages/cultures studied, and that permits, therefore, their comparison. It is precisely guided by the *tertium comparationis* that the researcher selects the corpus, forming the problem as residing in the choice of the element that constitutes this invariant: the speech genre is imposed in an almost unanimous way as a response to the problem. However, this is not an uncontroversial point, since, by itself, the discursive genre does not guarantee the comparability of the documents, once it raises questions such as: what is genre? What approach should be taken? The situation is resolved in diverse ways for each

⁴ For reference, see footnote 2.

author, for example, by the use of reinforcing measures of the invariant to guarantee comparability. In this article, we aim to find the solution to this question in its relation to the concepts of the Bakhtin Circle, which we use in our research, having as our central guiding point, Bakhtin's concept of speech genres, and searching it for a possible invariant of comparison or not.

For Bakhtin, in *Speech Genres and Other Late Essays* (1986),⁵ speech genres are relatively stable. He concurs the presence of stable elements, which identify the genre in relation to others, and variable elements, which permit its adaptation according to the situation of production and its change throughout time: an imprecision and malleability that is accordance with its relation to human activities, also imprecise and malleable. In addition to this, we highlight the extreme heterogeneity of speech genres, differentiating primary genres (simple) and secondary genres (complex), from the conditions in which they arise. Secondary genres (as those from the artistic or scientific perspective) emerge from complex cultural-ideological conditions and relatively more developed than those that incorporate and redevelop in their formation – the primary genres, which belong to the context of immediate communication, in direct contact with concrete reality and reported utterances. The author indicates this essential difference between the two types of genres as indispensable to understanding the historicity of the genres and, with this, their full functioning.

Particularly in this research, once we treat different PS utterances from Grillo's perspective, we take the methodology of Cavalcante Filho (forthcoming),⁶ which, on promoting a contrastive analysis of PS from the perspective of Bakhtinian theory, constitutes its *tertium comparationis* not by the genres of utterances with which he works, but by the actualization of the dialogical relations of the PS in these utterances.

In this way, our main invariant will be the actualization of the PS in utterances in distinct languages/cultures: the Brazilian channel *Nerdologia*, and the American channel,

⁵ For reference, see footnote 2.

⁶ Work presented in a lecture by Cavalcante Filho, titled *Traços de didaticidade na divulgação científica brasileira e francesa: uma análise dialógico-comparativa do discurso de Ciência Hoje e La Recherche*. In: I Colóquio Brasileiro-Franco-Russo em Análise de Discurso (CBFR-AD), 2017, São Paulo, 9th of November, 2017.

Scishow. To this are added secondary invariants, which can serve as reinforcing measures of comparison, such as the genre of utterances – both are videos of scientific curiosities, that is, audiovisual utterances that spread scientific themes of possible interest to the presumed viewer, in an informal style, and that circulate in digital media, specifically, YouTube. Applying these criteria, we chose ten videos of scientific interest from YouTube that materialize the PS, which has a style (informal, with references to films, TV series, music, etc.) and composition (dynamic editing with quick shifts from one frame to another) that address a youthful segment of the audience of the two countries to which they pertain. This raises different spectrums of possible discursive cultures to which their presumed viewers are associated. We also chose themes covered in videos on both channels so that a parallel between them could be made, as shown in Fig. 1

Theme	Nerdologia Videos	Scishow Videos
Hipnosis	Hipnose (Hypnosis) Nerdologia 165 01 Sept. 2016 - https://www.youtube.com/watch?v=alsciIzdUFY	The Science of Hypnosis 10 Nov. 2016 - https://www.youtube.com/watch?v=RWMYNTnoEyQ
Dark Matter	Os poderes da Lince Negra (The Powers of Shadowcat) Nerdologia 99 17 Sept. 2015 - https://www.youtube.com/watch?v=EkyRnJgHQhI	Dark Matter 27 Dec. 2012 - https://www.youtube.com/watch?v=EkyRnJgHQhI
Lies	O JEITINHO BRASILEIRO (Brazilian Hustle) Nerdologia 19 13 Feb. 2014 - https://www.youtube.com/watch?v=CM9xBCj7h5Q	The Science of Lying 01 Jul.2012 - https://www.youtube.com/watch?v=MX3Hu8loXTE
Zika Virus	Vírus Zika (Zika virus) Nerdologia 112 10 Dec. 2015 - https://www.youtube.com/watch?v=pm3do0nEuuM	Zika Virus: What We Know (And What We Don't) 05 Feb. 2016 - https://www.youtube.com/watch?v=JUIGN5XJ5dc
Energy	Energia (Energy) Nerdologia 111 03 Dec. 2015 - https://www.youtube.com/watch?v=pXtVUobPQLs	World's Most Asked Questions: What Is Energy? 28 Oct. 2014 - https://www.youtube.com/watch?v=CW0_S5YpYVo

Figure 1: Summary of the videos that comprise the *corpus*, their date of publication on YouTube and their respective links.

The next step in defining the corpus was to determine the form of analysis. First, due to the need for an adequate method of transcribing the oral discourse of the videos, we opted for the NURC norms, as presented by Castilho (2016), as they allow us to register the utterances preserving the orality (intonation, emphasis, repetitions, pauses, etc.). Next, we relied on Von Münchow's research (2004, p.52) on this subject, which proposes, in short, a definition of categories, belonging to human language and not to one or another language – a relationship necessary for comparing the linguistic features between the languages and carrying out a *linguistic description*. The next step was to form inferences about the functions of the genre in question and the representations that were presented about the role of different viewers implicated and the genre itself – the *simple interpretation*. We can, then, extrapolate a link between these functions and the representations and the institutional, cultural, etc. causalities, producing a *causal interpretation*.

In our research, the category of language used in the comparison was the modes of transmission of alien discourse employed in the utterances, since, according to what was previously mentioned, this can clarify for us the different procedures of the PS to form a scientific culture with its viewer. The occurrences of this category were analyzed using methods from contrastive discourse analysis and according to Vološinov's classifications about the modes of transmission of alien discourse in *Marxism and the Philosophy of Language* (1973).⁷

3 Data Analysis and Interpretation

a Description and Analysis of the Occurrences

The texts by the authors of the Circle problematize the question of reported discourse, rethinking utterance as a single and unrepeatable link in the discursive chain, in which the subject-author appropriates the existing discourse to transform it within his or her

⁷ VOLOŠINOV, V. N. *Marxism and the Philosophy of Language*. Translated by Ladislav Metejka and I.R. Titunik. London: Seminar Press, 1973.

own context. It is, therefore, “speech within speech, utterance within utterance, and at the same time, also *speech about speech, utterance about utterance*” (VOLOŠINOV, 1973, p.115; author’s emphasis).⁸ Vološhinov (1973)⁹ discusses the subject distinguishing the concepts of the model of transmission of alien discourse and its modifications: the model would be the abstract and idealistic ‘mold’ of transmission of alien discourse, while the modification would be the concrete variants that actualize this model. In this analysis, we find occurrences of the two basic models proposed by the author – indirect and direct speech – of which we discuss their modification.

Vološhinov (1973)¹⁰ first defines indirect discourse, primarily basing it on its analytical characteristics. It is delineated as the translation of information contained in the form of the cited utterance, in developed and complete elements, transposed, with mediations in the content of the speech that cites it. The author presents two main modifications of indirect discourse: *referent-analyzing* and *texture-analyzing* (VOLOŠINOV, 1973, p.30).¹¹ The first is characterized by the analytic transmission of the *referential composition* of the reported speech, that is, only its content, since, in this modification, the reported utterance is perceived as a semantic position of the speaker, which categorically distances the author’s word and the reported word.

In our corpora, we found 29 occurrences of referent-analyzing indirect discourse in the videos of the *Nerdologia* channel, and 43 in Scishow. Along with this relatively expressive quantitative difference between the channels, distinct qualitative differences appear in the way that this modification is used in each channel. *Nerdologia* has a high rate of occurrences from specified subjects – and its written books or articles –, with their name cited, their photo exhibited and even commentaries about the author and what his or her relevance is within the theme being explored, as well as specifications of the source from where the alien discourse was taken, by naming and showing a visual of the author’s book, for example, as in the following cases:

⁸ For reference, see footnote 7.

⁹ For reference, see footnote 7

¹⁰ For reference, see footnote 7

¹¹ For reference, see footnote 7.

LOC.1 – ((frame change – photo of the book ‘The Physics of Super Heroes’ appears and its author James Kakalios)) **in Physics of superheroes... the physicist from the university of minnesota james kakalios proposes another way out... Tunneling...** ((a strip with the word ‘tunneling’ appears))

LOC.1 – ((frame change – a drawing of a podium appears with people stealing from one another, and with the symbol of Transparency International below, beside a worldwide perception of corruption graphic)) last year **Brazil FELL in the ranking of perception of corruption of the transparency that ALTHOUGH CRITICIZED ... STILL it is a source of consultation for those who plan to invest in other countries...**¹²

On the other hand, in Scishow, the majority of referent-analyzing indirect discourse refers to a generalized and indeterminate reported subject; an indistinct collective, without mentioning from where the sources of the information were taken or the relevance of the subject of alien discourse in the area covered by the video. The following is an example:

LOC.1 - but **REsearchers have estimated** ((writing appears 10-15% of people are highly hypnotizable’)) **that** around TEN to fifteen percent of people are HIGHlyhipnoTizable... ((the writing disappears))

The texture-analyzing modification, in its turn, perceives the reported utterance not only in its referential aspect, but also in its *form*, in its *expression*, which is transmitted together with the content in an analytical way through the indirect construction, which gives it the high degree of individualization of the reported discourse – the individual speaker constitutes a subjective mode specified in the discourse, using quotation marks, for example. At the same time, however, it superimposes over this colorful alien discourse, authorial tonalities, such as irony, which causes estrangement in authorial discourse in relation to the alien. At its limits, the texture analyzing modification constitutes a linguistic and stylistic analysis, *joined* to referential analysis. In all of the videos analyzed, only one

¹² In the original Portuguese: “LOC.1 – ((mudança de quadro – aparece a foto do livro ‘The Physics of Super Heroes’ e de seu autor, James Kakalios)) **in PHYsics of superheroes... o físico da university of minnesota james kakalios propõe outra saída... o TUnelamento...** ((aparece faixa escrito ‘tunelamento’))” “LOC.1 – ((mudança de quadro – aparece um desenho de um pódio com pessoas roubando umas das outras, e com o símbolo do Transparency Internacional abaixo, ao lado de um gráfico mundial de percepção de corrupção)) ano passado **o brasil CAIU no ranking de percepção de corrupção do transparency que EMBORA CRITICADO... AINDA é uma fonte de consulta pra quem planeja investir em outros países...**”

occurrence of texture-analyzing discourse was found – in the video about lies on the Scishow, used in the following example:

LOC. 1 – religious systems... began to drive home the point that god reWARDS... and CARES... for the TRUTHFUL and PUnishes LIARS... so if you could survive being thrown into the pond and tied up with a sack of hammers god was ON YOUR SIDE... and you were telling the truth if NOT... you were... OBVIOUSLY lying oh: medieval european judicial system... how I LOVE you...

In this example, a modification of the subject-author's intonation, confers irony on particular words of the alien utterance with the emphatic and expressive intonation, as if delivering a religious discourse. In this way, it is the discourse that is referring, but exaggeratedly reinforcing the stressed words in the speech, with which the subject-author disagrees. From this verbal resource – the expressive intonation, defined by Bakhtin in *Speech Genres and Other Late Essays* (1986)¹³ as a constituting aspect of utterance, one of the forms by which the speaker expresses his or her evaluative relationship with the subject of speech –, the speaker seems to determine the reported character of the speech through the change of referential signification of the reported discourse. This, on being reproduced in aspects not only referential, but also expressive, and interpreted by the ironic intonation of the speaker, is *reevaluated*, that is, transferred from one evaluative context to another – in this case, from the context of positive evaluation of the religious discourse cited, to the context of negative evaluation of the discourse itself. In addition, the speaker's final comment, ironizing the transmitted discourse, reinforces the perception that the discourse of the other is being dealt with; discourse that was brought by the author to illustrate the subject at hand and to demonstrate disagreement.

The second model of transmission of the alien discourse discussed by Vološinov is direct discourse. The author characterizes it as a pictorial style of transmission of the reported discourse, particularized by the extreme lightness of interaction and mutual penetration between the authorial discourse and the alien discourse. It presents, initially, two main modifications: preset and particularized direct discourse (VOLOŠINOV, 1973,

¹³ For reference, see footnote 2.

p.134).¹⁴ The first would be the direct discourse that arises from indirect or free indirect discourse, in which the main themes are anticipated by the context which “color the author’s context...with its authorial intonations still intact” (VOLOŠINOV, 1973, p.135).¹⁵

In our corpus, we find an irregular distribution of this modification throughout the videos: the videos on the *Nerdologia* channel have three occurrences that can be taken as examples of preset direct discourse, while the Scishow channel presents seven in total. The occurrences of the two channels serve different functions in each case. The occurrences on Scishow function to clarify, appearing within a story that illustrates the concept covered by the author:

LOC.1 – and you know you don’t... make friends and influence people going around saying things like... ((frame change – a drawing of a caveman talking to a woman appears)) ((intonation change)) **ACTually... thatloincloth DOES makeyourbutt look big...** ((intonation change)) or...**hey... uh... I HAVE been having sex with your brother while you were out hunting mastodons so little glurg over there’s... PRObably your cave nephew...**

LOC.1 - then the subjects were given a VERY specific suggestion... ((frame change– writing appears in quotes ‘the words they would see in the fMRI scanner were gibberish, and they had to identify the color shown as quickly as possible’)) **the words they would see in the fMRI scanner... were Gibberish and they had to identify the COLOR shown as quickly as possible...**

In *Nerdologia*, this modification appears in the form of a literal quotation from scientific speech, mainly to conclude the argument constructed throughout the video as in the following example:

LOC.1 – **which brings us to dan ariely’s conclusion... “people have the SAme propensity to be dishonest”...** ((writing in quotes appears on the screen ‘People have the same propensity to be dishonest’, with the name Dan Ariely in parenthesis below the writing))¹⁶

¹⁴ For reference see footnote 7.

¹⁵ For reference, see footnote 7.

¹⁶ In the original Portuguese: “LOC.1 – **o que nos traz pra conclusão de dan ariely... “as pessoas têm a MESma propensão a serem desonestas”...** ((aparece na tela o escrito entre aspas ‘As pessoas têm a mesma propensão a serem desonestas’, com o nome de Dan Ariely entre parênteses abaixo do escrito))”

Meanwhile, the particularized direct discourse, according to Vološinov (1973),¹⁷ is characterized by the referential shadings of the authorial context about the direct discourse, once the evaluations and emotions of the referential presentation of the reported discourse passes to the authorial context. The direct discourse is, therefore, diminished in semantic weight, but broadened in its importance for characterization, in its ability to color the discourse. In our corpora we have irregular and scant examples, however, varied in their utility within the context. In general, the particularized direct discourse appears 12 times in *Nerdologia* versus just once in Scishow.

In the *Nerdologia* videos, we consider particularized direct discourse to include every instance in which a source appears on the video, through a photo of a page or article, but that is not cited by the author, since its content is reproduced literally, and in its expressive and formal aspect, but does not have semantic weight in the authorial context, merely serving a stylistic function – to endow the information brought by the speaker with a degree of reliability. The following example illustrates this situation:

LOC.1 – but even so... the best evidence we have... are that COUNSELLING ((**a photo of a scientific article about the subject appears, together with a photo of Bernardinho**)) it is AS effective as hypnotherapy... ((an oldfashioned poster of a hypnotizer is displayed beside the Bernardinho’s photo)) to quit smoking for example... ((between the two images the ‘no smoking’ symbol appears))¹⁸

In addition to this case, in *Nerdologia*, the modification is used, moreover, to corroborate what is being said by the speaker, as when a video is shown that illustrates precisely the point covered by the speaker, or confirming his argument, as in:

LOC.1 – ((frame change – a drawing appears of a man seated in a recliner watching a commercial on television of a video cited by the speaker)) now listen again to the commercial of seventy six ((a photo appears of the debut of the film Star Wars ‘1976’)) with the player GÉRson nunes... which created the FAMous law of GÉRson... and tell me if

¹⁷ For reference, see footnote 7.

¹⁸ In the original Portuguese: “LOC.1 – mas mesmo assim... as melhores evidências que temos... são de que ACONSELHAMENTO... ((**aparece uma foto de um artigo científico sobre o assunto, junto a uma foto de Bernardinho**)) é TÃO eficaz quanto hipnoterapia... ((exibe-se um cartaz antigo de um hipnotizador ao lado da foto do Bernardinho)) pra parar de fumar por exemplo... ((entre as duas imagens surge o símbolo do ‘proibido fumar’))”

our culture favors trickery... ((audio from the video)) ((written in quotes appears ‘Why pay more if vila gives me everything i want in a good cigarette? I like to get the advantage in everything, you feel me? You get the advantage too’)) **“why pay more if vila gives me everything i want in a good cigarette?... I LIke to get the advantage in everything, FEEL me? ...GEt the advantage too”**¹⁹

However, in the only occurrence present in the Scishow videos, its use is entirely different, since the discourse is used in an introductory way, taking up, at the beginning of the discussion, the terms used in the reported discourse for transmitting the content already introduced by the authorial context:

LOC.1 – and earlier this week the world health organization declared an interNATIONAL public health EMERGENCY... over the ZIKA virus ((writing appears ‘zika virus’)) which... in its words **“is spreading EXPLOSIVELY across central... and south america”**... now if there are three words you never want to hear in the same sentence they are probably... **“Virus”**... **“eMERgency”** and... **“exPLOsively”**... ((the words ‘virus’, ‘emergency’ and ‘explosively’ appear in quotes))

In addition to these, Voloshinov (1973, pp.137-138)²⁰ brings yet another two modifications of direct discourse: *rhetorical* and *substituted*. In the rhetorical, we have a modification that is situated on the border between authorial and reported discourse and can be interpreted as integrating this or that, making sense of phenomena from rhetorical questions and rhetorical exclamations. Rhetorical direct discourse appears more heavily in our corpora, but as a way of including the voice of the *viewer* in the authorial context, anticipating his or her questions and comments about what is being presented by the speaker. Rhetorical questions occur more frequently in the two channels, but without foregoing the rhetorical exclamation – both having the same function. Thus, we have the following examples:

¹⁹ In the original Portuguese: “LOC.1 – ((mudança de quadro – aparece o desenho de um homem sentado na poltrona vendo televisão e, nesta, o vídeo da propaganda citada pelo locutor)) agora ouça novamente a propaganda de setenta e seis ((aparece foto da estreia do filme Star Wars com a legenda ‘1976’)) com o jogador GÉRson nunes... que criou a faMOsa lei de GÉRson... e me diga se nossa cultura favorece trapaça... ((áudio do vídeo)) ((aparece entre aspas o escrito ‘Por que pagar mais caro se o vila me dá tudo aquilo que eu quero de um bom cigarro? Gosto de levar vantagem em tudo, certo? Leve vantagem você também’)) **“porque pagar mais caro se o vila me dá tudo aquilo que eu quero de um bom cigarro?... GOSTo de levar vantagem em tudo CERTo?...LEVe vantagem você também”**

²⁰ For reference, see footnote 7.

LOC.1 – ((frame change – speaker appears)) since dark matter can't be detected **you might... wonder... why do we even think that it EXISTS...** well we can INFER its existence..." – rhetorical exclamation on the Scishow channel.

LOC.1 – ((frame change – a pocket watch swinging in the view of the spectator)) concentrate on the watch and become aware of your breathing... you are getting sleepy... relaxed... your arms are heavy... and you feel the hUGE desire to share nerdologia with your friends... **but where did this come from?** ((a question mark appears on the screen))" – rhetorical question on the Nerdologia channel.²¹

In the substituted direct discourse, there is a solidarity between the authorial context and the alien discourse with regard to the intonations, evaluations, which give them the same 'intonational' direction and contribute to masking the limits between one and the other. In the entire corpus, we have only one occurrence that can be considered a substituted direct discourse, in a video from the *Nerdologia* channel, since it is used in a direct citation from a character, with merely the function to close the sentence that corresponds with this quote's evaluative stance and intonation. The resource is used stylistically, as a video closure, to 'play' with the viewer to produce references to his or her discursive culture (as we shall see further on):

LOC.1 – ((frame change – as scene from "X-Men: The Film" appears)) FINALLY... as professor xaviER would say... it's all a question OF? ((audio from the scene of the film)) **"physics"**...

The findings of the quantitative data are summarized in Figure 2. From this description of how the data appears and how the different models and modifications of the reported discourse are distributed in the videos of the two channels, we move on to the interpretations of these data that will constitute our final considerations.

²¹ In the original Portuguese: "LOC.1 – ((mudança de quadro – aparece um relógio de bolso balançando na visão do espectador)) concentre-se no relógio e perceba sua respiração... você tá ficando com sono... relaxado... seus braços tão pesados... e você sente uma vontade eNORme de compartilhar o nerdologia com seus amigos... **mas de onde veio isso?** ((um sinal de interrogação aparece na tela))" – pergunta retórica no canal Nerdologia

Number of occurrences of the models of transmission of the alien discourse and their modifications	Nerdologia					
	Video Themes	Dark Matter	Lies	Zika Virus	Energy	Hypnosis
Referent-analyzing Indirect Discourse	3	5	3	6	12	29
Texture-analyzing Indirect Discourse	-----	-----	-----	-----	-----	0
Preset Direct Discourse	1	1	-----	-----	1	3
Particularized Direct Discourse	3	1	4	2	2	12
Rhetorical Direct Discourse	-----	5 questions and 1 exclamation	-----	3 questions	1 question	9 questions and 1 exclamation
Substituted Direct Discourse	1 occurrence	-----	-----	-----	-----	1
Free Indirect Discourse	-----		-----	-----	-----	0
Number of occurrences of the models of transmission of the alien discourse and their modifications	Scishow					
	Video Themes	Dark Matter	Lie	Zika Virus	Energy	Hypnosis
Referent-analyzing Indirect Discourse	7	6	10	1	20	44
Texture-analyzing Indirect Discourse	-----	1	-----	-----	-----	1
Preset Direct Discourse	-----	6	-----	-----	1	8
Particularized Direct Discourse	-----	-----	1	-----	-----	1
Rhetorical Direct Discourse	1 exclamation	5 questions	-----	2 questions	3 questions	10 questions and 1 exclamation
Substituted Direct Discourse	-----	-----	-----	-----	-----	0
Free Indirect Discourse	-----	-----	-----	-----	-----	0

Figure 2: Summary of the results found in the reported discourse analysis of the corpus.

b Interpretation of the Data

Indirect discourse, mainly the referent-analyzing modification, is the model of transmission of alien discourse most used, and which has the most regular occurrences. This was not an expected result. Vološinov associates this form of transmission of alien discourse with the “authorial context that is somewhat rationalistic and dogmatic in nature – one at any rate in which the focus of attention is strongly ideational and in which the author shows through his words that he himself, in his own right, occupies a particular ideational position” (VOLOŠINOV, 1983, p.131).²² Thus, the use of indirect discourse in these utterances can be justified by this being an element associated to *scientific style* with which the utterances seek to align themselves.

The texture-analyzing modification, in its turn, appears one single time in the entire corpus. Vološinov (1973)²³ attributes this modification to the realm of the realist and *critical* individualism, in opposition to the referent-analyzing modification, which belongs to the rationalist individualism. Therefore, the emergence of the modification in a critical context is justified. However, this does not create a problematization, or a break in paradigms, since it addresses religious discourse – the target of criticism from scientific discourse throughout the historical development of the two realms in the context of the western world. What we have, then, is that the use of the texture-analyzing modification consists of nothing more than the agreement with the discourse, historically constructed from the same realms of human activity in which the utterances analyzed aim to be included.

Thus, the use of both modifications of indirect discourse on the two channels points to one identical, intended objective: to associate the utterances with the scientific field, in an attempt to affirm it as a reliable source of scientific information. This explains, furthermore, the use of the texture-analyzing modification not to break with paradigms to cause controversy, but to produce discourse that agrees with the scientific discourse already in existence, and consequently, with which to be associated.

²² For reference, see footnote 7.

²³ For reference, see footnote 7.

Direct discourse, however, and its different modifications appear irregularly throughout the corpus, with greater or lesser frequency in each case. Beginning with the occurrences of preset and particularized direct discourse, we identified a great variety of functions for which they are used, but are characterized by the illustrative, pictorial use of these resources, giving what has already been said the tint of alien discourse, but without adding new information to the utterance. Meanwhile, in the rhetorical and substituted discourse, the common element that emerges is the use of the mode of transmission of the alien discourse so that the author can dialogue with the presumed audience directly, including it in the utterance, whether through the voice, or through the field of knowledge cited.

Direct discourse is defined by Vološinov (1973)²⁴ as a *pictorial* style of the transmission of alien discourse, characterized by an extreme levity of interaction and mutual penetration between authorial and reported discourse, and therefore, disassociated from a scientific and rationalistic context. Using this definition, aligned to the concepts of Bakhtin (1986),²⁵ we note that direct discourse is used in our corpora to stake out an association of the utterance to primary genres of the discourse – the genres of everyday life – in counterpoint to the secondary (in which scientific genres are included), marked by indirect discourse.

Likewise, we found that the direct discourse was used illustratively, and does not represent any great innovations in the referent content of the utterance, but rather amplifies its expressivity, its coloring, or it may refer to the viewer, drawing him or her into the utterance. The presence of this model of transmission of the alien discourse does not serve the basic composition of the utterance, and is not essential to its functioning. Rather, it seems to have a *stylistic* function, which does not make it any less interesting, since it appears in service to the construction of a concrete and scientific argument, characteristic of a secondary genre.

The reason for this confluence of occurrences and objectives of the elements identified as primary and secondary genres can be in the very nature of the PS, on thinking

²⁴ For reference, see footnote 7.

²⁵ For reference, see footnote 2.

of this process through the historicity of its utterances throughout the chains of discourse. The PS, previously actualized mainly in print genres, such as newspapers and magazines, has moved on to include sites and blogs, of which YouTube channels are a recent innovation. This video-sharing site was founded in 2005, and since then has developed in a plural environment, dealing with a multiplicity of themes and presumed viewers – viewers, who seem to be primarily youth (between 18 and 30 years old), as shown in research regarding the use of the internet both in Brazil in the *TIC Domicílios*²⁶ research, and in the United States, in research carried out by the Pew Research Center.²⁷ Notably, the number of young users is high in diverse activities online, from entertainment by accessing videos, to the search for information and knowledge, through online studies or research mechanisms. Figures 3 and 4 present these rates.

²⁶ Research consulted: Proportion of individuals who already access the internet by age group in Brazil. Historical series from 2008 to 2015. Source: CGI.br/NIC.br, Regional Center of Studies for the Development of the Information Society -*Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação* (Cetic.br), Research on the Use of Information Technologies and Communication in Brazilian - *TIC Domicílios*.

²⁷ Research consulted: Proportion of individuals who already access the internet by age group in the United States. Historical series from 2000 to 2014. Source: PERRIN, Andrew; DUGGAN, Maeve. **Americans' Internet Access: 2000-2015:** As internet use nears saturation for some groups, a look at patterns of adoption. Projeto do Pew Research Center.

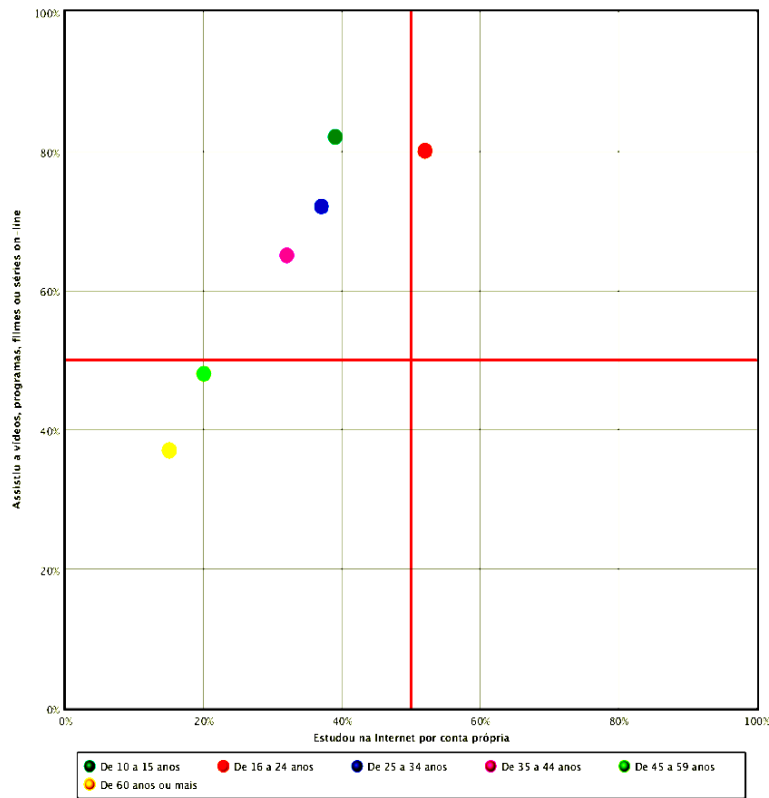
Online activities, by demographics

% of internet users age 18+ within each group who do the following activities online

Date of survey	Search	Email	Buy a product	Use social network sites	Bank online
	May 2011	Aug 2011	May 2011	Aug 2011	May 2011
All adults	92%	91%	71%	64%	61%
Men	93	89	69	63	65
Women	91	93	74	66	57
Race/ethnicity					
White, Non-Hispanic	93	92	73	63	62
Black, Non-Hispanic	91	88	74	70	67
Hispanic (English- and Spanish-speaking)	87	86	59	67	52
Age					
18-29	96	91	70	87	61
30-49	91	93	73	68	68
50-64	91	90	76	49	59
65+	87	86	56	29	44
Household income					
Less than \$30,000/yr	90	85	51	68	42
\$30,000-\$49,999	91	93	77	65	65
\$50,000-\$74,999	93	94	80	61	74
\$75,000+	98	97	90	66	80
Educational attainment					
No high school diploma	81	69	33	63	32
High school grad	88	87	59	60	47
Some College	94	95	74	73	66
College +	96	97	87	63	74

Sources: The Pew Research Center's Internet & American Life Project Tracking Surveys, May & August 2011. Interviews were conducted by landline and cell phone, in both English and Spanish.

Figure 3: Summary of the activities online in the United States in 2011, distributed demographically.



Total de usuários de Internet(1)
 (1) Fonte: CGI.br/NIC.br, Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação (Cetic.br), Pesquisa sobre o Uso das Tecnologias de Informação e Comunicação nos domicílios brasileiros – TIC Domicílios 2016.
 Fonte: Núcleo de Informação e Coordenação do Ponto BR (NIC.br).

Figure 4: Data of individuals in Brazil who use the internet to study on their own, and individuals who use the internet to access videos, programs, films or series online in 2016, by age group.

Subsequently, the PS, as actualized in videos on YouTube, must be adapted to address the following issues: to understand any information and knowledge that the young search for on the internet, to surmise which apperceptive background of knowledge they carry with them, “the whole aggregate of life experiences and the outward expressions directly connected with it” (VOLOŠINOV, 1973, p.92)²⁸ or rather, to which speech community (discursive culture) the youth associate, and who surf the internet, mainly on YouTube, as a form of leisure. This confluence of the two complex universes in one

²⁸ For reference, see footnote 7.

utterance explains the manifestation accentuated in the forms used to transmit the reported discourse that is associated with secondary genre characteristics – reinforcing their link with the scientific sources that are the holders of knowledge sought after by the presumed audience – to the forms associated with the primary genres – employed by the universe of entertainment to which this same audience belongs. Thus, this shows that the attempt of the PS to settle into and gain reliability in digital media, integrating its informality and plurality of the themes it possesses, as well as its presumed viewer being varied and generalized, using precisely its conciliatory characteristic that has defined it throughout its discursive history.

However, this does not explain everything we found in our analysis: within the greater objective proposed by the PS in this medium, differences emerge, both quantitative and qualitative, regarding both of the channels. For example, qualitative issues on the production of indirect discourse, present in the manifestations of the referent-analyzing modifications of both channels, are relevant here. We observed the reinforced marking of the subject in the reported discourse, as shown in the *Nerdologia* videos, and its opposition to the present tendency in the Scishow videos, in which the subject of the reported discourse is generalized in an indistinct collective. This seems to demonstrate there is a greater affinity by the Brazilian channel for a scientific style and its linguistic-discursive resources than the American channel, which revolves more around, apparently, the ideology of daily-quotidian life and the resources associated with it, than the scientific sphere.

This is reinforced when we analyzed how each channel used the resources associated with the primary genre. While *Nerdologia* used them to construct the argument defended by the author, and, thus, integrated these resources with the needs of the scientific style, Scishow used them mainly to include the voice of the audience in the video, to reach their universe of knowledge and consider their apperceptible background of responsive understanding and with this, not to incorporate the secondary genre. It is as if the author-subject interrupted what was being said in a scientific style, to clarify, with the resources of the primary genre, what has already been said to the audience. From this, we can see that each of the channels seems to lean toward one of the main sides that compose the PS. The

Brazilian channel is more inclined to the scientific sphere and the American channel is more inclined to the quotidian sphere. In function of this, the other spheres of human activity that are employed by the PS are used in favor of the main goal intended for each channel, and to help tilt the balance toward a particular side in each case.

Observing the data regarding the public who uses the internet in each country, as well as the differences in the self-identification of each channel – both in its introductory video on YouTube and on the Facebook page –, we can apprehend what generates distinct functions in the both cases. Observing Figures 3 and 4, we see that both Brazil and the United States have a high number of youth in research and study activities, as well as in leisure activities, such as the use of social networks and accessing videos and films. However, notably, there is a greater distance between the youth and the other age groups in leisure activities in relation to studying activities – a distance that is more accentuated in the American scenario than the Brazilian. This suggests the existence of a more accentuated familiarization of Brazilian youth, compared to the American youth (in a generalized way, as average representatives of their social group), with regard to research and study activities, carried out through means of the genres similar to those analyzed in the videos, which have traces of scientific style in them as well. With this data in mind, as well as the characteristics of the digital media of the generalized and undefined presumed viewer, it is possible to think about how the two channels select, from within this spectrum of possibilities, a specific group that they seek to invite to their utterances.

The Brazilian channel seeks, then, to employ the scientific style without being associated to the genres accessed for study activities. For that, it seems to make use of a markedly scientific language – more than that which is employed in video-classes, for example – in which the secondary genre resources are abundantly utilized, and the primary genre resources are integrated to the needs of the first, producing a didactic strategy *camouflaged* by everyday-quotidian elements. In this way, the channel disassociates itself from the universe of study to become associated with that of entertainment (evidenced in its classification on Facebook as an entertainment site), appealing specifically to the presumed young, *nerd* viewer and the speech community-discursive culture with which he or she associates, characterized, by the presumed knowledge of the functioning and characteristics

of the genres, which reinforces the use of secondary genre resources in the utterance. The appeal to this presumed specific viewer is signaled immediately in its introductory video on the channel, in which it is characterized as “The channel where the pop world becomes science!”

The American channel, in its turn, does not have such a strong counterpoint in the area to which it belongs. Instead, it is classified on Facebook as a *science site*, directed to a curious audience who, as the introductory video of the channel’s slogan says,²⁹ hates not knowing things. However, it also appeals to a presumably young audience, but not necessarily very familiar with the scientific sphere and its genres, and therefore, not necessarily having a broad appreciable background about the subjects covered – a presumed viewer with generalized characteristics, however, associated to a discursive culture that is not as specific as that of *Nerdologia*. Given this scenario, the utterance needs a language that grabs the viewer’s attention to the video, through the use of resources more explicitly associated to the primary genres, seeking to create a sense of intimacy with the language used and that explains why subjects are treated in a broad and accessible way, encompassing this generalization of the presumed viewer. Thus, there is less integration between the function of the scientific and the quotidian resources in the Scishow videos compared to the *Nerdologia* videos.

Statement of authorship and responsibility for published content.

We declare that both authors had access to the research *corpus*, participated actively in the discussion of the results and conducted the review and approval process of the paper's final version.

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²⁹ “Here at Scishow, we hate not knowing things!”

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