A Genre Analysis of Popularization Articles on Autism in *Science Daily*

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ABSTRACT

This paper analyzes the genre of popularization article discussing autism published by the magazine *Science Daily*. The objective of this research is to define this genre and describe its structure, language and most common features. The method applied involved the analysis of 50 samples of texts following the model proposed by Casañ-Pitarch (2016), and based on Bhatia (2004) and Swales (1990). Results suggest that there is a usual common structure among the texts of this genre and there are also some language forms that occur in most of the texts such as length, moves and steps, morphology, and the use of pronouns and verbs. In conclusion, after analyzing the results obtained from our corpus, some patterns have been suggested in order to define the most common structure and language forms within the genre of popularization articles published by *Science Daily* that discuss the topic of autism.

Keywords: Genre analysis, popularization articles, autism, Science Daily.

RESUMEN

Este artículo analiza el género de los artículos de divulgación sobre autismo publicados por la revista *Science Daily*. El objetivo de esta investigación es definir este género y describir su estructura, lenguaje y las características más comunes. El análisis incluye 50 muestras de textos siguiendo el modelo de Casañ-Pitarch (2016), este basado en Bhatia (2004) y Swales (1990). Los resultados sugieren que existe una estructura común entre los textos de este género y también hay algunas formas de lenguaje que aparecen en la mayoría de los textos, como la longitud, los contenidos, la morfología y el uso de pronombres y verbos. En conclusión, después de analizar los resultados obtenidos de nuestro corpus, se han sugerido una serie de patrones que definen la estructura y las formas de lenguaje más comunes dentro del género de artículos de divulgación publicados por *Science Daily* que tratan el tema del autismo.

Palabras clave: Análisis de género, artículos divulgativos, autismo, Science Daily.

1. Introduction

Reading science research papers could often become a difficult task for non-experts, despite their great willingness to understand the information and gain new knowledge. Sometimes, the general public prefers to read summaries or adapted scientific papers since the language used in them has been previously modified according to the type of readers who could be interested in those papers. Consequently, authors and editors of popularization articles should be completely aware of how to write them following the magazines' well-defined

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instructions on content, structure and forms. This practice was coined with the term *Churnalism*; and according to Johnston and Forde (2017), it was coined by Harcup in 2004, who defined it as "a form of journalism that relies on recycling press releases and agency copy and which involves little or no independent reporting or attempt at verification" (cited in Kristensen, 2018). In words of Johnston and Forde (2017: 943), this scientific genre describes "in less-than-complimentary terms the recycling process of news production which drew increasingly on wire service copy and public relations (PR) subsidies". Concerning the etymology of this word, *Churnalism* combines the terms *churn* and *journalism* and it implies the reuse of existing research material. The result of these articles is a brief summary of a previous research using suitable language for non-experts. For the interest of this research, *Churnalism*, a type of recycled and popularized documents, should be considered a particular genre. In this sense, genres are defined as "a recognizable communicative event characterized by a set of communicative purposes identified and mutually understood by members of the professional or academic community in which it regularly occurs" (Bhatia, 2013: 49); and they can be analyzed and defined. To this purpose, genre analysis is a field of applied linguistics which focuses on analyzing professional and academic documents with the aim of identifying text structures and language and forms and help users apply them into real contexts. In words of Bhatia (2004) the importance of these studies is the fact that they help communicators make the correct linguistic decisions such as the choice of lexicon and grammar in any rhetorical situations. Thus, genre analysis aims at reproducing specific discourse forms in any given context.

The objective of this research is to analyze and define the genre of popularization articles, more concretely those on the topic of autism and published in the magazine *Science Daily*. This article continues with the review of some literature related to defining this genre; then our method is detailed, and at last the results achieved are introduced and discussed. To fulfill the aim of this research, the following hypotheses have been stated:

H1- The texts corresponding to this genre shall follow a well-defined structure and common among the texts.

H2- The language used within this genre shall be formal and easy to read for a non-expert audience.

2. Popularization articles

Previous research describing features of popularization articles has been made (see De Avila and Torres, 2010; Myers, 2003; Nwogu, 1991; Seidel, 2016). Some of these researchers investigated the social and contextual properties of popular science texts, which are mainly associated to the fields of journalism and media or scientific communication (Alcibar, 2004). From a linguistic perspective, other researchers have also studied this genre and have analyzed its grammar, verbs usage, modality and hedging, or rhetorical structures, among others (see Myers, 2003; Calsamiglia, 2003; Ciaspucio, 1997). Following the findings of these previous researchers, it seems that this genre is characterized by features related to their audience, writers, publication format and specific communicative purposes, as it happens with other genres (Swales, 1990). These texts are generally addressed to non-specialist and broad audiences, and they are usually written by journalists and published in different outlets (Gotti, 2003; Peters, Kok, Crutzen, & Sanderman, 2017). In addition, it also seems that the purpose of this type of document is to disseminate science and make specific knowledge comprehensible to an audience that is non-expert in the field and has some or little knowledge on the topic described (Edwards, 2015; Nguyen, 2014). Thus, this genre of popularization texts aims to inform their readers and extend their knowledge with findings that are novel to them (Diéguez Morales, 2005). Connected to popularization articles, it shall be noticed that a new tendency appeared in the early 20th Century known as *Churnalism*. As it has been explained

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in the introduction, it recycles existing scientific articles and creates a new popularized version of them with the aim of communicating science to non-expert audiences (Johnston and Forde, 2017).

From a discourse study perspective, popular science writing has been approached from three broad areas. Calsamiglia (2003) explained that these three forms refer to the patterns of specific language and discourse used in different fields of science, the reinterpretation or reformulation of scientific content, and the micro-discourse features related to context, register, or text-type, among others. In addition, this genre of texts is also a valuable resource from a linguistic perspective because it provides deep insights that can be used in the language for specific purposes classroom.

In this research the main focus is placed on the genre of popularization article discussing the topic of autism and being published by the magazine *Science Daily*. Autism could be defined as "as a neuron-developmental disorder, characterized by repetitive stereotypic behaviors or restricted interests, social withdrawal, and communication deficits" (Sener, Uytun, Bayramov, Zararsiz, Oztop, Canatan, & Ozkul, 2016: 613). The choice of this topic was made due to professional interest and related to the experience of the researchers of this paper. In this sense, it seems that popularization articles should follow the standard *IMRC* structure suggested by Swales (1990), which involves the moves of introduction, method, results, and conclusion. No specific information has been found on the steps within the previous moves in this particular field, but from a general perspective the introduction should contextualize the topic and set the research thesis as well as raising the audience's interest (McGaghie, Bordage & Shea, 2001; Solar, 2013). Next, the method is the section describing the participants, materials, procedures and other information used during the research (Pyrczak, 2016). Meanwhile, the results section summarizes the data collected and explains the treatment of the data in basis to the hypotheses of the study (Singer, 1999). At last, the conclusion should provide the implications of the main findings and the perspectives of future research (Davidson & Delbridge, 2012).

Regarding other elements that can be considered characteristic of popularization articles are its word category frequencies, including the use of pronouns and verbs, as well as their specific terminology. To this purpose, some literature related to these items has been previously published. For example, Fortanet-Gomez (2004) suggested that pronouns show how audiences are conceptualized by speakers; thus, the different choices can imply different perspective on individuals, things or facts. In the same way, Cangelosi and Parisi (2001) explained that verbs convey actions, and express states or relation among people or things; whereas Biber, Johansson, Leech, Conrad and Finegan (1999) explained at the same that time they control the focal point of the clause and they also influence the other elements. In addition, another feature of interest to this genre concerns reporting information, Bloch (2010) suggested a list with the most usual reporting verbs that could be used to use somebody else's information; his taxonomy shall be considered in this research. At last, regarding the word category frequencies of this genre, Heylighen and Dewaele's (1999) should be cited. They considered that the formality of a text is influenced by its word category frequencies. In this case, these authors classified words into formal (non-dependent: nouns, adjectives, prepositions, determiners) and deictic categories (dependent; pronoun, verb, adverb, interjections). Thus, the presence of nouns contrasting with a low degree of verbs would result in a high level of nominalization, whereas the opposite would imply more action and little focus on the description of facts. The first case would be more formal in written documents, whereas the second could be considered less formal and more usual in oral discourse. The degree of occurrence of the other remaining elements would also imply consequences within the text that will vary on the possible combinations.

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3. Method

This study aims at defining the genre of popularization article discussing the topic of autism in the magazine *Science Daily,* within the field of psychology. To this purpose a genre analysis was carried out following the model suggested by one of the authors in his previous research (Casañ-Pitarch, 2016). This model, at the same time, was based on Bhatia (2004) and Swales (1990). The corpus was formed by 50 articles published in the free-access magazine *Science Daily* dealing with the topic of autism from 2009 to 2017.

Macro-structure	1. Quantification of forms and structures - Wordsmith
	2. Moves and steps forming the genre - none
Micro-structure	3. Morphology - TagAnt
	4. Morphological Formality - TagAnt
	5. Terminology - Tropes
	6. Personal pronoun - AntConc
	7. Verbs and tenses – TagAnt, Tropes, AntConc, other.

Table 1. Analysis of multi-genre structures (Casañ-Pitarch, 2016)

The elements within the two broad categories in table 1 are the ones analyzed in this research. The macro-structure involved the analyses of the major structures and forms with the software *Wordsmith* as well as the moves and steps, which required a non-electronic analysis. On the other hand, after describing these previous elements, the research continued with the analysis of the micro-structure. This part of the analysis defined the language minor forms, including morphology, terminology, formality, personal pronouns as well as verbs and their tenses. In order to find the most usual form, the mean, median, mode and usual range of occurrence were considered. As it has been detailed in table 1, each item of the micro-structure was analyzed with specific software. In the case of verbs and their tenses, part of the analysis was carried with different software, but in the end it also required non-electronic checking. The analysis of the morphological formality was carried out applying the formula introduced by Heylighen and Dewaele's (1999). These authors classified words into formal (non-dependent) and deictic categories (dependent), as previously explained; and their formula was the following: *([noun% + adjective% + preposition% +determiner%] – [pronoun% – verb% – adverb% – interjection%] + 100)/2.*

4. Results

4.1. Macro-structure

Our results have shown that the analyzed texts followed a well-defined pattern. These texts always began with the *title* of the article - mean: 9.76 words-; and they were rarely accompanied by *subtitles* (18%), and whose mean length was 14 words. In addition, other items were always included in the top section of these popularization articles: *date*, *source*, and *summary*. The last of these had a mean extension of 49.20 words, and their content was the same or very similar to the one included in the next element, *full story*, which always appeared within this document and had a mean length of 53.26 words. Indeed, 46% of the summaries analyzed used the same words in their corresponding *full story* section. Their content mainly focused on introducing the main results achieved in their research (80%); however, in fewer samples, authors also referred to a description of their experiments (18%) or the method implemented (6%). It shall be noticed that in most occasions only one of these steps was introduced (96%), whereas two steps were combined in two articles. Furthermore, in order to

complement this information, 28% of the *full story* sections included a picture with a brief description (mean: 26.36 words) and its source.

Order	Item	Occur	Length (words)	Additional Information
1	Title	100%	9.76	
2	Subtitle	18%	14	
3	Date	100%	-	Years: 2009-2017
4	Source	100%	-	From universities: 58% From other institutions: 32%
5	Summary	100%	49.20	Content: Results (80%)
6	Full story	100%	53.26	Research description (18%) Method (6%)
7	Image with text	28%	26.36	

Table 2. Introductory Information

Regarding the main text, our first hypothesis suggested that the structure of popularization articles should be clearly-stated and common to all the texts; and in words of Swales (1990), it should be divided into introduction, body (method and results) and conclusion. Regarding this assertion, 98% of the articles analyzed in this research followed that pattern. Only one text focused exclusively on results and showed a brief conclusion. Within the different moves of the text, our results also identified some steps. In this sense, introductions tended to contextualize the study with some literature, what had been done, or their objectives (68%), but some also referred to the results obtained (28%), or included some previous related research (20%). We also found that 82% of the texts included one of these steps, whereas 16% of them covered two. Besides, results also suggested that the length of the introduction was 30.48% of the text. Concerning the body, the texts introduced a brief summary of the method (88%) and the results obtained (90%). These two steps were combined in 78% of the texts analyzed, whereas in the other 22% only one of them was shown. We also found that the extension of the method was 16.70% of the text, whereas the results covered 35.34% of the text length. At last, the conclusion involved two steps, implications of the results achieved (64%) and further research (38%). In this case, most texts only included one of these steps (98%), whereas only one case included both (2%). The extension of this last move was 17.47% of the text.

Move	Steps	Length	
Introduction	Context: 68% Previous Research: 28% Results: 20%	30.48%	
Body	Method: 88% Results: 90%	16.70% 35.34%	52.04%
Conclusion	Implications: 64% Further Research: 38%	17.47%	
This pattern of moves occurred 98%			

Table 3. Moves and steps

In addition to the analysis of moves and steps, a quantification of the forms was also made with the software *Wordsmith*. Our results showed that the average length of words in each text was 481.34. We also identified the median, 493, and the mode, 400-600 (44%), as well as the longest text, 906, and the shortest one, 148. Regarding the amount of sentences, our results showed that the mean was 19.46 sentences per text. These sentences introduced a mean of 24.73 words in each sentence; furthermore, the largest amount of words per sentence was

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37.09, whereas the shortest one was 17.29. Our results also showed that the median compiled 25.15 words per sentence and the mode was the range between 23 and 28 (48%). At last, our research found that there was a mean of 11.82 paragraphs per text. This also implied that the mean of sentences per paragraph was 1.65, similar to the median, 1.67, and the mode, 1.50-2.00 (58%). The text with largest amount of sentences per paragraph was 2.44, and the shortest one contained 1.10.

Item	Mean	Median	Mode	Range	
Words per text	481.34	493	400-600 (44%)	148	906
Words per sentence	24.73	25.15	23-28 (48%)	17.29	37.09
Words per paragraph	38.80	41.79	35-45 (56%)	23.30	59.63
Sentences per text	19.46	19	17-22 (34%)	6	40
Sentences per paragraph	1.65	1.67	1.50-2.00 (58%)	1.10	2.44
Parragraphs per text	11.82	12	10-15 (52%)	4	22

Table 4. Quantification of forms

Finally, other elements identified within the samples of texts were also analyzed. After the main text, the document was always followed with information regarding the journal reference and information on how to cite this page. After these sections, the documents usually suggested some additional readings (98%); they were entitled recommended articles (56%) or related articles (42%). Ten similar or related articles were suggested in the first case and four in the second case.

4.2. Micro-structure

The second part of our analysis focused on different elements that belong to the micro-structure of the texts. This part of our research involved the analysis of the word category frequencies in our corpus, morphological formality, terminology, use of pronouns and verbs. Our corpus contained 24,178 words corresponding to the main text of the 50 documents analyzed. Thus, this analysis did not consider titles, summaries, or other secondary sections.

To start with, the first element analyzed was the word category frequencies in our corpus. As it can be observed in table 5, the most usual category was the nouns (34.82%), followed by prepositions (16.86%), verbs (15.98%), determiners (11.35), and adjectives (9.85%). On the contrary, adverbs (4.37%), connectors (3.94%) and pronouns (2.83%) occurred less often, whereas no interjections were found. In addition to these results, the formula introduced by Heylighen and Dewaele (1999) was applied in order to assess the morphological formality of the texts analyzed. This calculus resulted in a morphological formality degree of 74.98.

Formal Categories			Deictic Categories		
Noun	8,418	34.82%	Verb	3,863	15.98%
Adjective	2,382	9.85%	Pronoun	684	2.83%
Determiner	2,745	11.35%	Adverb	1,057	4.37%
Preposition	4,077	16.86%	Interjection	0	0.00%
Total	17,622	72.88%	**Total**	5,604	23.18%
Morphological Formality: 74.85					
Neutral Category			Connectors	952	3.94%

Table 5. Word category frequencies

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Furthering our research on the word category frequencies in our corpus, we also analyzed the terminology fields within the texts analyzed using the software *Tropes*. As it can be observed in table 6, there are 5 fields which seem to be the most relevant, and these are directly connected to the nature of the text as it was described in our theoretical framework. In addition, we also classified what we considered the most usual non-general nouns, adjectives and verbs according to the results provided by the same software. It could be observed that the most significant nouns were *autism*, *children*, *study*, *disorder* and *researcher*; whereas the most common adjectives were *social*, *clinic*, *important*, and *genetic*; similarly the most usual verbs were *find*, *suggest*, *know*, *know*, *affect* and *identify*. Results on specific terminology are shown in table 7.

Field	Quant.		Field	Quant.	
Health, life and casualties	1,421	5.88%	Education and work	271	1.12%
Properties and characteristics	863	3.57%	Behaviors and feelings	250	1.03%
General concepts	776	3.21%	Politics and society	227	0.94%
Sciences and technology	754	3.12%	Arts and culture	218	0.90%
People and persons	745	3.08%	Countries and locations	174	0.72%
Numbers, time and dates	289	1.20%	Communication and medias	158	0.65%

Table 6. Terminology fields

Nouns	Frequency	Adjectives	Frequency	Verbs	Frequency
Autism	326	Social	104	Say	163
Child(ren)	281	Clinic	41	Find	62
Study(ies)	195	Important	39	Use	61
Disorder(s)	110	Genetic	38	Show	58
Researchers	94	Early	33	Suggest	42
Behaviours	78	Different	26	Report	31
Research	75	New	26	Know	29
Brain	72	Specific	24	Make	28
Parents	67	Intellectual	24	Affect	27

Table 7. Most usual non-general terminology

The following aspect that was considered in our research concerned the verbs and their use. In this sense, table 8 shows the most frequent tenses and verbal forms. As it can be observed, active present (30.42%) and past simple tenses (21.04%) were the most common verbal forms. In addition, the active voice (64.29%) was also more common than the passive one (11.15%) among finite verbs. On the other hand, the use of non-finite forms was 24.56%; and within this category, the most usual ones were the infinitive as well as the present and past participle. Regarding the use of modal verbs, the software *Tagant* found 274, which represent the 7.09% of the verbs analyzed. Among them, the most usual ones were *can* (79), *may* (74), *could* (40), *will* (19), *might* (17) and *should* (15). No other modal verbs were found, only the forms of *have to* (5) and *must* (2) also occurred, but their presence seemed to be less relevant. At last, it was also found that most verbs had positive polarity (97.83%), whereas only a few were negative (2.17%).

Verbs Analyzed: 3,863	
Tensed Verbs	
Active	**Passive**
Pres. Simple: 30.42%	Pres. Simple:4.33%
Pres. Continuous: 2.03%	Pres. Continuous: 0%
Pres. Perf. Simple: 3.45%	Pres. Perf. Simple: 1.06%
Pres. Perf. Continuous: 0.09%	Pres. Perf. Continuous: 0%

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Active Present: 35.99%	**Passive Present: 5.39%**
Total Present: 41.38%	
Past Simple: 21.04%	Past Simple: 5.31%
Past Continuous: 0.35%	Past Continuous: 0%
Past Perf. Simple: 0.27%	Past. Perf. Simple: 0%
Active Past: 21.66%	**Passive Past: 5.31%**
Total Past: 26.97%	
Total Tensed Verbs: 68.35%	

Modal Verbs	**Active**	**Passive**
Simple Modal	6.45%	0.45%
Continuous Modal	0.19%	0%
Total Modal Verbs: 7.09%		

	TOTAL NON-FINITE: 24.56%	
TOTAL FINITE: 75.44%	Infinitive: 8.43%	Pas. Infinitive: 1.24%
	Pres. Part.: 8.43%	Past Part.: 6.02%
	Imperative: 0.44%	
Positive Polarity: 97.83%	**Negative Polarity: 2.17%**	

Table 8. Analysis of verbs

In addition to these results, it was also found that reporting verbs were frequent. Following the research carried out by Bloch (2010), we found that the texts contained 433 reporting verbs. This also corresponded to a high degree of direct quotations that the author of the articles used to refer to the original sources. The software *AntConc* found 250 direct quotations after introducing a specific formula in the search bar: *"\.+?\"*. This implied a mean of 5 direct quotations per the text analyzed. The most usual reporting verbs were *say* (163), *find* (62), *show* (58), *suggest* (42), *report* (31), *explain* (12), and *examine* (10).

The last item considered in this research was the use of personal pronouns. Previously, table 5 showed that the amount of pronouns within the text analyzed was 684. This analysis also found that 590 of these were personal pronouns, 2 of them were the pronoun *one/s*, and the remaining 92 were relative pronouns. Below, table 9 shows the amount of pronouns in each category. It can be observed that the most usual forms were *we (119)*, *they (110)*, *it (69)* and *their (130)*. If we consider the different categories, these results showed that the ones most frequently used were subject pronouns (344) and possessive determiners (184). At last, the cases of the third person were the one that occurred more often (421) as well as the first one (165). Besides, it shall also be noticed that the plural forms (424) were more common than the singular ones (262).

			Subject Pronouns	**Object Pronouns**	**Possessive Determiner**	**Possessive Pronouns**	**Reflexive Pronouns**
First Person	Singular		I (2)	Me (2)	My (2)	Mine	Myself
	Plural		We (119)	Us (14)	Our (25)	Ours (1)	Ourselves
Second	Singular/Plural		You (4)	You	Your	Yours	Yourself
Third Person	Singular	Fem.	She (25)	Her (2)	Her (8)	Hers	Herself
		Masc.	He (15)	Him (1)	His (2)	His	Himself
		Neut.	It (69)	It (13)	Its (17)	Its	Itself (4)
	Plural		They (110)	Them (17)	Their (130)	Theirs	Themselves (8)

Table 9. Personal pronouns

5. Discussion

After the description of the results obtained in this research, this section discusses some common features of the genre of popularization articles on the topic of autism and published in the magazine *Science Daily*. As it has

been explained, the aim of *churnalism* is to summarize scientific documents with specialized language and jargon and make them easy to read to a non-expert audience (Gotti, 2003; Peters, Kok, Crutzen, & Sanderman, 2017). Having considered the results obtained, it seems that there are some common characteristics among the texts analyzed within this genre. In this sense, it shall be considered some usual features referring to both the macro and the micro-structure. The general structure of the text would correspond to the one suggested in figure 1. As it can be observed below, it includes all the sections analyzed except the subtitle and images, which were rarely found within the corpus. The sections that seem to form this document are *title*, *date*, *source*, *summary*, *full story, main text, journal reference, cite this page, recommended articles (10) or related articles (4)*. As it was commented on the last item of the previous list, authors of this site could choose one form or the other indistinctively; their only difference was that the first one provided 10 articles whereas the second introduced 4. In addition to our proposed general structure of this genre, the quantification of forms also seems to have revealed that the length of the title should be approximately 10 words. Besides, the summary should contain about 45-50 words, and the *full story* should be a little longer and range between 50 and 55 words. Furthermore, in both cases, they should describe the results obtained in the original research. However, considering the similarity of the content introduced in these two sections, it would be advisable that editors of *Science Daily* clearly stated and distinguished the purpose of each category in their guidelines; and in case these were similar, we suggest that one of these sections should be removed.

ScienceDaily®

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TITLE (9-10 words)
Date: Month day, year
Source: University/Institution
Summary: 45-55 words

Full story: 50-55 words

(Main text: 450-550 words)
Introduction: 150 words
Method: 85 words
Results: 180 words
Conclusion: 85 words

Story Source:
Journal Reference:
Cite This Page:
Recommended Articles: 10 / Related Articles: 4

Figure 1. Pattern structure of the Magazine Daily Science

Next focusing on the main text of the article, we suggest that the introduction should contextualize the research using approximately 150 words. The body should be divided into two halves; the first would be the method applied in the research and its length should be about 85 words. Then, the body section should also be accompanied by the results obtained, and should contain around 180 words. At last, the conclusion should refer to the main implication of the research using approximately 85 words. Obviously, other options would also be

possible despite most texts analyzed followed this pattern, and the mean, median and mode of our results tended to coincide.

In addition, it was also found that there were several paragraphs along the text and they contained few sentences. It was usual to find paragraphs with one single sentence, which contrasts with the most common form of academic documents (Swales, 1990). Based on our results, the texts should be formed by approximately 12 paragraphs. Besides, the amount of sentences per paragraph should be 1 and, in some cases, 2. In addition, concerning the amount of words per sentence, it should be approximately 25 words each. However, we believe that a better cohesion among sentences would be advisable, and consequently paragraphs should be longer as well. As result, it seems that the length of the texts, paragraphs and sentences in popularization articles is shorter than in the original scientific ones with the aim of disseminating science and making specific knowledge comprehensible to novel and non-expert audiences (Edwards, 2015; Nguyen, 2014).

Other details concerning the micro-structure were also considered. To start with, regarding morphology, there was a high degree and predominance of nouns, which implied a high degree of word nominalization. However, the degree of verbs was high, in comparison to our previous research, and this fact suggests continuous action within the text and discourse directness, as suggested by Heylighen and Dewaele (1999). In contrast, it seems that the amount of determiners and adjectives were low. This might suggest that the texts were not very descriptive and actions occurred regularly. Since this type of document is a summary, the authors focused more on action than on describing facts. In addition, these results concerning morphology also helped apply the formula introduced by Heylighen and Dewaele (1999) and obtain the degree of morphological formality within this genre. The result of 78.43 seems to be a reasonably high percentage in comparison to the examples these authors introduced in their work. This means that this type of document avoids the use of context dependent word categories and this implies formality despite the high degree of verbalization. These results lead again to the conclusion that the language register used in these articles needs to be neutral rather than scientific or academic.

Besides, a relevant amount of words should be related to the terminology field that they represent. In our case, the main topic was autism, within the field of psychology, and this implied that terminology within the text was related to *health, life and casualties*, *properties and characteristics*, and *science and technology* as well as *general concepts*. Besides, our results have also identified the most usual words that should be considered when developing the text. As result, it has been found some nouns such as *autism*, *children*, *studies* or *disorder*, adjectives including *social, clinic, or genetic*, verbs like *say, find or use*, which seem to be relevant within our corpus of texts. These words are obviously related to the field of research within this genre, but it seems that these usual words should sound familiar to most non-expert readers. This also implies that words have a neutral register.

Another aspect analyzed was the use of verbs. It could be stated that active present and past simple seem to be mandatory. These can be combined with infinitive and present and past participles, whereas the use of simple modal verbs was also common. Most part of the text had positive polarity, so negative forms should definitely be avoided. Concerning the verbs analyzed, it was also found that reported verbs occurred very often, especially *to say*, and as it was suggested by Bloch (2010). Furthermore, this also implied that direct quotations are often used to refer to the main article in an attempt to raise credibility. This seems to be common practice among these articles since they are a modified and summarized version of a previous one and need to prove their reliability.

At last, the use of pronouns was also analyzed, despite their use was quite unusual along our corpus. Yet, it could be determined that some forms need to be taken into account, especially *we*, *they*, *it* and *their*. Relative and indefinite pronouns such as one were rare, and very few cases were found with the software *AntConc*. In words of Fortanet-Gomez (2004) pronouns conceptualized the audience; thus, the pronoun *we* imply the participation of all the members of a community and is inclusive. This personalization of the text is a characteristic of non-academic texts and gives an idea of the intention of the author, who probably aims at approaching the reader, and this fact contrasts with the principles of academic texts, which avoid personalization of the information conveyed.

6. Conclusion

The aim of this paper was to analyze texts on the topic of autism, which were published in the magazine *Science Daily*. As it has been previously explained, these texts are popularization articles which belong to a genre known as *Churnalism*. The purpose of this type of magazines is to make scientific texts accessible to non-experts, making the language easier to understand and summarizing the content, only including the most relevant facts and findings. Results have shown that there are some common aspects among the different texts analyzed; and thus, they could be considered common to this genre. Our first hypothesis stated that the texts analyzed would follow a well-defined structure and common among the texts. As it has been shown, not all the texts follow the same structure but most of them did so. Regarding the second hypothesis, it seems that the language was formal (78.43), but also accessible and easy to read for a non-expert audience. It seems that this hypothesis can be confirmed after identifying the high degree of both nominalization and verbalization; furthermore, other features such as the use of the active voice, the type of terminology and the use of non-deictic categories made the texts easier to read for non-specialist readers. It seems that the authors of this type of articles clearly aim at disseminating science and making it comprehensible to non-expert audiences.

In further research, newer genres could be the focus of our study and in the same way other elements within this genre could also be considered such as syntax or speech acts. We consider that the use of 50 articles were sufficient to develop this research, despite it shall be acknowledged that a larger corpus would have been more relevant and reliable. At last, regarding some limitations, it shall also be acknowledged that this type of analysis could be more complete with syntax, semantic and pragmatic analysis, despite the real limitations on the development of suitable software that could carry out these actions.

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