MODALIZATION IN DATASHEETS: USING CORPUS LINGUISTICS AS AN AID FOR DEVELOPING LESSONS FOCUSED ON HIGHER EDUCATION STUDENTS' ENGLISH READING SKILLS

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MODALIZAÇÃO EM DATASHEETS: USANDO A LINGUÍSTICA DE CORPUS NO AUXÍLIO AO DESENVOLVIMENTO DE AULAS COM FOCO EM HABILIDADES DE LEITURA EM INGLÊS DE ALUNOS DE EDUCAÇÃO SUPERIOR

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Abstract

Datasheets are documents in English that must be read by electrical engineers and technicians who deal with electrical components. Higher education students seeking training in these areas do not always find it easy to read these documents in English. This study presents an investigation on how modality is featured in these documents under a *Systemic Functional Approach*, using Corpus Linguistics as a methodology. The investigation aims at providing help for teachers of higher academic levels to plan their reading *English for Specific Purposes*

lessons with the aid of Corpus Linguistics tools. The researchers gathered 40 datasheets of 10 different electrical components, totalling 74660 tokens. *Sketch Engine* tools were used to research the corpus. Findings point to modal verbs expressing expected modalizations of warning, and instruction; but of persuasive language as well, through modalizations of possibility and volition. Results serve as sufficient argument for teachers using Corpus Linguistics to aid ESP students in academic higher levels to read datasheets.

Resumo

Datasheets são documentos em inglês que devem ser lidos por engenheiros, eletricistas e técnicos que lidam com componentes elétricos. Os alunos que buscam formação nestas áreas nem sempre apresentam facilidade de ler estes documentos em inglês. Este estudo apresenta uma investigação de como a modalidade é caracterizada nesses documentos sob uma *Abordagem Sistêmico- Funcional*, utilizando a *Linguística de Corpus* como metodologia. Esta invstigação visa promover um auxílio aos professores de cursos de níveis superiores que planejam suas aulas de *Inglês para Fins Específicos* com o suporta da Linguística de Corpus. Os pesquisadores reuniram 40 datasheets de 10 componentes elétricos diferentes, totalizando 74660 tokens. As ferramentas do *Sketch Engine* foram usadas para pesquisar o corpus. Os resultados apontam para verbos modais que expressam as modalizações esperadas de aviso e instrução; mas também apresentam linguagem persuasiva por meio de modalizações de possibilidade e volição. Os resultados servem como argumento suficiente para os professores usarem a Linguística de Corpus para ajudar os aprendizes de Inglês para Fins Específicos em contextos de educação superior a ler os datasheets com mais eficiência.

Entradas para indexação

KEYWORDS: Datasheets. Corpus Linguistics. Modalization. Interpersonal Function. Reading Skills.
PALAVRAS-CHAVE: Datasheets. Linguística de Corpus. Modalização. Função Interpessoal. Habilidades de Leitura.

Texto integral

1. INTRODUCTION

Languages represent great amounts of meanings their own way; considering this, teachers of English across the globe have to manage these peculiarities and still be able to sustain fair steadiness on learners' comprehension. In Brazil, the practice of reading skills based on English for Specific Purposes is an area that has been growing in research and institutions are granting more space for it to be offered to different levels of students (LEFFA, 1999; CELANI 2008, MONZÓN e XXXX, 2016; TERENZI 2019; XXXX 2019 e 2020). In these types of courses, specific textual genres are studied, with the aim of improving students' reading strategies and proficiency regarding their area of interest. For example, in Engineering areas, it is quite common working with datasheets due to their functionality and the necessity to describe, prescript, explain or guide the understanding of a machine, the assembly of it or even the use of a device.

Datasheets are documents printed by manufacturers of several different products, electrical ones included, which aim to inform the technical specificities of

use, installation and general features of the product (COTTRELL, 1997). They are almost always found in English. The choice for analysing these documents in this study is justified by their role in the professional path of Electrical Engineering students, since Gimenez (2013) and Finardi (2016) state that very few Brazilian Higher Education students hold at least a B1 level of fluency in reading English[1].

According to Dewey (1998), datasheets are a result of synchronized work between the marketing department of the company and the areas of design and development of the electrical goods:

> The datasheet is *not* advertising but, in fact, fills the gap between the advertisement and the personal sales call. Purchases from a data sheet are a direct result of need; impulse buying is rare; customers buy products, not datasheets. The datasheet *should* be written by the engineers who know the product best, but they would rather be designing new products (DEWEY, 1998, p.01).

Datasheets feature persuasive characteristics (XXXXXXX 2017), showing use of argumentative language, adverbs and adjectives aimed at rendering the product attractive to potential consumers.

Therefore, ESP teachers or professors who work with engineering higher education students whose mother tongue is not English and who need training in the terminology of datasheets can benefit from studies that characterize how the language of these documents is featured.

The lack of research and publications related to the analysis of datasheets language features aiming at modality, as well the possibilities to the ESP teacher to teach how to apply reading strategies is a reality in Brazil. Therefore, our main objective in this research is to provide an analysis of the Electrical datasheets regarding modality features, in order to aid the work of teachers who need to work with students that need to read this technical-scientific language in English.

In order to achieve this objective, we make use of Corpus Linguistics as a methodology, which allows us to examine data from a compilation of datasheets, therefore accomplishing to examine features of the real language of these documents.

The main characteristic of Corpus Linguistics is empirical analysis, based on existing patterns in natural texts, using computerized tools and relying on qualitative and quantitative approaches (BERBER-SARDINHA, 2004). Biber et al (2010), Gries (2006, 2009), and Thompson and Hunston (2006) are some of the authors whose extensive work share this methodological use of Corpus Linguistics. For them, examining the use of language entails finding patterns of occurrence within contextual factors. Through Corpus Linguistics, it is possible to observe the language under analysis more realistically. We make use of *corpus-based* procedures

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[1] According to the Common European Framework of Reference for Languages, a B1 level in reading means that the user can understand factual texts on subjects of interest. Available at: https://www.coe.int/en/web/common-european-framework-reference-languages/level-descriptions

(TOGNINI-BONELLI, 2001) since our aim is to use the corpus to find a previously formulated hypothesis. Regarding the size of the corpus, we agree with Biber (2012), who states that a corpus does not need to be gigantic as long as it is representative for the researcher.

The corpus of datasheets was compiled gathering 40 datasheets of 10 electrical devices from the internet. The devices were chosen according to the suggestion of a professor of Electrical Engineering at the University where the researchers work – Universidade de Caxias do Sul. The datasheets were inserted into Sketch Engine[2] (KILGARRIFF *et al* 2004), and tools such as Wordlist, Concordance and Word Sketch were used. A Wordlist was made to sort the modals that occurred more than 100 times, and Concordance and Word Sketch were used to check the meanings of the modalization and the co-occurrences.

2. THE INTERPERSONAL FUNCTION IN SYSTEMICS FUNCTIONAL GRAMMAR

According to Halliday (1994), and Halliday and Mathiessen (2014), in Systemics Functional Grammar language operates under three functions: Experiential, Interpersonal and Textual; this paper concentrates on the Interpersonal Function: communicating with others does not mean to simply utter sentences, it requires speakers to use language in order to exchange interpersonal meanings with the listener (HALLIDAY, 1994).

The interpersonal meanings "cover two main areas: one concerns the type of interaction taking place and the kind of commodity being exchanged, and the other concerns the way speakers take a position in their messages" (BUTT *et al*, p. 86, 2000). As claimed by Halliday and Mathiessen (2014), the most fundamental types of speech role are: (a) giving/offering and (b) demanding; and the commodities in exchange presented in their studies are (a) goods-and-services, as well as, (b) information.

Modality is also a prominent feature in the Interpersonal Function. Under a Hallidayan Functional Perspective, Modality represents the degrees of indeterminacy between 'yes' and 'no'. In between the certainties of 'it is' and 'it isn't' lie the relative probabilities of 'it must be', 'it will be', 'it may be' (HALLIDAY; MATHIESSEN, 2004). Modality moulds one's discourse according to his/her degrees of responsibility or conviction towards a saying, always taking into account the kind of relationship established between interactants. Besides other language constructions, Modality may be expressed by Modal Verbs. Modal Verbs can usually exhibit more than one meaning: sometimes involving the external-physical world, and other times involving internal mental reasoning (TYLER 2008).

For instance, in the clauses ´*Dad said I should be home by 3pm*', the modal verb *should* might represent a mild obligation and, at the same time, hold a stronger effect than if one had selected the modals *might* or *could* in order to report the same type of message (obligation). On the other hand, in the example ´*There was a knock at the door. That should be Mary*´, the same modal verb represents a probability, something

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[2] Available at: www.sketchengine.eu. Last access: October 2020.

one assumes to be true if the situation goes according to plan (BIBER et al 2010). In addition to that, *should* can be commonly applied to give general advice such as in *'all companies should see complaints in this way- as a gift'* and *'you should start from the view that she does have a valid argument'*. According to Dellar and Walkley (2015) if we add should + past participle, the meaning shifts again, allowing the speaker to express a sense of regret or strong criticism towards a past experience: *'you should have sold that car when you had the chance'*, it is the same for its negative polarity: *'they shouldn't have come since they were not invited'*.

Because of this strong idiosyncratic characteristic present in Modality (TYLER 2008), it seems crucial that teachers think about whether narrowing a student's apprenticeship to traditionally built explanations will be sufficient to pave a learner's path towards mastering the usage of these complex constructs of language, or if approaching the use of modal verbs, its related expressions as well as subject and finite combinations in a more integrated manner would lead to more satisfying outcomes. Actual improvement on reading skills could happen if students were directed to study the characteristics presented by modality appearing in the real textual genres they have to read.

3. THE READER AS AN ACTIVE AGENT IN THE PROCESS

The process of reading includes general patterns or often occurring structures which are repeated in the experience. Past practices would be related to new ones, including the knowledge of "objects, situations, and events as well as knowledge of procedures for retrieving, organizing and interpreting information (KUCER, 1987, p. 31). A reader comprehends a text when one is able to bear in mind a schema giving account of the situation described in the message. In this direction, comprehension is the process of "activating or constructing a schema that provides a coherent explanation of objects and events mentioned in a discourse", to quote Anderson (1994, p. 473).

Comprehending a text promotes an interaction between old and new information. Anderson and Pearson (1988, p. 38) emphasize that only when a reader is capable of finding a mental "home" for the information in the text, one has comprehended it. Also, when a previous mental home has been modified in order to settle that new piece of information. Therefore, a reader's scheme would be rebuilt to accommodate new information, once it is added to the system, according to Omaggio (1993).

The reader's role is essentially not a passive one and the first requirement is that the reader should share the same language, including the same linguistic demands of the reader's area of expertise. Thus, the reader and text should impart certain assumptions about the world and the form it functions, as expressed by Nuttall (1988).

Reading may be referred to as the active dialogue with the text, in which process the reader approaches the meaning of the text, going beyond its surface. In short, the reader – as an active participant of the reading process – should set the

meanings into the interpretation of the text, relating information already known to what is being brought by the text.

This active role of the reader calls for a perspective of regarding textual genres as entities that have social action, determining and modifying events and social conventions, instead of only result from the same (BAZERMAN 2005). The textual genre datasheet acts as determinant of the actions of electrical engineers and technicians, and the ones who do not show proficiency in reading them are excluded from the practices of the domain.

Likewise, upon reading a datasheet, the student may think its primary purpose is only to give/supply information through clear instructions, leading him or her to believe the modalization present in the documents will carry mostly meanings of permission, prohibition and warning; however the results presented in the next section show that datasheets may feature instances of persuasive language expressing volition and possibility, switching the communicative interpersonal function to an offer of goods and services. This change in the axis of communicative intent is a relevant point to take into consideration when material/plans for improving reading skills is/are prepared. Students will use their knowledge of "old" information – the expected meanings of permission, prohibition and warning naturally found in instructive material – and might relate it to the new information regarding the persuasive face of datasheets, completing thus the schema process.

4 RESULTS AND ANALYSIS

The analysis that will be presented takes into consideration the modal verbs that appeared more frequently in the corpus (over 100 occurrences) and that presented features of modalization that would entail an advertising function: *can, must, may, will, should*. Given that presenting all the occurrences of these modals found in the corpus would be impractical, we chose to present some examples to illustrate the modalization expressed by them.

4.1 THE MODAL VERB CAN

The modal verb CAN is usually found as a modalizer of ability, possibility, permission or probability. The negative form is associated with prohibition (COLLINS, 2009; BIBER et al 2010). In the corpus, instances of CAN were found to modalize the ideas of possibility either as a warning, or as a promise of a feature of the device. Occurrences of CAN as instruction and prohibition also appeared. CAN resulted in 234 occurrences, of which 16 were found in the negative form CANNOT.

The modal verb CAN in its affirmative polarity was mostly used collocated with the verb be + a participle construction (139 instances), characterizing the passive voice. The passive voice in English is a structure often associated with providing instructions and warnings; however, the corpus presented more instances of this construction with the possibility as a promise modalization: 88

occurrences, versus 51 instances of warning and instructions. Table 01 shows a few examples:

Table 01 - The modal verb CAN – Possibility as warning, promise and instruction

Possibility as warning	Possibility as promise	Possibility as instruction
The ''Absolute Maximum Ratings'' are those values beyond which the safety of the device **cannot** be guaranteed A critical component is any component of a life systems which, (a) are intended for surgical implant support device or system whose failure to perform **can** harm the body… when properly used in accordance support device or system, or to affect its safety or with instructions for use provided in the labelling, **can** effectiveness be reasonably expected to result in a significant injury to the user ''Typical'' parameters which may be provided in SCILLC data sheets and/or specifications **can** vary in different applications and actual performance may vary over time.	The normal output state **can** be reversed through the mode of operation switch S1. The Termination Board **can** be used for general-purpose applications or in conjunction with intrinsic safety barriers for hazardous applications.RS 485 terminals are redundant and **can** be daisy chained. Although it **can** be programmed via an ic bus it does not require users to provide an ic interface host processor its volatile memory **can** operate in any system	Informaion on typical parametric values **can** be found in Chapter 2 further information **can be** found in the appendix… tPUR and tPUW are the delays required from the time VCC is stable until the specified operation **can** be initiated… The ready/busy status of the CAT93CXXXX **can** be determined by selecting the device and polling the DO pin.

The modal verb CAN also collocate with other verbs, this time showing a more balanced occurrence of warnings and instructions modalization in relation to possibility as a promise modalization, as shown by tables 02 and 03:

Table 02 - The modal verb CAN – warnings and instructions

Verbs collocated with CAN with warnings and instructions modalization – 24 occurrences total	Examples from the corpus:
Result (4)	…for your safety disregarding the guidelines in this manual **can** result in operational failure bursting and fire.
Make (1)	…a coding system which **can** make it a bit tricky to work out the capacitance voltage rating tolerance…
Extend (2)	…in order to ensure that the overpressure disconnector **can** fully extend figure minimum space over and between the capacitors.
Cause (5)	A variation in temperature across the PCB **can** cause a mismatch in the Seebeck voltages at solder joints …
Continue (1)	Advanced Information Stock No. 21084-01 2/98 **can** then continue to clock in 8-bit (16-bit for x16 format) data to be written to the next higher address.
Affect (1)	…the distribution from the power source to the input of the converter **can** affect the stability of the converter…
Lead (1)	…active parts of this equipment carry a dangerous voltage which **can** lead to burns or electric shock …
Discharge (5)	…only allow parts to contact material that **can** discharge in order to assure that eventual charges may smoothly flow off…
Destroy (1)	only small electrostatic voltages **can** destroy led-chips and ics…

Exceed (1)	…continuous short-circuits **can** exceed the power dissipation ratings and cause eventual destruction.
Help (1)	Magnetically shielded against radiation **can** help achieve longer battery life …
Last (1)	This period of high current demand, referred to as inrush, may be as great as ten times the current required under steady state (normal) operating conditions, and **can** last up to 40 milliseconds.

Once the modalization of possibility as promise is identified, the reader might comprehend that these instances were built to exert some persuasion over a possible buyer for the electrical device, by eliciting attractive features of the device. The interpersonal Function switches, then, from supplying/giving information to offering goods and services.

Table 03 - The modal verb CAN – possibility as a promise

Verbs collocated with CAN with possibility as a promise modalization – 20 occurrences total	Examples from the corpus:
Manage (2)	…series controllers **can** manage analog components including vrms linear regular pols and fans …
Operate (4)	…it does not require users to provide an I2C interface, host processor, or non-volatile memory; Z-One® Digital Power **can** operate autonomously in any system.
Replace (7)	…products provide two independently regulated high current outputs and in many applications **can** replace two single output quarter bricks low profile heights with no heat sink required.
Act (1)	…therefore, the CAT93CXXXX **can** act as a signal conditioning circuit for an externally applied reset.

Benefit (1)	...DC gain blocks and many other conventional op amp circuits which **can** benefit from the single power supply capability.
Go (2), perform (1)	Since the inputs can go 100mV beyond either rail, the op-amp **can** easily perform 'True Ground Sensing'.
Display (1)	The resolution of a 32.0" is 1366 x 768 and this model **can** display up to 16.7 million colors with wide viewing angle of 89 or higher.
Work (1)	...it is a multimode inverter because it **can** work both in grid-tied configuration as well as in stand-alone configuration...

The negative polarity CANNOT appears as expected by its main meaning of prohibition, mostly modalised as a warning or instruction, as figure 1 shows. CANNOT is heavily associated here with the parts of the datasheets that cover possible legal issues that the manufacturer may have with the customer.

Figure 1 - Examples of CANNOT in the corpus

	Details	Left context	KWIC	Right context
1	doc#1	e those values beyond which the safety of the device	**cannot**	be guaranteed. </s><s> The device should not be ope
2	doc#6	nevertheless expressly point out that such statements	**cannot**	be regarded as binding statements about the suitabilit
3	doc#6	ents or failure before the end of their usual service life	**cannot**	be completely ruled out in the current state of the art e
4	doc#6	production and delivery of products consequently we	**cannot**	guarantee that all products named in this publication v
5	doc#8	ualclosing take place correctly in this position the key	**cannot**	be removed the operations and signals are normal rer
6	doc#13	s on all inputs and output. </s><s> Input and out pins	**cannot**	be biased more than 200mV beyond either supply rail
7	doc#15	nevertheless expressly point out that such statements	**cannot**	be regarded as binding statements about the suitabilit
8	doc#15	ents or failure before the end of their usual service life	**cannot**	be completely ruled out in the current state of the art e
9	doc#15	production and delivery of products consequently we	**cannot**	guarantee that all products named in this publication v
10	doc#16	ics table added ordering information for stratum parts	**cannot**	assume responsibility for use of any circuitry other tha
11	doc#17	to the insulating effect of the substances the charging	**cannot**	spread out this however is what they are always push
12	doc#18	nevertheless expressly point out that such statements	**cannot**	be regarded as binding statements about the suitabilit
13	doc#18	ents or failure before the end of their usual service life	**cannot**	be completely ruled out in the current state of the art e
14	doc#18	production and delivery of products consequently we	**cannot**	guarantee that all products named in this publication v
15	doc#22	istalled across Pins 5 and 6. </s><s> If this capacitor	**cannot**	be used, a shielding printed–circuit foil may be advisa
16	doc#23	imber (6) Others 1. </s><s> After service part Lamps	**cannot**	be replaced because of the narrow bezel structure. 16

4.2 THE MODAL VERB MUST

Regarding the modals must/must not, there were 142 occurrences of them, the modalizations expressed in the corpus expressed, in their affirmative form, either obligation or strong suggestion. In the negative form, must not was usually used as a prohibition. This was expected, due to the instructional and warning nature of the datasheets. MUST collocated vastly with passive constructions (77 occurrences). Figure 2 shows a few instances of must and must not:

Figure 2 - Occurrences of MUST and MUST NOT in the corpus

	Details	Left context	KWIC	Right context
1	doc#1	</s><s> The 150 and 151A have a strobe input which	**must**	be at a low logic level to enable these devices. </s><s>
2	doc#2	oltages or electric fields. </s><s> However, precautions	**must**	be taken to avoid applications of any voltage higher tha
3	doc#2	range GND (Vin or Vout) VCC. </s><s> Unused inputs	**must**	always be tied to an appropriate logic voltage level (e.g
4	doc#2	rel (e.g., either GND or VCC). </s><s> Unused outputs	**must**	be left open. *Maximum Ratings are those values beyor
5	doc#2	</s><s> All operating parameters, including "Typicals"	**must**	be validated for each customer application by customer
6	doc#5	les are polarity sensitive so most electrolytic capacitors	**must**	be connected into circuit so that voltage isalways applie
7	doc#6	iot exceed �c the maximum casing temperature of �c	**must**	not be exceeded temperature is one of the main stress
8	doc#6	structions for capacitors mounting conditions capacitors	**must**	be installed in a cool and well ventilated place and not c
9	doc#6	erature the distance between the reactor and capacitor	**must**	be large enough so that no reactor heat is conducted vi
10	doc#6	ice instructions for capacitors the threaded bottom stud	**must**	be fastened with certain specified torques fixing phased
11	doc#6	e supply cable cable specification the connection cable	**must**	be of flexible type material should preferably be copper
12	doc#6	discharge the capacitor before re switching capacitors	**must**	be discharged to of the rated voltage or below a dischal
13	doc#6	nts specified in the technical data of the specific series	**must**	never be exceeded avoid resonance conditions electric
14	doc#6	observe the following requirements the elastic metal top	**must**	not be impaired caution the connecting lines must be fle
15	doc#6	l top must not be impaired caution the connecting lines	**must**	be flexible leads cables there must be sufficient space f
16	doc#6	he connecting lines must be flexible leads cables there	**must**	be sufficient space for expansion above the connection
17	doc#6	ctions stated for the different models the folding groove	**must**	not be retained by clamps the maximum allowed fault c
18	doc#6	e maximum allowed fault current of a to the ul standard	**must**	not be exceeded stress parameters of the capacitor mu
19	doc#6	ist not be exceeded stress parameters of the capacitor	**must**	be within the specification film april please read caution
20	doc#6	s the installation of a de tuned capacitor bank reactors	**must**	be considered check the discharge resistors reactors ar

4.3 THE MODAL VERB MAY

The modal verb MAY has occurred 111 times, out of which 9 were in the negative form. MAY appeared a lot less indicating modalization of permission and possibility, but there were some instances. Most occurrences brought the modalizer to a warning meaning. In the examples showing possibility, it is possible to see that the modalization here focuses on persuading the reader of the datasheet in regards to the features that the product presents, or possibilities of operation, prhaps rendering the product more appealing.

Table 04 shows a few examples of MAY / MAY NOT as warning, and a few of the occurrences of the permission and possibility modalization. The most frequent collocate for may in all modalizations was the verb be + participle, characterizing a passive construction, such as what happened to CAN.

Table 04 - The modal verb MAY – permission, possibility, warning

May as permission	May as possibility	May as warning
necessary, the DO pin **may** be placed back into a high impedance state during chip select by shifting a dummy "1" into the DI pin. No technical content pages of this document **may** be reproduced in any form or transmitted by any means ... The differential input voltage **may** be larger than V+ without damaging the device. The products may be exposed to reflow soldering process of above profile tup to two times.	Since the conductance of the media **may** vary, the relay response sensitivity is adjustable. The value **may** be given directly in electrolytic capacitor nanofarads with three significant digits. Shelves **may** be partially populated for reduced currents or paralleled for higher currents. They **may** also be operated from split power supplies. Phasecap compact capacitor series **may** be mounted in the vertical or horizontal position	Grounding and shielding methods **may** be important to minimize the interference. CAS numbers and other limited information **may** not be available for release. ... actual performance m**ay** vary over time. Stresses beyond those listed under absolute um ratings **may** cause permanent damage to the device. In any case handle capacitors carefully because they **may** still be charged even after disconnection...

4.4 THE MODAL VERB WILL

The modal verb WILL has resulted in 104 occurrences, of which 02 are found in the negative form WILL NOT. The modal verb WILL in its affirmative polarity is mostly used collocated with the verb BE (23 occurrences); 18 other occurrences are composed by passive voice. Another sequence found is the combination of the modal verb WILL + a manner adverb + an infinitive (8 occurrences).

This modalizer carries, among others, a meaning of intrinsic volition (BIBER et al 2010), establishing a connection with the features of advertising language in

the datasheets: the company producing the electrical components would want to show volition towards helping the customer, or would "promise" certain features regarding the component's suitability. Out of the 104 occurrences, 86 were of examples of WILL expressing intrinsic volition in the corpus, and the others were used to express a warning (see table 5 for some examples):

Table 05 - The modal verb WILL – intrinsic volition and warning

Will expressing intrinsic volition	Will expressing a warning
In other countries further information will be found on the internet Useful information on this will be found in our material data sheets on the internet During powerup, the RESET outputs remain active until VCC reaches the VTH threshold and will continue driving the outputs for approximately 200ms (tPURST) after reaching VTH. During a system failure, the CAT93CXXXX will respond with a reset signal after a time-out interval of 1.6 seconds for lack of activity. Content of header bars and of data sheet will be automatically entered… All ranks will be included per delivery. The output response will normally be fast and stable. Additionally, this fuse kit will fit most competitors' units.	The output should not be forced more than 0.5V beyond either supply, otherwise current will flow through these diodes. Once the reset threshold voltage is selected it will not change even after cycling the power, unless the user uses the programmer to change the reset threshold voltage. We cannot guarantee that all products named in this publication will always be available. However, it will be at the expense of the secondary voltage. As long as the reset signal is asserted, the Watchdog Timer will not count and will stay cleared. A transformer in a circuit subject to inrush will typically attempt to provide the load with the required current during the inrush period.

4.5 THE MODAL VERB SHOULD

The modal verb SHOULD has resulted in 110 occurrences, of which 13 are found in the negative form SHOULD NOT. The modal verb SHOULD in its affirmative polarity is mostly used collocated with the verb be + a participle construction (65 instances), moreover, the modal SHOULD in its negative polarity has 8 more

instances collocated with the verb be + a participle construction, both of which characterize the passive voice. As stated in the analysis of the modal verb CAN, the passive voice in English is often associated with providing instructions and warnings. On the analysis of the modal SHOULD this structure serves the same purposes, but also represents advice. Table 06 shows a few examples:

Table 06 - The modal verb SHOULD – warning, advice and instruction

Warning	Advice	Instruction
The device **should** not be operated at these limits. The output **should** not be forced more than 0.5V beyond either supply, otherwise current will flow through these diodes. Interface signal **should** not be kept at high impedance when the power is on. If the liquid crystal material leaks from the panel, it **should** be kept away from the eyes or mouth. … capacitors **should** not be used any longer in case of dents...	Feedback Components and Suppression of Ringing Care **should** be taken to ensure that the pole formed by the feedback resistors Recommendation: Product **should** be used within six months from the time of delivery. … to prevent this from occurring the registers **should** be read using a single multi byte read operation figure To avoid leakage currents, the surface of the board **should** be kept clean and free of moisture.	A bypass capacitor of 0.1µF as close to the part as possible **should** be used between power supply pins... Test Equipment Setup The measurement **should** be executed in a stable, windless and dark room... Not more than one output **should** be shorted at a time. seconds electrode **should** be covered with solder. All power input pins **should** be connected together.

The modal verb SHOULD is also collocated with expressions that modalize instances more explicitly. By itself, the modal verb SHOULD serves the purpose of modalizing sentences as a warning, however, when used with adverbs, together they can emphasize and mark a certain idea even more (table 7).

Table 07 - The modal verb SHOULD – warning

Examples from the corpus
Power supply **should always** be turned on/off...
...should be essentially surrounded by ground foil on all sides...
...damage distribution equipment occurrences of resonance **should by all means** be avoided by appropriate application
... the connection cable must be of flexible type material **should preferably** be copper do not use solid core cables

The modal verb SHOULD also appears inverted in the mood block. This inversion, common in formal situations, characterizes an extra emphasis to the strong suggestion uttered. This characterizes a double speech role that the manufacturer is trying to express: as well as supplying information, the manufacturer gently uses the modalization of should to demand specific attitudes or actions from the buyers. Table 08 shows examples present on the corpus:

Table 08 - The modal verb SHOULD – inversion aiming emphasis

Examples from the corpus
...should you have any more detailed questions please contact our sales offices we constantly strive to improve our products...
Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out.
...should the original packing not be available and immediate installation is not possible store in covered well ventilated dry dust free non corrosive atmosphere away...
...should there be any doubts please contact our service center...

> **Should** Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers...

> In no case **should** a figure less than the Application Inrush VA be used.

The findings from the corpus show that the modals that occurred more frequently on the datasheets bring to the reader modalization ideas of instruction and warning, but can also present persuasive language (COOK, 2001; DELPECH; DIZIER, 2008; JOHANSSON, 2001; POVOLNÁ, 2018), expressed by possibility and volition. It was also noticeable how close the relationship of collocation between these modal verbs and constructions using the passive is.

It is also interesting to point that within the Interpersonal Function, the types of speech role and commodities being exchange in instructions are supplying information; in warning, the function expresses a demand for goods and services as well as supplying information; as for possibility and volition, an offer of goods and services.

Teachers who work with reading skills should take these modalizations and speech roles into account when planning activities for students who need to improve their readability skills of datasheets. Such exercises could include the use of Corpus Linguistics tools either to produce practical activities or to show students features of the real language contained on these documents. This way, students' schema processing would be enhanced since they would be engaged in working with patterns of the language that repeat and that carry a meaning they can relate to their previous knowledge. Furthermore, they would carry out their reading experience in much more active procedures.

Therefore, the utility for teachers to include Corpus Linguistics into their practice of working with reading skills is quite visible; this would help students deal with challenging idiosyncratic levels of language as the one of Modality in a more functional way.

Working with Corpus Linguistics and Functional Grammar methods and tools could be a way for teachers to be able to prepare teaching material more grounded on authenticity of the language features. According to Butt et al (2000, p. 246), the analysis of language patterns produced by effective English speakers in texts, combined with a teacher's knowledge on grammar, texture and text structure can be applied to class planning and therefore aimed at enhancing students' comprehension and controlling of language usage for different purposes.

5. CONCLUDING REMARKS

This article attempted to research how functions expressed by modality help feature Electrical datasheets, using the methodology of Corpus Linguistics to investigate these documents used by electrical technicians and engineers. The results and the discussion showed that the most frequent occurrences of modal

verbs in the genre presented the expected modalization of instruction and warning; however, a considerable amount of occurrences also pointed to the use of possibility and volition towards a function of offering goods and services, characteristic of persuasive language. These features match the purposes of the genre as it is designed by manufacturers of electrical components.

The results and discussion also bring some insight to teachers who are working with reading skills in ESP. The findings can aid teachers in their preparation of activities with datasheets, providing reading practice to students that will activate schema and promote a posture of active readers on students.

It is important to pinpoint that both Corpus Linguistics and Systemics Functional Grammar can be great allies with the procedures mentioned above because they support teachers with accurate language in use and are not concerned with the structure of language per se, whereas with how speakers interact and make meaning from it. Henceforth, we may say that teachers have a great set of tools with the mindful usage of text in contexts and the constant observation of language patterns combined with functional activities that address how students can produce meaningful communication and be more easily inserted in social contexts.

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Para citar este artigo

FADANELLI, S. B.; DALL'AGNOL, S.; LIMA, G. de. Modalização em datasheets: usando a linguística de corpus no auxílio ao desenvolvimento de aulas com foco em habilidades de leitura em Inglês de alunos de educação superior. **Macabéa — Revista Eletrônica do Netlli**, Crato, v. 10, n. 8, 2021, p. 438-458.

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