Towards an Ergonomic Linguistics. Application to the Design of Controlled Natural Languages
Anne Condamines

To cite this version:

HAL Id: halshs-03721216
https://shs.hal.science/halshs-03721216
Submitted on 12 Jul 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Towards an Ergonomic Linguistics. Application to the Design of Controlled Natural Languages

Anne Condamines
CLLE
CNRS et U. de Toulouse

Abstract: This article proposes to define a “new” discipline within applied linguistics: ergonomic linguistics. The article addresses issues concerning language use within organisations, focusing on human-oriented Controlled Natural Languages (CNLs) whose role is to limit the problems encountered with natural language, in professional contexts in particular. An ergonomic linguistics approach involves first taking into account real linguistic productions and analysing them with corpus linguistics methods, and then evaluating the efficacy of linguists’ recommendations using cognitive evaluation or acceptance tests. Two projects concerning human-oriented CNLs that adopt an ergonomic linguistics approach are presented, the first in the space domain and the second in aeronautics.

Keywords: Controlled natural language, corpus linguistics, ergonomic linguistics, readability, usability

INTRODUCTION

Most information in companies and organisations is transmitted between humans via natural language, which is not a perfect vehicle for this purpose mainly because of its intrinsic vagueness and polysemy, even in professional contexts. Despite this fact, few linguists are hired by companies, either because speakers are not aware of the language difficulties, or because the task of making proposals to control language use is entrusted to expert speakers or to psychologists (ergonomists), while linguists are rarely involved in such projects. A possible reason for this situation is the fact that for several decades, most linguists were mainly interested in generativist approaches and the notion of an “ideal speaker”, and consequently seldom explored real uses until at least the 1980s. They were therefore not present within firms, while psychologists have had a place there since the end of the Second World War. While corpus linguistics and sociolinguistics are concerned by real productions, studies conducted on linguistic data from firms are nevertheless relatively scarce. Moreover, when such studies do exist, the aim is rarely interventionist: linguists describe linguistic phenomena but do not propose solutions to the problems that the use of natural language may cause. The notion of “situated linguistics” which we proposed in (Condamines and Narcy-Combes, 2015) concerns both real productions and real needs. With “ergonomic linguistics”, I propose to take into account specific needs within organisations (principally companies); but, as in ergonomics, I also propose to place the user at the center of the approach, not only as speaker but also as the user of linguistic products. As we will see with the example of human oriented Controlled Natural Languages (CNLs), linguistic recommendations can be built from real productions and/or their efficiency can be evaluated by tests or experimentation. Their usability (a term borrowed from ergonomics) is thus one of the main aspects guiding this research. After presenting CNLs and the questions they raise in Part 2, I describe in Part 3
what I mean by ergonomic linguistics. Part 4 presents two studies on CNLs carried out using an ergonomic linguistics approach.

CONTROLLED NATURAL LANGUAGES AND THEIR USABILITY

This part presents Controlled Natural Languages (CNLs) and more specifically human-oriented CNLs and shows how the notion of usability can be adapted to them.

Controlled Natural Languages (CNLs)

The need to control and plan language is not recent. Some recommendations were made as long ago as the 16th century by F. Bacon, with his notion of ‘plain language’. More recently, in 1930, C.K. Ogden published his book Basic English: A general introduction (Basic is a backronym for British, American, Scientific, International, Commercial) (Ogden, 1930). But these initiatives have often been criticized (Shubert et al. 1995). Flesch for example declared that Basic English, with its 850 words, was neither basic nor English (Flesch, 1944, 343). Few studies have been carried out, however, to evaluate proposals for normalisation, and those that exist, at least for human oriented CNLs are very often based on outdated criteria (Dubay, 2004; Flesch, 1948; Klare, 1976; Oakland and Lane, 2004). Very few assessments of their efficiency have been conducted.

With regard to the controlled languages themselves, the first one was designed in the Caterpillar firm in 1972. It was followed by many others (Kuhn, 2014). In all cases, the aim was to control language-related risks (Condamines, 2010), especially in domains where human life and/or high costs are concerned. These risks are linked to the use of Natural Language, which is supposed to convey information. However, it is well known that natural language is not dedicated to this role alone. Jakobson, for instance, described six functions of language (Jakobson, 1963), and information transmission is just one of these functions. Moreover, the lexicon is sometimes polysemic or vague. As a result, there may be a difference between what the speaker wants to convey and what the interlocutor understands. In order to avoid these intrinsic difficulties, and because the kinds of information that need to be transmitted in most situations within firms are restricted, some CNLs were designed. They were first developed in human written communication:

Empirical CNLs were developed with the declared aim of improving the efficacy of written communication, specially of technical information in industry […]. (Ryan, 2018, 294).

The situation has changed, however, and perhaps one of the most important need now is for these CNLs to be managed with computer tools, in particular in Human Computer Interaction. With the development of the semantic web, a lot of work is now being done to develop CNLs as an interface for knowledge bases (Denaux et al., 2017; Fuchs et al. 2008). In (Safwat and Brian, 2017), several of these CNLs are evaluated. These CNLs concern a very specific task:

Controlled Natural Languages (CNLs) for knowledge creation and management offer an attractive alternative for non-expert users wishing to develop small to medium sized ontologies (Safwat and Brian, 2017, 190).
CNLs are therefore used to allow non-experts to use formalisms that they do not master. During the evaluation, it is therefore this precise task of assisting translation into a formalism that is targeted. Interesting as they may be, these works do not really fall under a linguistic problem because they are very little interested in the meaning and the interaction between humans. In some cases, CNLs “have been one approach to adjusting to the complexities, where the source text is rewritten in some systematic form” (Wyner et al., 2016, 92). But these studies still concern Human-Machine Interfaces and not Human-Human Communication which is what interest us.

It is generally agreed that a CNL is always related to a natural language:

A controlled natural language (CNL) is based on a natural language but includes restrictions on vocabulary, grammar, and/or semantics, in order to reduce or eliminate ambiguity and complexity. (Davis et al., 2017, 9).

This necessary relationship comes from the fact that, in most cases, at one point or another in the process, the CNL must be able to be understood by a human. In the case of Human-Human Communication, usability, a concept borrowed from ergonomics, concerns the linguistic form given to the information to be transmitted.

The issue of usability

Usability is a concept that comes directly from ergonomics (or human factors). The ISO definition reads as follows:

Usability: extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. (ISO, 2018).

Usability testing is mainly performed on products (Dumas et al., 1993). This notion is used in document formatting (Alamargot et al. 2007) and, more recently, for evaluating Human Computer Interaction (Hustak et al., 2017; Lewis, 2010; Marquardt et al., 2017).

But, once again, the choice of linguistic forms only partially requires knowledge of how the language works.

With a more linguistic point of view, some sociolinguists use a closely related notion (acceptance) in the domain of language planning:

For the sociolinguistic study of language planning, not only the content of planning activities is important, but also the acceptance or rejection of planning efforts. (Haarman, 1990, 105)

I propose to use this notion of usability to characterise the readability of a text (or any linguistic production) written following human-oriented CNL recommendations, drawing on the classification developed by Kuhn (Kuhn, 2014). His PENS classification (precision, expressiveness, naturalness, simplicity) can be used to characterise any CNL.

In order to address all these elements, I propose to adopt a two-step method, based on the following definition of the notion of usability applied to texts: A text (or any linguistic form)
will be usable if it is close to the spontaneous forms used by speakers and if it is understood rapidly and without error in the context of the reader/listener.

THE ERGONOMIC LINGUISTICS APPROACH

I use the term “ergonomic linguistics” in order to characterise a linguistic approach that takes into account human needs concerning the readability of texts (or oral exchanges) within organisations. Such a notion belongs mainly to linguistics and, in particular, to applied linguistics as defined by AILA (http://www.aila.info/en/):

*Applied Linguistics is an interdisciplinary field of research and practice dealing with practical problems of language and communication.*

But, ergonomic linguistics also draws on ergonomic concepts such as the notion of usability discussed above. As the main aspect in human oriented CNL concerns the transmission of meaning, it seems legitimate that linguistics plays a major role in ergonomic linguistics and that it organizes the contributions of the other disciplines.

**Using real linguistic productions to design CNLs**

As underlined above, CNLs are always related to a natural language, but in the case of specific technical domains, such as the ones encountered within firms for example, “natural language” means the language used in the firm, or even in a particular department of the firm, since they can be considered to constitute discourse communities (Hymes, 1972). This language is already reduced compared to the natural language spoken by the general population. Approaching the issue from another viewpoint, Harris (Harris, 1966) dubbed these languages “sublanguages”.

More or less consciously, human-oriented CNL designers (often domain specialists and expert speakers) generally base the linguistic constraints they propose on their own perception of the way they speak. As a result, a CNL is related to the sublanguage used in a firm or a department and, as Kittredge suggested, it may be designed from it.

One or more related sublanguages may serve as the basis for a controlled language, where standards are introduced to reduce ambiguity, limit complexity, and enforce uniform style (Kittredge, 2003, 430).

With the development of corpus linguistic approaches (especially corpus-driven approaches (Tognini-Bonelli, 2001; Biber, 2009)), it is now possible to assist in designing human-oriented CNLs through the systematic study of real productions. More precisely, it seems possible to automatically identify phraseologisms, i.e. recurrent lexico-syntactic structures (Gries, 2008). These phraseologisms are often formulaic expressions that characterise the sublanguage from which the CNL has to be designed. It should therefore be possible to propose writing recommendations close to the spontaneous productions in use, which are already reduced compared to “natural language”. Several tools can be used to extract such phraseologisms but some of them are dedicated to helping linguists to characterise the style of a corpus. It is the case for SDMC (Sequential Data Mining under Constraints), designed by the LINA Lab, the tool we used in our experiment:
The goal is to provide to the linguist experts some prominent, relevant and understandable patterns which can be characteristic of a specific type of text so that these experts can carry out a stylistic analysis based on these patterns. (Quiniou et al. 2012, 167).

To achieve this goal, the authors thus present their method:

First, we show that mining sequential patterns of words with gap constraints gives new relevant linguistic patterns with respect to patterns built on n-grams. Then, we investigate how sequential patterns of itemsets can provide more generic linguistic patterns (ibid. 166).

This is possible when the corpus is very homogeneous, for example if the texts belong to the same domain and textual genre (Bhatia, 1993).

**Set up tests to evaluate the effect of CNLs on readability**

Readability concerns the linguistic dimension of usability. As noted by (O’Brien, 2010):

Little work however has been done on the effects of CL on readability […] If CL rules do indeed reduce ambiguity, then we might reasonably assume that a secondary consequence is that the readability of the text is improved. (O’Brien, 2010, 143).

This is a real problem. However, beyond the controversial first readability formulas (Bruce et al., 1981), evaluating readability is feasible. For example, De Jong and Schellens detail fourteen methods to evaluate readability (De Jong and Schellens, 1997). Most of them could be used to evaluate the efficiency of a human-oriented CNL. The same goes for the tests set up to evaluate the CNLs developed in the context of the semantic web. Moreover, new experiments are now available. O’Brien, for example, used experiments from neuroergonomics (eye tracking) in order to evaluate the efficiency of human-oriented CNLs, in this case in a translation task (O’Brien, 2010). Neuroergonomics, which is the application of neuroscience to ergonomics, is probably a promising line of enquiry for the future in the evaluation of CNLs.

**Towards an ergonomic linguistics**

The term “ergonomic linguistics” is little used. The term “linguistic ergonomics” is used by ergonomists but only for evaluating document design (Allwood and Kalen, 1997; Shackel, 1991) or characterising human-computer interfaces (Broadbent, 1977; Bodart and Vanderdonckt, 1995):

An ergonomic criterion is a well recognized usability dimension in human-computer interaction whose reliability, effectiveness and usability have been assessed. Linguistic ergonomic criteria are criteria that have been linguistically decomposed into sub-criteria according to the seven layers of Nielsen’s linguistic model of interaction. (Bodart and Vanderdonckt, 1995, 367)

The term ergonomic linguistics is preferred here because it situates the approach within the paradigm of linguistics, and specifically of situated linguistics, i.e. an approach that takes into account both real linguistic productions and the needs linked to these productions. Fundamentally, they belong to the general issue of language planning (itself part of situated
linguistics) and to the possibility of normalizing language exchanges. This issue has been raised by numerous scholars but rarely dealt with in firms where specific problems are encountered (Condamines et al., 2017).

Nevertheless, at least two linguists use the term ergonomic linguistics. The first is Sager, in the domain of language planning:

This opposition between natural and artificially constructed languages offers many interesting research perspectives for ergonomic linguistics, a new field of study associated with language planning and with efficiency of communication. (Sager, 1994, 9)

The second one, François Rastier, generally uses the term *ergonomie linguistique* (linguistic ergonomics) in French, but in a paper written in English one finds ergonomic linguistics:

We can thus assume that the development of ergonomic linguistics depends mainly on the progress achieved in descriptive linguistics and, more specially, descriptive semantics. […] This analysis must, however, keep to certain “ecological” conditions, that is the corpus of data to be collected must carefully exclude any artefacts. (Rastier, 1993, 336-338).

In this passage, he claims that real uses need to be taken into account.

While agreeing with these two scholars concerning the need to draw inspiration from ergonomics and the role of real uses and corpus linguistics for exploring them, I think that a third point has to be added: the evaluation of CNLs’ usability before they are made available.

So, notion of ergonomic linguistics covers a three-point approach:

- A linguistic approach based on ergonomic notions such as usability;
- A method for constructing CNLs based on real productions using corpus linguistic tools;
- An evaluation of the CNLs based on (neuro)psycholinguistic experimentation or acceptability tests.

In the last part, two examples of projects that applied an ergonomic linguistics approach are presented.

**EXAMPLES OF ERGONOMIC LINGUISTICS PROJECTS**

The two studies presented below were conducted as part of PhD research, the first one in the space domain (Warnier, 2018) and the second one in the aeronautic domain (Jahchan, 2019). These two studies are part of the response to business needs aimed at creating effective linguistic recommendations, that is to say adapted to the transmission of information and really usable.

**Creating a new human oriented CNL in order to improve the writing of specifications**

This study originated from a request by the Quality Assurance Sub-Directorate of CNES (Centre National d’Études Spatiales), the French Space Agency: how could the writing of space project requirements be improved?

*Requirements* are defined by IEEE (1990) as “conditions or capabilities that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or
other formally imposed document”. Most of them are written and organized in documents called requirement specifications, i.e. sets of requirements.

The readability (usability) of specifications plays a crucial role in the building of systems since they are reference documents. At CNES, until recently, no CNL had been defined in order to guide the writing of specifications. Nevertheless, some spontaneous regularities appear, as is always the case when speakers collaborate in the same firm and for the same objectives. These regularities also correspond to sublanguages as we saw above. In such cases, the extra-linguistic situation is accompanied by linguistic regularities. So we can consider that specifications belong to a textual genre. Since there is no CNL at CNES (even if speakers have perhaps been in contact with CNLs in other firms), we can consider that it is possible to develop a CNL from these regularities, i.e. to define a standard for the writing of specifications that is close to the spontaneous productions used at CNES.

As mentioned above, the project was based on the patterns identified using SDMC. Then, from these regularities, we identified linguistic problems (use of pronouns, length of sentences, use of modalization ...) from which we built an assessment test.

The studied corpus was made of requirements extracted from several specifications written (in French) at CNES for two past projects. About 2,500 requirements were extracted for Pleiades and approximately 1,000 for Microscope (a smaller project). After removing all the tables and figures (for which an automatic analysis would be much more difficult), the corpus contained 161,403 words.

Here are some examples of extracted patterns, that we considered as phraseologisms.

- Some of them correspond to terms (Warnier and Condamines, 2015).

  \{PRP_ en\}{NOM_ pointage}{ADJ_ inertiel} \{preposition/name/adjective\}, \textit{(inertial pointing)}.

- Other correspond to real sentences templates

  \{sur\}{réception}{de\}{le}{tc\}{le\}{lvc\}{envoyer} \{on receipt of the tc the lvs sends\}

In this case, the structure corresponds to a “boiler plate”, that is a template in which it is just necessary to indicate the recipient of the tc.

- Other use massively modal verbs such as \textit{devoir} (must) or \textit{pouvoir} (can). Here are some examples of such patterns.

  \{NOM_\}{devoir}{VER:infi_}\{DET:ART_\}{NOM_\}{PRP_ de}
  \{NOM_\}{devoir}{VER:infi_}\{être\}{VER:pper_}\{PRP_\}
  \{NOM_\}{devoir}{VER:pres_}\{VER:infi_}\{DET:ART_\}{NOM_\}{PRP_}

  \{DET:ART_\}{NOM_\}{PRP_ de}\{NOM_\}{pouvoir}{être VER:infi_}\{VER:pper_\}
  \{DET:ART_\}{NOM_\}{VER:pres_pouvoir}{être VER:infi_}\{VER:pper_\}{PRP_\}

\textit{Devoir: must}
\textit{Pouvoir: can}
\textit{Être: to be}
\textit{NOM: Name}
\textit{VER:infi : Infinitive verb}
We then selected patterns corresponding to what seemed most characteristic of the specifications genre. In the case of the patterns identified above, since the concern textual data are requirements, we have identified the need to impose an element (must) but also to modalize this requirement by softening it (can). In other cases, the injunctions are modalized with present or future tenses.

For all the linguistic issues identified (expression of injunction, use of conjunctives, use of nominalizations...), we built alternative structures that, in our opinion, conveyed the same meaning. We were also inspired by the recommendations of official CNLs (ASD-STE (AeroSpace and Defence Industries Association of Europe, Simplified Technical English, (ASD-STE, 2007), and INCOSE (International Council on Systems Engineering, (Incose, 2016). Twenty series of sentences were then tested. The survey was conducted through an online questionnaire, using Qualtrics, a tool dedicated to the management of online surveys. Each user was given a definition of what a specification is and was asked to rate the structures from 5 to 1 based on their assessment of the relevance of the structure, for more details see (Warnier and Condamines, 2017a). Eighty-seven persons answered the questionnaire: 48 respondents, accustomed to reading specifications, were from CNES, and 39 were non-experts (ordinary speakers) (Warnier and Condamines, 2017b).

Here are two examples of the tested series, concerning the alternative linguistic forms of the injunction in a particular statement.

L’opérateur a le choix du mode de saisie :
   il rentre
   il peut rentrer/
   il doit pouvoir rentrer/
   il rentrera/
   il pourra rentrer/
   il devra pouvoir/
   l’adresse directement ou indirectement en précisant le nom d’un label.

(The operator has the choice of input mode:
   he enters/
   he can enter/
   he must be able to enter/
   he will enter/
   he will be able to enter/
   he will have to be able to enter/
   the address directly or indirectly by specifying the name of a label.)

La configuration
   est/
   peut être/
   doit pouvoir être/
   sera/
The configuration is
  can be/
  must be able to be/
  will be/
  will be able to be/
modified by 2 events.

I can’t give all the details of the experiments and all the results (see for this (Warnier, 2018)). In the case of the injunction, both the experts and the existing CNLs prefer the pattern with 
doit or devoir even if the corpus does not always use it. We can conclude that, for experts, the recommendations have to indicate the necessary to use this modal (or another injunctive form) in order to distinct requirements from information.

In this study the two elements of ergonomic linguistics, namely using a corpus-based approach and testing the best structures for conveying information, were both present (Condamines and Warnier, 2017). The study ended with the production of recommendations in the requirement writing at CNES (Ergonomic Controlled Natural Language for Requirement Writing).

**Improving readability of the CNL dedicated to alarms in Airbus Cockpits**

The second study is included in a project with Airbus Group. It concerned the linguistic form given to alert messages in Airbus cockpits. The current messages (current CNL) were designed in 2003 (Spaggiari et al., 2003). The alarms are intended to warn the pilot of any type of problem, from the most harmless to the most serious. Depending on the gravity of the situation, (s)he must intervene or not. These forms are syntax poor (for example: Cabin Altitude Regulated to 700 FT). There are two reasons for this. First, there is a size constraint related to the size of the screens. This point should evolve in the new cockpits. Second, the deletion of syntactic elements is very frequent, not only in CNLs but also in specialized discourses (Kittredge and Lehrberger, 1982). Consciously or not, speakers consider that the extra-linguistic situation plays an important role in the interpretation and compensates for the absence of syntactic elements. The underlying hypothesis is that if the reading time is reduced, the interpretation time is also reduced, which entails cognitive economy. An evaluation of this hypothesis was conducted by Carol Simpson (2016). In a study done in NASA’s Ames Research Center, she showed that, in oral alerts, by forming clear unambiguous sentences using the same original keywords, the message was detected more accurately and pilot’s reaction times was faster. For instance fuel low was inserted in a sentence in the same order the fuel pressure is low. Response times to sentences were approximatively 1 second shorter than response times to two-word messages. The initial hypothesis concerning the efficiency of short messages was invalidated, at least in this study. The same hypothesis concerning form and length of the messages of written alarms (contrary to Simpson’s study on oral messages), was evaluated by Jahchan in her PhD thesis (Jahchan, et al., 2016), (Jahchan, 2019). She proposed to start from existing messages and to evaluate a more natural CNL, i.e messages enriched with syntactic or lexical elements.

Generally speaking, the experiments performed were based on calculating the reaction time of the subjects after the presentation of messages with vs without all the syntactic or lexical elements (more “natural” messages), in different situations. It is not possible to detail these studies (see Jahchan, 2019) but I present one of them hereafter. It consists in the presentation
of a message and then a photo that is either congruent or incongruent with the message. The message is either consistent with the CNL or closer to natural language. In the case of congruence between the message and the photo, response times were compared between controlled messages and more ‘natural’ messages. The messages were built from the structures of real messages but the lexicon was modified since the experiments were carried out both with expert speakers and non-expert speakers. We wanted to assess whether the experts (pilots), used to the current CNL, had a different appreciation of the form of the message. Note that in this case, we start from the existing CNL and not from what could have been said spontaneously before the design of this CNL. This is due to the fact that the pilots are accustomed to these messages and that it is not a question of creating a new CNL but of seeing how to modify the existing one to make it more efficient.

The constructed messages respected exactly the form of alarm messages as in the example below. For example, [Adj Noun Num Noun Noun available] corresponds to the structure of certain messages in the cockpit (L TK 1700 KG MIN AVAIL). N.Jahchan constructed examples with the same syntactic structure, for example Empty house 2 metal basement doors available or, as in the example below, Local bakery 2 vanilla wedding cakes available. The difficulty was that the examples had to be able to correspond to representations on a photo. More natural (more syntactically rich) messages were also randomly proposed, for example in the chosen example: There are 2 vanilla wedding cakes available in local bakery [There are Num Noun Noun Noun available in Adj Noun]. Figure 1 shows the two messages randomly proposed and the photo presented following each message.

[Here is the figure]

Local bakery 2 vanilla wedding cakes available

Vs

There are 2 vanilla wedding cakes available in local bakery

Figure 1: Example of the two messages randomly proposed and the photo presented after them

Seventy-two persons participated in this experiment. Thirteen of them were native speakers. The English level of the others was variable. Competences concerning the CNL used in Airbus cockpits were also different. As noted above, the test consisted in the presentation of photos that were either congruent or incongruent with the message (randomly proposed with or without syntactic elements). Participants responded using a joystick. In the case of a good response (i.e., with respect to the congruence between the message and the photo, as in the case presented above since only two of the four cakes are (or appear to be) vanilla), the response time between the end of the reading and the action on the joystick was calculated. Full details concerning the way the data were constructed, the way the experiment was elaborated and the way the results were interpreted are available in (Jahchan, 2019).

To summarize the results obtained, we can say that, in all cases, the results were not better with the CNL (briefer messages) than with more natural messages. Moreover, in the event of ambiguity, more natural language messages can be processed more rapidly. This study presents an interest both for the Airbus Company (which will be able to take these results into account to define future cockpits) and for linguistics. From a situated linguistics perspective, it shows that syntactic information may play a crucial role, particularly in critical situations
Another experiment was done to simulate a critical situation. This is an important point showing the importance of an ergonomic linguistics approach in firms.

CONCLUSION

In this article, I proposed to go towards a new discipline, relating to applied linguistics, but that uses concepts and methods from ergonomics such as usability: ergonomic linguistics. It is mainly concerned with how linguists can intervene within organisations where natural language is used in order to convey information between humans. In order to normalize linguistic uses, ergonomic linguistics proposes to take into account users’ needs and the usability or acceptance of the linguistic norms proposed. First, real productions have to be taken into account and studied with corpus linguistic methods. Then, when linguistic norms have been developed from these real uses, their efficiency has to be assessed with experiments or acceptance tests. Two studies have been presented dealing with Controlled Natural Language issues and the way ergonomic linguistics may help to design and evaluate texts written with CNL recommendations.

Such an approach requires skills in corpus linguistics (and more generally in tool-assisted methods) and in cognitive experimentation. A single researcher seldom possesses all these skills, especially as research in these areas is progressing rapidly thanks to deep learning and to neuroergonomics. Future research will no doubt take place in multidisciplinary teams but hopefully we will better understand eventually what it means “to make sense”.

REFERENCES


http://www.tradulex.com/varia/Europhras2017-II.pdf
