

Specialized Languages

The alter ego of any research field

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Abstract

Across different fields of research, one feature is often overlooked: the use of language for specialized purposes (LSP) as a cross-discipline. Mastering cross-disciplinarity is the precondition for communicating detailed results within any field. Researchers in specialized languages work cross-disciplinarily, because they work with both derivative and contributory approaches. Derivative, because specialized language retrieves its philosophy of science as well as methods from both the natural sciences, social sciences and humanistic sciences. Contributory because language results support the communication of other sciences. Take for instance computational linguistics: its derivative part uses the competences and methods from computer science and couples them with linguistics; its contributory part is the lexicographical, terminological and syntactical results within a specific domain or genre that help science fields communicate their findings. With this article, we want to create awareness of the work in this special area of language studies and of the inherent cross-disciplinarity that makes LSP special compared to common-core language. An acknowledgement of the importance of this field both in terms of more empirical studies and in

terms of a greater application of the results would give language specialists in trade and industry a solid and updated basis for communication and language use.

Keywords Corpus linguistics, cross-disciplinarity, lexicography, terminology, textual linguistics.

Background

A general question from society is what humanities can contribute with, on its own and cross-disciplinarily. On its own, as part of humanistic sciences, language has a fundamental role in describing the mechanics of communication. Cross-disciplinarily, specialized languages bridge not only a communicative void, but add to defining and clarifying the knowledge basis of any research field. In recent years, the focus on relations between language and societal factors is gaining ground. Within LSP as an academic discipline, this relation has mainly been researched in academic genres, for instance in abstracts, research grant proposals, etc. (Biber 2006; Swales 1990). There are only scarce academic studies dedicated to specialized language applied in a trade and industry context. Trade and industry is currently dominated by companies which set up prescriptive rules for specialized language, for instance in the form of language policies and templates. These systems are unable to cope with the challenges of the new millennium with its increased use of neologisms, inter-language transfer and new genres of communication, etc. This is a challenge, to which specialized language as a cross-discipline can supply methods from the academic world to help create an overview in an applied context. Generally, the linguists' role is to create consciousness and awareness of characteristics in specialized texts, thus contributing to clear and unambiguous communication between expert-to-expert or expert-to-layperson across disciplines.

Language for specialized purposes (LSP), also known as specialized language, is linked to discourse communities shared by specialists in a given domain. The insight into and work with specialized languages are decisive for a shared understanding between experts who learn to use a logical, united, unambiguous discourse for developing their specialized fields. In addition, specialized language in an adapted form is a means to communicate the substance of the field to external semi-professionals, students or lay persons.

In a translation context, specialized language is a challenge because it develops differently in different languages.

As explained above, we shall address the need for an academic approach to the fields of linguistics which help trade and industry, as well as science and technology cope with their challenges to create meaningful communication by developing and drawing on the specialized register for either laypersons or for experts. The fields in question are terminology, lexicography and textual linguistics. We shall also address how cross-disciplinarity is involved in the terminological, lexicographic and textual-linguistic processes.

Terminology and cross-disciplinarity

The main function of terminology is to create an overview, to document or ensure consistent language use, monolingually or bililingually. This aim is emphasized by the Handbook of Terminology:

The HoT aims at disseminating knowledge about terminology (management) ... to a broad audience: students, researchers, professionals and lecturers in terminology, scholars and experts from other disciplines (among which linguistics, life sciences, metrology, chemistry, law studies, machine engineering, and actually any expert domain). In addition, it addresses any of those with a professional or personal interest in multilingual terminology, translation, interpreting, localization, editing, etc. (Kockaert and Steurs 2015, ix-x).

The quotation labels a number of specialists and students as possible stakeholders in both the input and output sides of terminological science. In general, domains such as law, engineering, life sciences and economics are characterized by special linguistic features at different levels referred to as the register (ref. e.g. Halliday and Hasan 1976). The register concept is thus most easily understood as a particular situational configuration of linguistic resources (Wales 2001, 337). Within engineering, for instances, there will be differences between promotional texts and technical documentation.

The core of the register is the term, which—unlike words in Language for General Purposes (LGP)—is unambiguously defined by pairing concept and term. The pioneers of the terminology disci-

pline, notably Schlomann and Wüster, worked cross-disciplinarily as they were subject-field experts dedicated to structuring the vocabulary of specialist areas. Later, terminologists leaning on the early work of subject specialists were normally linguists or translators (Humbley 1997, 25). The term and its definition normally emanate through the discourse in different disciplines. Term management, in turn, is cross-disciplinary and involves extraction of terms and analysis of the precise definition of a term as well as clarification of conceptual relations, such as hypernyms – the more general concepts, for instance vegetable; hyponyms – as the included elements under the hypernym, for instance radish and carrot; and synonyms – the same meaning of a word in different contexts (Wales 2001), for instance the Latin *radicula* for radish and Latin *carota* for carrot. Though linguistics is not normally associated with terminology (Hummel 2009, 109), a linguistic apparatus is involved at terminological level, i.e. from the identification of term candidates and classification of terms to selection of information categories in a database. The difficulty of term management is the additional, specialized knowledge needed to cope with a specialized discipline. In such fields, cross-disciplinarity is first of all at play for linguists, who have to acquire semi-professional knowledge. Secondly, cross-disciplinarity is at play in the cooperation between semi-professional linguists and field experts. And thirdly, cross-disciplinarity results in products generated by linguists and domain experts from e.g. medicine, law, economics and technology.

The strict definition doctrine within terminology has led some terminologists to question just who is supposed to use it: experts know the definition already, and laymen do not have the subject knowledge to make use of it (Humbley 1997, 25). Faber pinpoints this problem:

Although it is not infrequent for experts with an acceptable level of a second language to try to translate texts because of their knowledge of terminological correspondences, they generally find that writing an article in another language is far from simple. In a parallel way, some translators believe that their syntactic and semantic knowledge of two languages guarantees an adequate translation of a scientific or technical text without any other previous preparation or documentation. Both enterprises are generally destined to failure (Faber 2009, 108).

Terminology is derivative because professions such as engineering and natural sciences provide the raw material; and contributory because the product is returned to the research fields and companies in the form of terminology databases. An example is the term base of the European Union (IATE 2016).

Specialized lexicography and cross-disciplinarity

Lexicography is a cross-discipline which helps bridge knowledge communication asymmetries between subject-matter experts and laymen. In contrast to the terminological product – at least classical terminology, user adaption is the signature of specialized lexicography. The definition of the user situations (for instance translation or conceptual understanding) and the user groups (for instance expert, semi-expert or layman) determine the information categories. There is a full range of linguistic and extra-linguistic information, including parts of speech (POS), collocations, phrases, meanings, discourse types, etc., all depending on the type of dictionary.

Especially the meaning or extended definition category, including encyclopaedic information and cross-references to related entries, is essential here to cope with the knowledge gap described above. Also involved are antonyms – the contrasts of meaning; polysemes – words with more than one meaning (Wales 2001), etc. Although the linguistic apparatus is basic, lexicographers have to work either cross-disciplinarily or collaborate with a subject expert. The input of specialized lexicography comes from the domains in the form of texts. This raw material is synthesized to define and delimit lexical terms and their linguistic use. The raw material is thus basically the same as for terminology, but the processing of it and the output differ to make it user-oriented. Hence, the output of lexicography is suitable as the basis for text writing, translation or reception.

Textual linguistics across disciplines

As mentioned earlier, the core of register is the lexical choices within a genre or a domain. But register knowledge also includes genre and domain literacy. Domains are characterized by content and the corresponding lexicon, while genres are characterized by the choice of linguistic elements as a function of extra-linguistic factors, the rationale in the discourse community, and rhetorical strategies in terms of progression of strategic moves (Swales 1990). Genre litera-

cy includes insight into the formalization of knowledge, spanning from the set-up of a text, over logical sequencing of information to typical phrases used as well as special connectors, anaphors and cataphors, grammatical choices, etc. In a cross-disciplinary perspective, it is noteworthy that job adverts for technical writers are often open for both linguists interested in technology and technicians with a flair for languages.

Translation as a special case

More than any other discipline, the translation of LSP texts draws on the entire range of linguistic fields outlined above, including cross-disciplinary knowledge. The translation of LSP texts is in no way a straightforward or one-to-one relation between linguistic elements in the source and target texts. In the first place, it is necessary for a translator to cope with any knowledge gap to be able to transfer the meaning of the source text. Secondly, in the transfer from source to target text, a translator can be confronted with different challenges and choices.

The constant development of any special field includes new concepts and terms, or old terms with new definitions (Nistrup Madsen 1999, 107; Engberg 2002), or different conceptual systems in different countries (Fischer 2010, 32). Experts may have different terminologies for the same concepts, or there may be a terminological battle in the coinage of new inventions (Freixa 2006), etc.

One example of this is found in the SEO (search-engine-optimization) field, where Danish and Spanish coin different concepts for the same phenomenon that originated in English. Table 1 below shows the languages' alternative listing for the word crawler.

English	Spanish	Danish
Crawler Spider	Crawler Spider Rastreador Araña	Crawler Spider Edderkop

Table 1: Search engine and its synonyms in English, Spanish and Danish

Both English, Spanish and Danish use the words crawler and spider. However, to reach the target audiences, Spanish adds ras-

treador and araña as possible synonyms, Danish adds edderkop. In Danish, the English and Danish terms compete directly, whereas the battle in Spanish takes place by one word being stated first, and the chosen local synonym in a parenthesis (Jensen et al. 2012, 26), cf. “Un crawler (rastreador) es un programa que recupera páginas web.” (Benítez Andrades 2010, 1).

So the one-to-one relationship in the terminological field is an oversimplification which means that an ongoing check of terminology is needed. Scarpa refers to the problem of incommensurability in LSP translation (Scarpa 2008, 134-139). Likewise, the combinatorial choices, such as domain-specific collocates or phrases, cannot be made intuitively or by means of introspection, but need factual checks in target language comparable texts, etc. Finally, on the textual level, choices have to be made within the dichotomy of direct-indirect translation (Vinay and Darbelnet 1958/2000). A direct, or literal translation, follows the source text as closely as possible with respect for grammatical conventions in the target language. An indirect translation emphasizes the linguistic and stylistic expectations of the target audience with the purpose of producing an idiomatic translation. In this respect, indirect translation is a kind of target-audience orientation.

On a continuum between a source-text orientation and a target-audience orientation in translation, the content is subject to change in a target-audience orientation within the fields of specialized language. Content changes can be ascribed to socio-cultural differences between source cultures and target cultures. In the automotive industry, for example, a right-side steering wheel can be changed to a left-side steering wheel depending on the market. In an LSP context – apart from minor genre differences – legal texts will often require direct translation in order to maintain the legal effect of the original document while other texts, e.g. technical manuals or financial reporting, will benefit from indirect translation, which means adapting the text to target text conventions to achieve a communicative effect and make it more recognizable for a target audience.

Hence, the general view of specialized translation from an outsider’s point of view – that the communicative process and result are the same all over the world – is basically flawed. The precision and complexity of the cross-disciplinary work processes make the work of specialized-language translators essentially different from

the work of literary translators, who have a primary wish to create literary effects in texts. LSP translators work with a narrower focus on knowledge precision and specialized target group adaptation.

These different work processes surfaced in a study of LSP and LGP students' translation methods and research procedures when the translators were subjected to translating both LSP and LGP genres. It appeared that each group brought its own translating strategies into the work with the unfamiliar genres. After the translation experiment, the LSP translators found the LGP genres fun to translate, but focused very much on terminology precision rather than literary effect. The LGP translators, on the other hand, were quite lenient in their choice of LSP terminology and had a spare-me attitude to LSP translation in the future (Dragsted and Hvælp-lund 2015).

Cross-disciplinarity historically and beyond

Rounding off our discussion of cross-disciplinarity, we argued that linguistics has both a derivative and a contributory part. The derivative part can for instance be ascribed to Wittgenstein's idea of a logical link between language and the way the world is described (Wittgenstein 1922). A practical example of this logical link is the work of Carl von Linné, who in the 18th century organized the botanical world (Karsch 2006, 173), thereby supplying the framework for other scientists and linguists to pursue the organization of the world at large. The 20th century saw subject-matter experts, such as Wüster and Drezen, working with terminology management (Picht 1998, 341f). Later on, different fields from natural sciences, social sciences and linguistics recognized cross-disciplinarity as a necessity. Picht's two examples are technology and economics, in which the link to linguistics is expressed:

Für beide Wissenschaften also: für die Sprachwissenschaft wie für die Wirtschaftswissenschaft ist die Soziologie ein neuer Anschauungshintergrund geworden." (Levy 1932, quoted by Picht 1998, 339).

This necessity of language conventions and genre literacy to express knowledge gradually found its form in English and other languages, once Latin was dispensed with as the science *lingua franca*

(Sollaci 2004). Newton was one of the first scientists to write in both English and Latin. In his work "Opticks," the obvious lack of formalized writing of science results is noteworthy. The following is his description of the optics experiment:

By this way of arguing I invented almost all the Phænomena described in these Books, beside some others less necessary to the Argument; and by the successes I met with in the Trials, I dare promise, that to him who shall argue truly, and then try all things with good Glasses and sufficient Circumspection, the expected Event will not be wanting (Newton 1730, 132).

The trustworthy expert style expected from a scientist or a researcher today was not standardized when English was introduced as a professional discourse, even if we consider language changes over the centuries. The personal interjections, the promises and the narrative flow of a scientific text would not be found today in professional discourse communities.

The gradual standardization has developed with genre conventions for different media and situational uses combined with the discourse of the domain in question. "Opticks", by the way, contains page-long definitions for precision and clarity purposes (Newton 1704, 1-20). Today, most of this work would be found in industry standards and would be explained and exemplified in lexicographic encyclopedia. This is where professional linguistics has its contributory force: the world is defined, logic is put into place, ready to be used for the next scientific project. Genre and domain specifications add edges to the puzzle, and IT technology paves the way for both general and proprietary realizations. Genre content management, for instance IMRAD (introduction-method-research-and-documentation) for science documentation, is one among many writing and organizational systems in use (Sollaci 2004).

New trends

Over the years, specialized linguistics has incorporated ever more theoretical and methodological aspects from adjacent areas. It now draws on cognitive linguistics, socio-linguistics, pragmatism and textual linguistics, to just mention some.

Computer science has indeed renewed the study of LSP. The transition from the classical paper-and-pencil studies to e-tool analysis has given rise to important shifts within the different subfields of LSP research. The corpus-linguistic method, i.e. the compilation of electronic text corpora and subsequent software processing, has meant a huge step forward in terms of identification, documentation, efficiency and new approaches to a number of LSP studies.

The corpora used are generally either parallel corpora, which consist of basic core texts within a domain and their equivalents in other languages; or comparable corpora, which consist of domain-specific texts, typically retrieved via key search words in different languages and systems. A newcomer is the ad-hoc corpus, which is apt for use in specialized contexts, i.e. small, domain-specific corpora, which are collected on-the-fly and serve a particular purpose, for instance defining new terminology in a domain, finding specific traits within a certain genre, or looking at the keyness of certain phrases in a given context, or finding thematic issues—or something entirely different, depending on the situation.

Both terminology, lexicography and textual linguistics benefit from the corpus-linguistic method.

Within terminology, corpus-linguistics in the form of the combination of electronic text corpora and analytical tools are now prevailing. The quick retrieval of keywords from a specialized corpus as well as the representative amount of raw data in the corpus entail a shift of paradigm in terms of time and quality. A recent example comes from Kast-Aigner who has used a parallel corpus of EU texts to identify specialized terminology and to show how word clusters are used to classify domain-specific issues in the EU (Kast-Aigner 2009, 139-151).

Using a domain-specific, comparable corpus of life-science-related texts, Temmerman has bridged terminology and socio-specialized linguistics, thus creating an internal linguistic crossfield within LSP to make templates to expand the definitions with user-relevant information and make them more understandable for non-experts (Temmerman 2000). Along similar lines, Faber has combined electronic corpus analysis with the theory of frames by using concordance lines in a coastal engineering text corpus to observe the combination of the keywords and roles (agent, process, instrument, patient) of the collocates. The results include frames or schemata as

mental representations of the field—a renewal of the classic tree-diagram of terms (Faber 2009).

Over the years, specialized lexicography has focused increasingly on the theoretical and practical development of high-quality online dictionaries. Laursen and Duvå discuss the design of an optimal solution including new information categories for online dictionaries to target translators (Laursen and Duvå 2005). Nielsen focuses on the multitude of combinatorial choices of informational categories that online environments facilitate. He has used this knowledge to make an online dictionary of accounting. Where the work with specialized lexicography has been informative in its nature, focus has now moved to a “functional focus [that] may better help users achieve their intended goals.” (Nielsen 2002; Nielsen 2015).

At the textual level, corpus linguistics offers advantages when it comes to identifying and comparing the text-constituting elements in different domains or genres. As examples, Laursen et al. have used multilingual ad-hoc corpora to determine domain-specific SEO terminology in English, Spanish and Danish, revealing a cross-linguistic difference in the use of code-glossing—defined as meta-discursive elements used to reformulate and exemplify the meaning of new concepts (Hyland 2007)—as a means to guide the reader in new domains (Laursen et al. 2014). Moustén et al. have tracked the use of financial language Anglicisms in genre-compiled ad-hoc corpora of stock blogs and stock analyses in Spanish and Danish (Moustén and Laursen 2015), and Corpas Pastor and Seghiri have extracted special English and Spanish discourse features in bilingual corpora of travel insurance documents (Corpas Pastor and Seghiri 2009).

Conclusion

Language for specialized purposes has developed essential preconditions for all other sciences to explore, develop and communicate their fields. We have focused on the specialized language fields of terminology, lexicography and textual linguistics, both with their classical contributions, their cross-disciplinary contributions, and more recent contributions through the use of electronic systems. We have argued that for instance specialized language research is derivative in its use of the raw material, methodology and theories based on the findings from other research fields. We have also ar-

gued that specialized language fields are contributory in their cooperation with and contributions to other research fields and trade and industry professions, both in the form of outputs ranging from raw terminology databases over retrieval methods for different work processes to the more advanced forms of research communication. With the increasing requirements for precise communication to get a break-through of essential research results as well as efficient hands-on trade-and-industry communication, specialized language knowledge with its adjacent research fields is a prime parameter of efficient communication. In other words, LSP research, LSP studies and LSP teaching are important alter egos in the social acts of research and business.

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