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New Challenges for Research on Language for Special Purposes

Ingrid Simonnæs / Øivin Andersen / Klaus Schubert (eds.)

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New Challenges for Research on Language for Special Purposes

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Bergen / Hildesheim, July 2019

Ingrid Simonnæs

Øivin Andersen

Klaus Schubert

Introduction

In June 2017, the 21st Conference on Language for Special Purposes was arranged at NHH Norwegian School of Economics. The topic of the conference was “Interdisciplinary knowledge-making: challenges for LSP research”. This is reflected in the selected proceedings of the present anthology. When deciding on how to categorise the papers, we decided to do this according to the development of research on specialised language in which the focus has expanded considerably from the beginning until today – now referred to as specialist communication or more recently specialised discourse (see i.a. Ehlich 1992; Kalverkämper 2004; Schubert 2007, 2011; Engberg 2008 and Gotti 2011).

The beginning of the 20th century is usually defined as the rise of modern LSP research characterised by a particular focus on the study of the specialised lexicon of professions and disciplines (for an overview see Hoffmann et al. 1998). In their overview, they focus on the development of LSP from the industrial revolution, the rapid development of the natural sciences and later the social sciences and the humanities. Before the turn of the millennium systematic terminology dominated with the tradition from Wüster and Felber centered at the International Information Centre for Terminology, known as Infoterm, in Vienna. In this tradition, the main focus was on terminology and standardisation where trained terminologists worked together with domain experts. The approach was strictly onomasiological, *i.e.* the terminologically unambiguous concept was a primary point of departure. They relied heavily on a small set of concept systems, where the ideal was to make the system so transparent that terminological definitions could be generated from it. Especially generic definitions in the Aristotelian tradition with necessary and sufficient features were sought for. Both monolingual and bilingual systems were worked on, and LSP translation was early an important area of LSP.

In the 20th century, this tradition was unchallenged for a long period of time, and we had a type of Kuhnian “normal science” in LSP. But in the 90s and especially after the turn of the millennium things changed rapidly. The technological

progress speeded up and gave rise to not only a terminological explosion, but also a huge rise in digital resources. This resulted in separate symposia on terminology and knowledge engineering (e.g. Galinsky & Schmitz 1996). All this, combined with increased globalisation and the growth of interdisciplinarity in academia, has profoundly effected the development of LSP studies. The formerly uncontested Wüsterian tradition was challenged because the multidimensional character for modern LSP research saw the communicative needs of LSP practitioners as more important than the formal cooperation between terminologists and domain experts along a predefined set of principles. This gave rise to various new ideas from the 90s and into the new millennium. According to Cabré Castellví (2003), this critique came from cognitive science, the language sciences and the communication sciences. In cognitive science, Eleanor Rosch had challenged the classical Aristotelian concept theory and advocated a prototype approach to the concept where fuzziness was considered a basic property of natural human languages (Rosch & Lloyd 1978). Temmerman introduced this view into an alternative terminological theory. This led to a controversy between the two terminological schools (for more details see Cabré Castellví 2003). Focus was directed more to the role the interlocutors play in the construction of knowledge. Terminological data should be observed in their natural environment in specialised communicative discourse. This opened up for textual analyses and functional pragmatic stylistics. Whereas the Wüsterian tradition had been strictly onomasiological, the alternative approach was semasiological and thus more like traditional lexicography in this respect. As evidenced in proceedings of most LSP proceedings after the millennium shift, semasiological terminology increasingly rely on electronic corpora, using statistics and token frequency. This is also reflected in the selected publications of this volume.

We decided to start with the paper by Kjersti Fløttum, being one of the three keynote speakers. In addition, her paper can be seen from a bird's eye on the overall conference theme. Fløttum argues i.a. for the intricate multivoicedness of this kind of discourse, which represents a major challenge for linguistic and discursive analysis and invites to cross-disciplinary research.

Chapter 1 – Terms and Terminology – contains contributions on terminology from different aspects. Firstly, one has to take into account that ‘terminology’ is polysemous and covers three meanings: (1) the science of terminology, *i.e.* the scientific study of the concepts and terms found in languages for specific purposes (ISO 1087), (2) the special vocabulary (terminology/*Fachwortschatz*) of a

particular domain and (3) the methodology in the field of terminology. Obviously, in professional communication much focus has always been on the specific vocabulary. Hence, Chapter 1 contains papers investigating terminology using corpora in diverse domains and with diverse approaches

In Chapter 2 – Text and Textlinguistics – the perspective is extended to specialised texts/discourse for specialised purposes. The contributions illustrate the use of computational tools in this field and its usefulness in various applications. The contributions include both pedagogical aspects of LSP writing and descriptive topics of various features of LSP texts such as investigating collocations and argument structures using electronic corpora.

Chapter 3 – LSP Translation – focuses on translation in the realm of LSP. The starting point for modern translation theories is generally seen in the second half of the 20th century. The general theories were primarily linguistically oriented (e.g. Fedorov 1953/1968; Jakobson 1959; Nida 1964; Catford 1965; Reiß & Vermeer 1984) and changed subsequently to more cognitively based explanations (e.g. Risku 1998; Halverson 2003, 2010a,b, 2014). Internationalisation and globalisation engendered since the need for and focus on translation for special purposes, (e.g. Lykke Jakobsen 1994; Schäffner 2004, 2012; Schubert 2011; Garzone, Heaney & Reboni 2016). This chapter contains therefore papers on translation within heterogeneous domains of LSP.

In Chapter 4 – Training and Didactics – we gathered the contributions on training/didactics focusing on i.a. translator's competence models, translator skills, language resources in research infrastructures and knowledge-making process through content visualisation.

Presentation of the individual contributions

Keynote

As mentioned above, the anthology starts with the paper of keynote speaker Kjersti Fløttum who focuses on the complex of discourses in the current debate on climate change. She demonstrates how a combined approach based on a polyphonic (multivoiced) and the complex genre of the narrative applied to texts such as IPCC, UN documents and the Norwegian governmental White Paper, can reveal new and important knowledge about Norwegian citizens' view on climate change solutions. The documents vary as to who are depicted as heroes or as

villains in the projected narrative structure. These data are supplied with a “survey discourse” in the form of open-ended questions directed at Norwegian citizens where 4,634 persons responded. This yielded a corpus of 93,942 words. Some of the responses were quite long and revealed a clear linear narrative structure with a simple syntactic structure in clear contrast to the complex structures of the White papers. Fløttum’s contribution clearly shows the advantage of combining a narrative and a polyphonic approach. In her concluding remarks Fløttum highlights the successful cooperation with political scientists who had used the Structural Topic Modelling (STM) for a better and more reliable topic structuring of the content transmitted by the respondents in the survey discourse. Fløttum’s group worked in close cooperation with the political scientists and the results were interesting and revealing both for the linguists and the political scientists. STM allows incorporation of covariates such as age, gender and education, among other things. This can be combined with different types of regression analyses. But Fløttum’s group wanted to go deeper into the data to analyse the different topic constructions to find different actors, different opinions and attitudes, something that is beyond the capacity of the STM. This has only been possible as in their quantitative analysis.

Chapter 1 – *Terms and Terminology*

The first paper in this chapter is the co-authored paper of **Jelena Anđelković** and **Gordana Jakić** who present a dictionary-based and corpus-based study of metaphorical terminology transfer from English into Serbian in the multidisciplinary subject field of management. The following research questions were asked: What strategies are employed to render English metaphorical terms into Serbian? What factors influence the translatability of English metaphorical term into Serbian? Do metaphorical terms represent an obstacle to knowledge transfer and understanding? And finally, do these terms represent a challenge to Serbian terminology standardisation? The results revealed that three main strategies were employed. The most common one was direct borrowing of metaphorical terms into Serbian, indicating that anglicisms are more appropriate for terms than metaphors with different levels of adaptations both orthographically and morphologically.

Jelena Filipović and **Andrijana Đordan** give a report on Serbian language policy in the terminological field and find that the Serbian terminology creators are, in fact, terminology users being experts with no linguistic background. The activity

is highly uncoordinated, based on a bottom-up policy and planning. They contrast this approach with the top-down terminology policy conducted by terminology policy makers, being mainly linguists. The authors introduce principles of language leadership in order to offer a new platform for a unique, contemporary process of professional terminology creation, evaluation, storage and standardisation. They call for help for all relevant actors to establish closer cooperation in this task.

Kim Grego and **Alessandra Vicentini** analyse a corpus of two British newspapers over one year, revealing a special connection existing between domain-specific terminology and ideology, using an integrated discursive approach. The focus is especially on a highly debatable issue of assisted dying. The key terms involve a number of interconnected domains such as medicine, law, politics, economics and religion. The results reveal the semantic fields involved, the actors at play and the power relations between them, amongst other things.

Marcus Müller, **Hartmut Behr** and **Jens Steffek** present their explorative longitudinal study on the transformation of the key terminology of the academic field of International Relations. In their diachronic corpus study, they focus on the terminologisation of the word “regime” in IR, using a digital discourse analysis enabling them to trace key concepts and their change through time. The method combines corpus linguistics and qualitative textual analysis. Their findings reveal that from 1976 to 1982 the word “regime” changes from being an ordinary general language item to becoming a scientific term (controlled by a definition).

Juan Rojas-García and **Melania Cabezas-García** use knowledge patterns (KP) to extract conceptual information from a corpus of English environmental texts. The applied method is a distributional semantic model (DCM) applied to semantic vectors. The DCM combined with KP and a clustering technique resulted in an in-depth semantic analysis of two terms belonging to the same cluster: *beach* and *erosion*. This combined methodology showed its usefulness for the retrieval of relations such as “part of”, “has part”, “causes”, “caused by” and “affects”, “affected by”.

Katia Peruzzo presents the results of the research team’s work on TERMitLEX, a terminological knowledge base (TKB) based on the former TERMit data base. In contrast to the latter, TERMitLEX deals exclusively with legal matters and has taken into account not only translators and interpreters as end users but also

(prospective) lawyers. Hence the need to identify these groups' specific needs preferences when using such a TKB and subsequently to design the data base accordingly. Peruzzo points to the main challenge of how to design a terminological record template. The requirements to such a template is that it is (1) well structured, clear, and user-friendly and (2) contains information relevant to both professional communities, without at the same time giving rise to an information overload. Particularly, she points to the important implementation of two new fields in the TERMitLEX's template structure, viz. Legal system and Legal framework, which seems to be very useful. However, she concedes that some practical aspects with respect to the type of information to be recorded have still to be reconsidered for further improvement of the record template.

Natascia Ralli and **Isabella Stanizzi** describe an ongoing project on harmonisation of legal and administrative terminology in South-Tyrol, where German, Italian, and Ladin are official languages. The project is carried out in collaboration with the Institute of Applied Linguistics of Eurac Research and the Office for Language Issues of the Autonomous Province of Bolzano. The challenge the authors are faced with, is how to translate legal concepts of the Italian legal system into German along with already used denominations in the legal systems of Austria, Germany and Switzerland. Ralli and Stanizzi first describe their approach by comparing the legal concepts in the Italian legal system, *i.e.* the onomasiological approach, and subsequently looking for a German denomination (the semasiological approach) already in use, which covers more or less the same concept. Here they have to take into account the well-known difficulty that legal concepts intrinsically are linked to their specific legal culture. The ultimate goal of this terminological project is the aim of harmonisation of legal and administrative terminology and its dissemination in the online-information system for legal terminology, *bistro*, to the benefit of the population in this region.

Lotte Weilgaard Christensen explores in her paper the results of using a semi-automatic extraction of Danish knowledge patterns by means of a valency identification of Danish verbs. This is a pragmatic character-string approach using the query system Sketch Engine. The topic of the corpus is on electric cars. Her aim is to construct a generic concept system and assess its completeness.

Chapter 2 – *Text and Textlinguistics*

In Chapter 2, two papers deal with academic writing, but each with a particular focus. **Fátima Faya Cerqueiro** reports on students' collaborative abstract writing from academic articles in English. Students were writing in pairs and the final abstracts were discussed and analysed in order to learn more on peer collaboration. In spite of difficulties regarding grammar and formal language conventions the students were able to produce well-structured abstracts.

The particular focus of the paper of **Nataša Logar** and **Tomaž Erjavec** is on academic Slovene vocabulary in the field of expert discourse by means of a frequency profiling method. They used to this end the academic non-balanced Slovene corpus KAS and the balanced reference corpus of Slovene KRES. Five comparisons between four sub corpora yielded five lists of lemmas. The PhD sub-corpus vs. the fiction sub-corpus produced the highest number of good academic vocabulary candidates.

Clara Inés López-Rodríguez describes a methodology for retrieving the most prototypical verbs co-occurring with nominal phrases of the conceptual category DISEASE in object position in medical language. The goal is to retrieve significant knowledge patterns in medical texts using Dik's semantic roles in Functional Grammar. These verbs may facilitate the comprehension of the terms and conceptual relations between the most prototypical semantic categories by non-experts and non-native speakers.

Päivi Pasanen applies knowledge patterns as a method for semi-automatic extraction of semantic relations in the field of maritime safety. Knowledge patterns refer to lexico-syntactic patterns pointing to terminological information. The aim of her case study is to construct a prototype framework for a collision event. The method was applied to an English corpus of selected accident investigation reports published by the Marine Accident Investigation Branch (MAIB).

Chapter 3 – *LSP Translation*

Specialised translation encompasses many different approaches and topics. **Tania Paola Hernández-Hernández** analyses the polemics on how a particular loanword within medical language is rendered from English with different spellings in Mexican Spanish. To this end, she adopts a sociological approach following Bourdieu's concepts of linguistic capital and doxa. She refers to a

controversy in 2015 about the spelling of the term ‘chikungunya’, which designates a viral disease, by the editors of the Mexican medical journal *Revista Médica del IMSS* and a professional medical translator. She argues that the concepts ‘linguistic capital’ and ‘translational doxa’ enables her to analyse the regulating principles of journalism as well as the set of values and beliefs that shape the practices of the individuals (editor(s) and a specialised translator) involved therein. In her conclusion, she argues for the medical translator’s view that translation practice must be organised to a doxa, which is established and endorsed by an international professional translation community having both linguistic and translational capital.

The paper of **Miriam Paola Leibbrand** focuses on financial translation, which she claims is located at the interfaces of corporate, especially financial, communication, languages for special purposes (LSP) and specialised discourse, terminology, specialised translation, and accounting. As an object of investigation, it is therefore an interdisciplinary topic and calls for an approach that takes into account diverse fields of inquiry based on interdisciplinary knowledge and insights. More precisely, Leibbrand analyses terminological variation in the language of accounting and financial discourse by using consolidated financial statements in English and French based on International Financial Reporting Standards (IFRS) representing a highly specialised genre in an expert-to-expert setting. In her conclusion, the author points to the fact that the analysed terms in the field of consolidated financial statements between English and French and vice-versa did reveal much variation in accounting terminology where monolingual variants act as synonyms and are the result of a highly dynamic terminology. In addition, she suggests that investigations based on large-scale specialised corpora aiming at quantitative insights into this terminology and its translation should be performed in order to support and expand her findings based on a very small specialised corpus.

Aurélien Picton and **Amélie Josselin-Leray** investigate how Knowledge Rich Context (KRC), in combination with other resources, are used during the translation process. Using a popular science corpus on volcanology, the authors report on five experiments, which they carried out with 68 trainee translators. Their case studies based on a mixed-methods approach, including both qualitative and quantitative approaches, show how this approach can be used to assess what KRCs can bring to translation. Finally, the results enabled the authors to

characterise KRCs more precisely for translation use in contrast to the terminographer's need for conceptual KRCs.

Chapter 4 – *Training and Didactics*

In didactics of translation studies, different well-known models of translation competence exist, for instance Pym (2003), PACTE-Group (2005), Göpferich (2008, 2009, 2013), and Schäffner (2012), as well as the EMT (2017). All models consist of different sub-competences. However, they do not always use the same denominations. **Elena Chiocchetti** and **Flavia De Camillis** focus on modern forms of teaching translator skills for expert-to-lay communication by way of e-learning. Their starting point is that translators traditionally have been trained in paying close attention to the need to adapt the message to the needs of different recipients, which is one of the requested translation sub-competences. In contrast, the authors rightly claim that domain experts are rarely trained to write for non-experts, and that technical writers are rather seldom involved in text production. Hence, translators are often the first communication specialist who read texts authored by experts and must adapt (pre-edit) them to a new group of recipients, *i.e.* non-experts or lay persons. The authors discuss a translation project performed in an e-learning course on occupational health and safety in South Tyrol as a multilingual area in Northern Italy. On the basis of real examples, the authors illustrate the source text (ST) editing process, showing how translation may be an occasion to enhance the quality of the ST. Ultimately, they claim, applying technical writing skills to enhance the ST may become an extra service offered by translators.

Vesna Lušicky and **Tanja Wissik** give an overview of language resources at two Austrian universities and how these resources can contribute to the teaching of specialised translation. This is a pilot study of how to integrate language resources in this type of courses. One of the main challenges for LSP instructor in higher education is to create high quality language resources, especially in technology-driven curriculum designs. But modern research infrastructures will provide several benefits for instructors, students and researchers in LSP.

Another contribution in this chapter is **Anila Scott-Monkhouse's** study where the focus is on one of the sub-competences of translation competence, *viz.* the development of a translator's professional skills within a training programme for the continuing education of legal professionals. The study describes how the

postgraduate programme English for Law and International Transactions (EFLIT) has adopted the EU recommendations on key competences for lifelong learning, where digital literacy is now one of the additional competences included in its scope. EFLIT uses i.a. LinkedIn® as an educational tool. By using/adopting a learning-by-doing methodology, the programme's participants are actively involved in 'doing' (e.g. in drafting a contract, negotiating, explaining provisions, etc.). According to the author, this didactic approach has resulted in EFLIT in becoming the largest provider of 'legal English skills' instruction in Italy and to be recognised by professional associations for accreditation purposes in legal continuous education.

Tamara Sladoljev-Agejev and **Višnja Kablin-Borenić** present a preliminary study of college students taking notes on texts on a course in Business English in order to illustrate that structured communication is top priority for today's professionals. Students were instructed to convey the main ideas of a text (its macrostructure) in the form of a summary to another group of students who had not read the text. In a second text, the students were required to give a graphic organisation of the text illustrating the logical structure of the text. This shows that ESP teachers have an important role to play as facilitators and motivators in encouraging students to put effort into careful reading of texts leading to knowledge making.

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KEYNOTE

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A cross-disciplinary perspective on climate change discourse

Abstract

Tackling climate change constitutes one of the most pressing issues facing humanity today. Opinions and attitudes on important questions in this context are represented in multiple contemporary discourses. These discourses take many forms and are characterised by intricate multivoicedness. Divergent and convergent voices (scholars from different fields, politicians, NGOs, media, citizens) are variously represented, explicitly or implicitly. Accounting for such discourses, their role in societal and individual interactions and their influence on opinions and actions, presents a major challenge for linguistic and discursive analysis and invites to cross-disciplinary research.

In the first part of this article I will present some of the main components of the cross-disciplinary project LINGCLIM, discuss reasons for developing the cross-disciplinary collaboration and introduce some general thoughts about challenges and opportunities in this kind of collaboration (section 2). In the second part I will present some results from the project, with a focus on two areas: first, an introduction to what we have called “climate change narratives”, mostly limited to the textual level of analysis (section 3); and second, a presentation of some case studies, including a discussion of the notion “survey discourse”, corresponding to citizens’ freely formulated answers to open-ended survey questions related to the issue of climate change (section 4). I will end by some final remarks on cross-disciplinarity and the mutual benefits for both linguistics and political science (section 5).

Keywords: multivoicedness, climate change narrative, survey discourse, topic modeling

1 Introduction

When observing and experiencing some of the dramatic consequences of climate change, one may wonder whether language really matters. However, the important role of language use in climate change communication has been emphasised since the beginning of this millennium, in studies of various genres of text and talk produced in different contexts. My own interest started in talks that I had with geophysicists and climate model researchers at the Bjerknes Centre for Climate

Research at the University of Bergen (UiB). Since the first reports were published by the Intergovernmental Panel on Climate Change (IPCC), established in 1988, climate change communication has in fact been considered as a central challenge. After a period where climate communication was already an object of study within psychology (see Capstick et al. 2015) and social sciences (Grundmann & Stehr 2010; Nerlich et al. 2010), the first linguistically oriented approaches developed from the beginning of the 2000s (Grundmann & Krishnamurthy 2010; Moser 2010; Fløttum 2010, 2016, 2017). An agenda was set by the seminal paper published by Brigitte Nerlich and colleagues in 2010 affirming that: “Investigations of climate change communication cannot avoid attending to the role of language” (Nerlich et al. 2010: 103). Another relevant reference is the book *Why we disagree about climate change*, by Mike Hulme (2009), providing an overview of the many-faceted context in which linguistic representations of climate change appear. One reason for this growing interest is the fact that climate change (CC) has moved from being predominantly a physical phenomenon to being simultaneously social, political, economic, cultural, ethical – and communicational, and thus the important role of language.

This was some of the rationale for setting up the cross-disciplinary LINGCLIM project, funded by the SAMKUL programme of the Research Council of Norway. LINGCLIM is short for *Linguistic representations of climate change discourse and their individual and collective interpretations*; both representation and interpretation are important here, and the interaction between the two. The aim has been to generate integrated new knowledge on the role of language in the multi-faceted climate change debate, where multiple actors and voices are present, through cross-disciplinary collaboration, including linguistic, political, psychological, computational and climate sciences. Through this collaboration, we have aimed at exploring the impacts of conflicting voices/narratives/frames on public opinion, attitudes/emotions and behaviour.

Our main research components as reflected through a series of different methodological tools have been linguistic, textual and discursive analyses of a large number of different text genres, such as scientific reports, political documents, white papers, news media, and blogs. We have undertaken (semi-) automated analyses of large text corpora and tried various types of opinion surveys. All this in order to provide an innovative and needed contribution – theoretically and methodologically – to the knowledge base on which societal and political decisions and actions related to CC are based. Unsurprisingly, we have had quite

some methodological challenges, working together with so many different scholar traditions. So, why this cross-disciplinary mix? In short, we early understood that as linguists we would not get answers to all the questions we wanted to ask without collaborating with other disciplines. In the gradually fruitful collaboration, we found the following points crucial: (1) the collaboration with climate scientists helped us to understand the relation between science-based knowledge and what is actually said or written in the public or private sphere; (2) the collaboration with psychologists contributed to the explanation of the relation between language representations and people's responses, and (3) in order to explain public attitudes and opinion, in terms of patterns of consensus and controversy, the collaboration with political scientists was very valuable.

2 Cross-disciplinarity

I will now continue with some general thoughts about cross-disciplinary collaboration. I prefer to use the term cross-disciplinarity instead of interdisciplinarity or transdisciplinarity. My intention is not to go into detail about these notions. In the present paper cross-disciplinarity means nothing more than collaboration of scholars from various academic disciplines.

In my view, there are some fundamental prerequisites for good collaboration of this kind. Most importantly, the basis must be solid disciplinary competence. For working together in the same project, it is necessary that the members agree on a common overarching research idea for developing new knowledge on the actual issue; and the attitudes must be of the open, generous and humoristic kind. Without leaving one's own discipline, one has to be able to look outside of the discipline silo and comfort zone which is one's formal belonging, and not least to be ready for laughing at the many possible misunderstandings which may pop up. Potential barriers may be attitudes, but also too large differences between disciplines, lack of dialogue and leadership, and various organisational matters. In addition to these matters, I would emphasise that the notion of cross-disciplinarity is more a goal in a time-consuming process, than a state. It is a process where one should continuously strive for acknowledging that various «tools» may provide new and different knowledge and keep the awareness of the importance of enriching the involved individual disciplines.

In the LINGCLIM project it was important to find the “right” people, with qualities as those just mentioned. This takes time; and as a leader there are many

talks to do with possible partners, to ensure that we have – eventually – the common understanding of the main research idea, and not least, an agreed division of workload. We stayed at our respective departments, but we needed a location which could serve as an appropriate working place when we had our regular meetings and seminars. This did not become a problem for us, with departments that are open for cross-disciplinary, cross-faculty and cross-institutional collaboration. We are also lucky since in Bergen we are, mostly, within walking or biking distance to each other. Another advantage is that we have relevant infrastructure such as a well-functioning computing unit at the company Uni Research now Norge), and the Norwegian Citizen Panel/DIGSSCORE, a national opinion survey infrastructure, within easy reach. However, even though we managed to organise the project in a way that enabled us to work and to move the research front forward, there are various organisational and financial challenges to address that, often, are not taken seriously enough in our institutions. In addition, cross-disciplinary collaboration can be risky, and special efforts must be made in order to maintain group loyalty and foster enthusiasm. My experience is that it is important to have clearly defined goals from the outset, both short-term (so people do not get bored) and long-term. It takes time to develop the confidence needed. A specific experience that I could mention in this context is that we tried to exploit interesting opportunities for public outreach, which was an important part of the project, in order to foster collaboration over disciplinary barriers, such as the Science Week, various Faculty open days as well as media input. To sum up, cross-disciplinary research is not for the risk-averse; it may come with some pain but also with much joy.

3 Climate change narratives

In this section, I will present some of the research we have undertaken, and first, what we have called climate change narratives. After an introduction of the notion itself, I will illustrate our application of it through a couple of case studies. I would like to start this part by pointing to the omnipresence of the notion of narrative, one of the main rhetorical modes of discourse. Used in a rather non-critical way, it seems that any representation of connected events, real or imaginary, through written or spoken words, or images, can be labelled a narrative. Narratives, or stories, are everywhere, found in multiple forms of human creativity, from grandparents' storytelling via novels and films to comprehensive accounts of different factual topics.

As we know, there are multiple kinds of representations of climate change discourse, and there is definitely not one specific discursive genre in which we can put them. They come in many varieties, through different channels and voices: scientific reports and papers, different journalistic genres, political manifestos and speeches, NGO programs, blogs, social media discussions and individual personal stories. They may be based on knowledge from the natural or social sciences, from personal experiences, and influenced by different political and ideological points of view; thus, they often represent hybrids, where different genres are mixed. However, the LINGCLIM project has undertaken research indicating that climate text and talk can, in many cases, be considered as “climate change narratives”, a perspective which identifies typical components in a “story”, and different actors or narrative characters, such as heroes, villains, and victims. The societal importance of this is that stories used to communicate CC knowledge and politics have an important role in shaping opinions related to the issue. Furthermore, by applying the narrative lens on different genres, we take on a comparative perspective which may allow us to explore the impacts of conflicting narratives.

Narration as a fundamental human activity dates from far back in history and has spread throughout many different civilisations. Within cultural and literary studies the narrative perspective underwent some kind of renaissance through the work of the Russian scholar Vladimir Propp (1928/1958), who analysed the basic plot components of Russian folk tales (published in Russia 1928, *Morfologija skazki*, translated to English 1958, *Morphology of the folktale*), and it had a major influence within various cultural studies, in particular fiction, from the 1960s on. Then, with the breakthrough of text linguistics, the narrative perspective entered forcefully into analyses of non-fictional texts through scholars such as Werlich (1976), van Dijk (1980), Adam (1992, 2008). Maintaining that the notion of narrative has often been used in a non-critical way, we have proposed what we call “climate change narratives” according to the classical structure of a narrative, with five main components, as suggested by Adam (1992, 2008). He developed his approach to narratives as part of an effort to propose a typology of text sequences which could be used to analyse all texts, in spite of their highly varied and heterogeneous nature. The result was five prototypes: argumentation, explanation, description, narrative and dialogue. As for his prototypical narrative sequence, it contains five elements, illustrated through this constructed example:

(Initial situation) Three young friends went swimming in the Annecy lake. (Complication) One of them, Janinetti, went missing. (Reaction) The others dove in. (Resolution) They managed to pull her out, (Final situation) but she was already dead.

(Adam 2008: 145)

At the heart of the narrative is the intrigue, or plot, a tension between the different actions, actors and events which drive the account. In this example, the idyllic trip turns into a crisis, prompting the characters' attempt to counteract the disappearance of their friend, but to no avail. The need to have some form of tension in the account could also be illustrated through a counter-example borrowed by Adam from Umberto Eco:

Yesterday I left home to take the train at 8.30 which arrives in Turin at 10. I took a taxi to the train station, there I bought a ticket and I went to the platform. At 8.20 I boarded the train which was on time and which took me to Turin.

(Umberto Eco 1984/1985 cited in Adam 1992: 53)

According to Adam, this account does not constitute a narrative but just an enumeration of actions, as there is no intrigue or tension, between these actions. However, some scholars also claim that the presence of intrigue is not a sufficient condition for a text to constitute a narrative, arguing that the world of the narrative must also be both logically and spatio-temporally distinct from the world of the storyteller (Filliettaz 1999). Thus, a narrative should take place at a different time and/or place than the situation in which it is told. In my mind, this dual condition of intrigue and separation of worlds leads to a very restrictive view of narrativity. I understand the narrative as a specific discursive activity, *storytelling*, which manifests itself in the form of text sequences, without the restriction of separation between storytelling and the world of the story. The restrictive perspective also contrasts with narrative as understood by the social sciences. Born in reaction to the view that narratives are inaccessible to scientific enquiry, the Narrative Policy Framework (NPF) takes the view that a policy narrative has *a setting*, *characters* (heroes, villains and victims), *a plot* and *a moral*, corresponding to the policy solution. Indeed, this framework, developed by Michael Jones and colleagues, takes the generalist position that all such narratives share this fundamental structure (Jones et al. 2014). Further, more often than not, the world of the policy narrative is *not* detached from the world of the storyteller.

To sum up, we have adopted Adam's five narrative elements while sharing the view of the NPF that the argumentation in climate change discourse carries a fundamental narrative structure (see also Fløttum & Gjerstad 2016).

For illustrative purposes, our model is represented here in a constructed example of a possible climate change narrative sequence, using Adam's categories:

1. Initial situation: Human beings lived in harmony with nature.
2. Complication: CO₂ emissions have increased dramatically since 1990 and have caused serious climate change.
3. Reaction: The UN organises international summits (COPs) to discuss action on CC.
4. Resolution (Outcome): At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first-ever universal, global climate agreement.
5. Final situation: Climate change still constitutes a serious threat to the Planet and future generations, and those who have contributed least to the problems are the ones most vulnerable to the consequences.

All five components are not obligatory. The core is constituted by the three middle components, and among them, the 'complication' (component 2) is mandatory. Regarding components 1, 3 and 4, they can be realised at different degrees according to the situations, institutions, actors and voices involved. Component 5, the final situation, may be present for example in descriptions of how our world will develop if we undertake such and such action, or how our world will develop if we do nothing about the stated climate complication. In addition, moral or ethical aspects may be integrated.

Thus, through a narrative lens, one expects to find a plot to the extent that it recounts some kind of *complication* related to climate change, with different kinds of actors (humans, nature, society, etc); this may be followed by a sequence of events or *reactions*, or more often (explicit or implicit) recommendations or imperatives of actions, which take place or should take place to achieve some particular effect(s) or *final situation*; and, according to different interpretations of the complication factor, *ethical perspectives* may be advanced (Fløttum 2013: 280–281).

4 Case studies

4.1 IPCC and United Nations documents

With this as a backdrop, I will now move on to some case studies. The first case represents a first explorative application of the five narrative components on

authentic texts (Fløttum 2013). The aim was to test the hypothesis that a narrative analysis is a fruitful perspective within the more overarching research question about how different actors construct their climate policy linguistically. The empirical support of this study was texts from the IPCC and some UN reports. We found that the IPCC Summary has a macro-structure dominated by the complication component, which can be illustrated by this example:

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level [...]. (IPCC 2007: 2)

The “story” which is told is one of the complexities and uncertainties inherent in climate change. Even though there is a section on adaptation and mitigation options, there are few direct inputs to an action component. One reason is that the IPCC should be policy-neutral, even though policy-relevant (Fløttum & Dahl 2014). Its role is to provide a clear scientific view on the current state of knowledge in climate change but never to be policy-prescriptive. However, a future perspective, indicating some implicit risk, is present, hinting at some possible final situation, as you see in this example:

Such changes [in metres of sea level rise] are projected to occur over millennial time scales, but more rapid sea level rise on century time scales cannot be excluded. (IPCC 2007: 13)

Concerning narrative roles, representing possible actors, there is none clearly explicit. However, nature could be interpreted as the victim, and humans together with society as a whole – as villains. In a study of IPCC Summaries for policymaker from 2013–2014 (from the Fifth Assessment Report from 2013–2014), the analysis shows that, even though the IPCC uses the term “narrative” about its own texts (in the WGI and WG III reports), there is no “full story” being told, mainly due to the lack of a clear reaction component (Fløttum & Dahl 2014). Through the analysis of two UN reports (HDR: *Human Development Report 2007/2008* – UNDP 2007–2008, and WDR: *World Development Report 2010* – World Bank 2010), we found that they have a shared starting point (Fløttum & Dahl 2012), *i.e.* they both emphasise that high-income countries can and must reduce their carbon footprints, thus claiming that those who have contributed least to climate change are the ones who are most vulnerable to the consequences, which may be interpreted as both an initial situation and a moral component in a narrative perspective. Their overarching point of view is that the rich countries are the villains and the poor countries victims, as you can see here:

Rich nations and their citizens account for the overwhelming bulk of the greenhouse gases locked in the Earth's atmosphere. But, poor countries and their citizens will pay the highest price for climate change. (UNDP 2007–2008: 3)

Despite this common point of departure, the content and the argumentative orientation are divergent, which we can observe through a narrative perspective. HDR's main focus is the complication and evaluation components of the narrative structure while WDR emphasises the reaction component. These differences result in different stories. For HDR, focusing on rich countries' moral responsibility, climate change becomes part of the fight for humanity and for freedom. The WDR, in contrast, focuses more on the reaction dimension than on the complication. The necessity of growth is emphasised and climate change, to some extent, is blamed because it is costly to do anything about it (almost like a villain in this perspective).

To sum up these exploratory case studies, the narrative perspective was shown to contribute to a deeper understanding of these particular instances of climate change discourse. Importantly, the analysis showed that the notion of narrative could be a useful frame for comparative studies and thus to better understand both consensus and controversy in the climate change debate.

4.2 White papers

The second example is taken from the analysis of white papers, which also allows us to focus on specific countries. The white paper is a government document containing proposals for political action in a specific area. We have done some studies on both green and white papers from South Africa, but I will here limit myself to two Norwegian white papers, the “Norwegian Climate Policy” and “The High North (Visions and strategies)”-papers (Fløttum & Espeland 2014).

Norway is interesting because it is a large oil and gas provider and at the same time a country that has a reputation of being, or maybe rather wanting to be, internationally leading in environmental and climate issues. There is a duality in our culture, marking our attitudes and opinions in different ways: we are the rich fossil fuel producer and the somewhat renowned environmentally concerned country. This is also something that makes other countries wondering about our policies, for example, on June 17th 2017, the New York Times published an article with the headline “Both Climate Leader and Oil Giant? A Norwegian Paradox” (Sengupta 2017). With this as a backdrop, a more thorough study of the Norwegian stories about climate change and policy becomes important.