

Questioning the Climate Crisis: A Contrastive Analysis of Parascientific Discourses

Niall Curry (Manchester Metropolitan University)

Abstract

Research on climate crisis discourses occupies an important niche in applied linguistics. While it is known that cross-linguistic and cross-cultural variation can play key roles in differentiating the construction of climate knowledge, there remains a dearth in multilingual work on climate-themed parascientific discourses. Addressing this gap, this paper presents a corpus-based contrastive analysis of direct questions in parascientific texts in English, French, and Spanish. The results demonstrate that direct questions are a core feature of climate-themed academic news blogs in each language and that they are significantly more frequent in French than in English. Second, they indicate key thematic domains in which experts ask questions in each language, including science and technology in English, science in French, and politics and society in Spanish. Third, they offer insight into the metadiscursive and discursive roles of direct questions in an emerging, multilingual parascientific genre. These roles include helping authors to manage texts, make arguments, and frame hypothetical situations. Thematically, questions address climate science, social and political issues, and impact and adaptation in English, French, and Spanish, climate scepticism in English and French, and climate communication in Spanish.

Keywords: climate crisis; contrastive analysis; corpus linguistics; discourse analysis; questions; English/French/Spanish

1. Climate discourses, parascience, and questions

Research on climate crisis discourses occupies an important niche in applied linguistics, with studies addressing the likes of social media, newspaper, and corporate discourses (Becken et al. 2021; Fuoli and Beelitz 2023; Kunelius and Roosvall 2021). Work in this area has also revealed that different climate-related issues, such as deforestation and climate scepticism, appear to be of varying importance across cultures and languages (Dayrell 2019). In the context of academic and scientific

Curry, Niall. 2024. 'Questioning the Climate Crisis: A Contrastive Analysis of Parascientific Discourses.' *Nordic Journal of English Studies* 23(2): 235–267. <https://doi.org/10.35360/njes.v23i2.39190>. Copyright (c) 2024 Niall Curry. This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

knowledge production, this notion of culturally-mediated epistemologies is well established (e.g., Bennett and Muresan 2016) and such a view of epistemologies can offer insight into culturally contingent ways of experiencing and constructing the climate crisis. Yet, despite the evident role that the academy plays in the global and social construction of climate knowledge, there is a dearth in work, monolingual and multilingual alike, on academic climate-themed discourses. This means that our understanding of how academic knowledge of this global crisis is constructed across languages and cultures remains unclear.

In the context of knowledge creation, academics produce many traditional disciplinary genres to communicate their research to one another, e.g., research articles, conference presentations, and books. More recently, academia has seen a growth in the production of digital genres and parascientific communication (Luzón and Pérez-Llantada 2022), through which academics share their research with those beyond their disciplinary confines and with non-specialist audiences via, for example, academic blogs and podcasts. While traditional disciplinary genres are primarily published in English (Phillipson 2019), parascientific texts offer new avenues for multilingual academic discourse studies.

As an emergent genre, academic blogs are noted for their hybridity, reflecting features of their parent genres (i.e., academic and journalistic texts, Curry and Pérez-Paredes 2021). While limited research exists on such texts, there is a growing interest in studying academic blogs across languages, owing to the insight they afford into the social and culturally situated construction of knowledge (Luzón and Pérez-Llantada 2022). In their study of COVID-19 discourses in English and Spanish, for example, Curry and Pérez-Paredes (2021) found that academic blogs reflected culturally contingent ways of understanding the pandemic. This research offered insight into how different cultures and countries were experiencing the unfolding COVID-19 pandemic. Exhibiting different degrees of certainty and openness, and expressing stances as factual, evidence-based, argumentative, and ideational, for example, characterised UK and Spanish framing of COVID-19 knowledge in different ways.

In the context of the climate crisis, the majority of research on the climate blogosphere centres on blogs produced by climate activists, climate sceptics, and climate organisations (Sharman 2014). In this domain, van Eck and Feindt (2022) investigated culturally situated ontologies in 357 blogs produced by climate sceptics and climate activists

in the UK. Their research shows how climate sceptics undermine scientific evidence as a means to support their views, while activists, for example, focus on the positive potential of future research. Elsewhere, Fløttum et al. (2014) found climate change to be viewed as a threat, not only in relation to nature and human life, but also to security, economy, and industry. Focusing on polarised perspectives, their research shows the affordances of blogs for socially constructing collective understandings of the climate crisis, which, they argue, can offer insight into future climate responses, policies, and adaptation practices. In terms of academic blogs or multilingual perspectives relating to the climate crisis, the current state of the art is limited. This paper responds to this evident dearth, through a study of climate-themed academic news blogs in English, French, and Spanish.

The hybridity of academic blogs indicates their likelihood to embody more ‘extreme linguistic characterizations’ than their parent genres (Biber and Egbert 2016: 129). In Curry and Pérez-Paredes (2021), the focus on writer stance reflects this tendency. Yet, while stance has received much attention in the literature, features of reader engagement are notably less studied. This is despite the sustained and growing use of certain reader engagement devices, such as questions, in written academic communication (Hyland and Jiang 2019). Questions have been found to be a valuable metadiscursive resource for directly engaging readers in English (Curry 2021; Hyland 2002) and other languages (Curry 2021). In this way, they can position readers in texts and create affect, demonstrate doubt, organise texts, express critique, set up claims, and signal research gaps. Based on their interviews with academic bloggers, Zou and Hyland (2020) find questions to be an important feature of academic blogs, as their respondents note their value for challenging ideas or attracting attention. Academic bloggers also report a greater likelihood of using questions in blogging, when compared to research article writing.

Notably, in the domain of discourse analysis, this form of rhetorical question use is understudied, despite the many potential functions questions can perform in a text. There is evident potential for questions to encode not only textual practices in academic blogs, but social, contextual, and cultural practices, shedding light on when and how questions are asked, as well as what is being questioned. Therefore, given their increased use in English written academic communication, their value for academic bloggers, their propensity to play a key role in French and Spanish

academic blogs (owing to their presence in their academic parent register, Curry 2021), and their potential metadiscursive and discursive value, direct questions offer an important means to understanding the social construction of climate crisis knowledge.

Overall, what is truly needed is a better understanding of how cultures shape the language used to communicate about the climate crisis. Achieving such insight will be essential for developing joint, international responses to the climate crisis that cohere around shared concerns and understandings, informed by mutual exchange and a better appreciation of cross-cultural differences in climate crisis communication. Recognising the need to unpack how parascientific discourses on the climate crisis correspond across languages and cultures, this paper presents a corpus-based contrastive analysis of direct questions in a corpus of academic news blogs extracted from *The Conversation's* Australian, UK, US, Canadian, French Canadian, French, and Spanish websites. These blogs centre around the climate crisis and are indexed across a range of thematic categories (e.g., arts, science, education). The analysis of these academic news blogs is guided by the following research questions:

1. How does the presence of direct questions compare in English, French, and Spanish in The Conversation Corpus of Climate Discourses?
2. Are there any particular thematic categories that exhibit a significantly frequent use of questions in The Conversation Corpus of Climate Discourses?
3. If there are particular thematic categories that exhibit a significantly frequent use of questions, what is the role of these questions therein from a metadiscursive and discursive perspective?

2. Methodology

This section presents the data and analytical approach used to conduct the study of direct questions in climate-themed parascientific communication. Section 2.1 presents the data, followed by the presentation of the analytical approach in section 2.2.

2.1 Data

This paper is based on the analysis of *The Conversation Corpus of Climate Discourses in English, French, and Spanish* (CDEFS)—a comparable corpus of academic news blogs from the English, French, and Spanish sites in *The Conversation*. To build CDEFS, a python code was developed to scrape every climate-themed blog published in *The Conversation* by January, 2024, as well as a range of accompanying metadata. This includes all texts with tags that relate to climate discourses e.g., *climate change*, *changement climatique*, *cambio climático*. The metadata scraped include author name(s), author affiliation(s), date/year/region of publication, the thematic category and topic tags used to index the blogs, and whether or not the text is translated. In terms of the scraped text, only titles and authorial texts from the website were captured and advertisements and comments were excluded.

This process resulted in three subcorpora. Table 1 presents a summary of these subcorpora, when analysed using Sketch Engine (Kilgarriff et al., 2014).

Table 1: The Conversation Corpus of Climate Discourses in English, French, and Spanish

Corpus Data	English	French	Spanish
Tokens	6,953,600	1,611,319	356,945
Sentences	292,215	52,437	13,350
Blogs	6,572	1,205	308
Authors	6,122	1,380	467
Affiliations	696	367	203
Dates	2,782	923	282
Years	14	10	7
Regions	9	2	1
Themes	19	15	8
Topics	8,043	1,973	609
Translated Texts	392	342	103

Overall, the subcorpora in CDEFS exhibit clear differences in their composition. The English subcorpus is much larger, followed by the French and Spanish subcorpora. In developing a comparable corpus, the comparability of the sampling frame is of the utmost importance in order to ensure like is compared with like (Curry 2021). In the case of these corpora, despite the evident variability in size, comparability is assured

owing to the fact that each blog has undergone a similar editorial process, is of similar length, and is published by the same organisation. The difference in corpus size, and by consequence, the differences across the range of metadata may seem problematic initially. However, this corpus captures every blog published by *The Conversation* to which climate topic tags are attributed. Therefore, it represents the entire catalogue of research published on the topic in *The Conversation* since 2011 in English, 2015 in French, and 2018 in Spanish, until January 2024.

2.2 Analytical approach

This paper presents a two-step corpus-based contrastive analysis of direct questions in CDEFS, followed by a metadiscourse and discourse analysis of questions in specified thematic areas. In the first step and responding to the first research question, a convergent analysis (Chesterman 2007) was employed to study the occurrence questions marks, i.e., '?', as a form of illocutionary force indicating device (Curry 2023). This involved using Sketch Engine (Kilgarriff et al. 2014) to identify and extract all sentences that contain direct questions in CDEFS, excluding translated texts.

Once these direct questions were identified, frequency and dispersion were tested as equivalences to ensure that there is a *tertium comparationis* at the foundation of the analysis. First, chi-square tests and pairwise comparisons, adjusted using the Bonferroni correction method, were conducted. These tests identified any significant differences in the use of direct questions in academic news blogs across CDEFS. Next, direct question use and dispersion were analysed. This involved identifying the relative frequency of direct questions per BLOG; AUTHOR; AFFILIATION; DATE; YEAR; REGION; THEME; and TOPIC. The frequencies of direct questions were normalised per 40 sentences, as the average blog length is 44, 44, and 43 sentences in English, French, and Spanish, respectively. Normalisation per sentence was chosen as the direct questions analysed herein were extracted as sentences containing a question mark. Upon determining relative frequencies, the mean frequency of questions (M), their distribution range (R), their standard deviations scores (SD), their co-efficient of variation (CV), and their Juilland's D (JD) scores were calculated. These scores each test for dispersion across the data, offering multiple ways of determining whether question use is skewed by metadata.

In the second step, a further convergent (Chesterman 2007) contrastive analysis was conducted. As the goal of the second research question was to identify thematic categories that exhibit significantly frequent use of direct questions, direct question use in terms of THEME was investigated. THEME refers to broad categories into which blogs are grouped by *The Conversation*. There are 19, 15, and 8 themes in the English, French, and Spanish CDEFS subcorpora, respectively. Some THEME categories may correspond broadly to disciplinary categorisation and they do not necessarily correspond across languages. The variation in THEME categories is owing to the fact that they are developed iteratively by the individual websites of *The Conversation* as a means to index the large number of blogs they house. In the English CDEFS subcorpus, the themes include *Arts, Books and Ideas, Business and Economy, Cities, COP26, COVID-19, Education, Elections, Environment and Energy, Ethics and Religion, Health, Insights, Manifesto Check, Paris climate talks, Podcasts, Politics and Society, Science and Technology, Tokyo 2020, and USA 2012*. For the French CDEFS subcorpus, the themes include *COVID-19, Culture, Data, Économie et Entreprise, Éducation, En anglais, Environnement, International, Mondes francophones, Podcasts, Politique et Société, Présidentielle 2022, Santé, Science et Technologie, and Spécial COP21*. Finally, for the Spanish CDEFS subcorpus, the themes include *Ciencia y Tecnología, COVID-19, Cultura, Educación, Medicina y Salud, Medioambiente y Energía, and Política y Sociedad*.

Given that the answer to the second research question is a thematic category, statistical significance was identified as the primary equivalence used to test the *tertium comparationis*. Thus, chi-square tests were used to compare all themes per subcorpus and conduct pairwise comparisons of each theme per subcorpus, adjusted with the Bonferroni correction method. In so doing, it was possible to identify blogs attributed to themes that host a significant number of direct questions.

To respond to the third research question, a manual qualitative analysis was conducted of the direct questions found in the significant THEME identified in each language. This analysis centred on identifying the metadiscursive and discursive roles of questions in the academic blogs. Three such roles emerged, drawing on a conceptual framework derived of metadiscourse studies. For 1) managing the text, interactive metadiscourse (Hyland 2005) was used to identify questions that manage the flow of information in a text. For 2) making arguments, interactional

metadiscourse (Hyland 2005) was used to identify questions that serve to critique, evaluate, and demonstrate some form of reader positioning and writer stance. Finally, for 3) framing hypothetical situations, hypothetical metadiscourse (Bamford 2005) was used to identify questions that signal genuine gaps in knowledge and future-oriented reflections. Within each category, a bottom-up discourse analysis was conducted to identify the themes that were being managed, argued, and framed as hypothetical.

For both the metadiscourse and discourse analyses, 95% confidence samples ($\pm 5\%$) were taken of direct question concordance lines to determine sample size. The sample was analysed in batches of 30 noting when the point of saturation was reached—if no point of saturation was reached, a larger sample would be analysed. As the Spanish data had fewer direct questions, all of these were analysed. An independent rater studied 20% of the direct questions and, using Stemler's (2004) consensus estimates, the raters' dynamic agreement determined the classification of the questions.

3. Results

This section presents the results of the two-step corpus-based contrastive analysis, and the metadiscourse and discourse analyses of direct questions in CDEFS. Section 3.1 discusses the presence of questions in CDEFS. Next, section 3.2 presents the selection of the THEME in which questions occur significantly. Subsequently, sections 3.3–3.5 present the metadiscourse and discourse analyses of direct questions in the selected THEME in English, French, and Spanish.

3.1 The presence of questions in CDEFS

Direct questions occur frequently in CDEFS, evidencing their value in parascientific communication across the languages studied. Overall, direct question range is comparable, with 56%, 63%, and 58% of texts in the English, French, and Spanish subcorpora containing questions, as Table 2 indicates.

Table 2: Question presence in CDEFS

	Frequency		
	English	French	Spanish
Questions	8,310	1,597	253
Blogs with Questions	3,482	542	119
Range of Blogs with Questions	56%	63%	58%

The findings from the chi-square test signal a significant difference in the presence of questions across the CDEFS subcorpora ($\text{Chi}^2:17.5650$, $p=0.0001534$). The post-hoc pairwise analysis reveals that the English subcorpus contains significantly fewer questions than the French subcorpus ($p=0.0003765$). However, no significant difference was found between English and Spanish ($p=0.48055$) or French and Spanish ($p=0.23790$). Generally, the comparable range of questions within the CDEFS subcorpora signals that direct questions are a valuable rhetorical device employed by academics who wish to raise questions about the climate crisis, regardless of the language used to do so.

When the overall dispersion of questions across CDEFS is considered, there is generally a narrow distribution, as Table 3 shows. In the instances where variation occurs, these differences are marginal. The most notable sites of variability include THEME in the French data and TOPIC in the Spanish data. Overall, the emergent story is one of convergence and comparability, with limited skewing of the data. Note that the score of N/A for Spanish in REGION occurs as only one REGION exists in the data, i.e., Spain. For the French data, variation by region is also not particularly meaningful, as there are only two regions in the French data, with most of the data coming from *The Conversation France*.

Section 3.2 focuses on identifying the significant presence of direct questions in terms of the THEME attributed to blogs in CDEFS.

Table 3: Dispersion of direct questions in blogs CDEFS.

Question dispersion per	Questions in blogs														
	English					French					Spanish				
	M	R	SD	CV	JD	M	R	SD	CV	JD	M	R	SD	CV	JD
BLOG	2.39	1.00	2.36	0.99	1.00	2.95	1.00	2.53	0.86	1.00	2.13	1.00	1.85	0.87	0.99
AUTHOR	1.70	1.00	1.32	0.77	1.00	2.40	1.00	2.22	0.93	1.00	1.75	1.00	1.37	0.78	1.00
AFFIL.	1.28	1.00	0.97	0.76	1.00	1.71	1.00	1.35	0.79	1.00	1.46	1.00	1.19	0.82	0.99
DATE	1.56	1.00	1.29	0.83	1.00	4.46	1.00	2.34	0.52	1.00	1.85	1.00	1.59	0.86	1.00
YEAR	1.32	1.00	0.45	0.34	0.99	1.29	1.00	0.33	0.25	0.99	0.73	1.00	0.24	0.33	0.98
REGION	1.52	1.00	0.76	0.50	0.96	2.39	1.00	2.28	0.95	0.10	0.76	1.00	N/A	N/A	N/A
THEME	1.2	1.0	0.86	0.73	0.97	1.8	1.0	1.95	1.07	0.92	1.13	1.00	0.40	0.36	0.98
TOPIC	1.39	1.00	1.13	0.81	1.00	2.38	1.00	1.53	0.64	1.00	1.84	1.00	1.88	1.02	1.00

3.2 THEME and direct questions in CDEFS

Overall, in English, there are significant differences in direct question use across the THEME categories ($\text{Chi}^2:1535.2872098649161$, $p=0.0000e+00$). When compared to the other categories, *Environment* exhibits significantly fewer questions ($p=0.00e+00$). *Science and Technology* ($p=5.24e-62$), *Politics and Society* ($p=2.22e-32$), *Arts* ($p=1.96e-31$), *Books and Ideas* ($p=5.60e-14$), *Education* ($p=1.25e-11$), *Business and Economy* ($p=9.22e-11$), *Election* ($p=2.26e-07$), *USA 2012* ($p=4.58e-04$), and *Cities* ($p=1.26e-02$) exhibit significant scores, indicating highly frequent use of direct questions when compared to the other categories. Of these, *Science and Technology* demonstrates a significantly higher frequency of direct question use compared to four other categories in the English CDEFS subcorpus, i.e., *Environment* ($p=2.22e-256$); *Health* ($p=1.94e-05$); *Business and Economy* ($p=3.53e-05$); and *Politics and Society* ($p=1.16e-02$). No other THEME shows a significantly more frequent use of direct questions than *Science and Technology*. Therefore, it emerges that in the English CDEFS subcorpus, direct questions are more likely to be used in *Science and Technology* academic news blogs.

For French, there are also significant differences in direct question use across THEME categories ($\text{Chi}^2:1535.2872098649161$, $p=0.0000e+00$). *Environnement* ($p=0.00e+00$), *Podcasts* ($p=7.12e-261$), *Science* ($p=1.88e-156$), *Économie et Entreprise* ($p=2.53e-125$), *Éducation* ($p=1.47e-84$), *Politique et Société* ($p=1.53e-82$), *Culture* ($p=7.55e-46$), *International* ($p=9.04e-41$), *Présidentielle 2022* ($p=1.19e-15$), *Spécial COP21* ($p=8.41e-14$), *Santé* ($p=5.39e-08$), and *COVID-19* ($p=1.24e-04$) all show a significantly higher use of direct questions when compared against all other themes. As the three most significant themes, *Environnement*, *Podcasts*, and *Science* are noteworthy. Given that this analysis is not interested in the modality or genre of delivery (e.g., podcasts), the focus is reduced to *Environnement* and *Science* as primary categories of interest. Of these categories, *Science* shows a significantly more frequent use of questions than *En anglais* ($p=2.51e-12$) and *Santé* ($p=2.30e-03$) with no other theme being significantly more frequent than *Science*. This same story does not emerge for *Environnement*, as direct question use in *Éducation* is significantly higher ($p=4.20e-04$). Therefore, it emerges that in the French subcorpus of CDEFS, direct questions are more likely to be used in relation to *Science*.

Finally, for Spanish, there are also significant differences in direct question use across the THEME categories ($\text{Chi}^2:168.93620597505912$, $p=7.5615e-34$). *Medioambiente y Energía* ($p=1.54e-08$) exhibits a significantly lower usage of direct questions when compared to the rest of the categories, while only *Política y Sociedad* ($p=2.03e-04$) shows a significantly greater usage of questions, when compared to the rest of the categories. When pairwise comparisons are considered, no theme is more significant than *Política y Sociedad*, which is significantly more frequent than *Medioambiente y Energía* ($p=6.41e-06$). As such, the use of direct questions in Spanish is most common in texts indexed in *Política y Sociedad*.

Recognising that direct questions are statistically significant within *Science and Technology* in English, *Science* in French, and *Política y Sociedad* in Spanish, the following sections present metadiscourse and discourse analyses of direct question use in these selected THEME categories.

3.3 A metadiscourse and discourse analysis of direct questions in Science and Technology academic news blogs in English

Direct questions in *Science and Technology* account for 686 (8.3%) of the total direct questions in the English subcorpus of CDEFS. When sampled with a 95% confidence level (+/-5%), this resulted in a random sample of 246 questions, which were analysed in terms of their metadiscoursal function in the data and the discursive themes they address. A point of saturation was reached after the first 60 direct questions were analysed. As such, it was decided not to expand beyond the analysis of the 246 direct questions. The questions were grouped into three functions addressing four thematic areas, as Table 4 outlines. The percentage distribution per function is based on the overall number of questions per question theme.

Table 4: Question Percentages in CDEFS English Blogs: Science and Technology

Question Theme	Percentage of all Questions	Managing the Text	Making Arguments	Framing Hypothetical Situations
Climate Science	43%	68%	27%	5%
Social and Political Issues	23%	67%	28%	5%
Impact and Adaptation	15%	21%	18%	61%
Climate Scepticism	19%	63%	37%	0%

The majority of questions in *Science and Technology* in English engage with concepts in climate science and, typically, these questions serve interactive metadiscoursal purposes that help to focus the discourse and the reader on the main topic being addressed. Such direct questions perform a well-established metadiscoursal function, i.e., organising the text (Curry 2021; Curry and Chambers 2017; Hyland 2002). This function is evidenced in (1), as the direct question is followed by a discussion of a visit to Miami to access a swamp for research.

- (1) But what if you don't live near a swamp?

When using direct questions that serve to make arguments, authors appear to propose technological and procedural solutions to present and future climate issues. In these cases, authors often draw on both technology and the natural environment to make these suggestions. For example, in (2), the use of historical data in conjunction with natural phenomena is posited as a means for understanding better the issue of rising sea levels, and ice sheet and glacial melting.

- (2) Could we use tide-gauge observations over the 20th century to infer how individual contributions combine to produce the global increase in sea levels?
Addressing this question turned out to be much more challenging than any of us initially thought.

Such questions allow authors to engage their readers directly by making them co-investigators and offering them a response to the question.

Likewise, in (3), the focus is on the use of deep-sea sediments as a novel method for reconstructing past oceanic conditions and thus, preparing for future crises.

- (3) Can we check—using material from the surface of deep-sea sediments—whether these archives do provide useful and accurate information about oceanic conditions?

The question can also be turned around ... We want to know if GEOTRACES uncovered interesting patterns in ocean chemistry that could be the start of new proxies.

This question employs the inclusive pronoun *we*, subsuming both the authors and wider scientific community, to position the climate crisis as a shared challenge facing humankind that may be addressed through the use of technology. From a rhetorical perspective, the authors appear to use the question as a core means of framing their research interest, as directly following this question, they signal the complexity of the question posed and their ultimate goals.

A further example of this focus on technology and natural phenomena is evidenced in (4), in which the authors highlight the potential of machine learning for enhancing our understanding of oceans.

- (4) Is there a way to fill in the missing data, so we can have a complete global picture of the ocean's surface at any given moment?

This is where machine learning comes in.

Through this question, the author problematises NASA's approach to ocean topography with satellites. In this single-authored text, a question is raised, creating doubt as to what can be done to address this issue and, through the use of the inclusive *we*, the problem becomes shared. This doubt is immediately addressed by the author, who offers a solution in machine learning.

A second area of interest in *Science and Technology* in English pertains to social and political issues. Many of the direct questions therein serve to manage the text, with authors posing questions that frame the subsequent, informative text, as (5) shows.

- (5) Which policy tools, taxes or credits are needed to assist farmers, including those in Eastern Canada, prevent further soil carbon losses and move to a more positive soil carbon status?

Some voluntary carbon credit markets such as Nori and Puro are primarily interested in supporting a reduction of current atmospheric carbon dioxide levels.

Nevertheless, this area of questioning also includes, for example, the use of questions to critique institutions that exploit marginalised communities and sustain hegemonic power structures. As (6) demonstrates, direct questions can reflect this form of argumentative critique.

- (6) A multibillion-dollar bailout for industry is floated as simply a matter of common sense. It is, we're told, what's best for us. But who and what is actually represented in that 'us?'

A third role of questions that emerges from the data pertains to climate impact and adaptation, where questions serve to raise concerns for potential catastrophes, with the subsequent text seeking a means to adapt to climate crises, as illustrated in (7).

- (7) What if a landslide into a reservoir creates a wave that overtops a dam?

This happened in 1963 in Vajont, Italy, killing more than 2,000 people who lived downstream. A better understanding of how landslides generate waves is crucial.

In (7), the question presents a real-world concern with a potentially catastrophic outcome. Following the question, the authors give examples of previous tragedies and signal the need to develop knowledge surrounding this issue so as not to repeat history. In so doing, the authors make use of a direct question to address the potential impact of the climate crisis on a hypothetical future.

In terms of impact, the question of frequency recurs, where authors ask questions to consider how the occurrence of climate disasters may increase in frequency over time, as reflected in (8).

- (8) How much more often will they occur? How much warmer will they be? And how much longer will they last?
Ultimately, scientists should develop forecasts for policy makers, managers and industry that could predict the future impacts of marine heatwaves for weeks or months ahead.

This question makes clear the importance of scientific knowledge for understanding the climate crisis. Moreover, in the text that follows, the authors discuss the potential positive impact that this kind of knowledge could have on people impacted by the climate crisis.

A fourth theme identified in the English direct questions relates to their use for addressing climate denial and science communication. In this context, the questions target challenges in science communication and public scepticism, highlighting the need for effective engagement strategies to foster public understanding and acceptance of scientific evidence. This can be seen in (9).

- (9) Why are people ignoring, or at worst rejecting well-established science?
We present a snapshot of the factors, influences and causes of why scientific issues find themselves dragged into public fights. We touch on ideas such as the ... campaigns of strategic misinformation by vested interests.

Following (9), the authors offer an answer, attempting to explain why climate denial, conspiracies, and anti-science have increased over time. These issues are attributed to the complexity of climate science as well as wider social issues.

In a similar vein, (10) addresses the proliferation of climate denial, signalling the active derailing of a positive collective response to the climate crisis in order to support economic policies.

- (10) Who in the scientific community is promoting the denial of global warming?

The authors link conservative research institutes with the anti-science movements, drawing large corporations into the discourse as external agents negatively influencing public engagement with science.

Furthermore, direct questions used to address climate denial serve not only to identify the causes and sources of this phenomenon, but also to gauge its impact, as (11) shows.

- (11) How much of an effect has science denial had on the progress of the science itself?
It is difficult to quantify, but there is some evidence to suggest that science denial has affected not just public discourse but also science itself.

Here, the author appears to raise a question to make clear to readers the seriousness of climate denial. A response is immediately offered, signalling that not only does climate denial impact public perceptions of the climate crisis, but also it influences climate science directly, with those involved in knowledge production and dissemination writing more cautiously so as to avoid misunderstandings or misrepresentations.

3.4 A metadiscourse and discourse analysis of direct questions in Science academic news blogs in French

Direct questions in *Science* account for 158 (9.9%) of the total direct questions in the French subcorpus of CDEFS. When sampled with a 95% confidence level (+/-5%), a random sample of 113 questions were identified and analysed in terms of their metadiscoursal function in the data and the discursive themes they address. A point of saturation was reached after the first 60 direct questions were analysed. As such, it was decided not to expand beyond the analysis of the 113 direct questions. The questions were grouped into three functions and four thematic areas, as Table 5 outlines. These areas map directly to the areas identified in the English data. Note the percentage distribution per function is based on the overall number of questions per question theme.

Table 5: Question Percentages in CDEFS French Blogs: Science

Question Theme	Percentage of all Questions	Managing the Text	Making Arguments	Framing Hypothetical Situations
Climate Science	47%	60%	38%	2%
Social and Political Issues	27%	27%	73%	0%
Impact and Adaptation	16%	8%	17%	75%
Climate Scepticism	10%	81%	19%	0%

As with English, the majority of direct questions in the French subcorpus appears to address climate science issues, often serving to manage the text. In these cases, the questions largely act as a rhetorical device used by authors to manage the presentation of information and introduce new content to discuss, as (12) demonstrates.¹

- (12) Que peut-on dire sur des périodes plus lointaines?
 Il est possible de suivre précisément l'évolution d'indicateurs clés du climat comme la température moyenne à la surface de la Terre
 'What can we say about more distant periods?
 It is possible to precisely monitor the evolution of key climate indicators such as the average temperature on the Earth's surface.'

However, direct questions in the French data can also be used to offer arguments and explanations that serve to position the author at the centre of debates. This can be seen in (13), in which a direct question is followed immediately by the author's proposition.

- (13) Vénus ne présente pas de champ magnétique, mais il existe des émissions diffuses dans la haute atmosphère—s'agit-il

¹ All translations are by the author of this article.

d'aurores?

Le débat n'est pas tranché.

'Venus has no magnetic field, but there are diffuse emissions in the upper atmosphere—are these auroras?

The debate is not settled.'

When offering informative and argumentative responses to questions, authors often point to scientific and technological solutions for climate problems, as in (14), which discusses artificial intelligence.

- (14) Alors, peut-elle aider ici?
A vrai dire, l'apport de l'IA est particulièrement spectaculaire sur des données disparates et/ou concernant des sujets dont le comportement repose sur des lois mal connues, voire inexistantes.
'So can it help here?
In fact, the contribution of AI is particularly spectacular on disparate data and/or concerning subjects whose behaviour is based on poorly known, even non-existent laws.'

In terms of social and political issues, direct questions are used to draw relationships between climate, social, and political issues that may not seem apparent to readers. For example, questions can be used to signal the impact of diplomacy on science, as shown in (15) in which the author asks a question to exemplify and critique international approaches to climate diplomacy.

- (15) Comment, sur le thème du changement climatique, la science peut-elle aider un pays à atteindre un objectif diplomatique?
L'actualité récente a apporté une réponse éclairante.
'How, on the topic of climate change, can science help a country achieve a diplomatic goal?
Recent news has provided an enlightening answer.'

In what follows, the author discusses political involvement in science, citing US President Trump's withdrawal from the Paris Agreement and how, on the basis of scientific engagement, French President Macron

responded by encouraging France to lead the fight against global warming. This question anticipates a perceived lack of connection between climate science and diplomacy and demonstrates how climate specialists seek to ensure that readers know that climate science does not exist in a political vacuum.

In terms of impact and adaptation, questions are raised about the potential impact that the climate crisis may have on the natural environment and biological life, as (16) attests. This question addresses the hypothetical future of turtle reproduction, which the author approaches with caution. In this way, the question serves to demonstrate a real-world issue with which climate experts are wrestling (and for which they have no solution).

- (16) Ce facteur est source d'inquiétude: qu'arrivera-t-il à ces espèces avec les hausses de température prévues pour les années à venir?
Le prédire n'est pas si simple. Plusieurs éléments doivent être pris en compte, ce qui rend toute conclusion délicate à formuler.
'This factor is a source of concern: what will happen to these species with the temperature increases predicted for the years to come?
Predicting this is not that simple. Several elements must be taken into account, which makes any conclusion difficult to formulate.'

The murky futures evoked by questions surrounding the impact of the climate crisis often relate to other global issues in the French data. This includes the convergence of multiple climate issues, e.g., food production, pollution, global warming, etc. Also, questions of impact show the complexity involved in solving the climate crisis, owing to its impact on and it being influenced by other global challenges, such as pandemics, as (17) shows.

- (17) Quelles seraient les conséquences humaines d'une telle pandémie combinée avec un phénomène naturel extrême—ouragan, incendie géant, canicule—dont la probabilité et

l'amplitude augmentent à cause du réchauffement climatique?

'What would be the human consequences of such a pandemic combined with an extreme natural phenomenon—hurricane, giant fire, heatwave—whose probability and amplitude are increasing due to global warming?'

Questions of climate scepticism also occur in the French data, albeit to a lesser degree than in the English data. These questions seek to directly engage with the issue of climate scepticism, producing a space for experts to address the entities they hold responsible for creating distrust among the public, as (18) demonstrates.

- (18) D'où viennent de tels décalages entre la perception du public et l'opinion de la communauté scientifique?
On pourra invoquer entre autres l'attachement des Américains au libéralisme économique pour le rejet des sciences du climat, ou à certaines croyances religieuses concernant la théorie de l'évolution.
'Where do such discrepancies between public perception and the opinion of the scientific community come from?
We could cite, among other things, the Americans' attachment to economic liberalism for the rejection of climate science, or to certain religious beliefs concerning the theory of evolution.'

Where these direct questions serve to make arguments, authors engage their readers in critical discussions of those entities that, in the authors' views, are fostering climate scepticism. Authors signal the organisations they hold responsible for the challenges the world is facing in garnering public support for climate science and climate initiatives. This view is reflected in (19), where the authors raise a direct question surrounding the need for public support for climate science.

- (19) Ces sujets, parce qu'ils portent de forts enjeux scientifiques et qu'ils concernent des enjeux sociétaux majeurs, nécessitent un engagement public des chercheurs

Pourquoi?

Parce que certains lobbies, qu'ils soient industriels, politiques ou religieux, instrumentalisent les débats scientifiques et/ou éthiques pour en tirer une partie de leur pouvoir de conviction.

'These subjects, because they raise strong scientific issues and because they concern major societal issues, require public commitment from researchers.

Why?

Because certain lobbies, whether industrial, political or religious, exploit scientific and/or ethical debates to derive part of their power of conviction.'

Overall, these direct questions on climate scepticism allow authors to address readers' perceptions of the drivers of climate denial and offer critical perspectives on the actors they hold responsible for the lack of public support for climate science. Thus, the direct questions serve as means to anticipate readers' perspectives and inform them of the malevolent forces that guide climate denial.

*3.5 A metadiscourse and discourse analysis of direct questions in *Política y Sociedad* academic news blogs in Spanish*

Direct questions in *Política y Sociedad* account for 20 (7.9%) of the total direct questions in the Spanish subcorpus of CDEFS. All 20 questions were analysed and grouped into the four areas and three functions, as Table 6 outlines. In the case of the Spanish data, while three of the areas and the three functions corresponded to those found in the English and French data, the area of *Climate Denial* was not identified. Instead, the area of *Climate Communication* emerged. Note the percentage distribution per function is based on the overall number of questions per question theme.

Table 6: Question Percentages in CDEFS Spanish Blogs: Politics and Society

Question Theme	Percentage of all Questions	Managing the Text	Making Arguments	Framing Hypothetical Situations
Climate Science	15%	100%	0%	0%
Social and Political Issues	15%	33%	67%	0%
Impact and Adaptation	65%	0%	0%	100%
Climate Communication	5%	100%	0%	0%

Many questions in the Spanish data served a rhetorical function of managing texts—this is the second most frequent function, following the framing of hypothetical situations. In the case of climate science, these questions allowed the author to signal the focus of the text, as (20) attests.

- (20) ¿Ha hecho alguna vez tanto calor en el pasado?
 A nivel mundial, en 2023 se han registrado algunos de los días más calurosos dentro de las mediciones modernas.
 ‘Has it ever been this hot in the past?’
 Globally, 2023 has seen some of the hottest days in modern measurements.’

Through questioning, the author engages the reader by drawing attention to a topic and moving to open the blog with a discussion of this topic in greater detail. Notably, in the Spanish data analysed, all questions relating to climate science were retrospective, focusing on what past experiences could tell us about the climate crisis of today.

In the context of social and political issues, the direct questions were largely argumentative, where authors use direct questions to raise doubts, as in (21), in which the current state of political systems is critiqued.

- (21) Pero ¿goza de buena salud nuestro sistema democrático en este sentido?, ¿son realmente efectivos los derechos de participación política que tenemos?, ¿vivimos en una sociedad democrática avanzada en este inicio de la tercera década del siglo XXI?

Aparentemente, y en puridad constitucional formal, la respuesta a esos interrogantes sería afirmativa.

‘But is our democratic system in good health in this sense? Are the rights of political participation that we have really effective? Do we live in an advanced democratic society at the beginning of the third decade of the 21st century?’

Apparently, and in formal constitutional purity, the answer to these questions would be affirmative.’

Such questions show how authors position policy and people at the centre of the climate crisis, as the authors continue to demonstrate that, in the domain of politics and society, the climate crisis is constructed as a social, rather than scientific issue.

In the Spanish data analysed, most direct questions address the potential impact of the climate crisis, signalling the varied, negative hypothetical futures we may face as a result of the climate crisis as well as the need to adapt to these futures. In (22), the author questions the means to encourage climate adaptation practices, signalling the need to raise awareness of climate issues.

- (22) ¿Puede la mera reflexión empujarnos a actuar o es necesario algo más?
El primer paso para incitar a la actuación contra el cambio climático consiste en atraer la atención hacia él.
‘Can mere reflection push us to act or is something more necessary?’
The first step in inciting action against climate change is to draw attention to it.’

Following this question, the author signals the importance of public uptake and engagement with climate initiatives as a means to adapt to climate challenges. In a similar vein, (22) presents a direct question used to discuss how specific societies, such as *Inuit* and *Western* societies, may be affected economically by the climate crisis.

- (23) ¿Cómo responderían ante una situación de crisis económica estas sociedades?
... Los inuit, ante una crisis como esta, reaccionarían

cooperativamente, buscando el beneficio colectivo. La economía occidental ... no posee una teoría económica del entorno natural ... sino que es una teoría económica basada en el beneficio y en la desigualdad de ingresos.

‘How would these societies respond to a situation of economic crisis?’

... The Inuit, faced with a crisis like this, would react cooperatively, seeking collective benefit. The Western economy ... does not have an economic theory of the natural environment ... but is an economic theory based on profit and inequality from income.’

Overall, in the Spanish direct questions analysed, impact and adaptation appear to cohere around social issues, responses, and reactions, centring on humans and their policies.

For climate communication, direct questions largely serve interactive metadiscoursal functions of managing the text, as (24) shows.

- (24) Pero ¿cuál es el límite de los efectos de ese pesimismo, si es que lo hay?
Esto es lo que estudiaron en el tercer y último estudio con más de 1 100 participantes, que vieron nuevos materiales, pero esta vez con 3 posibles finales: optimista ... pesimista ... o fatalista
‘But what is the limit of the effects of this pessimism, if there is one?
This is what they studied in the third and final study with more than 1,100 participants, who saw new materials, but this time with 3 possible endings: optimistic. ... pessimistic ... or fatalistic’

Here, the focus is on whether there is greater uptake of climate science when more pessimistic perspectives are offered. Thus, like climate science, direct questions addressing climate communication appears to also relate to social and political issues.

4. *Questioning the Climate Crisis: Discussion*

This discussion responds directly to the three research questions guiding this study. Questions 1 and 2 are addressed in section 4.1 and Question 3 is addressed in section 4.2.

4.1 *Direct questions in CDEFS*

In response to the first research question, there are two main findings. First, it is clear that direct questions are an established feature of academic news blogs, based on the analysis of CDEFS. Questions are distributed across a comparable range of texts in each subcorpus and, when interrogated in terms of their dispersion, any variability identified is negligible. This is arguably unsurprising, as the use of questions as metadiscourse in academic writing has been found to be on the rise, in English at least (Hyland and Jiang 2019). They have also been found to be a valuable source of reader engagement in English, French, and Spanish academic discourse (Curry 2021), and have been identified by academic bloggers as a valuable rhetorical device (Zou and Hyland 2020). To the author's knowledge, no research to-date exists on the use of questions in French and Spanish academic blogs. As such, this research offers a valuable insight into the presence of questions in parascientific communication in English, and particularly in French and Spanish.

Second, reflecting on the statistical analysis, one notable finding pertains to the French data, wherein authors appear more likely to raise direct questions than authors represented in the English data. This is, arguably, somewhat surprising, given that the English language is typically said to be more reader-oriented than French (Fløttum et al. 2006; Curry and Chambers 2017) and that previous research on English and French does not reveal any significant differences in question use in other academic genres, such as research articles. Notably, in Curry (2021), English uses significantly more questions than Spanish in economics research articles. Therefore, there are evident differences in these parent and hybrid genres at a cross-linguistic and cross-cultural level. Yet, overall, this finding tells us, in the case of academic blogs, direct questions are an important rhetorical feature of climate-themed parascientific communication, particularly in French when compared to English.

In response to the second research question, there is notable variation in the THEME in which questions are most frequently asked across the data. In the English and French data, *Science and Technology* and *Science*

demonstrate a significantly frequent use of direct questions when compared to the remaining THEME categories in the data. This shows, from a broad perspective, that authors in these contexts are posing questions in relation to research on the climate crisis in the scientific domain. However, the presence of ‘technology’ in the English THEME indicates an epistemological difference in the thematic and disciplinary indexing of blogs across cultures, as, simply put, *Science and Technology* and *Science* are not necessarily the same. The Spanish data show a more obvious distinction, with most questions occurring in *Política y Sociedad*. As authors are likely to use questions in academic blogs to draw attention to important issues or engage in key debates (Zou and Hyland 2020), the propensity for authors to pose questions in these different THEME categories offers insight into the kinds of issues that appear to be worth questioning in these research cultures (Dayrell 2019). Owing to this propensity to ask questions in different THEME categories in English, French, and Spanish, section 4.2 presents an interrogation of what is being questioned within each THEME. As such, the differences exhibited are based on language and—primarily—THEME variation.

4.2 Elements of the climate crisis being questioned in CDEFS

In answering the third research question, the study finds that English and French direct questions in CDEFS share foci on climate science, impact and adaptation, social and political issues, and climate scepticism. The range of direct questions in the data studied for both languages reflects a complex context in which experts are addressing both the scientific and social issues that frame the climate crisis. In Spanish, the use of direct questions in the political and social domain exhibits shared foci on climate science, impact and adaptation, and social and political issues. Notably, the area of climate communication differs from climate scepticism, however, as it focuses on effective communication, as opposed to issues of engagement and trust in climate knowledge. This difference is likely owing to the substantively different THEME under investigation.

Across the three subcorpora, direct questions generally pertain to topics that Fløttum et al. (2014) position as ‘doom and gloom’, i.e., the questions largely address negative phenomena. Many of these questions serve a metadiscoursal function of managing a text. In such cases, questions were not addressing real issues or building arguments. Rather, they were used as interactive sequencing devices, allowing the writer to

move the discourse along to another topic or point to be discussed. This is a well-established function of rhetorical questions in academic communication (e.g., Curry 2021; Hyland 2002) and, as this study evidences, remains a core use of direct questions in academic blogs in different languages.

Across CDEFS, direct questions also facilitate interactional metadiscourse, allowing writers to build arguments and reflect on hypothetical situations in relation to the climate crisis. When building arguments, direct questions serve to position the author as an authority, as the authors are not addressing real unknowns. Rather, they are engaging readers to convince, guide, or educate them. For those questions on hypothetical situations and the climate crisis, authors appear to be sharing their concerns with readers, posing real questions for true unknowns.

The English and French data give evidence of direct questions being used to make arguments and offer solutions in the area of climate science. In such instances, authors typically present natural problems and offer scientific or technological solutions to address them, reflecting the sort of future-oriented practices that van Eck and Feindt (2022) identify in climate activist discourses. In so doing, they signal a shared value by English and French language writers to create doubt or uncertainty through questioning as a means to argue for the use of specific solutions. This practice is often supported by the use of inclusive pronouns that allow authors to make the reader a part of the proposed solution and position the issue in question as a collective one (Fløttum et al. 2006). This in turn serves to socialise scientific and academic knowledge on the climate crisis.

When questioning the social impact of the climate crisis, French and Spanish authors appear take a more authoritative position than English authors, who largely use direct questions to manage the text. In the French data, the focus is on the influence of science on policy and policy on science. Through the posing of direct questions, authors attempt to demonstrate to readers the context in which they work and how science is influenced by society more generally. For Spanish, there is limited engagement with climate science. Rather, climate issues are posed as political and social issues, indicating likely disciplinary variation owing to the difference in THEME.

The notions of impact and adaptation typify questions in all three subcorpora. In the English and French data, authors pose questions to signal the need to find ways to adapt to the reality of the climate crisis,

often focusing on natural and biological issues. A notable difference in questions pertaining to impact and adaptation is the lack of inclusive pronouns in questions. In these cases, authors are posing questions that construct hypothetical scenarios that can impact people. These questions are, in effect, real questions, as authors consistently note that the future is unclear and there is a need to develop scientific pathways for measuring impact and adapting to climate issues. For the Spanish data, the focus on hypothetical situations is also evident, as questions on impact and adaptation focus on the potential for climate issues to impact political and social phenomena. The Spanish data, unlike the others, exhibit potential disciplinary variation through the use of inclusive pronouns (e.g., *empujarnos*), reflecting efforts to construct a collective perspective on climate response and adaptation. For the English and French data, this finding is understandable, as the issues that emerge in the scientific data centre on scientific responses and very concrete, if hypothetical, occurrences. As such, it is likely that such movements as evoked in these direct questions would require specialist, not collective, efforts. For the Spanish data, the focus is on social responses and societal and political challenges. Therefore, impact and adaptation become everyone's issue.

For climate scepticism, English makes most use of argument building questions, though these are also evident in the French data. Climate scientists in both datasets appear to ask questions as a means to signal the causes and impacts of climate scepticism on climate science and wider society. These questioning practices indicate the importance and prevalence of this issue in climate science, which is responding to a barrage of anti-science and climate denial movements globally (Merkley 2020). By evoking questions on climate scepticism, authors position readers in their texts. They ask questions as a means to contradict and critique climate denial movements, which, in turn, ensures that readers reckon with this issue. These questions can also serve as a means to critique actors that authors perceive to be negatively impacting the climate crisis. These actors include political and corporate institutions, for example, reflecting a critique of such institutions espoused elsewhere in the literature (e.g., Fuoli and Beelitz 2023).

Generally, the direct questions in the English and French data are wide-reaching, focusing indeed on climate science but also on public impact, perception, and public engagement with climate knowledge—issues also reflected in Fløttum et al.'s (2014) study of climate blogs in

English. For the Spanish data, the focus is decidedly more disciplinary, as the direct questions all pertain to politics and society. While this is arguably unsurprising, given the THEME in which they are posed, it does demonstrate a potential disciplinary silo, where experts' questions do not necessarily relate to wider, transdisciplinary issues in the climate crisis. For example, while authors from scientific backgrounds appear to see science as influenced by politics and society, questions relating to this issue of mutual shaping are not apparent in the Spanish direct questions in *Política y Sociedad*.

Overall, the different perspectives within these THEME categories are worthy of interrogation and this analysis has demonstrated evident variation in direct question use across the THEME categories studied. Admittedly, it is not logical to compare question use across different THEME categories to draw inferences and linguistic or cultural variation, as it would make sense that blogs about science address issues of science and blogs about politics address issues of politics. We cannot reasonably expect them to discuss very similar topics and any such comparison would only afford insight into thematic variation. However, what can be compared from a cross-cultural perspective is the fact that different THEME categories contain significantly higher numbers of questions across languages. These THEME categories and the metadiscursive and discursive functions of direct questions that emerge therein tell us about the epistemologies of the research cultures studied in this paper. Therefore, as questions in academic blogs serve to spotlight on central issues (Zou and Hyland 2020), their presence in different THEME categories suggests that different research cultures exhibit a preoccupation with different climate crisis issues.

5. Conclusion

This paper reports on two convergent analyses of direct questions in climate-themed academic news blogs, and three metadiscourse and discourse analyses of direct questions in different THEME categories in English, French, and Spanish. In adopting this approach, this analysis demonstrates that direct questions are a feature of academic news blogging in each language, that the frequency of direct questions varies significantly according to THEME across languages, and that the metadiscursive and discursive functions of direct questions show differing degrees of correspondence across languages—THEME variation notwithstanding.

This, in turn, offers insight into how these different knowledge cultures are questioning the climate crisis. From a methodological perspective, this paper offered a novel approach by merging techniques and theoretical and conceptual frameworks from corpus-based contrastive linguistics, metadiscourse studies, and discourse analysis to access the presence, use and function of direct questions textually, socially, and culturally.

Responding to the climate crisis in any meaningful way will require joined-up thinking and a collective and shared understanding of the issue. To develop such a response, it is critical that we, as a community, understand how different knowledge cultures socially construct and frame the climate crisis. While necessarily limited in scope, this paper offers a valuable starting point for unpacking the questioning practices of academics involved in climate-themed knowledge production across languages and cultures. Given the evident capacity for convergence and divergence surrounding the issue of the climate crisis, it is imperative that we continue to study this phenomenon in order to gain a fuller picture of the global and social construction of climate crisis knowledge.

References

- Bamford, Julia. 2005. Interactivity in academic lectures: The role of questions and answers. In *Dialogue within discourse communities: Metadiscursive perspectives on academic genres*, edited by Julia Bamford, and Marina Bondi, 123–145. Baden-Baden: Niemeyer.
- Becken, Susanne, Harald Friedl, Bela Stantic, Rod Connolly, and Jinyan Chen. 2021. Climate crisis and flying: Social media analysis traces the rise of ‘flightshame’. *Journal of Sustainable Tourism* 29(9): 1450–1469. <https://doi.org/10.1080/09669582.2020.1851699>.
- Bennett, Karen, and Laura Muresan. 2016. Rhetorical incompatibilities in academic writing: English versus the romance cultures. *Synergy* 12: 95–119.
- Biber, Douglas, and Jessie Egbert. 2016. Register variation on the searchable web: A multi-dimensional analysis. *Journal of English Linguistics* 44(2): 95–137. <https://doi.org/10.1177/0075424216628955>.
- Chesterman, Andrew. 2007. Similarity analysis and the translation profile. *Belgian Journal of Linguistics* 21(1): 53–66.
- Curry, Niall. 2021. *Academic writing and reader engagement: Contrasting questions in English, French and Spanish corpora*. London: Routledge. <https://doi.org/10.4324/9780429322921>.

- Curry, Niall. 2023. Question illocutionary force indicating devices in academic writing: A corpus-pragmatic and contrastive approach to identifying and analysing direct and indirect questions in English, French, and Spanish. *International Journal of Corpus Linguistics* 28(1): 91–119. <https://doi.org/10.1075/ijcl.20065.cur>.
- Curry, Niall, and Angela Chambers. 2017. Questions in English and French research articles in linguistics: A corpus-based contrastive analysis. *Corpus Pragmatics* 1(4): 327–350. <https://doi.org/10.1007/s41701-017-0012-0>.
- Curry, Niall, and Pascual Pérez-Paredes. 2021. Stance nouns in COVID-19 related blog posts: A contrastive analysis of blog posts published in The Conversation in Spain and the UK. *International Journal of Corpus Linguistics* 26(4): 469–497. <https://doi.org/10.1075/ijcl.21080.cur>.
- Dayrell, Carmen. 2019. Discourses around climate change in Brazilian newspapers: 2003–2013. *Discourse & Communication* 13(2): 149–171. <https://doi.org/10.1177/1750481318817620>.
- Fløttum, Kjersti, Trine Dahl, and Torodd Kinn. 2006. *Academic voices across languages and disciplines*. Amsterdam: John Benjamins. doi:<https://doi.org/10.1075/pbns.148>.
- Fløttum, Kjersti, Anje Müller Gjesdal, Øyvind Gjerstad, Neyla Koteyko, and Andrew Salway. 2014. Representations of the future in English language blogs on climate change. *Global Environmental Change* 29: 213–222. <https://doi.org/10.1016/j.gloenvcha.2014.10.005>.
- Fuoli, Matteo, and Annika Beelitz. 2023. Framing the path to net zero: A corpus-assisted discourse analysis of sustainability disclosures by major corporate emitters, 2011–2020. *International Journal of Corpus Linguistics* 29(3): 361–388. <https://doi.org/10.1075/ijcl.22123.fuo>.
- Hyland, Ken. 2002. What do they mean? Questions in academic writing. *Text & Talk* 22(4): 529–557. <https://doi.org/10.1515/text.2002.021>.
- Hyland, Ken. 2005. *Metadiscourse: Exploring interaction in writing*. London: Bloomsbury.
- Hyland, Ken, and Feng Kevin Jiang. 2019. *Academic discourse and global publishing: Disciplinary persuasion in changing times*. London: Routledge.

- Kilgarriff Adam, Vít Baisa, Jan Bušta, Miloš Jakubíček, Vojtěch Kovář, Jan Michelfeit, Pavel Rychlý, and Vít Suchomel 2014. The Sketch Engine: ten years on. *Lexicography* 1: 7–36. <https://doi.org/10.1007/s40607-014-0009-9>.
- Kunelius, Risto, and Anna Roosvall. 2021. Media and the climate crisis. *Nordic Journal of Media Studies* 3(1): 1–19. <https://doi.org/10.2478/njms-2021-0001>.
- Luzón, María José, and Carmen Pérez-Llantada. 2022. *Digital genres in academic knowledge production and communication: Perspectives and practices*. Bristol: Multilingual Matters.
- Merkley, Eric. 2020. Anti-intellectualism, populism, and motivated resistance to expert consensus. *Public Opinion Quarterly* 84(1): 24–48. <https://doi.org/10.1093/poq/nfz053>.
- Phillipson, Robert. 2019. Languages in public policy, and constraints in academia. *Language Problems and Language Planning* 43(3): 286–311. <https://doi.org/10.1075/lplp.00046.phi>.
- Sharman, Amelia. 2014. Mapping the climate sceptical blogosphere. *Global Environmental Change* 26: 159–170. <https://doi.org/10.1016/j.gloenvcha.2014.03.003>.
- Stemler, Steven E. 2004. A comparison of consensus, consistency, and measurement approaches to estimating interrater reliability. *Practical Assessment, Research and Evaluation* 9(1): 1–11. <https://doi.org/10.7275/96jp-xz07>.
- van Eck, Christel W., and Peter H. Feindt. 2022. Parallel routes from Copenhagen to Paris: Climate discourse in climate sceptic and climate activist blogs. *Journal of Environmental Policy & Planning* 24(2): 194–209. <https://doi.org/10.1080/1523908X.2021.2000376>.
- Zou, Hang, and Ken Hyland. 2020. Academic blogging. *Ibérica* 39: 267–294. <https://doi.org/10.17398/2340-2784.39.267>.