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“People should get their booster”: stance towards Covid vaccination in news and academic blogs

Abstract

Debates around the efficacy and dangers of vaccination have taken on critical importance with the covid pandemic and with WHO naming vaccine hesitancy as a major global health threat. With electronic and social media replacing traditional news outlets for many people, we explore how writers use two types of blog, academic and journalistic, to promote key public health messages around the effectiveness and necessity of Covid-19 vaccinations to a broad and heterogeneous audience. Examining 120 Covid-19 vaccination themed posts from reputable news and academic blog sites, we compare the different ways writers present a stance and take a position towards vaccines and vaccinations in these different interactional contexts. Findings show that both types of bloggers are clearly aware the need to convey a stance towards their topic and audiences and feel entitled to position themselves in relation to vaccination issues, but with different emphases. The study thus has important implications for how healthcare information is disseminated and persuasion accomplished in these public arenas of discourse.

Keywords: academic blogs, news blogs, stance, Covid-19 vaccination, audience, context

1. Introduction

Covid-19 is the worst public health disaster in living memory. Millions of people around the world have been affected by illness, lockdowns, travel restrictions, unemployment, bankruptcy and the loss of loved ones. As a result, it has rarely been out of the news in the last three years, spawning articles in every section of the press and TV media from finance to sports reporting. In addition to the traditional media, observers have taken to Twitter, Instagram, TikTok and other social media, often to fuel a surge of rumours, hoaxes, and misinformation and so create a climate of uncertainty, scepticism and fear (Tasnim et al, 2020). In 2019, in fact, the World Health Organisation prioritised vaccine hesitancy as a top ten global health threat and recognized the role of viral misinformation on social media

as propagating vaccine hesitancy. However, the same tools which enable fake news and jeopardise measures to control the pandemic, also create opportunities to keep people safe, informed and connected.

In this paper we explore the role of two kinds of blog in this process, examining how journalistic and academic bloggers have sought to promote key public health messages around the effectiveness and necessity of vaccinations. These types of blogs sit at the more ‘serious’ end of the genre and, in contrast to the misinformation disseminated by some personal blogs (see *DebunkEU.org* for examples), help promote the legitimacy of new scientific discoveries and the potential benefits of vaccines. In particular, we focus on the stance taken by the writers of these blogs and how they seek to promote a particular viewpoint towards their material. Using Author 2’s (2005) stance model, we compare key stance indicators in 60 news posts and 60 academic posts to address these questions:

- (1) How do journalists and academics manage their stance towards Covid -19 in vaccination blogs?
- (2) How does stance differ in these two forms of blog?
- (3) How can we account for these differences?

In answering these questions, we hope to shed light on the phenomenon of stance and understand how it is accomplished in different interactional contexts and how bloggers position their knowledge to frame COVID-19 vaccine issues. The results should be of interest to those concerned with the dissemination of science in the digital world, to students of the pandemic and to all those interested in social media discourses.

2. Journalistic and academic blogs

Blogs, or text entries on dedicated websites, emerged in the late 1990s with web publishing tools that allowed ordinary people to post content without experience of programming. Many blogs provide commentary on a particular topic, add links to related content and allow readers to leave online comments, and this simplicity, reach and interactivity made the format attractive to corporations, celebrities and political groups. The advent of the user-friendly open-source platform *WordPress* helped grow the numbers and *Earthweb*, the online authority on social media, estimates there are now 600 million blogsites worldwide with more than 6 million posts uploaded daily¹.

¹ <https://earthweb.com/how-many-blogs-are-there-in-the-world/>

The advent of Web 2.0 encouraged an explosion of news sites with varying levels of resourcing and journalistic expertise, but is also a practice appropriated by professional journalists so blogs are now a core part of established newspapers and broadcast media (Hermida, 2009). News media were quick to embrace blogging, responding to the growing number of amateur news sites challenging the mainstream media. The BBC, for example, launched its Editors' blog in 2005 to provide better access to its news services and offer a 'fresh way of turning the traditional roles of writer and reader into those of people having a conversation' (Wilson, 2006). Today, news blogs are a familiar way of disseminating information and reporting news employing a format in which the author is more visible and the style is more personal (Domingo & Heinonen, 2008). With the advantage of speed, convenience and mobility, journalistic blogs are now a staple of the industry while, at the same time, establishing different interpersonal relations with readers and a different authority. It is journalism focused upon connection rather than just fact (Matheson, 2004).

Blogs have also proliferated in academic contexts in recent years as scholars are encouraged to engage in 'outreach' by taking their work beyond the ivory towers of academia to the taxpayers who fund it. Academic blogs are an attractive venue for academics seeking to take their own work, whether previously published or not, to a wider audience or to discuss topics in their field. This medium allows for the rapid dissemination of unfiltered material, speeding up the practice of reporting, knowledge sharing, and idea generation compared to traditional avenues such as print (Powell et al., 2011). Like all blogs, they benefit from the affordances of Web 2.0 such as hyperlinking to related work, filtering tools for searching and accessing material, and the immediacy of reader response, allowing them to reach a wide and diverse audience and get feedback on their work (e.g., Herring et al., 2013). They are seen as democratising research by making it more available and 'demythologizing' science (Mahrt & Puschmann, 2014) by allowing the public to see science as it is produced and participate in academic discussions.

Academic blogs and other new media, supported by evidence, adequate referencing, and clear arguments, can both position scientific research and offer reliable information in response to emerging public issues (Kirkup, 2010; Powell et al., 2011). Both academic and news blogs provide a more immediate and interactive option for readers while transforming the dissemination of news and science by offering a new demographic of readers new sources of information. Not only are they more accessible, both rhetorically

and financially, than many news and research outlets, but also provide a feedback loop of online communications. Both kinds of blogs, moreover, continue to co-exist with traditional venues, supplementing news media, research articles and popular science journalism while neither replacing nor entirely mimicking them.

Online news media have evolved to play a crucial role in times of crisis (e.g. Glik, 2007), so that both academic and news blogs can be useful channels of communicating risk to a wide audience, some of whom may not follow mainstream media. The need to present ideas to a heterogeneous audience of specialists and lay people, moreover, means they avoid the lengthy, sustained argumentation of the journal article and broadsheet newspaper to offer a more succinct and reader-friendly presentation (Author 1 & Author 2, 2020; Bednarek & Capel, 2012). As a result, they are rhetorically hybrid texts where recognisable features of traditional genres are combined with the exigencies of new delivery systems (Gotti, 2014). These new ways of presenting material also require new ways of relating it to readers and part of their appeal is that they carry a more personal stance than their traditional counterparts. Academic blogs for instance, reveal interactional strategies which contrast with the more reserved, author-evacuated conventions of traditional research writing (Author 1 & Author 2, 2019).

3. Blogs, Covid and stance

While blogs have the potential for publics to engage more deliberatively through dialogue in science issues such as climate change and vaccination efficacy, blogsites often consolidate their own polarised publics rather than engage them in the issues (Metcalf, 2020). They are just as likely to spread unfounded rumours as to give channels for progressive action. This is particularly problematic as numerous social networking sites like Facebook, Twitter and Reddit are often used to drive traffic to blogs sites.

Misinformation about COVID-19, in fact, has proliferated widely on social media, ranging from the peddling of fake “cures,” such as gargling with salt water and injecting with bleach to false conspiracy theories that the virus is caused by 5G phone masts or bioengineered in a lab in Wuhan (Scott, 2020; Spring, 2020). Such conspiracies and misinformation can adversely impact the effectiveness of Covid containment strategies and distort people’s risk perception of the virus (Krause et al., 2020). Freeman et al. (2020), for example, noted a link between belief in COVID-19 conspiracies and an increase in vaccine hesitancy. Blogs discussions on COVID-19 vaccination are often polarised (Jenkins & Moreno, 2020) and

contain implications for the general public's vaccination decisions. The potential impact of this broader blogging context on traditional editorial news values and scientific accuracy has been raised (e.g. Bruns & Highfield, 2012), challenging the status of more 'serious' blogs. Bloggers have also had to consider the increasing fragmentation of audiences as neither journalists nor academics can be quite sure who their readers are or what they know.

Social media has played an important role in what the public read about vaccinations (Wilson & Wiysonge, 2020). While social media fact-checks about COVID-19 appear fairly quickly after false information is circulated, it seems their ability to reduce overall misinformation spread is limited (Burel et al, 2021). This means that the role of academic and news blogs have been required to serve as major sources of public health information on Covid-19 for many. A WHO study of 23,500 18-40-year-olds in 24 countries, in fact, found that 44% often shared such scientific information on their own sites². This information is crucial to counter the misinformation which has resulted in reduced compliance with home quarantine and social isolation and served to reduce the legitimacy of scientific discoveries regarding vaccine candidates for this disease (e.g., Tasnim er al, 2020; Wilson & Wiysonge, 2020).

The crowded space within which blogs operate and the struggles of bloggers to compete with each other and with other information sources for attention, place some pressure on writers to make their voices heard. This is, then, an area where there is a considerable emphasis on individual voice and personal perspective. It involves writers taking a clear stance, with to convey their views and assessments, including how they obtained access to the information, what attitudes and perspective they hold, and how certain they are about these views (Biber, 2006). The linguistic means to convey personal feelings and assessments are referred to as stance (Biber & Finegan, 1989; Biber 2006). For Author 2 (1999), stance refers to the ways that writers project themselves into their texts to communicate their integrity, credibility, involvement and a relationship to their subject matter and audiences. It is an attitudinal dimension of interaction and concerns how writers stamp their personal authority or perspectives on their texts. Corpus studies have found genre-specific effects on the different use of stance features (e.g., Qin & Uccelli, 2019; Wu & Paltridge, 2021). In blogs, as in other genres, writers seek to position themselves in relation to their arguments and audience, displaying personal and community sensitivities.

² <https://www.who.int/news-room/feature-stories/detail/social-media-covid-19-a-global-study-of-digital-crisis-interaction-among-gen-z-and-millennials>

The stance which writers take in blogs in general seems to involve a particular concern with self-presentation as writers position themselves in a huge market of other bloggers and commenters (Myers, 2010). This emphasis on individual voice and perspective makes for engaging writing as writers signal their distinctiveness from other writers. It is unclear, however, if academics and journalists blogging their research for wider readerships adopt a similar strong stance as bloggers more generally, or whether academics adopt the same explicit rhetorical positionings as journalists when discussing similar material.

A number of studies have examined authorial stance in blogs. Author 1 and Author 2, for example, analysed the way academics express an authorial stance in their blogs compared with research articles (Author 1 & Author 2, 2019) and in 3-minute theses (Author 1 & Author 2, 2022a) while Luzon (2013) has looked at conflictual evaluation in academic blogs. Nor has stance been entirely neglected in studies of Covid blogs. Nor is there much research on how vaccination is discussed in blogs, although the issue of *trust* was a key feature of a large-scale study of vaccination topics on Twitter (Lyu et al, 2021). Jenkins & Moreno (2020) looked at stance in nine parenting blog posts related to vaccination and found 25% of comments comprised inaccurate information and 27% were considered aggressive. Martin et al's (2020) study of stance in prenatal vaccinations in over 16,000 blog posts in 16 languages found discussions included the value of vaccination, the ethics of involving pregnant women in vaccine research, and the trust of institutions. Many of the posts were framed negatively.

In one of the few studies on Covid in blogs, Curry and Pérez-Paredes (2021) identified similarities and differences in the use of 'stance nouns + that/de que' in a corpus of English and Spanish COVID-19 academic blogs, from *The Conversation*. The study found a broad similarity in the frequency of this feature, but that Spanish academics favoured *Possibility* and *Factualness* nouns while English academics used *Argument and Idea nouns* to a greater extent. The Spanish authors also made greater use of self-sourcing when presenting their ideas and combined their stances with expanding strategies, which encapsulate heteroglossic discourse, recognising other perspectives more than the English texts (Jiang & Hyland 2018). But while this study adds to our knowledge on stance in academic blogs and to scientific communication about COVID-19, it is restricted to one feature and blog posts from one website. In our study we look at a wider range of stance features and we expand the sources to include both *the Conversation* and *Huffpost* as a news blog.

Overall, however, little is known about the stance features used to support different positions on vaccination in journalistic blogs and how these compare with academic blogs. Clearly the two types of blogs have different purposes. One group posts with the intention of promoting their research, and the other to personalise journalism and bring important stories to a wider public, many of whom may not engage with traditional media. Both, however, speak from positions of relative authority and credibility and with the opportunity to sway opinions. Bloggers, like other writers, are able to use stance features to construct a particular writer persona and relationship with their readers (Author 1 & Author 2, 2019), therefore the analysis of the stances taken in the two forms may be useful in informing writers of persuasive practices in important arenas of public discourse.

4. Methods and procedures

4.1 Covac blog corpus

To compare how academic and journalistic bloggers promote a point of view on the topic of vaccination, we built a Covid-19 vaccination blog corpus (Covac). It contains two comparable sub-corpora of 60 Covid-19 vaccination themed academic blog posts from each of *The Conversation UK*³ and *HuffPost*⁴.

The conversation UK, hosted by the Conversation Media Group and funded by more than 80 UK universities, is one of the most influential sites for the promotion and discussion of academic research. All the posts are authored by academics who are encouraged to write engagingly for both colleagues and interested non-academics. The site claims to be fact-based and editorially independent, where articles “explain or have a different take on, news and current affairs, present interesting new research, or offer analysis of matters in the public interest”. It states that it only publishes articles by “academics employed by, or otherwise formally connected to, accredited institutions, including universities and accredited research bodies”⁵ All posts undergo strict review by the editors to ensure novelty, interest and readability. The website claims that contents are disseminated to more than 22,000 sites worldwide with a global reach of 38.2 million readers each month.

HuffPost, on the other hand, is an extremely influential and popular journalistic blog/news site crossover, started by the millionaire socialite Arianna Huffington in 2005. It is listed as

³ *The Conversation UK* website: <https://theconversation.com/uk>.

⁴ *Huffpost* website: <https://www.huffpost.com>

⁵ https://cdn.theconversation.com/static_files/files/1797/The_Conversation_Global_Editorial_Guidelines_2021.pdf

the most popular news blog on the internet by *Lifewire*⁶ and was ranked as the world's most powerful blogsite by the *Guardian* newspaper in 2008⁷. This then, is a blog and news site hybrid widely followed and at the respectable end of the blog continuum. The site posts short reports of a few hundred words on a range of topics such as world news, health, entertainment, politics, business, environment, and technology, written by both professional journalists and unpaid bloggers⁸. It has some 25 million unique visitors every month⁹ and was the first commercial digital media enterprise to win a Pulitzer Prize. The site is owned by BuzzFeed, Inc. which is also behind the *BuzzFeed* news blog which focuses on social news and entertainment. Aiming to include a diverse range of voices, *HuffPost* is dissimilar to mainstream 'liberal' newspapers such as *The Guardian*, and *New York Times* which are almost entirely written by journalists, have both written and online editions, have longer, more analytical articles, and where readers can only post comments on those which the paper opens to them.

We selected 60 blog posts from each of these two websites published between January 2020 and August 2022 when this paper was written. This period coincides with the greatest covid panic and the period where vaccine scarcity and hesitancy were most prevalent. Texts were selected based on their relevance to COVID-19 vaccination by searching for the keywords 'Covid'+ 'vaccination, vaccinations, vaccine, vaccines, immunize, immunization, vaccinate, and vaccinated'. In addition to containing these keywords, our criteria were that the blog posts:

- 1) were written in English;
- 2) were written by different authors;
- 3) reported research on social and medical Covid-19 vaccination issues (e.g. necessity, effectiveness, safety, side effects etc.)

Simple random sampling was used to select the texts following these criteria so that the final COVAC blog corpus comprised 120 texts of 115,932 tokens. The Journalistic and academic corpora were roughly of equal size with the academic blogs slightly longer. Details are given in Table 1.

⁶ <https://www.lifewire.com/top-most-popular-blogs-3486365>

⁷ <https://www.theguardian.com/technology/2008/mar/09/blogs>

⁸ <https://en.wikipedia.org/wiki/HuffPost>

⁹ <https://www.golem.de/1102/81224.html>

Table 1. Corpus size and composition

	Texts	Tokens	Mean word length	Standard deviation of word length
Journalistic blogs	60	56,741	945.68	330.64
Academic blogs	60	59,191	986.52	158.74

4.2 Annotation and analysis

We chose to analyse the corpus using Author 2’s (2005) stance model as this has proved useful to researchers studying a range of genres as diverse as research articles (e.g., McGrath & Kuteeva, 2012) and online book reviews (Author 1 & Author 2, 2022b) to 3-minute theses (Author 1 & Author 2, 2022a) and TED talks (Scotto di Carlo, 2014). The model comprises four broad functional categories:

- **Hedges** withhold complete commitment to a proposition and open a discursive space allowing others to dispute interpretations.
- **Boosters** help writers/speakers present their work with assurance and shut down alternative voices.
- **Attitude markers** indicate affective, rather than epistemic, attitudes to propositions, conveying surprise, agreement, frustration and so on.
- **Self-mention** is the writers/speaker’s intrusion in the text through use of first-person to emphasize their contribution.

The formal resources within these categories provide writers with what Author 2(2005: 41) refers to as a writer’s “armoury of rhetorical appeals” - or strategies for arguing and persuading.

The two sub corpora were searched for features identified by Author 2 (2005) and published as an appendix to that volume using AntConc (Anthony, 2018). This inventory comprised 350 common stance features together with additional items added by the authors after a thorough reading of the data. Next, all retrieved items were concordanced and each were manually checked in context to ensure that they performed the stance function they were assigned (as listed above). A 25% sample was then independently coded by each author, with an inter-rater agreement of 96% achieved through discussion. Intra-reliability tests were also conducted by each author re-categorizing 25% of the cases two weeks after the initial coding with full agreement achieved between the first and second categorizations. Finally, the frequencies of each engagement feature were calculated after

normalizing the results to 1000 words to allow for cross-corpora comparison. Statistical significance of the results was determined using the Student t-test in SPSS (version: IBM SPSS Statistics 24) which is a widely used technique to determine whether the difference between two groups of data is significant or not. The results are discussed in the following sections.

5. Stance: results and discussion

Overall, we found 3,516 stance devices in the *Huffpost* blog posts and 3,370 in *The Conversation UK* posts. This amounted to 61.97 items per 1,000 words in journalistic blogs compared with 56.94 in the academic blogs. The details are presented in Table 2. Bloggers of both types are clearly aware that they need to convey a stance towards their topic and audiences and feel entitled to position themselves in relation to vaccination issues; offering an opinion to arouse the audience’s interest and create trust.

Table 2. Stance features by blog type (per 1,000 words and %)

	Journalistic blog posts		Academic blog posts	
	per 1,000 words	%	per 1,000 words	%
Hedges	29.40	47.44	22.79	40.03
Boosters	15.07	24.32	11.61	20.39
Attitude markers	17.11	27.62	18.30	32.14
Self-mention	0.39	0.62	4.24	7.44
Total	61.97	100.00	56.94	100.00

It is perhaps unsurprising to find there are more stance features overall in the journalistic posts (log Likelihood = 3.488, $p < 0.148$), which reflects something of the differences between the purposes and traditional practices of journalism and academic research. Media bloggers are more visible and adopt a much more interpretative and opinionated position (Domingo & Heinonen, 2008; Wall, 2005). The finding shows evidence of register variation on the web, replicating the opinionated news texts of traditional print media and their extensive use of lexico-grammatical stance devices (Biber and Egbert, 2017; Biber and Zhang, 2018). These texts are marked for linguistic resources of personal involvement and interactivity such as stance verbs and stance adjectives (Biber & Egbert, 2017). What is more surprising, however, is that the journalists employed more epistemic devices, using far more hedges (log Likelihood = 17.13, $p < 0.001$) and boosters (log Likelihood = 10.45, $p < 0.01$). These devices concern the likely truth of statements and are generally regarded as a

central feature of academic writing (e.g. Biber, 2006; Author 2, 1996; Author 2. & Other, 2021). In contrast, the usually self-effacing and restrained academics employed more personal and affective devices, although the difference for attitude markers was not significant (log Likelihood = -0.213, $p < 0.53$ for attitude markers, log Likelihood = 23.83, $p < 0.0001$ for self-mention).

These frequency variations can be attributed to differences in the target audiences and communicative purposes of the two types of blog. Broadly, in journalistic blogs these are to inform an audience which may rely, at least in part, on internet media for its news and to gain its support through a stronger interpersonal relationship. In academic blogs it is to take research to non-specialist readership with an interest in scholarly work. In the following sub-sections, we present our results by stance category.

5.1 Hedges

Hedges function to downplay a writer's commitment to a proposition, modifying its scope, relevance or certainty. They seek to better ensure that statements meet a suitable degree of accuracy regarding what can be safely claimed and what is most likely to be accepted by readers (Author 2, 1996; 2005). The decision to hedge a claim therefore signals the writer's explicit intrusion into a text to make a judgement about what is being discussed. Hedges imply that a statement is based on plausible reasoning, showing the communicator's willingness to concede to the possible alternative views of the audience. We can see them, then, as attempts by bloggers to involve the audience as participants in the discourse and guide them towards agreement and they occur in both types of blogs discussed here:

(1) This is *likely* because the body responds to the vaccines differently, which *may* ultimately help produce a broader immune response. (H3)¹⁰

(2) As SARS-CoV-2 continues to evolve and is *likely* to become endemic, it is *possible* people *may* need periodic booster shots for the foreseeable future. (C4)

Hedges, as noted above, were significantly more frequent in the news blogs (log Likelihood = 17.13, $p < 0.001$) and were the most frequent stance resource for both types of bloggers. Journalistic conventions encourage news bloggers to re-engage with potentially

¹⁰ H refers to the *Huffpost* COVID-19 vaccination journalism blog sub-corpus and C to the *The Conversation UK* academic sub-corpus. The number identifies the text.

distrusting and alienated audiences who may have turned away from mainstream news sources (Pavlik, 2001). Raising a controversial issue, which vaccination certainly remains, with a largely unknown audience risks a possibly negative reaction and push-back. Hedging here presents a more cautious stance and offers space for disagreement and reasoned debate, encouraging more measured responses below the line. Moreover, as Biber & Egbert (2017) observe, news blogs are normally written by single authors who regularly posts their opinions and ideas about current affairs with little supporting evidence. By softening their claims and acknowledging different perspectives on vaccinations, it also helps say something about the blogging platform itself. Here hedging presents the site as a reasonable and democratic space in which concentric rings of varied voice are welcome, rather than the often-strident bullhorn of public blogs where the certainty of individual opinion seeks agreement by the force of rhetorical bluster.

The impact of hedging in these journalistic blogs can be seen most clearly when writers offer a view which might contradict that held by their readers. In (3) two hedges indicate a tentativeness about vaccine efficacy followed by a statement underlining the certainty of its effect. In (4) we see the writer offering a tentative concession to those who regard antibody testing as an alternative to vaccination by checking if the subject has built some immunity to the virus, but then cautiously dismissing the idea.

(3) Otherwise, it's *probably* safe to assume that you're *pretty* well protected against BA.2 if you recently had COVID and recovered, and if you're current on your vaccines, you're *definitely* protected against severe illness. (H31)

(4) Antibody testing *seems* like a good idea in theory, but *may not* be entirely accurate (H32)

A key issue related to COVID-19 vaccination is that of side effects, a widely discussed, and frequently misrepresented, topic on social media. We find the wide deployment of hedges in these news blogs serves to both limit challenges from 'antivaccers' to categorical assertions about the safety of inoculation and to shape sensitive claims in a more dialogic and conciliatory way. Moreover, journalistic bloggers often feel no obligation to establish their credentials, so tend to tone down their claims especially when expressing personal evaluations:

(5) CDC data published in December found that for the millions of vaccinated kids ages 5 to 11, side effects have been *largely* mild and short-lived. (H8)

(6) GBS *may* also be a rare side effect of other infections and shots. (C50)

In academic blogs we still find a high use of hedges, but fewer than in the journalistic texts. They also appear to be used for a different purpose, toning down blunt assertions to ensure a professional presentation and scientific persona. Academic writing, whether for a peer or popular audience, seeks to strike a balance between avoiding over-assertiveness and ensuring appropriate assurance; indicating a suitable degree of certainty in the truth of a statement. While the public appetite for information about science, and particularly about covid vaccination, is huge, this audience may not overlap with that targeted by blogging journalists, perhaps comprising readers who have greater familiarity with scientific subjects. Indeed, Bondi (2022) claims that academic blogs are widely read by other academics.

Hedges here therefore mark appropriate scholarly caution, conveying the precise and measured discourse of the academy. While space, and the nature of the genre itself, does not allow scientists to present the detailed and often complex proofs they may use as evidence to persuade journal readers, hedges allow writers to soften claims. Thus in (7) a hedge is used to express a speculative judgement. In (8), however, we see a hedge used to present information with greater precision, as the writer refuses to claim too much for the relationship, and in (9) these two purposes are combined: specifying the accuracy with which we can accept the percentages and then refusing to claim too much for the role of antibodies in reinfection:

(7) Evidence also suggests that in severe cases of COVID-19, the killer T cells *may* be exhibiting immune exhaustion and therefore be unable to mount a strong immune response. (C7)

(8) While the components of mRNA vaccines are *almost* identical to the components in our cells, there are some differences. (C20)

(9) *Roughly* 84% to 91% of people who developed antibodies against the original strains of coronavirus were *unlikely* to be infected again for six months, even after a mild infection. (C26)

We can also see academic bloggers using hedges to create space for negotiations around the potential efficacy of research regarding COVID-19 vaccines, making scientific work in

progress more accessible to general audiences:

(10) Our results indicate that COVID vaccines *may* be *slightly* less effective in people who are underweight. Vaccinated people who were underweight were *around* 50% less likely to be hospitalised and *around* 40% less *likely* to die than their unvaccinated counterparts. (C48)

(11) These studies show vaccination is *likely* to substantially reduce virus transmission by reducing the pool of people who become infected, and reducing virus levels in the nose in people with breakthrough infections. (C59)

5.2 Boosters

While hedges tone down commitment or assertiveness, boosters indicate certainty. They help remove any doubts about claims and function to stress shared information, group membership and mark involvement and solidarity with the audience (Author 2, 1999; 2005). Boosters were significantly more frequent in the journalistic blogs (log Likelihood =10.45, $p < 0.01$) this is, at least in part, because bloggers on the *HuffPost* site are mainly journalists who are trained to provide clear and decisive information (Bos & Nuijens, 2020). More likely, however, is the fact that news bloggers are constructing a dialogue across discursive domains and, in speaking to a wider, less predictable audience, they need to ensure that their readers will recognize the significance of information. Boosters leave readers in little doubt of the writer's stance, as in these examples:

(12) This is an *extremely* important point when considering how those with PASC might respond to a vaccine. (H47)

(13) All of the available booster vaccines offer *excellent* protection against severe illness from Covid-19 (H60)

Pittinsky (2015) suggest that the public consumes journalistic news about science with a measure of scepticism and in this context, boosters can play a crucial role in increasing audience acceptance and buy-in to vaccine benefits.

In addition to strengthening their position to project conviction in statements, journalist bloggers in our sample also used boosters as a way to overcome possible objections. Here boosters offer a conciliatory comment, referencing what readers are likely to find reasonable by appealing to their assumed knowledge and values, as here:

(14) *Of course*, the idea would need to be rigorously discussed beforehand as ethics rules generally forbid deliberately infecting human beings with a serious disease. (H21)

(15) *Surely* they should have built up enough immunity to coronavirus naturally, some argue, so shouldn't need to have the shot as well. (H46)

These boosters invoke solidarity with readers by attributing to them beliefs which the blogger him or herself holds.

In academic texts, on the other hand, boosters present bloggers with a dilemma. On one hand they can underline their convictions in a research outcome or claim, on the other they run the risk of attracting criticism and losing reader support. As we have noted, bloggers are vulnerable to immediate and potentially caustic criticism and so closing down opportunities for disagreement with boosters may be tempting but risky. In addition, the fact that scientific knowledge is typically associated with uncertainty and potential refutation, academic bloggers are also more cautious of using assertive claims. This helps explain why boosters often collocate with hedges in presenting findings and arguments, as in these examples seeking to persuade readers to accept claims related to vaccination:

(16) And it's *certainly possible* a new variant will emerge from a nondominant pool of SARS-CoV-2, which is how omicron itself came to be. (C4)

(17) To understand this result, *I believe*, we *must* first explain that vaccines work in two ways. (C41)

Boosters do not only differ in frequency across the two types of blogs, however, but were also used differently. Following Author 2 and Author 1 (2021) we found that each booster performed one of three functions:

- *Intensity boosters*: amplify the emotive strength of a statement (*extremely, amazing*)
- *Extremity boosters*: emphasise the upper edge of a continuum (*highest, greatest, most*)
- *Certainty boosters*: indicate the writer's epistemic conviction (*definite, prove, show*).

Table 3 shows that intensity and extremity boosters were more frequent in journalistic blogs (log Likelihood =17.68, $p < 0.001$ for intensity boosters and log Likelihood =4.04, p

<0.117 for extremity boosters), while certainty boosters were significantly more frequently used by academic bloggers (log Likelihood = 7.49, p <0.023).

Table 3. Types of boosters in journalistic and academic blogs (per 1,000 words and %)

Booster type	Journalism blogs		Academic blogs	
	per 1,000 words	%	per 1,000 words	%
Intensity	12.48	82.81	8.25	71.04
Extremity	0.16	1.05	0.07	0.58
Certainty	2.43	16.14	3.29	28.38
Total	15.07	100.00	11.61	100.00

Intensity boosters, which add a strong personal endorsement to a statement, were overwhelmingly the most frequent in both types of blog and were particularly favoured by journalistic bloggers. These kinds of boosters contribute to the more opinionated character of journalistic blogs, adding “affective colour to writers’ claims” (Author 2 & Author 1, 2021, p.8). These are like intense attitude markers in their effect and support statements with greater emotional vigour (18). Extremity boosters, on the other hand, have similar, although very low, frequencies across the two types of blog. These act to grab readers’ attention, affect their attitudes and evoke an emotive response (19).

(18) ...side effects like seizures or allergic reactions are *extremely* rare. (H34)

(19) .. a variety of underlying medical conditions put people at *the greatest* risk of getting very sick or dying from COVID. (H24)

The more frequent deployment of certainty boosters in academic blogs is related to the need to claim epistemic certainty by highlighting the strength of evidence which supports a statement, whether this is spelt out or not. Certainty boosters are an authoritative means of standing behind a claim as they imply the writer has good scholarly reasons for making the claim and as such they carry considerable persuasive force in these blogs. They express a clear stance towards the certainty or truth of a proposition and were therefore important in promoting vaccination:

(20) It is *definitely* not a new concept to give pregnant women vaccines and they have been shown to be safe and protective. (C1)

(21) But this has still *proven* invaluable in controlling the virus. (C40)

Boosters, then, carry a clear signal of commitment and certainty designed to assure readers of the writer's stance. For journalists it is a strategy which conveys a strong position and for academics the suggestion that the information can be accepted with assurance.

5.3 Attitude markers

Attitude markers express the writer's affective, rather than epistemic, evaluations towards propositional information, conveying surprise, obligation, agreement, importance etc. (Author 2, 2005). By signalling affect and evaluation, writers are able to step into the discussion to assert their presence and present their personal stance. Perhaps surprisingly, attitude markers were slightly more frequent in the academic blogs (log Likelihood = -0.213, $p < 0.53$), although the difference was not significant. The findings concur with Biber & Egbert's (2017) multidimensional analysis of online registers which show that news reports tend to present a stronger emphasis on facts and events than on personal thoughts. As academics, even when blogging, tend to adopt some of the rhetorical conventions they are familiar with from more peer-focused texts (e.g. Author 1 & Author 2, 2019; 2022b). The public communication of research, however, encourages a more personal and engaging form of discourse which contributes to a rhetorically hybrid genre. Writers have more latitude to voice their individual reactions to material and offer more personal evaluation and commentary (Luzón, 2013).

The explicit marking of strong affect helps to convey the significance of their research and add weight to judgements on vaccination issues. They act as supporters for their own positions to shape the positions of others.

(22) Hospitalisations for COVID in adults have been falling due in a large part to the successful vaccination campaigns. But this is *sadly* not the case for children.. (C3)

(23) There are more *complex* analyses in ongoing field studies that involve the related concept of vaccine effectiveness. (C22)

In journalistic blogs, on the other hand, writers may be less concerned about conveying affect to strengthen the significance of statements than to create an emotional response in readers. News bloggers often select topics which may have a controversial dimension, or at least which are likely to attract different sides as this "may be particularly appealing as news" (Schneider, 2010, p. 176). Attitude markers, like boosters, can therefore help writers

to both take a personal view and encourage readers to see matters in the same way: boosters can show that the view expressed is reasonable, even incontrovertible:

(24) While the coronavirus is more *dangerous* to adults than to children, youngsters can get severely ill - and more than 350 children ages 5 to 11 have died, according to CDC's count. (H15)

(25) *Unfortunately*, as the vaccine is rolling out and determinations about its efficacy are being made, crowded sporting events and packed concerts won't become part of our new normal. (H33)

Our findings also show academics and journalists used attitude markers a little differently. Table 4 shows the distribution of attitude markers according to the categories suggested by Dueñas' (2010). These are used to modify:

- assessment (i.e., acuity, novelty, interestingness, validity, quality);
- significance (i.e., relevance, importance); and
- emotion (i.e., emotional judgements)

We can see that assessment (log likelihood =0.52, $p < 0.435$) and significance types (log likelihood =28.38, $p < 0.0001$) are more frequent in academic blogs although assessment difference is not significant. In contrast, emotion markers are significantly more frequent in journalistic blogs (log likelihood =24.73, $p < 0.0001$).

Table 4. Functions of attitude markers across types of blogs (per 1,000 words and %)

	Journalistic blogs		Academic blogs	
	per 1,000 words	%	per 1,000 words	%
Assessment	13.71	80.12	14.89	81.35
Significance	0.74	4.33	2.31	12.65
Emotion	2.66	15.55	1.10	6.00
Total	17.11	100.00	18.30	100.00

Attitude markers which offer the writer's assessment of the information provided is overwhelmingly the most frequent function, accounting for the 80% of all forms in both corpora. Evaluating the novelty, usefulness, or contribution of information is clearly a central aspect of both types of blogging and a key feature of research, where it gives academics an opportunity to take a more involved and visible position on matters.

(26) A *novel* feature of BA.4.6 is that it replicates more quickly in the early

stages of infection and has a higher growth rate than BA.5. (C50)

(27) The mRNA vaccines currently used in the U.S. against COVID-19 have been highly *successful* at preventing hospitalization and death. (C7)

This kind of personal assessment helps inject the writer into the text and encourage a heterogeneous audience to align with the argument of the topic.

Significance markers were more common in the academic blogs where researchers sought to ensure that their claims were correctly understood, particularly important in texts where arguments may be complex and occasionally misunderstood. In research articles, for example, forms underlining the importance of statements comprised about half of attitude markers (Author 2 & Other, 2021). For the academic then, as for the journalist, it offers a means to impress a personal stamp on the discourse and convey significance through an individual endorsement. It is an opportunity for writers to step outside the conventions of objectivity to reveal someone who shares a judgement with readers:

(28) ... these examples raise an *important* question: Just how prevalent is physician vaccine hesitancy, and why might some physicians hold negative views toward vaccines? (C8)

(29) Ever since the appearance of SARS-CoV-2 variants, a *crucial* question has been on everybody's minds: will vaccines developed to protect against the "original" strain also work against new variants? (C29)

Perhaps unsurprisingly, we are likely to find more emotion attitude markers in the journalistic blogs. While explicit sentiment is relatively rare in the academic blogs, journalists use it occasionally to align with an audience and stir the same feelings to better convey the message they are presenting. While the audience may be broad and relatively unknown, such evaluative statements represent the personal actor in the public sphere, a human response to social and medical exigencies around the pandemic (30 and 31). However, such expressions of explicit affect are not unknown in the academic blogs where writers have the freedom to convey their own feelings about research and so underline the significance of the statement (32):

(30) This all may feel *pretty grim*, and *rightfully* so. But there are ways you can keep yourself and your loved ones safe.. (H35)

(31) *Unfortunately*, experts seem to agree that it's unlikely a vaccine for COVID-19 in children will be available as soon as one (or several) is available for adults. (H36)

(32) This is *worrying* because it suggests that COVID vaccines might be less effective against BA.4.6.. (C9)

It is also interesting to note that academic blogs, once again, differ from personal blogs in this regard. Whereas journalistic bloggers frequently use features associated with mental states to express their thoughts in an informal, colloquial manner (see Biber & Egbert, 2017), academic bloggers tend to avoid this feature. This points, once more, to the hybrid nature of academic blogs which sit between academic and personal writing.

5.4 Self-mention

Perhaps the most extensively studied aspect of writer stance is the use of first person. How we understand writers and their attitudes to their arguments and readers is heavily influenced by their choice of authorial presence: the extent they intrude into their texts with self-mention (Author 2, 2004). Table 2 shows that self-mention was significantly more frequent in the academic blogs (log Likelihood = 23.83, $p < 0.0001$), although it accounts for the smallest proportion of stance features in both blog types. Again, the finding is in line with Biber and Egbert's (2017) claim that News-opinion-blogs are detached and informational. rather than authorial involved.

Self-mention is an obvious strategy by which writers are able to insert themselves into their text and emphasize their own views or interpretations. For academics it is a rare chance to step outside the confines of academic conventions to stress their own contribution and gain credit for an exciting, difficult or important piece of research. Academic research carries greater authority and prestige than news blogging and perhaps writers feel more entitled to reinforce their personal role in vaccination research. Self-mention helps writers underline their role in research and indicate they are the source of a finding; a claim typically supported by research procedures:

(33) *Our* findings indicate that respiratory mucosal delivery of Ad-vectored multivalent vaccine represents an effective next-generation COVID-19 vaccine strategy. (C1)

(34) *We* found that politically conservative PCPs and those who previously contracted COVID-19 were 19% less likely to believe that vaccines in general are safe and effective. (C8)

Despite containing around 10 times more cases of self-mention than news blogs in our corpus, this is far fewer than other studies of academic blogs. Compared to the 4.2 cases per 1000 words in our 60 posts, Author 1 and Author 2 (2019) found 10.4 in their corpus of 30 posts and Author 1 and Author 2 (2022a) 10.0 in 75 posts. It seems that in the vaccination blogs writers are less inclined to use self-mention but prefer to create a strong authorial presence through other devices, most notably attitude markers. Speculatively, this may be because of the strong feelings that vaccination generates online and elsewhere so that academics prefer to be more cautious of stirring the generalized mistrust of experts which that debate engenders (cf Merkley, 2020).

Self-mention, as we have noted, was even less frequent in the news blogs, and it also seemed to convey a different function. Rather than using it to emphasise their stance towards the truth of their observations, journalist bloggers saw it as a way of connecting with readers. Thus, we get a sense of an attempt to engage and evoke shared experience with a wide internet audience (35):

(35) Earlier this week, *we* answered some of the most pressing questions parents of kids under 5 may have about the vaccine. Top of these for many parents and researchers are the side effects that may accompany the vaccine. (H9)

This effort to use self-mention for purposes of dialogic engagement with readers is most evident in the many examples where journalists combined the function with questions. Here writers empathetically relate to readers through placing emphasis on a shared concern; putting words into the mouths of readers by projecting on to them a question they might have before answering it immediately. This usage then, has a rhetorical purpose as they pull the reader into the argument and towards the blogger's response by adding the imaginary voice of a potential reader, (36 and 37):

(36) Why should *I* vaccinate my kid if they're low risk? (H8)

(37) What if *I* didn't get the Pfizer vaccine? (H12)

This is an interesting, and little discussed, function of self-mention which may be a

journalistic trope, or perhaps restricted to certain social media genres. Further research might illuminate this.

Once again, and as with the other stance features discussed here, journalists and academics differ in the frequency and function they make of these resources.

6. Conclusions

Focusing on a single issue which is both current and controversial, we have explored how two groups of professional writers take a stance towards that issue in seeking to present information and recruit agreement among a broad public audience. Clearly the blog offers both journalists and academics a platform for their ideas, observations and interpretations of research and events surrounding Covid-19 vaccination issues. But the blogosphere is a world in which virtually as many people express opinions as receive them, in contrast to a traditional mass media setting where communication is largely one way and allows only a limited response. Both journalists and researchers participate in this environment as relative interlopers, stepping into a genre very different from digital newspapers and research articles and with often different purposes and audiences.

The main purpose of these blogs is the need to convey ideas to a large and heterogeneous audience and, as Myers (2010) has observed, the primary concern of writers in doing so involves creating a credible self-presentation. We have shown that stance-taking is a defining feature of both news and research blogs posted on these prominent sites as writers position themselves in a crowded forum. But these two groups compete for attention for their work and their trustworthiness in different ways, with journalists favouring more epistemological features to stress the certainty of information and academics, perhaps relying on the credibility of their prestigious blogsite, home university or research knowledge, employing more affective and personal stances. The findings thus help lead to further discussion of registers in a continuous situational and metadiscourse space (Biber & Egbert, 2017), complementing the traditional analyses based on separate registers.

We recognise, of course, that our corpus is relatively small and that by focusing on COVID blogs we have restricted its generalisability further. *Huffpost*, moreover, may be an atypical blog site, at the more 'respectable' end of this turbulent forum, limiting our observations to more 'responsible' posts and neglecting those projecting different views or wishing to spread misinformation or hoaxes. Clearly there is space for further research into the ways writers at the other end of this communicative spectrum display their views as distinctive

and claim an entitlement to hold very different positions. We have however, laid out a baseline founded on the largest and most respected site for news blogs in the world.

It is difficult to assess the impact of these blogs in an environment where vaccine sceptics, political opportunists, Big Pharma, and any number of medical advice sites clamour for attention. The scale and scope of social media clearly possesses enormous potential for harm through misinformation, deception and frauds. But by restricting our study to academic and journalistic blogs and by examining *discourse* and the *process* of stance-taking, rather than the stance itself, we hope to have shown something of how reasoned contributions to vaccine debates are presented. This is because, in conveying their judgements, opinions and commitments to what they say, these writers are not only seeking to construct convincing arguments, but also credible personas. The extensive use of hedges, measured ways of expressing certainty, restricted explicit presence and moderate attitudes help to build audience confidence in what they are reading and the character of the writer. In this way, discourse analysis can contribute to our understanding of persuasion in public arenas and to the ways healthcare messages may be effectively disseminated.

References

- Anthony, L. (2018). *AntConc (version 3.5.7) [software]*. Tokyo, Japan: Waseda University.
- Author 1. & Author 2. (2019).
- Author 1. & Author 2. (2022a).
- Author 1. & Author 2. (2022b).
- Author 2. (1996).
- Author 2. (1999).
- Author 2. (2004).
- Author 2. (2005).
- Author 2. & Author 1. (2021).
- Author 2. & Other. (2021).
- Bednarek, M & Caple, H. (2012). *News Discourse*. London: Continuum.
- Biber, D. (2006). Stance in spoken and written university registers. *Journal of English for Academic Purposes*, 5, 97-116.
- Biber, D., & Egbert, J. (2017). *Register Variation on the Web*. Cambridge University Press.

- Biber, D., & Finegan, E. (1989). Styles of stance in English: Lexical and grammatical marking of evidentiality and affect. *Text*, 9, 93-124.
- Biber, D., & Zhang, M. (2018). Expressing evaluation without grammatical stance: Informational persuasion on the web. *Corpora*, 13(1), 97-123.
- Bondi, M. (2022). Dialogicity in individual and institutional scientific blogs. *Publications*, 10(9), 1-20.
- Bos, M., & Nuijens, F. (2020). Science journalism. In F. van Dam, L. de Bakker, A. M. Dijkstra & E. A. Jensen (Eds.), *Science communication: An introduction* (pp.119-144). World Scientific Publishing.
- Bruns, A., Highfield, T. (2012). Blogs, Twitter, and breaking news: The produsage of citizen journalism. In Lind, R. A. (Eds.). *Producing theory in a digital world: The intersection of audiences and production in contemporary theory*, vol. 80, (pp. 15-32). Peter Lang Publishing, United States.
- Burel, G., Farrell, T. & Alani, H, (2021). Demographics and topics impact on the co-spread of COVID-19 misinformation and fact-checks on Twitter. *Information Processing and Management*. 58 (6). <https://doi.org/10.1016/j.ipm.2021.102732>
- Curry, N., & Pérez-Paredes, P. (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.
- Domingo, D., & Heinonen, A.R.I. (2008). Weblogs and Journalism: a typology to explore the blurring boundaries. *Nordicom Review*, 29(1), 3-15.
- Dueñas, P. M. (2010). Attitude markers in business management research articles: A cross-cultural corpus-driven approach. *International Journal of Applied Linguistics*, 201, 50-72.
- Freeman, D., Loe, B., Chadwick, A., Vaccari, C., Waite, F., Rosebrock, L., Lambe, S. (2020). COVID-19 vaccine hesitancy in the UK: The Oxford coronavirus explanations, attitudes, and narratives survey (Oceans) II. *Psychological Medicine*, 1-15.
- Glik, D. C. (2007). Risk communication for public health emergencies. *Annual Review of Public Health*, 28, 33-54.
- Gotti, M. (2014). Reformulation and recontextualization in popularization discourse. *Ibérica*, 27, 15-34.
- Hermida, A. (2009). The blogging BBC. *Journalism Practice*, 3:3, 268-284
- Herring, S., Stein, D., & Virtanen, T. (Eds.). (2013). *Pragmatics of computer-mediated communication*. DeGruyter.

- Kirkup, G. (2010). Academic blogging: Academic practice and academic identity. *London Review of Education*, 8(1), 75-84.
- Krause, N., Freiling, I. Beets, B. & Brossard, D. (2020) Fact-checking as risk communication: the multi-layered risk of misinformation in times of COVID-19, *Journal of Risk Research*, 23:7-8, 1052-1059
- Lyu J.C., Han, E. L.& Luli, G.K. (2021). COVID-19 Vaccine-Related Discussion on Twitter: Topic Modelling and Sentiment Analysis. *Journal of Medical Internet Research*. 29;23(6), e24435.
- Mahrt, M. & Puschmann, C. (2014). Science blogging: an exploratory study of motives, styles, and audience reactions. *Journal of Science Communication*, 13(3), 1-17.
- Martin, S., Kilich, E., Dada, S., Kummervold, P. E., Denny, C., Paterson, P. & Larson, H. J. (2020). “Vaccines for pregnant women...?! Absurd”: Mapping maternal vaccination discourse and stance on social media over six months. *Vaccine*. 29;38(42), 6627-6637.
- Matheson, D. (2004). Weblogs and the Epistemology of the News: Some Trends in Online Journalism, *New Media & Society*, 6(4): 443-468.
- McGrath, L., & Kuteeva, M. (2012). Stance and engagement in pure mathematics research articles: Linking discourse features to disciplinary practices. *English for Specific Purposes*, 31, 161-173.
- Merkley, E. (2020). Anti-intellectualism, populism, and motivated resistance to expert consensus. *Public Opinion Quarterly*, 84(1), 24-48.
- Metcalf, J. (2020). Chanting to the choir: the dialogical failure of antithetical climate change blogs. *Journal of Science Communication*. 19(2), A04.
<http://dx.doi.org/10.22323/2.19020204>.
- Myers, G. (2010). Stance-taking and public discussion in blogs. *Critical Discourse Studies* 7(4), 263-275.
- Pavlik, J.V. (2001). *Journalism and New Media*. Columbia University Press, New York.
- Pittinsky T. L. (2015). America’s crisis of faith in science. *Science*, 348, 511-512.
- Powell, D. A., Jacob, C. J., Chapman, B. J. (2012). Using Blogs and New Media in Academic Practice: Potential Roles in Research, Teaching, Learning, and Extension. *Innovative Higher Education*, 37, 271-282.
- Qin, W., & Uccelli, P. (2019). Metadiscourse: Variation across communicative contexts. *Journal of Pragmatics*, 139, 22-39.

- Schneider, J. (2010). Making space for the “nuances of truth”: Communication and uncertainty at an environmental journalists’ workshop. *Science Communication*, 32(2): 171-201.
- Scott, M. (2020). Facebook’s Private Groups are Abuzz with Coronavirus Fake News. *Politico*. <https://www.politico.eu/article/facebook-misinformation->
- Scotto di Carlo, G. (2014). The role of proximity in online popularizations: The case of TED talks. *Discourse Studies*, 16(5), 591-606.
- Spring, M. (2020). Coronavirus: The Human Cost of Virus Misinformation. *BBC News*. <https://www.bbc.co.uk/news/stories-52731624>
- Tasnim, S, Hossain, M. M., Mazumder, H. (2020). Impact of Rumors and Misinformation on COVID-19 in Social Media. *Journal of Preventive Medicine and Public Health*, 53, 171-174.
- Wall, M. (2005). ‘Blogs of war’: Weblogs as news. *Journalism*, 6(2), 153-172.
- Wilson, G. (2006). Down with blogs... so here’s another. *BBC News*, June 26. Accessed 4th Oct. 2022, <http://news.bbc.co.uk/1/hi/magazine/5116654.stm>
- Wilson, S.L., & Wiysonge, C. (2020). Social media and vaccine hesitancy. *BMJ Global Health*, 5(10), e004206.
- Wu, B., & Paltridge, B. (2021). Stance expressions in academic writing: A corpus-based comparison of Chinese students’ MA dissertations and PhD theses. *Lingua*, 253, 103071.