

Persuasion in science communication

Empirical findings on scientific weblogs

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Science communication has gained high importance in the current knowledge and risk society. Nevertheless, there is still a lack of qualitative studies on how non-experts and experts engage in opinionated scientific debates and which linguistic devices they use to gain influence on other people's attitudes toward a scientific issue.

In our study, we examine dialogical modes of science communication (i.e. weblogs) used by bloggers and audiences to engage into opinionated discourse about scientific endeavors. As those exchanges easily lead to controversies between different points of views, stances and attitudes, we focus from a rhetorically-driven linguistic perspective on devices to persuade the other participants and readers and to control the discourse. Hence, we ask which linguistic instruments are used to gain influence on influence. The aim of our study is to get deeper insights into the persuasive strategies mainly used in those forms of external science communication.

Keywords: persuasion, science communication, rhetoric, ethos, logos, pathos, dialogue analysis, science blogposts

1. Introduction

The current media system, which offers ways of expressing oneself publicly to everybody (e.g., Grabe & Ozen, 2021), supplies formats that invite dialogue in science communication. This dialogue on scientific issues is further fostered by an ongoing pluralisation, fragmentation, and polarization of public debate (Schäfer & Metag, 2021). Current public discourse about science yields not only informing and explaining, but also arguing and narrating. Arguing and narrating can both imply persuasive communication (e.g., Bleumer et al., 2019; Ehlich, 2014; Bilandzic & Busselle, 2013). Hence, persuasion as a core element of rhetorics should be factored in linguistic analyses on science communication: How do people persuade, or try to persuade, each other on scientific topics? Which rhetorical

devices and strategies are used in this process of persuasion? Persuasion can be used in internal science communication, for instance, in controversies within a research field (Fritz, 2020). But it is especially visible in external science communication, where other societal stakeholders can be involved (from politics, NGOs, civil society etc.). The question arises how persuasive communication is used in external science communication. In this study we investigate popular scientific weblogs from two German weblog platforms. Starting from a rhetorical analysis of persuasive communication, we apply dialogue linguistic methods to analyse the blog posts and the follow-up commentaries in two steps, hence targeting persuasive potential in the blog post and persuasive dialogue in the commentaries. The aim of this study is twofold: To describe how rhetorical devices are put to use with linguistic aims, and to assess if the blog post itself triggers persuasive communication. This examination therefore gives insights on negotiation practices used by non-experts in dialogical forms of science communication and on how they try to heighten their persuasiveness in controversial debates.

2. Persuasion in science communication

2.1 Persuasion

Defining “persuasion” is not a trivial task as it is a frequently used term in many different scientific contexts (Gardikiotis & Crano, 2015). In our paper, we focus on a rhetorically driven linguistic perspective on persuasion, which seems to fit best with a linguistic approach to written forms of persuasive science communication. Rhetorical communication can be understood as a target-oriented communication in which a speaker or writer tries to gain influence on the mental orientation of the audience by using “linguistic devices which express the intent of his utterance most appropriately and effectively” (Fix et al., 2008, p. xi). In addition to this, rhetorical communication strongly focuses on the participants of the communication process and takes into account their linguistic and non-linguistic actions during the communication. Rhetorics can be seen as a highly actor- and hearer-centred communication concept and therefore seems to be an appropriate approach to interactional processes in science communication.

Since antiquity, there is a tight connection between rhetorical communication and persuasion to be stated. Rhetorical communication aimed (and still aims) to change the addressees’ attitudes, stances and/or behaviour. It even can be used to initiate actions, as we can observe in advertisements and election campaigns, for example.

However, it would be too undifferentiated to equate rhetorical communication with persuasion. Persuasion is a core element of rhetorical communication and consists of several communicative strategies which are suited to achieve the aim of changing the addressees' mental orientation. Still, the process of persuasion can only take place if there is a discrepancy between the speaker's and the addressees' stances. It is an important condition that the speaker's mental orientation about the truth or legitimacy of his or her position are fixed, whilst the addressees do not yet have any consolidated mental orientations about the speaker's claims or they even have contrary mental orientations about the speaker's claims (Rex, 2008, pp.142–143; see also Knape 1998).

Persuasion initiates a change of judgements, attitudes and convictions which may result in a change of behaviour or in performing a specific action (see also Chow 2022, in this volume). Those mental shifts regard for example the dimension of truth or likelihood (*the conviction that sth. is true/wrong; likely/unlikely*), the dimension of evaluation (*the conviction that sth. is good/bad; beautiful/ugly*), the dimension of validity (*the conviction that sth. is valid/invalid*) or the dimension of action (*the conviction that sth. should/should not be done*) (Knape, 2013, p.875).

According to Ortak (2004, p.152) the process of persuasion consists of three strategic operations: The speaker expresses an evaluative statement (POLARIZING) to which he claims legitimacy (PROFILING). These two operations are implemented by the formal-sequential principle of PLAUSIBILIZING (making the statement plausible). This process is successful, if the addressee accepts the plausibility of the expressed statement, which indicates the shift of mental orientation.

Nevertheless, because of its dialogic character, there is no guarantee that persuasive communication attains its aims. In terms of speech act theory we have to differentiate between the illocutive act, which focuses the speaker's intention of TRYING TO PERSUADE, the perlocutionary act, which focuses the intended reaction of the addressee, and the perlocutionary effect, which focuses the addressee's mental orientation of BEING PERSUADED. Hence, persuasive communication can only be successful with the addressee's participation in this process (Ortak, 2004, p.137). According to the findings of modern social science persuasion research, the occurrence of the perlocutionary effect depends on aspects such as the level of education, age, self-image and belief in authority (Rex, 2008, p.149; see also Ham 2022). Nevertheless, via a dialogue-oriented analysis of texts, the persuasive potential can be detected.

Traditional rhetoric theory, following Aristotle, distinguishes between three elements of persuasive impact which are used in persuasive communication: Logos, ethos and pathos (Kramer, 2020; Schönbach, 2016, p.21). These three ele-

ments usually occur in combination with each other, as they support each other. They are used as strategic devices to perform the process of persuasion described by Ortak (2004).

Although there are also differences in defining these three elements, they will be understood as follows in this study. Logos, in a broad sense, refers to the linguistic design of a persuasive communication, but in a narrower sense it refers to all forms of fact-oriented argumentation and its formal requirements (Hamimid, 2015, p. 47; Jakob, 2007, p. 124).

Ethos refers to the speaker's qualities with which he or she intends to win the addressees' favour. In particular, the qualities of credibility and reliability play a role in this context. These qualities can be attributed to the speaker before the persuasion process begins, but they can also be generated in the course of the persuasion process through the speaker's ability of self-presentation or charisma (Mouchel et al., 2013; Jakob, 2007, p. 123–124, see also Niebuhr & Silber-Varod 2022, in this volume). Ethos seems to have a high impact on persuasive communication and underlines that persuasion is mainly a process of personalized communication (Hamimid, 2015; Ortak, 2004, p. 17; Jakob, 2007). In terms of modern persuasion research, ethos can be equated with the notions of "source" or "source credibility". It retains its credibility from linguistic factors like eloquence as well as from extralinguistic factors like competence, self-presentation, professional or social state, level of education or shibboleth issues (Rex, 2008, p. 146–148). Whilst antique rhetoric theory refers to ethos as a device that mainly depends on the speaker's actions, modern theories take into account that there are some influential factors that are out of the speaker's reach. In this sense ethos is a communicative category, as Ortak (2004, p. 20) outlines, because it depends on mutual perceptions and expectations of speaker and audience.¹

Pathos, finally, means the emotional appeals during a process of communication. In persuasive contexts, it is used to influence and direct the emotional states of the addressees.² Pathos-based communicative devices can heighten the emotional receptivity of the addressees, which can result in a shortcut to the perlocutionary effect (Hamimid, 2015, p. 47; Jakob, 2007, p. 124). However, the use of emotional appeals often results only in short-term persuasion as modern approaches like the Elaboration Likelihood Model suggests (Petty & Cacioppo, 1986).

1. From a social psychological perspective, the interrelation between mutual perceptions and persuasive impact regarding robot-human-interactions is examined by Ham 2022, in this volume and by Langedijk & Ham 2022, in this volume.

2. As an example, laughter in face-to-face-communication can influence the addressee's emotional state, as psychological theories suggest. In his study, Mills et al. (2022, in this volume) examines the influence of written laugh particles in text based communication.

Analysing persuasive science communication linguistically from a rhetorical driven point of view means taking into account these three elements of persuasive potential and their interplay in concrete communicative situations (see also Gottschling & Kramer, 2021; Kramer, 2020). Therefore, it can provide new insights into the influence on influence in communicating scientific issues to a broader audience.

2.2 Persuasion in science communication

In this study we are focussing on external science communication, ‘external’ in the sense of addressing and communicating with audiences potentially beyond the community of a scientific field and especially including non-researchers. It encompasses communication at the individual and institutional level, with different communicative aims and roles in society (e.g., roles as different as journalism and institutional or strategic PR, but also communication at museums or schools) and communication about all sorts of sciences, from STEM to social sciences and humanities (Bonfadelli et al., 2017).

A very simple model of science communication could assume that by just informing the public in an understandable and fact-related way about scientific issues (for instance, filling a ‘knowledge deficit’), not only understanding but also acceptance of a scientific worldview and science-driven societal decision would thrive. That model is labelled the *deficit model* of science communication, and it has failed to be substantiated empirically (cf. Schmidt-Petri & Bürger, 2020; Priest; 2019). Just informing people can even lead to a boomerang effect (Hart & Nisbet, 2011), increasing public polarization and fostering antiscientific thought and action. One reason why ‘facts are not enough’ (Hornsey, 2020) is motivated reasoning within publics. Its effect on fostering unorthodox beliefs concerning science (opposing human-made climate change or vaccination or believing in chem trails) has been investigated, for example, by Kahan (2013). How to prevent notable parts of the public to believe in ‘bullshit’ (Frankfurt, 2005), or to detect ‘merchants of doubt’ (Oreskes & Conway, 2010) who use persuasive tools to delegitimize science as a basis for political decisions, is a virulent matter in many social sciences. Part of the research is concerned with the question on how to tailor messages in order to reach campaigning goals (e.g. Luong et al., 2019), for instance, for vaccination campaigns (e.g. Betsch, 2020).

The “grand challenges” of humanity like climate crisis or the ubiquitous usage of Artificial Intelligence move scientific endeavours right into the middle of societal debate (Leßmöllmann, 2020). “Matters of fact” have thus become “matters of concern” (Latour, 2004). Oftentimes scientific work is triggered by societal needs (such as the search for alternative energy resources), and projects are co-designed

with scientists and citizens, NGOs, activists etc. working together. These facets of ‘mode 2’-science (Nowotny et al., 2003) are intrinsically communicative, crossing borders of jargon and level of scientific background and yielding debate. Besides, the current media environment is intrinsically dialogical, giving all publics the opportunity to publish and foster debate. Hence, newer models of science communication conceive of it as a bi- or multidirectional public engagement with science or dialogue model, with science finding itself even in the challenged position to not be in control of the whole communication process all the time (i.e., Schmidt-Petri & Bürger, 2020).

As science is challenged and debated in an increasingly value- and identity driven world, the role and the manifestation of persuasive communication concerning scientific issues come to the fore (i.e., Gottschling & Kramer, 2021). People will not be convinced that something is true, or believable, just by telling them facts. As Hendriks et al. (2015) have shown, criteria like competence, benevolence and integrity influence how credible an expert is perceived. Experimental pragmatics shows under which circumstances the credibility of an expert is ranked higher than the quality of her or his argument (“guru effect”, Sperber, 2010; see also Martin et al., 2017). Hence, to make someone believe with good reasons that something is in fact the case and should be taken into consideration for attitudes and actions is an important factor in science communication. The question arises how persuasion occurs on the linguistic level, and how this may depend on the mediated context, i.e., in Weblogs (Meiler, 2018), and how persuasive communication unfolds in dialogue. Therefore, we need closer insights into linguistic strategies of persuasive science communication, which do not only take into account the texts of science communicators but also the comments of the audience. Research on dialogue-based science communication aims to understand how non-experts express their opinions and ideas about scientific issues and which linguistic strategies of persuasion they use. In this way, it would be possible to gather a more holistic picture of persuasive science communication which might help to improve the dialogue between professional science communicators and the public.

Nevertheless, we have to state, that these approaches still are a more or less unprocessed field of linguistic science of science communication. Our paper is intended as a proposal to work on this field.

3. Informal science communication: Popular science blogs

Since the development of the web 2.0 as a user orientated interface that facilitates the publication of content on the internet, the genre of weblogs emerged with great

success. Considering weblogs as an ideal platform to publish and discuss their research beyond academic borders, scientists early adopted weblogs for their purposes (Angler, 2020, p. 3). In Germany, in the early 2000s, two platforms emerged which provide a non-institutional environment where scientists are able to communicate their research knowledges, their approaches and their considerations about the scientific system to a diverse audience: *SciLogs*³ and *Scienceblogs.de*⁴ (Wenninger, 2019; Fischer, 2012). These two platforms are the most known and frequented ones in Germany (Lobin, 2017, p. 226). Nevertheless, there are further science blogging platforms, like *Hypotheses*,⁵ but they tend to address a narrower community of scientists. Therefore, we can distinguish between blogging platforms that provide a rather internal form of science communication like *Hypotheses*, aiming at a dialogue between scientists, and those which open up to broader publics. Since the focus of our study is on the aspect of multidirectional persuasion processes between bloggers and non-expert commentators, we excluded platforms like *Hypotheses* from our sample.

An increasing number of scientists runs a science blog more or less frequently, due to the fact that those forms of external science communication gain more and more acceptability in the scientific community. These communicative activities, however, are mostly not part of the professional workload of the scientists, but rather a voluntary occupation. Hence, the scientists usually do not represent their institutions with their blogging activities and usually do not gain supplemental scientific rewards for those activities from their institutions. Still, blogging activities may be used as instruments of self-representation to wider publics.

Nevertheless, science blogging is not an exclusive domain for scientists. There are also professional science communicators, science journalists or non-professionals⁶ in the scientific blogosphere, who reach with their blog posts a wide range of readers (Jarreau, 2015, pp. 137–141; Mahrt & Puschmann, 2014). In addition to this, there is also an increasing number of new actors who also run a Youtube channel and/or engage in further social media and who may have an activist background. In many cases, they blog during their freetime and they are not paid for it, as we can deduct from their self-descriptions in their blogs and from comments in the comment-sections of their blog posts.

3. <https://scilogs.spektrum.de>

4. <https://scienceblogs.de>

5. <https://de.hypotheses.org>

6. Non-professionals means in this context people who do not work in the field of science or science communication, but who might have an academic background as holding an academic degree.

Blogging activities in popular science blogs usually do not follow strict, canonised rules and forms such as published scientific papers. Hence, we can state a wide range of diverse forms of science blogging. For this reason, we can consider these blogging activities as informal science communication which is not bound to institutionalized methods and devices of scientific publishing like peer review (Henning & Kohler 2020; Wenninger, 2019; Lüthje, 2017).

Science blogs often address a heterogenous public of interested readers who do not necessarily have a disciplinary or even academic background. These blogs constitute more than a monological form of science communication as they offer the opportunity to engage in discussions about the contents of the blog posts via a comment section most blogs hold. Hence, they can be understood as an invitation to an exchange between bloggers and readers (Hanauska & Leßmöllmann, 2018).

The comment sections are in many cases highly frequented. An analysis of the first hundred blog posts published in 2020 on the *Scilog's* platform revealed a total number of 3091 comments, which makes an average number of about 31 comments per blog post. On *Scienceblog.de* we counted a total number of 2110 comments for the first 100 blog posts released in 2020, which makes a slightly lesser average number of about 21 comments per blog post.

Therefore, science blogging can be considered as an instrument of public engagement with science (Schmidt-Petri & Bürger, 2020) as blogs offer a forum to people interested in science to get involved in scientific discussions and to exchange with scientists and peers. Science blogs can replace static forms of one-way-communication by dynamic forms of bi-directional communications about science.

Additionally, science blogs offer scientists the opportunity to position themselves in scientific controversies (Fritz, 2020) and/or to publicly express societal demands from scientific research. Thus, science blogs can also be a platform to provide a normative or politized view on scientific research and knowledge.

However, the encounter between scientists and readers is not always free of conflicts, which are worked out in the comment section of the blog post. Those activities are highly interesting with respect to how and in which ways public engagement with science takes place. We can consider those conflicts as negotiation practices dealing with questions like “what is science”, “what are good scientific standards” or “which social consequences may or must scientific research entail?” Therefore, comment sections may give a good insight into perceptions of science and the scientific system.

Still, negotiation processes can even start from a more fundamental level, as they can provide a common ground with respect to scientific concepts and terms. Ethnomethodological approaches to negotiation processes describe them as mutual activities to create common ground about a subject (Clark, 2007; Clark

1992; Dieckmann & Paul, 1983; Kallmeyer, 1981), which takes place in everyday interactions.

In the context of persuasive communication, common ground negotiations seem to be an important requirement, as Kosta (1995) points out: If persuasion is to be successful, then the communication partners should have common ideas and meanings of main subjects of the contentious issue. “Equal prior information must apply with regard to knowledge of the world, encyclopaedic knowledge, denotate knowledge in the rational and emotive spheres. This includes equal expectations, fears, likes, dislikes, etc.” (Kosta, 1995, pp.311–312).⁷

Though there is still a lack of precise empirical data, we presume a significant number of common ground negotiations in blog post discussions which lead into higher level negotiations about the questions mentioned above. The blog post itself may trigger those negotiation practices if, for example, it demands prior knowledge or if it does not use a precise terminology.

4. Persuasive communication in science blogs

Persuasive communication can occur if the claims, which are set in the blog post, do not meet (or aren't assumed to meet) with the stances or believes of the readers. As we mentioned above, a precondition of persuasion processes is the discrepancy in the mental orientation between the communication partners and the desire of at least one communication partner to change the other's mental orientation. Therefore, the starting point of persuasive negotiation processes is the expression of disagreement in at least one issue.

In our study, we tried to answer the questions (1) whether there are any features of the blog posts that may trigger a comment discussion, because the commentators disagree with the blog posts' contents and/or the way those contents are presented and (2) what are the persuasive strategies that the commentators use to make their points. To address these questions, we chose a two-step approach in which we first examined the textualization of the blog post to detect features which indicate a persuasive intention of the blogger. The aim of this step is to examine whether comment discussions mainly take place in blog posts that tease objections or whether comment discussions even take place if the blog posts do not intend to persuade the readers of a specific (and perhaps controversial) point of view.

7. In their paper, Fischer et al. (2022, in this volume) outline common ground as an indicator of shared situations which may have an effect on the persuasiveness of robot-instructions to human recipients.

In a second step, we analysed the objecting and criticizing comments in our sample of blog posts in regard of the use of specific persuasive strategies to answer the question how commentators try to persuade their addressees of their point of view.

In this study, we used a rhetoric and linguistic approach that focuses the linguistic surface of blog posts and comments to find indicators of a persuasive intention and to describe the persuasive devices used in the dialogic process of persuasive negotiation.

4.1 The sample

For our study, we initially gathered a sample of one hundred blog posts, which were released during the period from 1 January to 17 March 2020 to get a better overview of the blogging and commenting practices on the platform. In a second step, we randomly chose 1/10 of this entity for our qualitative research. The only specifications in selecting the blog posts were that they should derive from ten different blogs to guarantee a wide range of different blogs, disciplines and subjects and that each of them should at least gather 20 comments in the comment section to give insights into the readers/commentators' attitudes towards the blog post. With these measures we tried to make sure that our small sample represents the diversity of blogging and commenting practices as well as possible.

Table 1. Our blog post corpus

Title of the blog post	Short title	Comments	Date of release	Blog
Datenkolonialismus (engl.: Data Colonialism)	Data Colonialism	25	04.01.2020	Die Sankore Schriften
Die Sprachpolitik der AfD (engl.: The language policy of AfD*)	Language Policy	91	13.01.2020	Die Engelbart- Galaxis
3 Millionen Jahre Klimawandel in der Computersimulation (engl.: 3 million years of climate change in computer simulation)	Climate Change	110	17.01.2020	Klimalounge
Die ultra-diffuse Galaxie Dragonfly 44 – ein kleiner Sieg für MOND (engl.: The ultra diffuse Galaxy Dragonfly 44 – a small victory for MOND**)	Galaxy	34	19.01.2020	Prosa der Astronomie

Table 1. (continued)

Title of the blog post	Short title	Comments	Date of release	Blog
Kommt das Coronavirus aus dem Labor? (engl.: Does the corona virus derive from a laboratory?)	Laboratory	45	02.02.2020	Fischblog
Wissenschaft und Selbstbetrug. Warum es (noch) Mut braucht, auf Fleisch zu verzichten (engl.: Science and self-deception. Why one still needs courage to renounce eating meat)	Self-deception	148	05.02.2020	Natur des Glaubens
Technologien und Medien können digitalen Stress verursachen – aber können sie auch dabei helfen, ihn zu reduzieren oder vielleicht sogar zu verhindern? (engl.: Technologies and media can cause digital stress – but can they also help to reduce or even avoid stress?)	Stress	21	10.02.2020	Gesund-Digital-Leben
Der schelmische Erasmus (engl.: Mischievous Erasmus)	Erasmus	55	16.01.2020	Anatomisches Allerlei
Fake Science – Neue Gefahren für die Integrität der Wissenschaft (engl.: Fake Science – new perils for the integrity of science)	Integrity	123	23.02.2020	Beobachtungen der Wissenschaft
Corona Quarantäne: Übertrieben oder letzter Ausweg? – Warum wir jetzt handeln müssen (engl.: Corona quarantine: exaggeration or last resort? Why we have to act now)	Quarantine	23	11.03.2020	Marlenes Medizinkiste

* AfD = Alternative für Deutschland (German right-wing party)

** MOND = Modified Newtonian Dynamics (astrophysical hypothesis on the modification of Newton's law)

The blog posts gathered in our corpus treat subjects like climate change, corona virus, calculation of star movement, scientific decency, consumption of meat or

data policies of tech enterprises. Hence, it is a very illustrious collection of different topics.

4.2 Analysis: Detecting persuasive intentions in blog posts

To examine whether the blog posts themselves contain some sort of persuasive message, we analysed the dominant type of textualization evolved in the single blogposts' textualization and the modes of communication used in them. Textualization in this context means the composition of a text using certain linguistic patterns to introduce and shape the dominant subject of a text.

According to Brinker et al. (2014, pp.60–80), there are four types of textualization: the descriptive textualization pattern, in which the subject denotes a unique or repeatable process, a living being or an object, which is described in the process of text generation (Heinemann, 2000), the explicative textualization pattern, in which an issue that needs explanation is logically derived from established facts (Jahr, 2000), the argumentative evolvement, in which a contestable standpoint is justified with arguments (Eggs, 2000), and finally the narrative evolvement, in which a unique event is told in a narrative manner (Gülich & Hausendorf, 2000). With respect to persuasion, narrative (Bleumer et al., 2019; Bilandzic & Busselle, 2013) and argumentative (Ehlich, 2014, see also Meiler, 2018) textualization pattern of the subject may be performed as persuasive communication because they may start from a contentious issue that is clarified argumentatively and with persuasive aims in the course of the text. We regarded those blog posts in which we found a strong argumentative textualization as persuasive, as in most cases the argumentation goes hand in hand with the blogger's positioning towards the contentious question.

Additionally, we examined in which way the contents were presented: in a neutral, in an evaluative or a deontic mode. The neutral mode comprises a wording with lexemes deriving from an unmarked linguistic register that mostly bear only denotative meanings, whilst an evaluative mode consists of the use of lexemes with a connotative meaning (e.g. *discrimination, manipulation, fraud*), the use of irony or sarcasm, and/or the use of evaluation acts (e.g. *it is good/it is bad*).

The deontic mode, finally, includes all utterances which recommend a certain action (e.g. *something should/should not be done; it is/is not necessary to do something*).

We considered the existence of deontic utterances as a clear cue to a persuasive intention, as they function as appeals to the audience. Therefore, we assigned blog posts, which consisted of at least one deontic utterance, a persuasive intention.

The existence of evaluative elements, though, is not necessarily an indication of persuasive communication intention. However, if evaluative elements occur frequently, they suggest such an intention. We therefore considered blog posts in which evaluative elements occurred frequently (but which did not have an argumentative textualization or any deontic statements) as “potentially persuasive”, because the use of evaluative elements may indicate the blogger’s attitude towards a certain issue of which she or he wants to convince the readers. According to our analysis of textualization type and communication mode, we classified nine of our ten blog posts as persuasive or potentially persuasive. Yet, we stated differences in the degree of persuasiveness.

Except for one blog post (Erasmus), each one followed an argumentative textualization pattern. In two blog posts, we found argumentative patterns which were not as dominant as the descriptive and explicative patterns used in these texts (Data Colonialism; Galaxy). In the blog post Data Colonialism, we can presume a persuasive intention of the blogger, although it is rather on an implicit level, because of its high use of evaluative elements (e.g. words and phrases with a connotative meaning like *new forms of colonialism*, *new forms of discrimination*, *erosion of the social world*). In contrast to this, the blog post Galaxy has only a low degree of persuasive impact, as it is predominantly descriptive and does not contain any evaluative or deontic elements.

There are three further blog posts (Climate Change, Laboratory, Stress), which have argumentative as well as descriptive features, but which do not deal with evaluative or deontic elements.

Finally, there are four blog posts with a high persuasive potential as they consist of a mixture of argumentative text structure, evaluative elements and deontic statements. It is striking that these four blog posts deal with topics that allow and even demand a determined stance from the blogger: they are about scientific misconduct (Integrity), the need for lockdown and quarantine measures in the Corona pandemic (Quarantine), the environmental impact of industrial meat production (Self-deception) and the language policy of German right-wing parties (Language policy).

The persuasive potential in these four blog post occurs in deontic statements as “we will always have to fight for it [i.e. the integrity of science]” (Integrity 41),⁸ “we have to stop the expansion – NOW” (Quarantine 47),⁹ “[i]f we want to slow down the climate change that is already taking place, [...] then we need to speak about an honest and significant reduction of our meat consumption” (Self-

8. “Wir müssen stets ums sie kämpfen.“ (Integrity 41).

9. „Wir müssen die Ausbreitung verlangsamen – und zwar JETZT!“ (Quarantine 47).

deception 39)¹⁰ or “[t]herefore, we should not let the German language be captured by parties that reject this canon of values” (Language policy 84),¹¹ which mark the bloggers’ aims of persuasion. In combination with evaluative elements like words and phrases with a negative connotation,¹² they unfold their persuasive potential, which is already inherent in the argumentative structure of the text.

As a result of this part of our research, we can state that most blog posts contain certain persuasive features, which may trigger objecting or criticizing comments. But the example of the blog post Erasmus also shows that even posts that do not provide any intentions of persuasion may initiate a long comment discussion, which may start from the criticism of certain utterances of the blog post.

4.3 Analysis: Persuasion in the comment section

Based on these findings, we took a closer look at the comments in our sample in order to examine the relation between the features of the blog post and the existence of objecting and criticizing comments. Our sample consists of 675 comments, which amounts to an average number of about 67 comments per blog post. In fact, the distribution of comments was rather unequal. We had some blog posts with a high number of comments (Self-deception: 148 comments; Integrity: 123 comments), some blog posts with a moderate number of comments (Erasmus: 55 comments; Laboratory: 45 comments), and some blog posts with a rather low number of comments (Quarantine: 23 comments; Stress: 21 comments; see Table 2).

To examine the question, if there is a correlation between the persuasive intention of the blog post and persuasive communication in the comment section, we looked at those comments in which there was some form of objection or criticism of the blog post.

We defined objection as all forms of not agreeing with an utterance (e.g. “it is clearly not true that there is ‘merciless’ censorship here”, Erasmus comment 53)¹³ and criticism as all forms of expressing a negative evaluative statement towards

10. “Wenn wir den bereits stattfindenden Klimawandel wenigstens noch abbremsen wollen [...], dann müssen wir über eine ehrliche und deutliche Reduktion unseres Fleischverbrauches [...] sprechen.“ (Self-deception 39).

11. „Wir sollten die deutsche Sprache deshalb nicht vereinnahmen lassen von Parteien, die diesen Wertekanon ablehnen.“ (Language Policy 84).

12. e.g.: „Fake Science“ (Integrity 9), „circle of conspiracy theorists“ (Integrity 7), “claims to cultural dominance” (Language policy 79), “propagandistic communication” (Language Policy 79), “mass animal farms” (Self-deception 18), “disaster” (Self-deception 20), “tens of thousands of seriously ill patients” (Quarantine 35), “state of emergency” (Quarantine 40).

13. ”dass “gnadenlos” zensiert wird, das stimmt nachweisbar nicht.“ (Erasmus, comment 53).

a preceding utterance (e.g. “Your reply to Ko43 is so superficial, subjective and selective that it borders on Fake-News....”, Erasmus, comment 54).¹⁴ Therefore, we stated the total number of objecting and criticising comments without regard of what would be the target of the objection or criticism to get a first impression of the kinds of comments in the respective comment section. Then, we distinguished comments that object to or criticize the blog post’s contents itself.

In fact, we realized that in every blog post discussion, at least one comment expresses a deviating point of view to the blog post. This occurred even in comment sections of blog post with no or only little persuasive intention.

Table 2. Comment section

Blog post	Total number of comments	Total number of objecting comments	Objecting to the blog post	Total number of criticizing comments	Blog post critics
Self-deception	148	25 (16.9%)	9 (36%)*	28 (18.9%)	11 (39.3%)**
Integrity	123	27 (21.9%)	0	21 (17.1%)	5 (23.8%)
Climate change	110	15 (13.6%)	1 (6.7%)	17 (15.5%)	4 (68%)
Language Policy	91	27 (29.7%)	4 (14.8%)	23 (25.3%)	5 (21.7%)
Erasmus	55	9 (16.4%)	3 (33.3%)	8 (14.5%)	3 (37.5%)
Laboratory	45	10 (22.2%)	6 (60%)	6 (13.3%)	2 (33.3%)
Galaxy	34	7 (20.6%)	1 (14.3%)	7 (20.6%)	4 (57.1%)
Data Colonialism	24	16 (66.7%)	5 (31.3%)	0	0
Quarantine	23	9 (39.1%)	1 (11.1%)	1 (4.3%)	1 (100%)
Stress	21	10 (47.6%)	2 (20%)	1 (4.8%)	1 (100%)

* The percentage refers to the total number of **objecting** comments.

** The percentage refers to the total number of **criticizing** comments.

However, we stated that not all blog posts with a high persuasive intention received a high number of challenging comments, as we can see in the case of *Quarantine*, which received only one objecting comment, and *Integrity*, which did not receive any objecting comment at all. This means, the commentators

14. "Ihre Antwort an Ko43 ist so oberflächlich, subjektiv und selektiv, dass sie an Fake-New grenzt..." (Erasmus, comment 54)

agreed with the bloggers' positions or at least did not express their objections. At the other end of the scale ranges the blog post *Self-deception*, which received not only a high number of objecting comments (9) but a high number of comments in total (148). Those objections to the blogpost state 36% of the total number of objecting comments.

Yet, at this end of the scale we also find the blog post *Laboratory*, which elaborates if the new corona virus might have been created in a biotechnological laboratory, from which it could have escaped. As the author of the blog post comes to the conclusion that it is highly unlikely for the virus to be of artificial origin, quite a number of commentators doubt this assumption. In their objecting posts they take the view of there being strong indications that the virus was accidentally released from a Wuhan biotech laboratory:

- (1) "I think that it comes from a laboratory and is only sold to us differently because of mass panic...the question is which animal or fruit should have transmitted this supposedly unknown virus to the market...nothing is said about this and why not? Because the coronavirus was created in the laboratory – it's as simple as that." (comment 32)¹⁵

Comments like this may trigger a persuasive interaction between the blogger and the commentators, which might lead into an agreement of the conflicting positions. This requires the two parties to argue their points of view by argumentative, emotive or personal means. Assuming a rhetorical persuasion concept, this means that they use logos-, pathos- and/or ethos-based means to give their statements the necessary persuasive potential.¹⁶

Furthermore, there are comments that express critics with the blog posts' contents. Those comments equally play an important role in initiating a dialogical persuasive communication as they may force the blogger to defend her or his positions.

15. "Ich denke das er aus einen Labor kommt und es uns nur anders Verkauft wird wegen Massenpanik...die Frage ist ja welches Tier oder Obst sollte dieses angeblich unbekannte Virus denn auf den Markt übertragen haben dadrüber wird nichts gesagt und warum nicht??? Weil der Coronavirus im Labor entstanden ist so einfach ist das." (Laboratory, Comment 32; n.b.: spelling as in the original comment, M.H./A.L.)

16. However, in many cases we do not have evidence of the success or failure of the persuasive process, because of the specific conditions of comment communication: Commentators do not necessarily follow the discussion until its end. Sometimes they only leave one or two comments but do not monitor the further course of the discussion. Or they retreat from discussions in which they received much objection. In both cases, we do not have any hints if the persuasion process came to a successful end by convincing them of the opposite standpoint.

The blog post *Climate Change* describes a new model to simulate the development of climate during the past 2.6 million years. One of the first comments to this blog post criticizes the method of computer simulations and insinuates that it might be manipulated. This commentator questions the validity of the data and, on an implicit level, the credibility of this scientific method, which is a strong implicate reproach to scientific methods:

- (2) “Unfortunately, these are only simulations and anyone who knows about simulations knows that they can also be manipulated. If I’m seeing this wrong, then my geography and computer science studies were probably for nothing?”
(Climate Change, comment 6)¹⁷

This comment, which attacks the trustworthiness and credibility of the blog post, needs an intervention of the blogger, which follows immediately. The blogger makes transparent the insinuation that resonates in the criticising comment and in turn demands evidence for these claims. In this fashion, he weakens the commentator’s criticism and can restore his own credibility to some extent:

- (3) “Are you accusing the scientists of manipulation? Any reasons or evidence for this blatant accusation? A researcher would risk his career and job over something like this.”
(Climate Change, comment 7)¹⁸

These few examples already suggest that persuasive communication plays an important role in blog post discussions. To get closer insights into these persuasion practices, we examined the linguistic surface of the comments concerning the ways logos-, pathos-, and ethos-based devices were used to strengthen the own stance or to diminish the opposing standpoint.

4.3.1 *Logos-based devices*

In accordance with our above-mentioned view of logos as argumentative features, we interpreted those utterances that display argumentative structures as logos-based devices. We included all kinds of informal argumentation, which do not have to follow a strict structure of logical argumentation consisting of claims, premises, warrants and conclusion. These forms of informal argumentation are more common in ordinary language and everyday argumentation (Kienpointner, 1992; Toulmin, 1958), as for example in every-day instructions like “take your

17. „Leider sind das nur Simulationen und wer sich mit Simulationen auskennt, der weiß, dass man die auch manipulieren kann. Wenn ich das jetzt falsch sehe, dann war mein Geographie- und Informatikstudium wohl um sonst?“ (Climate Change, Comment 6).

18. „Wollen Sie den Wissenschaftlern etwa Manipulation unterstellen? Irgendwelche Gründe oder Belege für diesen krassen Vorwurf? Wegen so etwas würde ein Forscher seine Karriere und Arbeitsstelle aufs Spiel setzen.“ (Climate Change, Comment 7).

umbrella with you. It is very cloudy”. In these phrases we can find an argumentation *in nuce*, starting with the conclusion “take your umbrella with you”, which refers to an explicit premise “it is very cloudy” and an implicit premise “it will rain today”.

We stated that the majority of comments have argumentative structures, even if the relation between claims and conclusion is not always plausible.

Being aware of the scientific context of the discussions, many commentators use devices that remind of scientific techniques to heighten their persuasive potential. They cite scientific studies and papers, they link their citations with the mentioned studies, and in some cases even use footnotes to give their statements a scientific veneer.

- (4) “The embedding of the German language in the German constitution is not an invention of the AfD. The overview of the language policy positions in the programmes of the parties currently represented in the German Bundestag deals with the party programme of the CDU from 2007, but: Norbert Lammert (CDU), President of the Bundestag from 2005 to 2017, already advocated a corresponding amendment to the constitution in 2006, and on 2 December 2008 the federal party congress of the CDU decided, against the resistance of Angela Merkel, that the CDU would advocate anchoring the German language in the constitution. [1]

[1] <https://www.deutsch-ins-grundgesetz.de/hintergrund.html> and https://www.deutsch-ins-grundgesetz.de/hintergrund_geschichte.html.”

(Language Policy, comment 26)¹⁹

19. „Die Verankerung der deutschen Sprache im Grundgesetz ist keine Erfindung der AfD. Die Übersicht über die sprachpolitische Positionen in den Programmen der derzeit im Deutschen Bundestag vertretenen Parteien behandelt das Parteiprogramm der CDU von 2007, aber: Norbert Lammert (CDU), Bundestagspräsident von 2005 bis 2017, setzte sich bereits 2006 für eine entsprechende Grundgesetzergänzung ein, und am 2. Dezember 2008 beschloß der Bundesparteitag der CDU gegen den Widerstand von Angela Merkel, daß die CDU sich dafür einsetzt, die deutschen Sprache im Grundgesetz zu verankern.“ [1] (Language Policy, comment 26) [1] <https://www.deutsch-ins-grundgesetz.de/hintergrund.html> und https://www.deutsch-ins-grundgesetz.de/hintergrund_geschichte.html.“ (Language Policy, comment 26)

As a supplementary strategy to increase the credibility of the claim, commentators refer to exact data and numbers to avoid vulnerability, but also to strengthen their argumentation:

- (5) “In 2017/18, 25,000 people died in connection with (viral) flu. And that was only in Germany! Did that stop anyone, exhibitor or visitor, from participating? Has any event been cancelled?” (Quarantine, comment 10)²⁰

To heighten the persuasive potential of their statements, commentators often use formulae like “it’s a fact”, “it is beyond any doubt” or “in fact” to simulate facticity, even if they do not provide any evidence for their claims. The following example even uses two evidence-evoking formulae to boost the credibility of its rather steep thesis:

- (6) “That vegans have more mental disorders is **beyond any doubt. This is empirically proven.** A good overview can be found in 2018 Vegan diets: [review of nutritional benefits and risks by the Swiss federal authorities](#).” (Self-deception, comment 7)²¹

Although these strategies also may have an effect on the personal credibility of the commentators and therefore might be seen as ethos-based devices, we regard it important in this context that the formal adaption of scientific techniques in the commentators’ argumentations has an impact on the logical presentation of the argument. Hence, we understand these strategies primarily as logos-based devices.

4.3.2 *Pathos-based devices*

As we defined pathos in the section above as emotional appeals to the addressee, in our study we consider all kinds of linguistic devices that try to emotionalize the participants in the blog post discussions as pathos-based devices. These can be words and phrases with a (in many cases negative) connotation as well as ironic or sarcastic utterances or the outline of a negative or positive scenario.

We realized that many commentators used emotional appeals either in combination with argumentative structures or as sole device to underline their points of view:

20. „2017/18 starben 25.000 Menschen in Verbindung mit einer (Virus-)Grippe. Und das allein in Deutschland! Hat das irgendjemanden, Aussteller oder Besucher, von einer Teilnahme abgehalten? Wurde irgendeine Veranstaltung abgesagt?“ (Quarantine, comment 10)

21. „Dass Veganer mehr mentale Störungen haben ist ohne jeden Zweifel. Das ist empirisch gesichert. Eine gute Übersicht findet sich in 2018 [Vegan diets: review of nutritional benefits and risks der Schweizerischen Bundesbehörden](#) [Link with the document].“ (Self-deception, comment 8)

- (7) “The handling of the coronavirus is **pure hysteria**. Most of the people who have died and will die from this would have died promptly anyway due to their age and pre-existing conditions.” (Quarantine, comment 10)²²
- (8) “The existing, **mendacious** and **corrupt** system of **absolutist** parliamentarism has proven, and continues to prove, **incapable** and **unwilling** to take significant steps towards effective climate action” (Climate Change, comment 68)²³

Based on the results of our study, we can say that pathos-based devices are often used to devalue the opponent’s position. This may be a strategy to compensate for the lack of valid arguments for one’s own position. This is clearly shown by the use of words and phrases with negative connotations like “prohibition of thought” (Integrity, comment 28), “paternalism” (Self-deception, comment 25); “climate protection as a substitute religion” (Self-deception, comment 47); “Castle in the air without a base” (Galaxy, comment 3); “ideologically contaminated hypocrites” (Quarantine, comment 18), to mention only a few.

Pathos-based devices also become manifest in the evocation of negative scenarios, as can be seen in the following example: To increase the persuasive impact of his standpoint that the data collecting activities of tech enterprises are perilous, the blogger sketches a picture of the misuse of data for military purposes in his comment during the discussion:

- (9) “Facebook photos could, for example, be sold to a security company that wants to improve the facial recognition software of its cameras using Deep Learning. The user has nothing to gain from this and Facebook will not and does not want to take responsibility for what third parties do with the user’s data. What if the cameras of this security company are used in armed drones that kill people in the cities of the Middle East?” (Data Colonialism, comment 12)

The suggestion of supposed dangers does not even need to be particularly justified, as we can see in the next example, which talks about perils emanating from Gender Studies:

22. „Der Umgang mit dem Coronavirus ist pure Hysterie. Die meisten Menschen, die gestorben sind und daran noch versterben werden, wären so oder so auf Grund ihres Alters und ihrer Vorerkrankungen zeitnah gestorben.“ (Quarantine, comment 10).

23. „Das bestehende, verlogene und korrupte System des absolutistischen Parlamentarismus hat sich nachweislich als unfähig und unwillig erwiesen, und tut es weiterhin, signifikante Schritte für einen effektiven Klimaschutz zu unternehmen.“ (Climate Change, comment 68).

- (10) “So-called gender studies, feminist anthropology, including feminist linguistics, [...] are even dangerous if they become extreme and crowd coercive, in much the same way as an unfavourable linguistic conservatism.”

(Language Policy, comment 43)²⁴

4.3.3 *Ethos-based devices*

Ethos, finally, can be regarded as a reference to somebody’s personal qualities, as we defined earlier. We put these devices at the end of our overview, because it seems to have the utmost effect on the participants in the discussions. Every single post is a mosaic stone in the construction of the blogger’s or the commentator’s virtual personality. As they form a virtual community and most unlikely meet in real life, the creation of their virtual personality is mainly based on their utterances in the discussions and have a strong effect on their virtual reputation. As we can state, many commentators are part of a long-term community of the blogging platform,²⁵ they engage quite regularly in blog post discussions and therefore have in many cases already constructed a kind of virtual personality. This has an impact to their credibility and reliability in the discussion.

During the discussion, the commentators can use special strategies to heighten (or improve) their personal impact by referring to their professional competences or to their experiences in a specific context.

- (11) “K 030 has been in the field of network-based communication for more than 40 years, as an early adopter, so to speak, [...]” (Stress, comment 18)²⁶
- (12) “Interestingly enough, as a **religious scholar** I experience it exactly the other way round.” (Self-deception, comment 105)²⁷

24. „Die sog. Gender Studies, die feministische Anthropologie, inklusive feministischer Linguistik, leisten hier minder, sind sogar gefährlich, wenn sie extrem und die Menge nötigend werden, in etwa so, wie ein ungünstiger sprachlicher Konservatismus dies ebenfalls ist.“ (Language Policy, comment 43).

25. The commenters quite regularly allude to their acquaintances with other commenters with expressions like “commenter-friend” or with hints to other discussions they interacted with each other.

26. „K030 ist seit mehr als 40 Jahren im Bereich der netzwerkbasierter Kommunikation dabei, als Early Adopter sozusagen, [...]“ (Stress, comment 18); Due to the personal rights of the participants in blog post discussions, we anonymized all reference to user names with a code system (K + number). It’s a particular feature of commenter K030 to refer to himself in the third person.

27. „Interessanterweise erlebe ich es gerade auch als Religionswissenschaftler genau umgekehrt.“ (Self-deception, comment 105).

However, we realized that these strategies are rather rarely used in the comments we examined.

In contrast to this, strategies that devalue the personal impact of opponents were much more frequently used. Corresponding to our observations on pathos-based devices, delegitimizing the opponent was used to weaken her or his position. In many cases, commenters practiced this strategy to disguise their lack of arguments.

- (13) “I have read many stupid comments from you in the last few years, but this one has a quality all of its own.” (Erasmus, comment 17)²⁸
- (14) “I would have hoped to get an answer from someone who understands the subject. And not some nonsense speculation by **amateur internet activists**.” (Galaxy, comment 5)²⁹

Our corpus shows a wide range of insulting and devaluating utterances. There are some terms that are used across discussions to denigrate other commentators, such as “cranks”, “trolls” or “ideological theorists”, which are intended to signal that a person should not be taken seriously.

We observed these forms of personal reproach even to the bloggers, mainly in highly emotional discussions like the discussion about renunciation of eating meat or the discussion about the language policy of the German right-wing party AfD.

- (15) „Once again I see: You have nothing to counter figures, data and facts with but baseless insinuations [...], polemics and insults [...], garnished with silly emojis“ (Self-deception, comment 127)³⁰
- (16) “The author of the article completely disqualified himself with this article – criticizing the corruption of the German language as a right-wing position.” (Language policy, comment 33)³¹

28. „Ich hab in den letzten Jahren wahrlich schon viele dämliche Kommentare von dir gelesen, aber der hier hat noch mal eine ganz eigene Qualität.“ (Erasmus, comment 17).

29. „Ich hätte gehofft hier ein Antwort von jemandem zu bekommen, der was vom Thema versteht. Und nicht irgendwelche windelweichen Spekulationen von Hobby-Internet-Aktivisten.“ (Galaxy, comment 5).

30. „Ich sehe wieder einmal: Zahlen, Daten und Fakten haben Sie nichts anderes entgegengesetzten als haltlose Unterstellungen [...], Polemiken und Beleidigungen [...], garniert mit albernen Emojis.“ (Self-deception, comment 127).

31. „Der Autor des (sic!) hat sich mit diesem Artikel – Kritik an der Verhöhnung der deutschen Sprache ist rechts – komplett disqualifiziert.“ (Language Policy, comment 33).

- (17) “To leave the sciences or the definitions of the sciences to people like you is to return to the Middle Ages, to persecute heretics, to burn witches in the service of the proclaimed ‘truth.’” (Integrity, comment 68)³²

The harshness of reproaches like this has the potential to weaken the bloggers’ personal impact and the credibility of their contents. In their reception study on incivility in online discourses, Anderson et al. (2014, p.383) come to the conclusion that “impolite and incensed blog comments can polarize online users based on value predispositions utilized as heuristics when processing the blog’s information”. That means that people who already have an opposite stance towards the blog post’s content are more likely to be strengthened in their attitude by very rude comments.

5. Results

In our study, we chose a two-step-approach to tackle the question of how persuasive science communication is used in dialogue-based formats: (1) examining the blog post as the initial input for the deliberation on a certain scientific subject and (2) analysing the comment section as the arena of discussion, where dialogical forms of persuasive communication are actually applied.

The results show that blog post discussions can be classified as persuasive communication as soon as objecting and/or criticizing comments appear. The blog post itself needs not necessarily have a high persuasive potential in order to trigger discussion. In fact, we realized that even those blog posts that do not show any persuasive features may result in a persuasive exchange about single utterances.

We were able to show that the persuasive potential of an utterance builds on rhetorical devices (logos-, pathos- and/or ethos-based), which bloggers and commenters seem to apply unknowingly. Applying those strategic devices entails linguistic operations in the process of persuasion described by Ortak (2004): polarizing, profiling, and plausibilizing. However, these strategies are no guarantee of an actual effect of persuasive communication because of its dialogical character.

Our closer look at the commentators’ persuasive strategies showed that they rather make use of strategies that weaken the opponent’s position instead of using strategies that strengthen their own view.

32. „Leuten wie Ihnen die Wissenschaften oder die Definitionen der Wissenschaften zu überlassen heißt, Rückkehr ins Mittelalter, Ketzerverfolgung, Hexenverbrennung im Dienste der verkündeten ‚Wahrheit‘“ (Integrity, comment 68)

These findings are in accordance with the results of a study on conflicts in blog post communication conducted by Luzón who concludes that “the use of antisocial behaviour helps commenters in academic blogs to sound more convincing and confident and to show their allegiance to a particular group by construing the conflict with those who support rival theories/ideas“ (Luzón 2012: 295).

6. Discussion

Communicating science is not a mere monological process in which a scientist disseminates his or her knowledge to passive recipients who are grateful of being relieved of their ignorance. In contexts of an informed and competent audience, it is much more a dialogue in which scientific research, methods and findings (and their relevance for society) may be discussed, doubted or even rejected. Recent forms of science communication rather emphasise the public engagement with science taking into account that science always has a fundamental impact on citizens' life.

Therefore, science communication can offer forums to talk about the effects of science on society, the hopes and fears it can evoke. In science blogs, as the amount of comments shows, discussions about science and its impact on the readers' life have a high value. Commenters use the opportunity to express their stances and attitudes towards scientific contents by using persuasive devices. Taking these forms of non-professional communication about science serious can provide insights into the commenters' perceptions of science, their opinions about scientific research and their hopes and fears. The examination of the persuasive communication in blog post discussions offers therefore the opportunity of developing better strategies to face the commenters' arguments with a higher persuasive impact and to improve the quality of the dialogical science communication. In short, it can improve the influence on persuasive communication in discussions about scientific issues with non-experts.

The investigation of the blog posts showed that the combination of textualization structure and communication modes can reveal the persuasive intentions of the texts. Still, it would be necessary to shed a closer look at these layers of analysis by means of a more refined examination. In this way, it would be possible to distinguish persuasive strategies in rather monological contexts in contrasts to strategies in dialogical contexts like the comment section.

Our study could be linked to studies of perlocution and experimental media reception that might ask how the persuasive potential of blog posts and comments is, how readers actually perceive these posts and what effects the posts have.

Still, it would be fruitful to investigate if there are certain subjects that trigger objection or criticism. It appears that topics that have an attempt to the readers' life are more likely to initiate a controversial discussion with a high proportion of persuasive communication than topics that are situated in a rather scientific context: The blog posts in our corpus showed that readers took more issue with subjects like meat consumption, climate change or quarantine measures than with the calculation of star movement or anecdotes about historical personalities.

Furthermore, our results go along with empirical findings that ethos- and pathos-based devices are very much used in discussions (Luzón, 2012) and might have a strong effect on the persuasive impact (Anderson et al., 2014). However, the database of our explorative study is rather small. The conclusions we draw need further examination and validation. In the context of our research project "En Blog", in which we investigate features of interactional science communication in science blogs, we aim to gather more insights into the process of persuasive communication in the comment section. A question that we still have to answer is how persuasive communication develops sequentially. Investigating this can provide insights on the dialogical process of persuasive communication.

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