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TWITTER CONFERENCE PRESENTATIONS: A RHETORICAL AND SEMIOTIC ANALYSIS OF AN EMERGING DIGITAL GENRE

LAS PRESENTACIONES EN LOS CONGRESOS TWITTER: UN ANÁLISIS RETÓRICO Y SEMIÓTICO DE UN GÉNERO DIGITAL EMERGENTE

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Abstract

One of the main responsibilities of researchers is the circulation and dissemination of scientific knowledge. However, this task has evolved over time, and new forms of digital communication have emerged. This study explores the science communication strategies used by researchers in an emerging digital genre, the Twitter conference presentation. A corpus of 55 presentations (300 tweets) was analysed under the theoretical and methodological lenses of genre analysis and semiotic resources analysis. Results showed that researchers relied on their previous rhetorical knowledge of other spoken research genres at the macro-structural level, while the micro-structural level encompassed a higher level of rhetorical dynamism. Concerning semiotic resources, embedding attachments in the form of images and hyperlinks was the preferred strategy by the authors. The most common interrelation functions between text and other semiotic resources were concurrence and complementarity. Consequently, the authors were able to reinforce the ideas mentioned in the

text and offer additional information to further explore their research topics. This study's findings contribute to the ongoing investigation of science communication with the description and analysis of emerging digital genres.

Keywords: digital genres, academic Twitter, science communication, genre-based analysis, semiotic resources.

Resumen

Entre las responsabilidades de los investigadores se encuentra la comunicación y difusión del conocimiento científico. Sin embargo, esta tarea ha ido evolucionando con el tiempo y han surgido nuevas formas de comunicación digital. Este estudio explora las estrategias de comunicación de ciencia empleadas por los científicos en un género digital emergente, las presentaciones en los congresos Twitter. Un corpus de 55 presentaciones (300 tweets) se analizó empleando los marcos teóricos y metodológicos del análisis de género y de recursos semióticos. Los resultados muestran que los investigadores reutilizaron su conocimiento previo de otros géneros académicos orales en el nivel macro-estructural mientras que en el nivel micro-estructural se encontró un mayor dinamismo retórico. Con respecto a los recursos semióticos, la estrategia más empleada por los autores fue el uso de imágenes e hipervínculos. Las interrelaciones más comunes entre texto y otros recursos semióticos fueron las funciones de concurrencia y complementariedad. De esta forma, gracias a la combinación de recursos, los autores pudieron reforzar las ideas mencionadas en el texto y ofrecer información adicional para continuar explorando los temas de investigación. Este estudio contribuye a la investigación actual sobre comunicación científica a través de la descripción y análisis de los géneros digitales emergentes.

Palabras clave: géneros digitales, Twitter académico, comunicación científica, análisis de género, recursos semióticos.

1. Introduction

There are three main functions in scholarly communication depending on the intended audience and the channel of communication (Puschmann, 2015). Firstly, *legitimisation* occurs in academic circles and is done, for instance, through publication in prestigious journals that support the scientific rigor of the results. Secondly, *dissemination* aims at transferring results to non-specialised audiences, for example, by using social media and microblogging platforms. Thirdly, *access, preservation, and curation* attempt to facilitate the archiving, accessibility, and identification of resources due to technological advances like the DOI number or researcher ID. To fulfil such functions, researchers use new forms of communication (i.e., new genres and media) that blur the geographical and intellectual boundaries between disciplinary communities and non-specialised audiences (Kelly & Miller, 2016). For instance, digitally remediated genres or emerging digital genres such as blogs, academic social networks, microblogging platforms, podcasts, and homepages help researchers produce, present, and share scientific information in new forms and for diversified audiences (Luzón, 2017, Freddi, 2020; Luzón & Pérez-Llantada, 2022).

According to Askehave and Nielsen (2005), attention should be paid to these new forms of communication, especially with regards to the medium where the genre is located because it "adds unique properties to the web genre in terms of production, function, and reception which cannot be ignored in the genre characterization" (p. 124). Examples of these properties in digital genres are hyper-textuality, the non-linear processes of writing and reading online, or the combination of semiotic resources to convey a message and a particular communicative purpose. The latter is achieved thanks to different "strategies for accommodating science and catering for the communication needs of these diversified audiences" (Luzón & Pérez-

Llantada, 2022, p. 74) that should be considered when analysing these emerging practices. All these strategies and properties, therefore, are crucial insofar as they mediate the interaction experience between the writer and a potential audience.

Sharing information to such audiences is "conceived […] as a discursive recontextualization for a less specialist audience, including scientists in other (sub)disciplines." (Luzon & Pérez-Llantada, 2022, p. 75). In this context, remediation becomes a central strategy for the shaping of new social and digital practices, and it refers to how "existing genres are imported into new media or evolve into variants afforded by the technical capabilities of the new medium" (Luzon, 2017, p. 7). Traditional publication types such as research articles, abstracts, and laboratory notebooks have shifted from print to digital form, in other words, they are digitally remediated. Similarly, with COVID-19 mobility restrictions in 2020, the traditional on-site academic conference has adapted to online environments with multiple approaches (e.g., synchronous, asynchronous, pre-recorded, offering online social spaces). There is extensive research that analyses the uses of Twitter as a supplementary conference tool for information exchange, networking, or promotional purposes; however, the latest novelty regarding conferences has been coined as Twitter conferences: an emerging digital genre, where a conference is entirely held on Twitter. Moreover, the idiosyncrasy of this microblogging platform mirrors the double purpose of academic conferences by combining features of "social and research-process genres" (Hyland, 2009, p. 79). It opens the research discussion to wider audiences, boosts the dissemination of findings and has more social impact granted by accessibility and participative practices (Puschmann, 2015; Morrison et al., 2020).

This study thus aims to shed light into conference presentations in social networks by taking the above considerations on board. Specifically, it

explores strategies for research content remediation and accommodation to engage wider audiences. The three research objectives guiding this study are:

- What does the Twitter conference presentation rhetorical structure look like?
- What semiotic (textual and multimodal) resources are employed and what meanings do they convey?
- What is the interrelation between semiotic modes and how they contribute to the rhetorical goals of the genre?

2. Theoretical framework

2.1. From traditional to digital genres

Some authors like Heyd (2015) or Luzón (2017) have based their understanding of genres according to Swales (1990)' view on genres as the expression of recognisable text types in combination with what Miller (1984) calls "social action". According to Miller, the communicative purpose of genres is shaped by their intended audiences and particular contexts. However, with the emergence of technological advances, the typification of genre forms has started to pose challenges to genre specialists, particularly if new digital affordances and constraints are considered. Affordances refer to what new technologies and Web 2.0. allow the user to do in contrast to the traditional written or spoken medium (Jones & Hafner, 2012). Therefore, when traditional stable genres are remediated in the digital environment, they show a dynamism that "address[es] new social exigencies and adapt[s] to changes in community membership, audiences, disciplinary activities and methodologies, media and technology, disciplinary values or public attitudes to science" (Luzón & Pérez-Llantada, 2019, p. 2).

Furthermore, whereas traditional academic genres relied heavily on textual and written discourse, digital genres and digital discourse often

combine different modes of communication and semiotic resources, distancing them from textual analysis and moving towards multimodal analysis. Visuals and other semiotic resources were examined previously by the literature to pinpoint their functions and usage in science communication. Mehlenbacher (2019) reviews several studies from the early 2000s and concludes that the combination of text and images in publications and textbooks is done primarily to disseminate scientific results and engage the audience. Images are employed strategically by researchers to circulate knowledge with the readers with an interactional rhetorical function: to interact with the text and catch the readers' attention. Likewise, Orpin (2019) contends that in the traditional research paper genre, images support and provide evidence of the author's claims, whereas genres used for the dissemination of science tend to use images to engage the reader or simplify findings. Hence, the combination of different semiotic modes such as image, video, audio, or emoji is a useful strategy to increase the level of interest in a message by analysing "modal density", i.e., the amount of different semiotic resources conveying a message (Norris, 2004 in Valeiras-Jurado, 2019, p. 94).

2.2. Spoken research genres

Examples of spoken research genres have been analysed in terms of lexico-grammatical features, textualisation or structural interpretation (Bhatia, 1993), and they tend to gather around the notion of presentations in different academic settings such as conference presentations, lab presentations, PhD vivas, or 3-minute thesis presentations. Although academic presentations are delivered in different contexts and for different audiences, their main purpose is to inform about current knowledge-making practices and persuade the audience of the value of the research at hand (Querol-Julián & Fortanet-Gómez, 2014; Valeiras-Jurado, 2019). In PhD vivas, the candidate needs to convince and appeal to an evaluation

committee (Swales, 2004). In 3-minute thesis presentations (henceforth 3MT), the speaker must convince a non-specialised committee that their research is the most important one through a combination of persuasive strategies based on pathos (emotions), ethos (credibility and authority), and logos (rationality, terminology) (Hu & Liu, 2018; Valeiras-Jurado, 2019). In conference presentations, the presenter's underlying goal is to highlight the significance of their research and receive valuable feedback (Mehlenbacher, 2019).

As far as conference presentations (henceforth CP) are concerned, the fact that they are context-dependent is decisive in the structure and selection of information to understand aspects such as form (structure constrained by time), type of content (research in progress), modes of communication (combination of spoken and written), or the relationship between presenters and the audience (Rowley-Jolivet & Carter-Thomas, 2019). CP were examined, especially in the 2000s, by scholars like Ventola (2002), Shalom (2002), Raisanen (2002), Rowley-Jolivet and Carter-Thomas (2005), and Hyland (2009). Overall, these studies followed a genre-based methodology to pinpoint the mixture of oral and written characteristics in presentations, i.e., features borrowed from written research genres like research articles, and how the communicative and contextual situation (social and research context) of the genre introduced oral features. At the lexico-grammatical level, Hyland (2009) reports recurrent linguistic patterns such as the use of active voice, boundary markers (ok, right, now), self-mentions, and existential *there*. Regarding sections, more time is allotted to the discussion of research failures and results are reported with less precision than in articles. Rowley-Jolivet and Carter-Thomas (2005), on the other hand, highlight that the major features of CP are set by the context like the work-in-progress nature of the presentation, the organisation of the content according to time constraints, and the need to

set up an interpersonal bonding with the audience through engagement strategies like humour, simplification, or creating an unthreatening environment.

2.3. Twitter for science communication

Twitter is a microblogging platform that allows users to quickly share thoughts, life updates, or comments on the news. As a platform characterised by fast and immediate exchanging of information and interaction, Twitter has become widely popular with almost 400 million users as of 2022 (Dean, 2022), and recently, more academics are opening professional profiles on the platform. Contextual restrictions have a major impact on Twitter communication. Moving away from the initial 140-character limitations in 2006, nowadays, tweets have a length of up to 280 characters (Ross et al., 2011; Cislaru, 2015). Moreover, it is possible to publish a series of connected and subsequent tweets, known as threads, written by the same user to elaborate on an idea (Lee et al., 2017). The main technicalities of Twitter, encompassing its constraints and affordances, can be listed as follows:

- *tweets*: short messages that users write to share information and reply to a given text.
- *threads*: series of subsequent tweets written by the same person.
- *mentions*: the @ symbol before a username is used to address a specific user so they get notified when there is a reply or mention.
- *hashtag*: the # symbol followed by a series of characters works as a searching tool for keywords and content categorisation.
- *attachments*: there is the option to attach different files such as images, gifs, links, polls, and location.
- *likes*: they show agreement with a specific tweet that can be saved for future reference.

- *retweets*: allow to forward or publicly share a tweet written by another user.

In a nutshell, Twitter fosters three of the main affordances common to all digital genres: hypertextuality through hashtags, links, and retweets; multimodality through attachments and emojis; and interactivity through mentions, replies, and likes (Jones & Hafner, 2012).

For the academic community, Twitter presents many benefits, particularly for communication with peers and non-specialised audiences. Luzón and Albero-Posac (2020), who summarise some of the main characteristics of academic Twitter, stress the speed and immediacy of the medium to disseminate work-related information, catch up with the latest discoveries in the field, network with peers and other researchers, and share scientific resources. Moreover, some Twitter features such as mentions can be used to send information to specific users or to reference work (Weller et al., 2011). In the case of retweets, they can work as quotation tools that facilitate the circulation of knowledge (Weller et al., 2011; Puschmann, 2015; Lee et al., 2017). Hashtags may come in handy to identify a community of practice with similar interests and concerns (Puschmann, 2014). Ultimately, these affordances boost the reach to diverse audiences, researchers' visibility, and their academic reputation.

As a valuable tool for conference organisers and participants, conference Twitter has been studied from different perspectives: at the various stages of the conference (before, during, after), diverse modalities (asynchronous, synchronous, live-tweeting), roles of users (organisers, presenters, attendees, non-attendees), and communicative purposes (to inform, promote, network, share resources) (Ross et al., 2011; Lee et al., 2017; Luzón & Albero-Posac, 2020). Also, Twitter works as a backchannel offering an alternative and informal channel of communication (Ross et al., 2011)

that turns the traditional conference settings into an open and welcoming environment, facilitating networking and access to information that otherwise would be limited to the on-site participants of the conference. Posting Twitter-mediated conference information is a way to make content available and accessible to anybody with a Twitter account and who has searchable interests. Thus, social networks encourage people to share knowledge, resources, and opportunities.

3. Methodology

3.1. Data collection and analytical procedures

The 1st edition of the Linguistweets Conference was organised by ABRALIN, the Brazilian Association of Linguistics, in the year 2020 amid the COVID-19 crisis. The organisers defined a Twitter Conference as:

> *an **online conference** that takes place on Twitter characterised by research presentations delivered via a series of no more than 6 tweets, presented during a 15 min time slot, under the hashtag **#linguistweets**. Besides removing the hassle of travelling, specially during the pandemics, Twitter conferences promote open science: everyone can follow the presentations, ask questions, and take part in the discussions. (Linguistweets, 2020, https://www.linguistweets.org/linguistweets-2020/en/about/)*

Participation in this conference followed the same conventions as traditional academic conferences, where authors submitted an abstract for acceptance. There was a total of 91 participants who presented their research in the different official languages of the conference: 60% of the presentations were in English, 36% in Portuguese, 2% in Spanish, and 1 participant combined English and Portuguese. If the presentation was

accepted, then information would appear in the programme tab of the conference website following the macro-level rhetorical organisation of date and time slot, conference identification, presentation title, author's details, highlight, hidden abstract, first tweet of the thread, and a Twitter button (see Figure 1).

Figure 1: Macro-level structure of a presentation in a Twitter Conference

The conference organisers, aware of the novelty of the genre, provided the participants with some guidelines to present their research in a maximum of 6 tweets per presentation. 23 rules for participation can be found on the website, which were classified into three broad categories regarding technology familiarisation, presentation planning, and interaction between authors and readers, to make the most out of the virtual event (see Table 1).

Table 1: *Conference guidelines organised by categories*

TECHNOLOGY	PRESENTATION	INTERACTION
• Twitter account creation • Twitter's policies for visual accessibility • Draft in advance (word constraints, cannot edit once the tweet is online) • Comment format (how they work, how to reply) • Conference hashtag for searching purposes • Public Twitter account	• Max 6 tweets in the given time • Language choice • Use of hashtags • 1st tweet tips • Provide a model • Use of links • Use of attachments • Content suggestion (visibility) • Posting suggestion (timing)	• Expert and lay audiences • Be online during the presentation time to answer comments • Participate with other presenters • Presenters' details on the program website (for contact and interaction) • Polite behaviour

Only the English-written threads were considered for this study. The retrieval process took place in December 2021, and tweets were manually collected and stored in plain text and pdf format. The corpus consists of 55 Twitter threads (n=330 tweets), including only the tweets forming the presentations.

The text was imported into an Excel spreadsheet to carry out the structural analysis of tweets, gather metadata (ID number, time slot, title, highlight, abstract, link), and then for the identification of the rhetorical structure, semiotic resources, and Twitter features. To do so, the corpus was stored in two different ways: first, including all the tweets together in one thread (i.e., by presentation), and second, dividing tweets into different sheets (i.e., all 1st tweets together, 2nd tweets together, and so on). As an

example, all the items examined per tweet are shown in the following figure:

Figure 2: *Example of a tweet and the identification of its structure, Twitter affordances, and semiotic resources*

The following Twitter features were included in the analysis: hashtags, mentions, and any file that could be attached to a tweet (attachments). Based on Cislaru's (2015) classification of hashtags, her categories were adapted into attitude (it expresses the author's attitude, usually at the end of the tweet, as a reaction or opinion towards the content of the message), classificatory (it classifies the tweet, e.g., conference name, thread number), and semantic (the hashtag can appear within the message, for instance, when a keyword is typed as a hashtag to boost its repercussion on Twitter, or at the end of the tweet, when writing down broad disciplinary fields).

Mentions were grouped into data-driven categories such as colleagues (e.g., co-authors, supervisors, research group), institutions (e.g., university, department, government), organisers (conference Twitter account), references (it mentions authors of other studies or frameworks applied to the study), sources (informs where the data come from like a corpus or specific website), and thread (a self-mention resulting from creating a thread).

Attachments could fall within the following categories: image, gif, poll (an interactive feature that can be inserted in a tweet), and links. As a note, hyperlinks were included in this category because a preview of the external link can be embedded in the tweet, especially video or audio, so it offered multimodal information. As in Luzón & Albero-Posac (2020), tweets were classified as textual (there is only text in the tweet), mixed (there are text, emojis and/or non-standard punctuation), and multimodal (tweets include at least one attachment).

Finally, images were also analysed as they may express an emotional reaction that the text may not invoke. This could be found, particularly, when applying strategies for audience engagement. To carry out the multimodal analysis, the pdf versions of the 55 threads were uploaded to the qualitative software Atlas.ti. v8.4.5. Multimodal elements were coded considering the following aspects: type (e.g., image), rhetorical move (e.g., introduction), rhetorical function (e.g., defining a concept), style (e.g., academic, non-academic), and interaction with the text (e.g., concurrence). Using this qualitative programme enabled me to interrelate the rhetorical analysis with the multimodal analysis and gain insights into the relations between the different semiotic modes.

3.2. Analytical framework

To identify the rhetorical structure of the Twitter conference presentations I followed Swales (1990) and Bhatia's (1993) move analysis, understanding a move as a rhetorical section that not only has functionality in the discourse, but also contributes to the communicative purposes of the genre. The studies of Hu and Liu's (2018) and Rowley-Jolivet and Carter-Thomas (2019) on 3MT presentations were chosen as comparable frameworks for the rhetorical structure of Twitter conference presentations (henceforth TCP) due to visible time and space constraints that the two genres share. Both frameworks share similarities in the rhetorical organisation of presentations, starting with an introduction that has both an interpersonal orientation (audience) and content orientation (contextualisation). The moves of rationale and purpose are combined by Rowley-Jolivet and Carter-Thomas, while Hu and Liu consider them as two different moves. The moves of methods and results are common in both studies. A discussion move is identified too although its frequency is minimal. The final moves in presentations correspond with the implications, discussion, and termination to thank the audience, and at times, to refer to publications. Overall, Hu and Liu (2018) give more weight to the initial steps (orientation, rationale and relevance, theoretical frameworks, purpose) in contrast to Rowley-Jolivet and Carter-Thomas (2019), who distinguish more moves in the middle and final sections of presentations (methods, results, discussion, implications, round off, references to publications).

The decision to use these two frameworks as the starting point of the analysis responds to the contextual and medium constraints of the TCP that, like 3MT presentation, may force presenters to decide what information is the most relevant for the potential audience. Secondly, the overall communicative purposes of academic presentations are both

informative and persuasive, which will grant the use of a similar rhetorical structure.

To analyse and interpret the multimodal elements I drew on Jones and Hafner's (2012, p. 80) framework of interaction between modes. These authors propose three main types of interrelation between text and images. Concurrence refers to how text and image convey the same message, often repeating or reinforcing the same idea. Complementary appears when there is slightly different information between text and image. Depending on the different information, it is possible to find enhancement, which explains how or the reason for the event described in the text, extension, which expands with some additional information to that of the main text, and elaboration, which specifies what is in the main text. Lastly, divergence is used when there are incompatible meanings between the text and image.

4. Results

4.1. Rhetorical structure

The analysis of the corpus led to the identification of a general rhetorical structure of Twitter conference presentations. As we are dealing with a series of tweets within a thread, authors used different strategies to signal the order of information: numerating at the beginning (1. …) or the end (1/6) of the tweets, signalling with the thread emoji and number (🧵 1/6), or writing the section heading ("Results").

Stemming from the moves reported by Rowley-Jolivet and Carter-Thomas (2019) and Hu and Liu (2018), similarities and overlapping in moves were found in the corpus data as a consequence of the medium constraints of word limitation and tweet limitation that resemble time limitation of 3MT. Table 2 shows the total distribution of moves throughout the corpus, where the moves of results (30.91%), background (17.27%), and

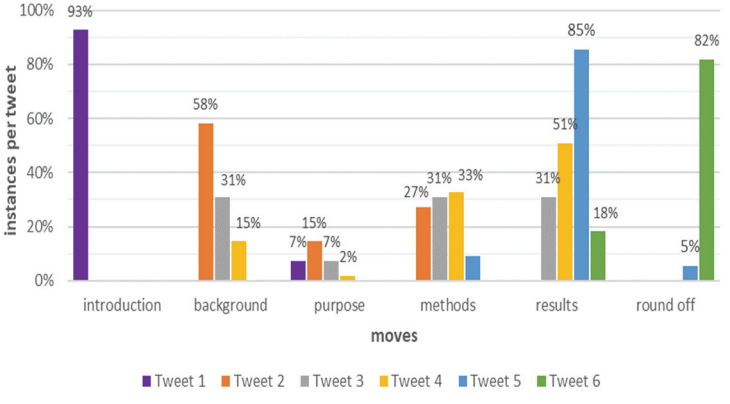
methods (16.67%) are the ones with the highest representation. This highlights which parts of a presentation the authors gave more relevance to.

Table 2: *Occurrence of rhetorical moves of Twitter presentations and its range in the corpus*

MOVES	%
M1_Introduction	15.45%
M2_Background	17.27%
M3_Purpose	5.15%
M4_Methods	16.67%
M5_Results	30.91%
M6_Round off	14.55%

Moves were not constrained to one tweet. On the contrary, they can spread all over a thread. Figure 3 illustrates this idea with the distribution of tweets per move. Apart from *M1_Introduction*, which appears only in the first tweet, the remaining moves can appear in several subsequent tweets, especially in the case of the middle tweets (3-5).

Figure 3: *Distribution of tweets per move*



Aligning with the moves identified in other genres (Hu & Liu, 2018; Jolivet-Rowley & Carter-Thomas, 2019), *M1_Introduction*'s rhetorical function is contextualising the talk, often taking the form of a question or a summary of the research at stake. Also, this move included an interpersonal function that is traditionally identified with the use of questions (to the public) or mentioning acknowledgements (to organisers and colleagues) during conference presentations. Likewise, in the corpus analysed this was done through mentions and questions, which can be explained by the fact that the question-answer strategy was recommended by the organisers, particularly to catch the reader's attention.

M1_Introduction could include most of the following steps: 1.1 acknowledging others (e.g., colleagues, participants, organisers), 1.2 setting the context by outlining content (1.2a) or by exemplifying (1.2b), 1.3 identifying a problem, and 1.4 stating an objective. Step 1.2 (either a or b) is the only compulsory step, as can be seen in the examples 1-3:

(1)

🙏 Obrigadas @abralin! Acknowledging Nyungar owners of unceded land and @arc_gov_au for #DECRA. Today: research into #Aboriginal English quotatives. Has global innovation BE LIKE been adopted by #AboriginalEnglish speakers? #linguistweets #lt0345 @UWAresearch. 1/6	1.1 acknowledging 1.2a setting the context

Thread 11 tweet 1

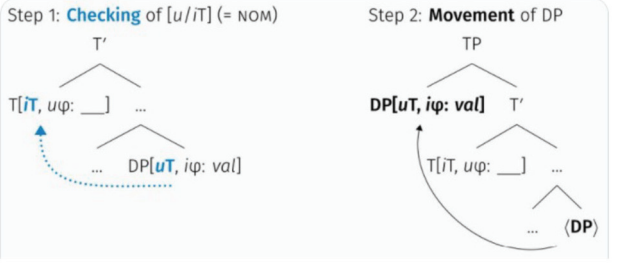
(2)

#linguistweets #lt0430 'Quick' and 'fast' are speed adjectives, with attributive (quick/fast person) and predicative (She is quick/fast) uses. But 'fast' doesn't work in the adjective-to-verb construction exemplified by 'quick to point out/condemn/seize'. Why?	1.2b setting the context 1.3 identifying problem

Thread 13 tweet 1

(3)

Bjorkman & Zeijlstra 2019 argue that agreement controllers must be structurally higher than agreeing heads (as shown). Adding to an open debate, we show that this is empirically inadequate for subject, object, comp agreement: there can be lower controllers. #linguistweets #lt0530



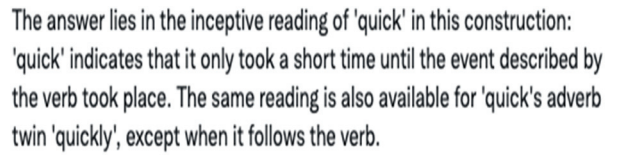
Thread 18 tweet 1

1.2b setting the context
1.3 identifying problem
1.4 Objective

M2_Background often involved two functions: either a didactic function (simple and direct style) where authors focused on defining the main concepts of the research with examples or a theoretical approach supporting the author's claims by referencing relevant studies for the research project (e.g., the surname of a researcher) and pointing at potential problems. The authors focused on the main concepts and then illustrated them with examples. Another finding refers to those authors who started their presentation with a question in tweet 1, and then in the next tweet, they provided an answer.

The following steps are found in the move: 2.1 a definition of main concepts with a didactic approach (2.1a) or a theoretical approach (2.1b), 2.2 exemplifying main concepts, 2.3 identifying a problem. Steps 2.1. is a compulsory step while 2.2 and 2.3 are optional steps, as illustrated in examples 4 and 5:

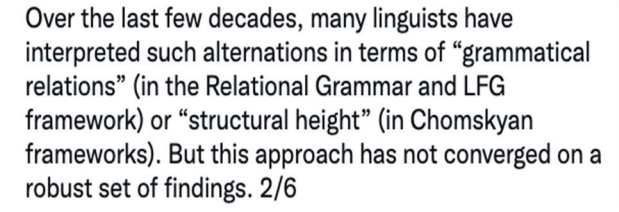
(4)



2.1a didactic definition
2.2 exemplifying concepts

Thread 14 tweet 2

(5)



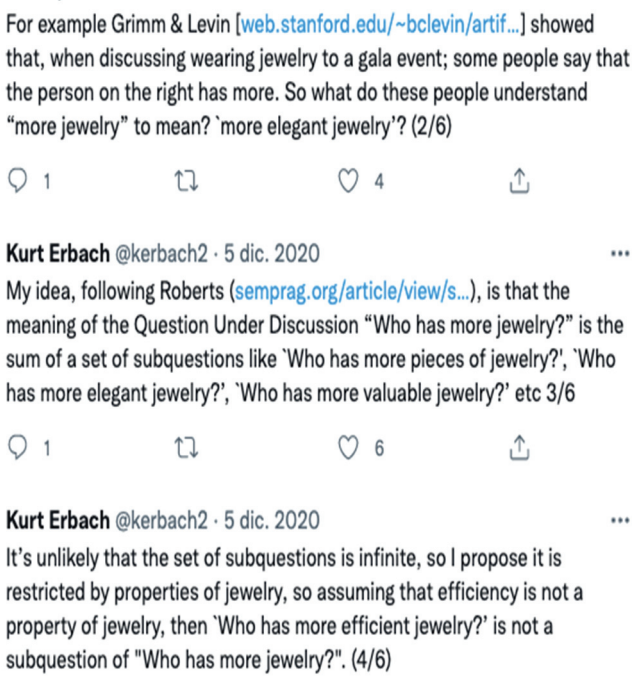
2.1b theoretical approach
2.3 identifying problem

Thread 38 tweet 2

Interestingly, the rationale move, which was a compulsory move according to Hu & Liu's findings (2018) and Rowley-Jolivet and Carter-Thomas (2019), becomes an optional step in TCP that might appear either in *M1_Introduction* or *M2_Background* in the corpus, but was seldom used.

Another finding refers to those presentations expanding *M2_Background* to more than one tweet (31% in two tweets, 15% in three tweets). When doing so, the authors employed more steps, and the textual information included in the tweets was more specific, identifying a problem and occasionally proposing a solution (i.e., the purpose of the presentation), as observed in example 6:

(6)



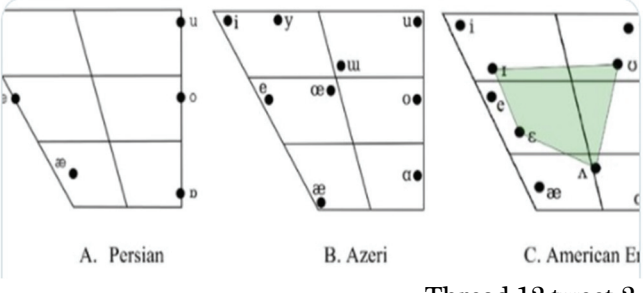
Thread 27 tweets 2-4

2.1b theoretical approach
2.2 exemplifying concepts
2.3 identifying a problem

M3_Purpose appeared as a consequence of the previously stated problem or gap identified in *M2_Background*. It often took the form of stating the research questions or the objectives of the presentation. This move showed certain variation because it could appear as a move in itself or as a step in the introduction move as part of the research contextualisation, which shows the dynamism of the genre. As a move, it contains the following steps: the compulsory step 3.1 stating the research questions (3.1a) or an objective (3.1b), and the optional step 3.2 briefly referring to a method. Examples 7 and 8 illustrate these steps:

(7)

1.How are the 11 AE vowels assimilated into the 6 Persian or 9 Azeri L1 vowels?
2.What is the learners' mental map of the 11 AE vowels (quality, duration)
3.How does mental representation differ from that of native AE speakers?
#linguistweets

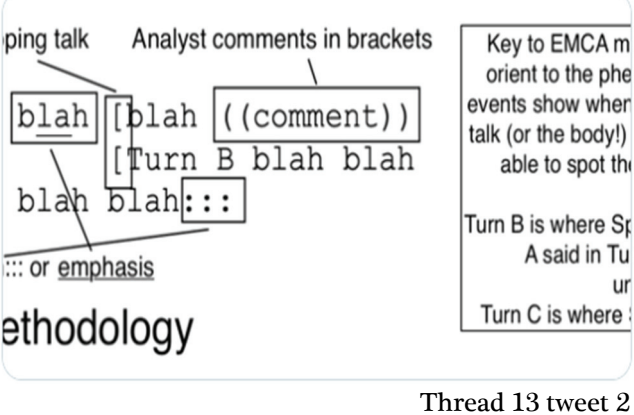


3.1a research questions

Thread 12 tweet 2

(8)

2/Except with some sounds: many #nonlexicals are treated as corresponding to bodily events eg. strain grunts. I study how people treat grunts in rock climbing. I use #emca to observe how people organize & make sense of grunts in interaction



3.1b stating objective 3.2 referring to methods

Thread 13 tweet 2

M4_Methods, which could appear in tweets 3, 4, and 5, included descriptive information about the methodology employed, participants, data, or analytical procedures. As shown in the examples (9-10), the steps of

M4_Methods include an optional step 4.1 presenting a hypothesis, and the compulsory steps 4.2 referring to a method, 4.3 describing data sources and/or participants, and 4.4 describing analytical procedures.

(9)

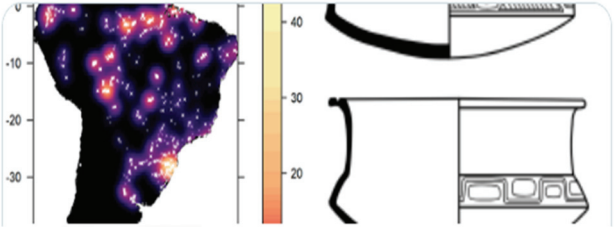
Assumption (following @betsysneller 2019): orientation to place=orientation towards ideology of that place. Identified 4 ideologies through interviews & ethnography. Translated ideologies into 7 yes/no questions (cf. Roberts 2016). Used those to assign affiliation scores. 3/6

4.1 hypothesis
4.2 methods
4.4 analytical procedures

Thread 7 tweet 3

(10)

Linguistic trees display classifications comparable with results from other fields (Archaeology, Ethnography, History). We test a model on lexical data only, then we interpret results considering extralinguistic data, evaluating hypotheses, and improve data and model accordingly.



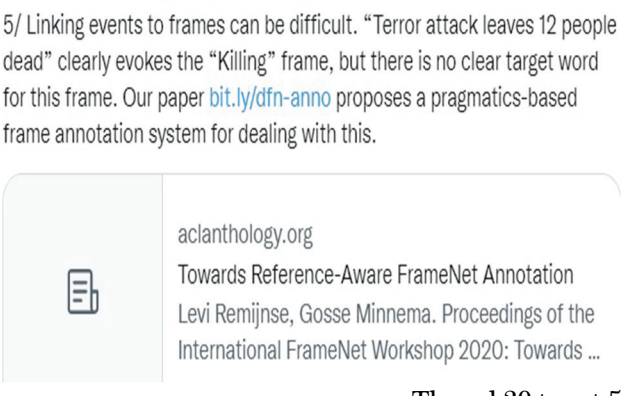
4.2 methods
4.3 data sources
4.4 analytical procedures

Thread 23 tweet 3

M5_Results often spread through several tweets, giving the authors the option to explain the findings of their projects in more detail. Results reporting was done with the compulsory steps 5.1 reporting results, 5.2 exemplifying results, and the optional steps 5.3 discussing implications of

results, and 5.4 promoting own research. The following example illustrates the main steps of this move:

(11)



Thread 30 tweet 5

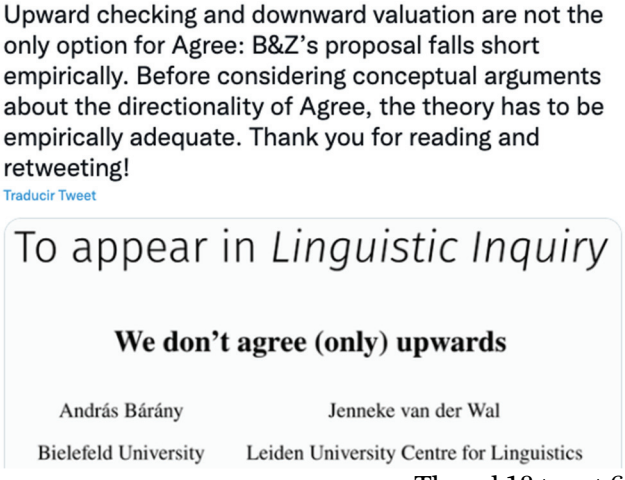
5.1 reporting results
5.2 exemplifying results
5.3 discussing results
5.4 promoting own research

At times authors attempt to go beyond step 5.1, which included a descriptive reporting of results and step 5.2, which often exemplified findings with the support of visuals (tables, graphs, sentences), by commenting on some potential implications of their findings. Even though the discussion of findings could be considered as a move itself, the unstable use and overlapping with *M5_Results*, were the main reasons behind its classification as a step instead of as a move. Likewise, Hu and Liu (2018) and Rowley-Jolivet and Carter-Thomas (2019) found this move in their analysis as one frequently omitted by presenters.

Lastly, *M6_Round off*, on some occasions an optional move, included a wide range of dynamism in terms of optional steps like 6.1 summarising the main ideas, 6.2 suggesting applications, 6.3 reflecting on limitations, 6.4 suggesting future work, 6.5 promoting own research, 6.6

sharing contact details, and 6.7 thanking the audience, as observed in examples 12 and 13:

(12)



Thread 18 tweet 6

6.1 summarising
6.3 limitations
6.5 promoting own research
6.6 sharing contact details
6.7 thanking

(13)

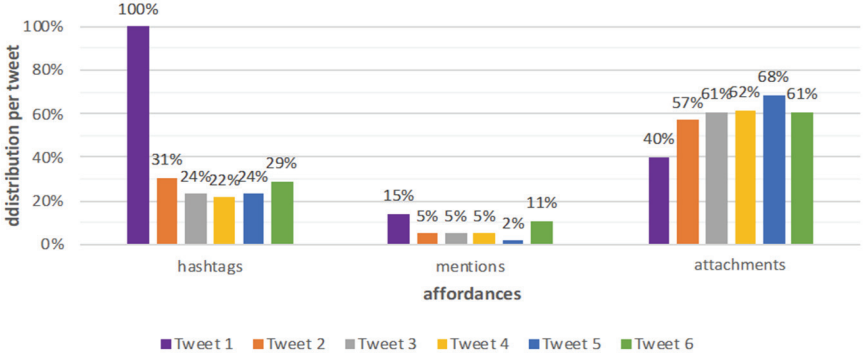
Thread 24 tweet 6

6.1 summarising
6.3 limitations
6.4 suggesting future work
6.5 promoting own research 6.6 sharing contact details
6.7 thanking

4.2. Twitter affordances

In the corpus, hashtags represented 31.34%, mentions 5.97% and attachments 62.69% of the affordances included in Twitter. Figure 4 breaks down the distribution of these affordances throughout tweets. Authors took advantage of Twitter affordances, particularly in the first tweet (40.45%) by combining hashtags, mentions, and attachments. This pattern was followed by the fourth and fifth tweets (25.45% and 28.01%) due to the use of attachments and hashtags. Yet, apart from attachments, hashtags and mentions were less common than initially expected.

Figure 4: *Distribution of tweets per affordance*

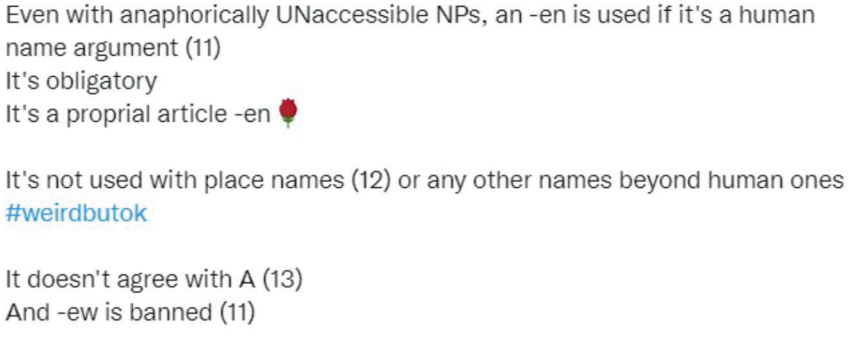


Hashtags appear either in line with the message (as part of the sentences) or outside the message (at the end as keywords). Despite the advantages of using hashtags to boost the visibility of keywords relevant to research, hashtag presence amounts to 31% of all the affordances found in the corpus.

Classificatory hashtags (25%) appear mainly in the first tweet according to the organisers' guidelines to facilitate the searching process of the different talks and to include the conference hashtag. Semantic hashtags (18%), have an average frequency of 15-18% throughout the tweets because

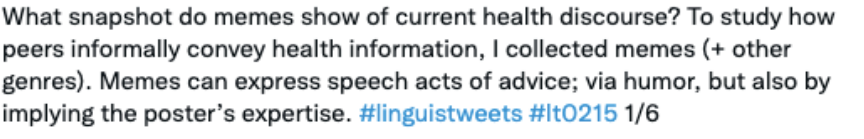
some authors marked keywords (concepts, frameworks, methods, disciplinary fields) with hashtags. The only instances of attitude hashtags (1%) are found in the final moves (*M5_Results or M6_Round off*), mainly to express the authors' opinion towards a specific finding.

Attitude



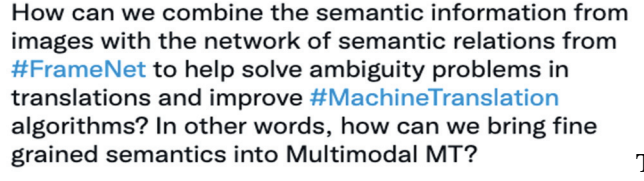
Thread 21 tweet 5

Classificatory



Thread 6 tweet 1

Semantic



Thread 53 tweet 3

Despite the low usage of mentions, barely accounting for 6% of all affordances, the most frequent functions referred to the category colleagues (4.58%) that include co-authors, PhD supervisors, and team members (see example 13), the category of institutions (2.29%) that included universities, institutions, or organisations (see example 1), and the category sources

(1.31%) to acknowledge different tools and data sets like @BYU 's Corpus (COCA) employed during the research process. Luzón and Albero-Posac's (2020) remarks on the use of mentions as engagement devices on academic Twitter could support the findings in the study regarding mentions, as they appear in the first and sixth tweets of the presentations, the ones with a more interpersonal orientation.

The third affordance analysed in this corpus refers to the combination of semiotic modes in tweets. The tweets including any multimodal features represent 73.64% of the corpus, followed by a far distance by mixed tweets (16.67%) and textual tweets (9.70%). This finding coincides with the high levels of multimodality reported in digital communication (Jones & Hafner, 2012; Mehlenbacher, 2019). In the corpus, this is found in the first, fourth, and fifth tweets. It is likely to respond to the creation of engaging introductions and the reporting of results that are often accompanied by visual support. The distribution of attachments is shown in Table 3, where we note that images occupy the primary role as a supplementary semiotic resource to text. It is also important to remind that in a tweet, several attachments can converge, for instance, up to four images or a poll and links.

Table 3: *Distribution of attachments in multimodal tweets*

ATTACHMENTS	%
image	71.60%
link	7.82%
gif	2.06%
poll	0.41%

In the next sub-section, the interrelation of the different semiotic resources in the meaning-making practices of the authors is reported.

4.3. Functions of semiotic resources

Looking at the four different types of attachments and their distribution in the corpus (image 71.6%, link 7.82%, gif 2.06%, poll 0.41%), Table 4 lists the previously identified steps to examine what rhetorical functions are conveyed by attachments.

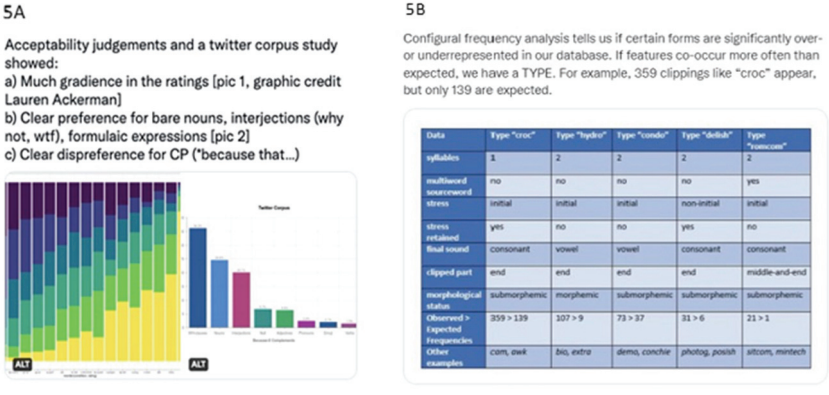
Table 4: *Distribution of attachments per rhetorical function*

RHETORICAL FUNCTION	IMAGE	LINK	GIF	POLL
acknowledging others	2.00%	-	-	-
setting the context	7.50%	-	-	100%
identifying a problem	-	-	-	-
referring to previous work	-	12.50%	-	-
stating an objective or research question	1.50%	8.33%	-	-
defining main concepts	6.00%	16.67%	-	-
exemplifying concepts	13.50%	-	-	-
referring to a method	0.50%	-	14.29%	-
describing data, participants, analytical procedures	11.50%	12.50%	-	-
reporting results	4.00%	-	14.29%	-
exemplifying results	37.50%	-	-	-
discussing implications	1.00%	-	-	-
promoting own research	3.50%	29.17%	-	-
summarising the main ideas	1.50%	-	-	-
suggesting applications	-	-	-	-
reflecting on limitations	-	-	-	-
suggesting future work	-	-	-	-
sharing contact details	7.00%	20.83%	-	-
thanking the audience	3.00%	-	71.43%	-

Images are the most prominent attachment in Twitter presentations and are varied in style. Most of them represent visuals associated with academic nature such as presentation slides, graphs, screenshots of sentences exemplifying concepts, tables, and word clouds. The most frequent rhetorical functions of images consisted of exemplifying results or methodological information and defining main theoretical concepts. These functions correspond with the traditional use of graphs and tables in other research genres (Mehlenbacher, 2019; Orpin, 2019).

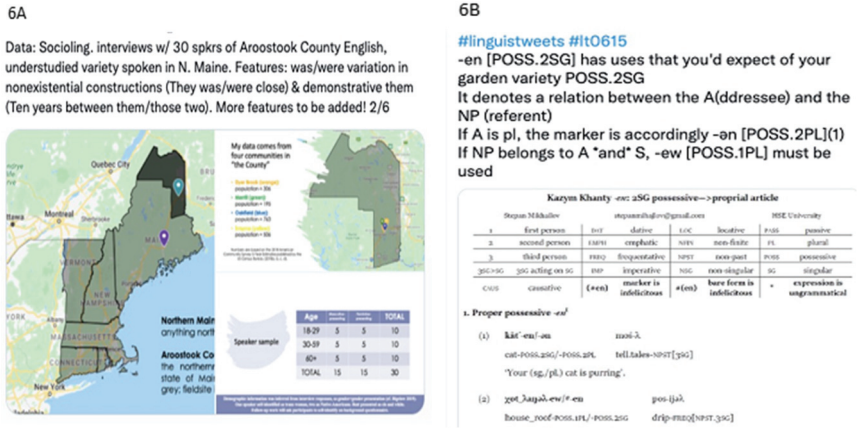
Examples of visual usage are shown in Figure 5, where authors cope with the character-limitation texts by attaching one or more images to their tweets. Direct references in the text to visuals indicate a concurrence relationship between text and image (5A), whereas when the text reports a general finding and then there is an image showing all the findings, it indicates a complementary interaction with elaboration (5B): the image often specifies what is in the text including a providing an overview of the statement.

Figure 5: *Images exemplifying results with graphs (5A) and tables (5B). Source: Thread 31 tweet 3 and Thread 26 tweet 4*



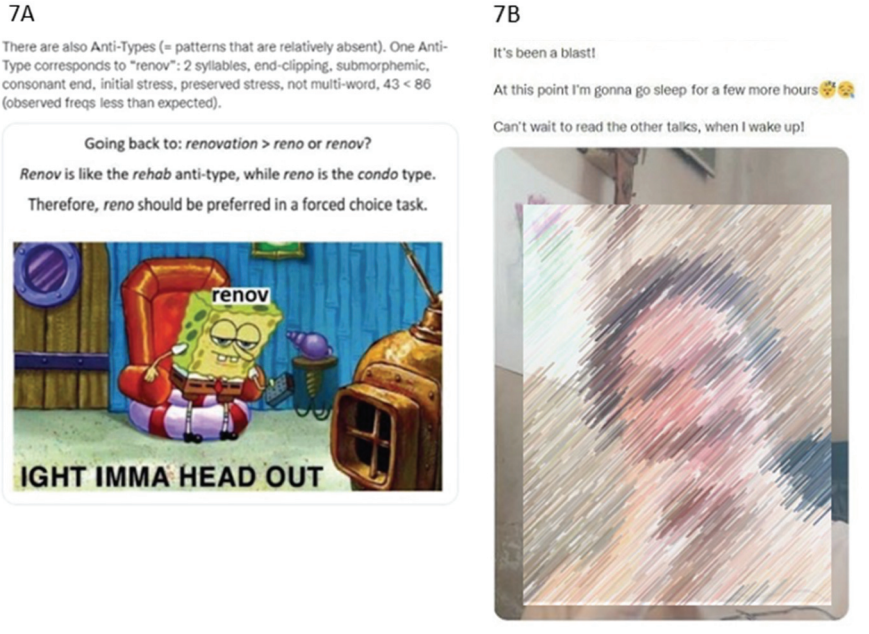
In the case of images describing methodological procedures or offering theoretical information to set the context of the study, we find an enhancement complementary interaction (Figure 6). This is achieved particularly through maps locating the research project and simultaneously offering additional information about the data. The use of images in these steps conveys objectivity, credibility, and transparency. Likewise, theoretical explanations and the contextualisation of research often include screenshots of sentences to illustrate abstract points with concrete examples (6B). This is very common in *M1_Introduction* and *M2_Background*, which shows the presenters' awareness of a diversified audience, who may or may not be familiar with some of the concepts they are dealing with, echoing Puschmann's concept of context collapse and the need to adapt scientific messages to a wide variety of audiences (2015).

Figure 6: *Images supporting methodological information (6A) and expanding theoretical information with examples (6B). Source: Thread 7 tweet 2 and Thread 21 tweet 1*



Even though the use of visuals throughout the corpus resembles other traditional research genres like conference presentations or even research papers, the corpus analysis revealed some instances of innovative communicative practices (Figure 7). Resulting from the introduction of popular culture references and photographs, we can find authors giving character traits or personifying some of their findings (7A) or trying to fill the physical and temporal gap between participants by posting a photo of them (7B).

Figure 7: *Creative use of images with memes (7A) and photos (7B). Source: Thread 26 tweet 5 and Thread 21 tweet 6*

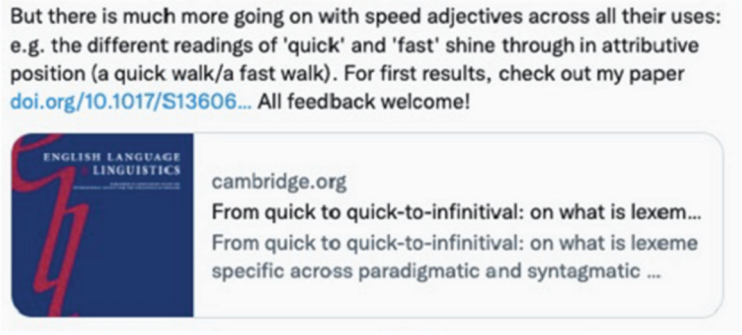


Another interesting finding refers to the combination of modes to convey different rhetorical functions. This is mainly seen in *M6_Round off*, where there is considerable variation regarding steps. In addition to images, this can also be seen in gifs, which are used mainly for the communicative function of thanking the audience. In this way, the ending of TCP includes different steps with different semiotic resources. The fact that gifs often come from popular culture references like films or TV series stresses the informal channel of communication that Twitter grants. When gifs appeared in different moves, they represented how a method was carried out (e.g., interview setting with participants) or expressed the author's opinion about a statement, similar function to the attitude hashtag. Following Jones and Hafner (2012), the interaction between modes is divergence as different communicative purposes are conveyed with different semiotic resources.

Regarding links (Figure 8), the most frequent types corresponded with the URL or DOI number to a paper, followed by the author's project website and some open access data sources like GitHub (8A). There are also links to some informal channels of communication like blogs or podcasts (9B), in this way, presenting scientific information in different forms can convince the reader to further explore the topic. Therefore, links were mostly used in *M2_Background* to support theoretical explanations and *M6_Round off*, to provide the readers with the link to their research papers or websites where they could explore in more detail the ideas exposed during the presentation. In all cases, the relation between text and links was complementary, particularly with the extension function to add extra information related to a certain extent to the tweets' contents. In this way, the authors guide the readers in their exploration of the topic at hand.

Figure 8: *Example of links extension use for references (8A) and project websites (8B). Source: Thread 14 tweet 6 and Thread 11 tweet 3*

8A



8B

5. Discussion

This exploratory study has investigated an emerging digital genre, the Twitter conference presentation, in terms of its macro and micro rhetorical structure, Twitter's affordances, and the use of (multi)semiotic resources to identify new communicative practices among researchers. The rapid advent of technological developments alongside new approaches to science-making and science-circulation practices have posed new forms of communication that scientists today can and should engage with.

In response to RQ1, "What does the Twitter conference presentation rhetorical structure look like?", this study has shown that Twitter conference presentations are similar to other spoken genres remediated on the web, such as 3MT presentations. The TCP relies on the traditional academic conference procedures as seen in the participation procedures and its macro-rhetorical structure. The move analysis has revealed that the most frequent moves in the corpus corresponded with *M5_Results*, *M2_Background*, and *M4_Methods*. Among the most frequent communicative functions, presenters dedicated more tweets to explaining, defining, and illustrating contents in these moves than others. Interestingly, the authors' decision to focus on central moves typical of traditional spoken genres, in addition to the contextual constraints of space and time, shows the need to address the main content of the research presentation directly, omitting any information that is not quintessential to the topic. On the other hand, moves that have been identified by previous studies as compulsory in academic presentations, like rationale, discussion, and purpose, were rarely found in TCP (Hyland, 2009; Hu & Liu, 2018; Rowley-Jolivet & Carter-Thomas, 2019). This study has also shown how academics face the challenges posed by a new digital genre by recycling their previous knowledge of other academic genres to organise their presentations. Yet, applying Swales' terminology (1990), there is variation regarding the micro rhetorical structure, in

particular the step analysis, with more optional than compulsory steps and overlapping step and moves because of the lack of familiarity of the authors with the genre.

Within the dynamism found in this Twitter-remediated genre, the combination of text and other semiotic resources was a strategy employed by authors to cope with space restrictions on Twitter presentations. With respect to RQ2 "What semiotic (textual and multimodal) resources are employed and what meanings do they convey?", the study has shown that among the three main Twitter affordances, attachments, particularly in the form of images, where the preferred semiotic resource chose by authors to perform diverse rhetorical functions. Images of academic nature (e.g., tables, graphs) were embedded in *M2_Background*, *M4_Methods*, and *M5_Results* to describe and illustrate results and abstract concepts, aligning with Melehnbacher (2019) and Orpin (2019) analysis of images in science communication. Hence, the use of images in TCP resembled the traditional use of images in other academic genres. On the other hand, the images embedded in *M1_Introduction* and *M6_Round off*, at the beginning and end of the Twitter thread, responded to the communicative purposes of attracting the attention of the audience and creating an interpersonal relationship between authors and potential readers. Take for instance the use of gifs to thank the audience for their time, to include photographs of the authors, or to insert memes in the tweets. Therefore, the use of non-academic images contributed to the creation of a welcoming environment in an academic context to shrink the physical distance between participants. Another semiotic resource authors benefited from was the hypertextuality offered by the medium. It is known that Twitter allows to include hashtags, mentions, and links in their tweets, and uses the blue colour to differentiate these technicalities visually from the text. By using these resources, authors boosted the visibility and impact of their tweets when including hashtags

that worked as keywords and searching tools (Lee et al., 2017), and mentions to interact with groups of interest such as colleagues, organisers, and institutions (Weller et al., 2011). Hence, the features and communicative functions identified in academic Twitter is replicated in TCP in terms of semiotic resources, Twitter affordances, and interactive purposes.

In response to the last RQ3 "What is the interrelation between semiotic modes and how they contribute to the rhetorical goals of the genre?", this study applied Jones and Hafner (2012)'s framework to examine the interrelation between verbal and visual modes. Interestingly, the combination of modes was a common strategy employed by the presenters to deal with Twitter restrictions (i.e., 280-character limitation) and the conference organisers' restrictions (i.e., 6-tweet limitation). It is shown that images play a main role in TCP, similarly to the use of slides in any conference presentation. Images were widely used throughout the tweets to expand and support the textual information. The function of concurrence found in the embedded images in *M4_Methods* offered descriptive information about procedures, which presented the author's persona as objective and transparent to offer credibility. In the case of the complementary function, different uses were found in different moves and resources. Particularly in *M2_Background* and *M5_Results*, authors could attach up to a maximum of four images providing examples, definitions, and data related to the presentation to give the reader the possibility to further explore the topics. On most occasions, precise information that could not be included in the text was inserted in a visual manner, expanding, and elaborating on what the text communicated. Similarly, links were employed to expand the whole presentation to promote the presenters' professional persona since most of the hyperlinks directed to the authors' papers and websites. There is therefore a different use between images, which offer detailed information necessary to better understand the content

of the presentation, and hyperlinks, which go beyond the presentation contents and explore sources and authors' profiles. Finally, the divergent function was found at times when several moves and/or steps were combined in one tweet. In this way, an author could express in text and images several steps. This was a recurrent aspect found at the ending of presentations, where authors would thank the audience, include references, contact details, or acknowledgements in visuals while dedicating the tweet's text to summarise the presentation main points, discuss limitations or suggests applications of the research at hand. It is possible to deduce from these findings that the combination and specific uses of modes are a valuable strategy that can promote the ultimate purposes of academic presentations: to be informative and persuasive at the same time (Querol-Julián & Fortanet-Gómez, 2014; Valeiras-Jurado, 2019).

6. Conclusions

This study contributes to the ongoing investigation of how science is communicated and what strategies can researchers use to achieve this goal from a rhetorical and semiotic perspective. It is presupposed that an engaging and concise writing style combined with attachments is more likely to be appreciated than a tweet including only text, or text with an overload of images. Thus, the blurring distinction between different types of audiences or 'context collapse' (Puschmann, 2015) and the concept of 'modal density' (Valeiras-Jurado, 2019) are crucial to understanding the delivery of effective tweets and the emergence of new tendencies in communication, where social media play an essential role in circulating scientific knowledge to widely diversified audiences. Yet, this preliminary assumption should be supported by an extensive textual analysis of tweets to explore the tweets' deployment of linguistic features and engagement strategies, and to what extent features of the spoken and informal language are present to understand their effects on the dissemination and impact of tweets.

Moreover, further research with a larger corpus would help to continue understanding how new models of scientific communication between peers and outer circles emerge, evolve, and stabilise in social media. Additionally, cross-genre comparisons (especially comparisons of traditional genres such as conference presentations and digital genres such as Twitter conference presentations) can shed further light on processes of genre remediation and innovation. In today's world where it is not only important what your message is about but how it is said, it is crucial to reflect on the importance of effective communication and dissemination of research findings to diversified audiences (institutions, companies, academics, citizens). This is an area of research where communication experts and applied linguists can contribute by offering valuable and research-based training and recommendations.

Acknowledgements

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