1 *Research Genres in Context*

1.1 Opening remarks

This book is a contribution to the existing literature on genres and English for Academic and Research Purposes. It builds on seminal work in genre studies and scholarly writing and, specifically, on John M. Swales's *Genre Analysis: English in Academic and Research Settings* (1990) and *Research Genres: Explorations and Applications* (2004). Both have been enormously influential pieces of work. Their bibliometric records – over 18,000 and 3,700 citations, respectively, according to Google Scholar at the time of drafting this book – evince a deep interest in the study of genres of scientific research communication. While *Genre Analysis* sets the theoretical foundations for the analysis of genres from text-linguistic, discourse and sociolinguistic perspectives, Swales's latter volume 'situates the research world in a wider context, discusses its various constellations of genres, reviews the status of the non-native speaker of English in that world, and reflects on possible roles for the analyst' (Swales, 2004: 1). The present book expands on these four investigative goals by critically examining the new social and sociolinguistic scenarios in which research genres today support socioliterate activity. Essentially, the book explores how, within these scenarios, research genres enable the enactment of social intentions across linguistically diverse academic and research settings.

The book also seeks to contribute an empirically informed description of genre evolution and innovation in multilingual scientific knowledge production and dissemination. To this end, it will cover a broader repertoire of web-mediated genres than that described in Swales, as Web 2.0 officially began precisely in 2004. My aim is to reflect on the interdependence of traditional and emerging genres and bring into focus the polycontextuality of the digital medium and the effects of what is called 'context collapse' (Marwick and boyd, 2011)

on processes of 'genre remediation' and 'knowledge recontextualisation' (Engeström, Engeström and Kärkkäinen, 1995; Spinuzzi and Zachry, 2000). While Swales's *Genre Analysis* and *Research Genres* mainly focused on issues of English in academic and research settings, this book acknowledges the functional role of English as a language for scientific communication on a global scale (e.g., English for Research Publication Purposes, ERPP hereafter) and also addresses issues of multilingual genre use for local, cross-border and global research communication.

At a time of profound social and technological transformation, the dynamics of knowledge production, distribution and consumption in global academia are undergoing dramatic changes. Because these dynamics have become more diverse, complex and multifaceted than ever before, this chapter first situates the contemporary research world in the context of ongoing globalisation processes in order to explore the outcomes of increasing global interaction and networking among researchers worldwide. Here, the concept of genre becomes a central construct to understand 'social ways of knowing and acting in the world' (Bawarshi and Reiff, 2010) and to examine aspects of scientific[1] knowledge exchange and dissemination, focusing on those genre-mediated activities that draw upon the rapidly changing technological affordances, particularly those of Web 2.0. Additionally, this chapter also reviews the critical conceptualisations of genre practices proposed by North American rhetorical genre studies to examine generic evolution, innovation and change in research communication from both theoretical and empirical perspectives. In this sense, the book as a whole will be summative and, above all, forward-looking and agenda-setting for future enquiry into research genres.

This book was also motivated by the paucity of in-depth theoretical enquiry into two fundamental issues that cut across research genres and socioliterate activity today. The first is the increasing reliance on digital technologies in research communication, as discussed in key rhetorical genre studies such as those of Gross and Buehl (2016) and Miller and Kelly (2017), as well as in recent ethnographic studies that

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[1] Although this book will focus on the STEMM (science, technology, engineering, mathematics and medicine) sciences, it will include occasional comments and references to the social sciences and the humanities. These fields are also scientific fields of enquiry. Research in literature, politics, psychology and philosophy does not generally use quantifiable data, but it nonetheless relies on data sources, analytical and critical methods and interpretive frameworks. More importantly, their research activity likewise draws on repertoires of (digital) genres and produces multilingual research outlets of various kinds. Therefore, at certain points this book will briefly address analogies across the disciplines.

have enquired into the impact of web-mediated communication on scholars' literate activity (Tusting et al., 2019). In this book I will argue that new ways of accessing and disseminating science in digital media are having a dramatic impact on current scholarly socioliterate practices. I will discuss how new social exigences account for the emergence of new genres (Kelly and Maddalena, 2016; Kelly and Miller, 2016; Luzón and Pérez-Llantada, 2019), the evolution of traditional, 'stabilised-for-now' (Schryer, 1994: 108) genres and the gradual disappearance and loss of some existing genres such as the book monograph (Abt, 2007). In subsequent chapters, I will explain the way traditional genres such as the journal article and the abstract are enriched by the technological affordances of the Internet and become 'enhanced publications' that offer authors and readers greater possibilities of knowledge access, circulation and dissemination through the multimodality and hypertextuality afforded by the digital medium (Gross and Buehl, 2016). In addition to aspects of genre remediation, it is also of interest for the genre analyst to understand how Web 2.0 has prompted the emergence of new genres and media formats (e.g., graphical abstracts, webinars, open laboratory notebooks, research blogs, podcasts and visualised experiment articles, among others) and how it impacts the text-composing process itself utilising 'visual rhetoric' and 'multimedia rhetoric' (Pauwels, 2006). Understanding genre uptakes, that is, 'how genres are taken up in certain ways and not others' (Bawarshi, 2016: 190) in the new media environment, for example through the use of multimodal and hypertextual affordances, to surpass the boundaries between expert readers and lay publics also seems a necessary investigative endeavour. Examining the world of research genres in new media environments can give us new insights into the form and substance of genres and, more importantly, into the interdependence between traditional and emerging genres, creating new genre assemblages and complex generic constellations in the digital medium. Linguistic and rhetorical approaches to genres and descriptions of the form and substance of the expanding repertoire of research genres are thus necessary to inform pedagogical practice and support researchers' professional development.

The second crucial issue that this book seeks to address relates to the implications that ensue from the linguistically diverse academic and research settings within which genres support socioliterate activity. While the existing literature has mostly focused on English-medium research communication, we are starting to see an increasing number of publications supporting the view that local, cross-border and global research communication involves multilingual practices (Corcoran,

Englander and Muresan, 2019; Lillis and Curry, 2010). We are also witnessing growing scholarly interest in bringing to the fore linguistic diversity in research communication practices (Gentil and Séror, 2014; Linares, 2019; Mauranen, 2012; Mauranen et al., 2010, 2020) and in the way multilingual digital genres enable researchers to reach both expert audiences and broader publics (Luzón, 2018a; Luzón and Pérez-Llantada, forthcoming). Theoretical research on genres in relation to plurilingual practices is very limited to date, even though it can help us better understand the outcomes of global Englishes and 'trans-cultural flows' (Pennycook, 2007) in contemporary academic and research settings. Issues of multilingual science production and dissemination have been under-researched and, perhaps, somewhat underappreciated at a time in which international research collaboration and networked communication have privileged English over other languages of science – see, for example, Phillipson's (1992, 2003) claims on English linguistic imperialism. To fill this gap, in this book I aim to address the transversal role of languages for academic and research communication in genre-supported activity and describe some language-related phenomena that characterise contemporary science communication. The book intends to assess the scope of what Pennycook (2007) refers to as 'increased local diversity' that results from socioliterate activity involving the use of researchers' first (local/ national) language(s) and the use of other languages. Such diversity can best meet the specific language education needs of graduate students, junior and senior researchers worldwide, who increasingly need to engage in new web-mediated forms of sharing and disseminating their research work drawing on plurilingual language repertoires.

Given these considerations, the overarching goal of this book is to demonstrate that genre theory has gained momentum at a time of profound social and technological transformations. The book will examine the current debates on written genres in relation to languages for communicating research with a view to assessing the value of multilingual science online using the genre analytical lens.

1.2 Situating genres and languages

Rhetorical genre studies and English for Academic Purposes (EAP hereafter) studies define genres as frames for social action that support researchers' socioliterate activity (Bawarshi and Reiff, 2010; Bazerman, 1994; Miller, 1984; Swales, 1990, 2004). An enquiry into today's research communication therefore requires a critical examination of the broad contexts of social interaction in which genres are situated in order to understand how they are influencing the

distribution and diffusion of scientific research. The conditions of globalising processes have fuelled the production and dissemination of scientific knowledge across national borders and fostered competitiveness, contributing to the progress and modernity of society (Pérez-Llantada, 2012; de Swaan, 2001). These contexts are intrinsically related to the constitutive conditions of knowledge-based societies (UNESCO, 2010), enabling the free flow of knowledge that links growth and economic development to the production and consumption of knowledge (World Bank, 2016). According to the *UNESCO Science Report: Towards 2030* (UNESCO, 2015), these conditions already involved 7.8 million researchers in 2013 and an overall production of 1,270,425 scientific articles listed in the Science Citation Index of Thomson Reuters' Web of Science in 2014. Both figures are on an upward trend.

1.2.1 Language, migration and mobility

Scholars and research staff's migration and mobility, together with the technological affordances of the Internet, have stimulated international cooperation in research and development activities across knowledge-based societies. The literature points out several benefits of international mobility. For Geuna (2015), the high demand for researchers has increased skilled migration and, in turn, researchers' productivity and the overall scientific output production of several countries. This author also observes that skilled migration results in financial gains for higher education and research institutions and greater availability of shared infrastructures. Using literature review data and data from a survey administered to UK-based researchers, Guthrie et al. (2017a, 2017b) define mobile researchers in Europe as a skilled population with a high potential to establish and maintain collaboration with other researchers worldwide. As these authors argue, mobile researchers represent increased staff expertise and skills development for both source (home) countries and destination countries (Guthrie et al., 2017a, 2017b: vi). These authors further add that the main reasons for migrant researchers becoming mobile range from personal interests in developing research networks and collaboration to professional development, career advancement and a better salary (Guthrie et al., 2017a, 2017b: 18). Interestingly, Guthrie et al.'s (2017a, 2017b: 20) study reports that patterns of mobility are related to the researchers' 'familiarity with the language and the culture of the destination country', the US and the UK being the preferred destinations of mobile researchers from Europe and Asia.

In the context of skilled migration and mobility, English remains 'the' shared language of international scientific exchange, collaboration and networking, corroborating earlier concerns regarding the predominance of English as a scientific and research language and the geopolitics of English academic writing (Canagarajah, 2002a; Ferguson, 2007, 2012; Giampapa and Canagarajah, 2017; Lillis and Curry, 2010; Phillipson, 1992, 2003). By way of illustration, the report 'UK research and the European Union: The role of the EU in international research collaboration and researcher mobility' reflects the growing international collaboration between anglophone and non-anglophone countries. While in the period 2005–2014 almost 40 per cent of the research papers published by the UK involved international co-authorship with EU partners, in 2015 such collaboration increased up to 60 per cent (Royal Society, 2011: 4). The International Collaboration Index (National Science Foundation Science and Engineering Indicators, 2016) indicates a similar trend. Nearly 40 per cent of the United States' international articles involve co-authorship with researchers from 'outer' and 'expanding circle' countries in Kachruvian terms – Brazil, China, France, Germany, Italy, Japan, the Netherlands, South Korea, Spain, Sweden and Switzerland. Supranational interests in the global outreach and excellence of research also become manifest in the EU's collaboration policies with the BRIC countries (Brazil, Russia, India and China (Boekholt et al., 2009)).

To grasp the dynamics of languages in today's research communication, we should bear in mind the important paradigm shift in the field of sociolinguistics. While the World Englishes (WE hereafter) phenomenon was initially described using the traditional scales of space and time as a phenomenon entailing the development of localised varieties of English in stable spaces across the globe (Crystal, 2003), post-globalisation brings about the need for a new paradigm, the 'sociolinguistics of globalisation' (Blommaert, 2010; Blommaert and Dong, 2010; Coupland, 2010). The 'sociolinguistics of distribution', the traditional sociolinguistic paradigm applied to the study of the structure of language and language variation and change, describes the movement of language resources in relation to horizontal and stable spaces (Wardhaugh, 1998: 12). According to this paradigm, the scales of space and time are no longer valid to explain the sociolinguistic variation of the English language because 'the mobility of people involves the mobility of linguistic and sociolinguistic resources' – hence, '"sedentary" patterns of language use are complemented by "trans-local" forms of language use' (Blommaert and Dong, 2010: 367–368). In view of the increasing collaboration and

mobility in today's research world, it seems apposite to adopt Blommaert and Dong's (2010) view of 'language-in-motion, with various spatiotemporal frames interacting with one another' to understand language variation and patterns of language use in research communication and to better grasp how genres support literate activity in (socio)-linguistically diverse academic and research settings. Further, as argued in Chapters 6 and 7 of this book, it seems germane for genre analysts to focus on language variation in the English-medium practices that facilitate researchers' mobility and international collaboration and, at the same time, to bring to the fore linguistic diversity in science communication in the age of digital and social media.

1.2.2 Dynamic multilingualism

'Language-in-motion' is a useful construct to understand how the spread of English in global scientific knowledge exchange permeates genred activity across multilingual communities of researchers worldwide. In many ways, it explains different phenomena of language glocalisation in research communication. For example, EAP studies have claimed that L2 English academic writing is discursively hybrid (Mauranen, 2018; Pérez-Llantada, 2012, 2013a). Discoursal hybridisation is the term used to describe how the texts written by researchers from non-anglophone linguacultural backgrounds exhibit linguistic features and aspects of rhetoric and argumentation characteristic of the writers' L1 academic writing tradition, as well as linguistic and rhetorical resources of anglophone academic writing. These glocal variants of the English language, discussed in Chapter 4 of this book, have been conceptualised using labels such as 'academic Englishes' (AEs hereafter) (Mauranen, Pérez-Llantada and Swales, 2010, 2020), 'English as a Lingua Franca' (ELF hereafter) (Mauranen, 2012, 2018) and Lingua Franca Englishes (LFEs hereafter) (Guillén and Vázquez, 2018). They apply equally to descriptions of English language variation in written and spoken genres as well as in digital genres (Luzón, 2018a). AEs, ELF and LFEs strongly suggest that English is a language-in-motion from which distinct similects have emerged that instantiate a parallel phenomenon to that of WE at the micro-level of social interaction, namely, academic and research settings (Mauranen, 2018).

Other outcomes of academics and researchers' migration and mobility that also relate to dynamic multilingualism and corroborate the view of English as a 'language-in-motion' are language phenomena such as 'languaging' (Shohamy, 2006) 'translanguaging' (Canagarajah, 2013) and 'polylanguaging in superdiversity' (Jørgensen et al., 2011)

that occur in communities of plurilingual language users. EAP studies have reported the use of multilingual repertoires in communities in which researchers use their local or national language, English, and other languages to communicate research through traditional genres of research (e.g., journal articles, abstracts and theses, to name a few) (Corcoran, Englander and Muresan, 2019; Muresan and Pérez-Llantada, 2014) as well as through web-mediated genres (Luzón, 2017, 2018b regarding research group blogs and microblogging). These practices suggest that genre-mediated action involves multilingual competence, or 'the command and/or use of two or more languages by an individual speaker' (Herdina and Jessner, 2002: 52). The conditions, constraints and consequences of using plurilingual genre repertoires for communicating science are issues that need to be investigated further to gain insight into socioliterate activity within and across (socio)linguistically diverse communities of researchers worldwide. It is also worthwhile to examine single monolingual genres and, above all, to focus on the language dynamics of interdependent genres and genre assemblages in one or more languages. Genre research, particularly in these latter aspects, is limited to date.

1.3 Commodification of science

In the wider contexts of ongoing post-globalisation and increasing migration and mobility, technological developments have emerged as one of the primary drivers of the massive increase in the production and diffusion of knowledge without any time and space constraints. It is therefore important to consider how Web 2.0 supports genre-mediated action for research communication in the broad social world that sociologist Anthony Giddens (1990) conceptualises as 'late modernity', an age of heterogeneity in global mass communication. At the macro-level of genre-mediated activity, both the production and consumption of knowledge in knowledge-based societies have become commodities, since both have a use value and an exchange value. Knowledge production is measured using bibliometric indicators such as the number of articles published in high-impact-factor journals and citation counts, and innovation and transfer indicators are used to measure countries' economic growth and the quality of the research outreach of higher institutions and that of individual researchers (Glänzel, Debackere and Meyer, 2007; OECD, 2008).

International recognition in higher education is also measured in terms of use-value and exchange-value indicators. Spencer-Oatey and Dauber's (2015) benchmarks for mapping and profiling internationalisation in higher education institutions include the following structural

indicators: staff members' organisation of international conferences, participation in exchange programs and international professional associations, attendance at international conferences and seminars, delivery of conference presentations abroad, participation in internationally funded projects and research networks, multilateral projects and international cooperation contracts, publication of books and articles in internationally refereed journals and number of highly cited authors (Spencer-Oatey and Dauber, 2015). Altbach (2004: 65) provides a different example, that of leading Chinese universities whose 'local' needs remain an essential and distinct counterpart of the 'global' in the process of internationalisation. These universities mainly produce research for internal use and draw on this stock of knowledge to establish links with the outside world. Underpinning these policies lie bilingual practices.

Turning to the micro-level of genre-mediated activity, we see in the literature that supranational, national and institutional research policies have had a significant impact on the types of genres researchers today engage in. Lillis and Curry (2010: 1) contend that the pressure on researchers to publish is the outcome of research policies that act as 'systems which influence academic text production in powerful ways'. When referring to the Research Excellence Framework in the UK, Tusting (2018: 483) explains the impact of 'genre regimes of research evaluation', that is, 'systems of accountability driven by institutions' need to succeed in the national competitive research evaluation system privileging particular types of output (journal articles, and, to a lesser degree, research monographs), published in particular locations.' In short, career advancement is linked to the production of journal articles in JCR high-impact-factor journals. Regrettably, predatory journals have emerged that publish authors' manuscripts for a publication fee in cases where JCR standards are unattainable.

One useful heuristic for understanding why a genre like the journal article stands as a core genre for research communication is the theory of structuration proposed by Anthony Giddens (1986) in his work *The Constitution of Society*. Giddens explains that social interaction practices lie at the intersection of structures and agents. In the case of the journal article, we could argue that this key writing activity for scientists takes place within a well-established *patterning of interaction* among different actors (authors, journal editors and reviewers). Moreover, journal article writing responds to the expectations of diverse agents – not only scientists or expert peers but also other science stakeholders such as funding organisations and governmental bodies. The intersection of structures and agents can explain why the

traditional journal article as a print genre becomes in the digital medium an enhanced publication with greater visibility and impact. The Article of the Future (AoF hereafter) best illustrates this point. In the AoF the article contents are enhanced with multimodal and hyper-textual elements (e.g., graphical abstracts, embedded videos, short summaries, audioslides and external hyperlinks), creating a macro-genre formed by the core genre (the article) and extensions of this genre (the add-on genres aimed at enhancing the article contents) (Casper, 2016; Cox, 2015; Pérez-Llantada, 2013b). Another example can be found in scientific video journals such as the *Journal of Visualised Experiments* (JoVE hereafter). This journal publishes articles reporting methodological protocols along with their associated video methods articles. In these videos the scientists thoroughly explain the methodological procedures and steps followed in their study so that other researchers can replicate the study (Hafner, 2018).

Digitisation of printed texts has also improved the circulation of knowledge via digital libraries, in which knowledge is stored locally and accessed remotely. Authors are able to share their research data with other scientists in a large scale, generally open-access, research-data repositories. Some journals have prompted the emergence of the so-called data articles, described as 'brief, citable articles' that offer authors the possibility to publish an abbreviated account of the significance of their data and make their data public along with the original journal article. Open access (OA hereafter) possibilities also account for the transformation of another traditional genre, the peer review, into a digital genre, the open peer review (Breeze, 2019). Likewise, Mehlenbacher (2019a) describes the genre of registered reports, a genre that has emerged as a requirement of the 'reproducibility of science', as a response to the need to make methodological procedures more transparent and science more trustable through a two-stage peer-review process. Scientists first submit a methodology report indicating the stages of the methodological protocol and, once this report is peer reviewed and accepted, the authors submit the full article for a second-round review.

1.3.1 Science in society

The inseparability of structures and agents postulated by the structurational approach can also help genre analysts to understand why some new genres on the web have emerged as a response to actors other than peer scientists, namely, publics with diverse knowledge backgrounds and interests in science. An example of transformative practice in science communication today is the case of genres related to