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Book review

Scott L. MONTGOMERY (2013)
Does Science need a Global Language?
English and the Future of Research.
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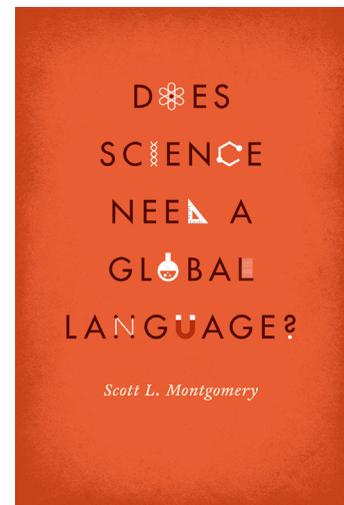
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In *Does Science Need a Global Language*, Montgomery investigates the role of English as the global language of science – with science being understood as natural sciences, medicine, engineering and, in terms of academic disciplines, those that fall under the science, technology, engineering, and mathematics (STEM) umbrella. Montgomery's approach is informed and scholarly, yet very accessible, offering a way into what could otherwise be an impenetrable philosophical discourse on whether a unifying language could exist, and whether this would be desirable. The humane tone of this long essay is aided by the plentiful use of anecdotes and examples, taken from Montgomery's career and wide reading, spanning many continents and professional domains. The book focuses on natural sciences, yet is also highly relevant for social sciences, including Business and Management, as well as for the humanities, since English has also become the language of knowledge and exchange in these domains. In fact, the field of Business and Management has only very recently begun to reflect on the role of English as its dominant language (Janssens & Steyaert, 2013; Tietze, 2004), and the consequences of the monolingual nature of the community of management scholars.

The book is divided into six chapters, with David Crystal providing a foreword to the scientific story that will unfold.

Chapter 1, *A New Era*, begins in typical fashion with an anecdote: the story of Ben, a Ugandan chemist, whose life and English-learning is grounded in historical-political changes which shape his professional choices and his ultimate belief that English provides a means to share knowledge, and is a language 'that will not take sides with any group' (p2). Yet, other experiences depicted in the book provide a counterbalance to overoptimistic assumptions about easy access to, and beneficial use of, the English language. Communicating scientific knowledge in English is necessary but can be awkward and difficult. This is the case for Elyana Meyer, a plant pathologist of Brazilian origin, who feels awkward when communicating in English, in particular in situations where knowledge is conveyed orally, such as at scientific conferences. Mastering the English language also presents difficulties for the



young Chinese biotechnologist, Liang Chin, who experienced problems when publishing in international, English-language journals, which he recognised as essential to his personal, professional and social ambitions. These fictional cases are representative of the major themes of the book: there is a global form of English for particular domains of human life and endeavour; multiple types of English coexist; there is unequal exposure to English, and nations are investing many resources in building educational infrastructure to support the STEM subjects, which are intrinsically linked to the English language. One of the strengths of the book is that it considers the geopolitical circumstances of English and its rise, how this shapes individuals' lives, and how global knowledge networks are formed – albeit precariously at times – through the medium of the English language.

Chapter 2, *Global English. Realities, Geopolitics and Issues*, presents a comprehensive background to the emergence of English as a global force, in terms of its spread across continents, the ever-growing numbers of speakers of English and number of domains in which English is the language of knowledge. The chapter describes the historical-political context behind the adoption of English as the main global language. It argues that the emergence of a global language is expressive of changes in geopolitical constellations of power and partnerships. The most significant recent shift was perhaps Asia's entry to the centre of work affairs, including China's building of an industrial and knowledge-based economy, and the rapid development of South Korea, Japan, Russia and India, propelled by technology, science and commerce. The extended exploration of historical-political events demonstrates that the English language is expressive of historical-political developments, but is not a driving force in its own right. It is seen as a tool of human and national projects and intents.

Montgomery provides plenty of evidence for his thesis that English has emerged as the lingua franca of knowledge and science. This includes a comparison of the world's ten largest languages, based on the number of native and non-native speakers, and the size of the global dissemination of languages. English is distinct from the other languages as it has a much higher number of non-native speakers and greater dissemination. While this dominance could be seen as a threat to other languages – a topic that is approached with great sensitivity in the book – the theory that English is responsible for declining language diversity is firmly rejected. The standpoint of the book is articulated on Page 54, where English is defined as 'nothing less than the tongue of modernism (...) it is attached to ideas of progress, internationalism, and emergence from poverty'. Also, as the expansion of English is a complex and by no means coherent process, there is room for different standards of English, for the appropriation of meaning and, while Anglo-America has supplied 'starting material (...) the rest of the world has been busy shaping it and making it its own' (p. 56). Yet, the extent of diversity and flexibility within Standard Written English (SWE), is constrained by formal institutional contexts. Montgomery advocates 'rhetorical flexibility' through a 'kind of broad, forgiving world standard' for written English, including within the language of science.

In Chapter 3, entitled *English and Science*, Montgomery articulates the central concern of his book. He starts with an extended anecdote about Andre Greim, a physicist of German-Russian origin, who won the Nobel Prize in 2010 for

his work on graphemes. Widely travelled and based at different universities in Europe and beyond, Greim's response to a question about the brain drain was that '[s]cience is not a football, and a scientist isn't a player on a team, but a worker for all humanity. The brain drain shouldn't be stopped (...) free movement should be allowed' (p. 70). Greim and other key talent who travel the world and are located in different countries and nation states have a shared global tongue – the English language – which is at once denationalised and supranational, and contributes to the progression of humanity. Through the exemplar of Greim's career, the book shows that global science relies on proficiency in English. In this regard, the so-called 'brain drain' experienced by some nation states is seen as only one part of a wider circulation of scientific knowledge, communicated across the parochial boundaries of nation states. Despite political interference, there is collaboration between these knowledge workers, which has only been possible through the sharing of a communicative tool. Echoing the words of Francois Rozier, the founder of one of the first scientific journals, *Observations sur la Physique, sur l'Histoire Naturelle et sur les Arts*, science is cast as a democracy, 'whose citizenship requires that one be both an active researcher and a speaker of the communal tongue' (p. 72). Through tracking publication trends of natural science research papers, the movement of scientists across national borders and collaboration trends between multiple researchers, Montgomery paints a picture of the 'Republic of Ideas' as tied to the existence of a shared language, which nonetheless allows for a degree of flexibility in terms of developing global standards for written research papers and crossing national, disciplinary and linguistic boundaries. Although the rhetorical norms for research papers remain dominated by western scientists, particularly native English speakers from Britain and the United States, the future presents opportunities for speakers from elsewhere: 'As researchers from more nations employ the English language to communicate their work and collegiality, science itself will become increasingly globalized beyond the borders of any single group of states, no matter how powerful' (p. 101).

In Chapter 4, *Impacts. A Discussion of Limitations and Issues for a Global Language*, Montgomery turns to the less favourable consequences of an emergent and increasingly powerful global language. As is appropriate to his humanistic approach, he advances a moral discourse on 'equity', 'fairness', 'marginalisation' and 'loss', opening up 'perspectives' on what it means to work as a scientist who uses a non-native language. First, he points to the divisiveness of a global tongue that separates those who can use it from those who cannot – those who are native speakers or have privileged access to learning it from those who feel they must forever struggle and compensate for their inferior ability. His debate is presented in terms of a 'core-periphery' divide of wealthy countries at the heart of knowledge production and those waiting to be let in. In subsequent pages, Montgomery's sophisticated argument discusses 'subtle hurdles' like linguistic conventions in scientific writing that make it difficult for non-native speakers of English to write in the required way to achieve publication – by which scientists stand or fall. Indeed, there can be terrible and unfair consequences for competent scientists who fall short of the required standard of English. Likewise, as new scientific terms are constantly coined – increasingly in English – will this mean that other languages become marginalised as the new frontiers of research and knowledge are carved?

Would important research be invisible and ineffectual if it were not published in English? Here, a noteworthy example is the avian influenza epidemic in South East Asia, where important papers on the disease went unnoticed despite their publication in Chinese-language journals. Montgomery points to possible solutions such as developing a support infrastructure for speakers of English as a Foreign Language (EFL), in particular at the level of providing editorial help. Yet, improving 'troubled manuscripts' is labour-intensive and many journals and institutions do not have the funds to provide this support.

However, the impediments EFL scientists face in articulating their research findings in English, whether in oral or written forms, is partially counterbalanced by research teams, with some members providing the required English-language expertise. Furthermore, the additional linguistic efforts which EFL scientists have to make may prove beneficial in the long term in that they strengthen discipline and resolve. On a macro level, domains of knowledge may experience 'domain loss', meaning that one language takes over the vocabulary and conceptual territory of a particular domain, such as government administration, the military, engineering, law or tax. As always, Montgomery believes that the responsibility of dealing with such pressures and finding workable solutions lies with particular groups, such as researchers, editors and other communicators in the natural sciences, as they ultimately choose whether to adopt new vocabulary directly from English or to search for an equivalent in their own languages. These processes are still unfolding, and, rather than offering conclusions at the end of each chapter, questions are left for the reader to address. This particular chapter concludes with a story of the anthropologist Thomson, a champion of the Aboriginal cause in Australia, who became lost during a journey and was befriended by the Bindibu tribe. On his departure, they gave him a wood-carved map which he had to learn to read in the Bindibu tribe language in order to decipher its meaning. The map revealed the location of hidden waters below the tribe's hunting ground. Thompson would perhaps have died of thirst had he not had access to this particular 'knowledge system'. A provocative question is posed and then addressed in the remainder of the book: 'The greatest long-term danger coming from the global spread of English – could it be to its own native speakers?' (p. 131).

In Chapter 5, Past and Future. What do Former Lingua Francas Tell us?, Montgomery turns to the past in order to predict the future of the English language as a global lingua franca. He opens the chapter with the story of Adelard, born in Bath (South West England) in 1080, a time of political upheaval which saw French being imposed in Anglo-Saxon life. Adelard travelled to many countries and learned their languages, and one of his major contributions to scholarship and the advancement of knowledge is the translation of Islamic texts into Latin, which made them available to a wider learned community. Despite language diversity and change – concomitant with the need to translate, a major theme in this chapter – Montgomery formulates his thesis early on in the chapter: 'periods in which knowledge about the natural world advanced to a high degree where characterized by major lingua francas' (p. 133). This excludes a brief period of about 300 years from 1680 to 1970, as Europe fragmented into competing nation states and as national tongues replaced Latin. The period remains an anomaly and has now come to an end as for 'scientists themselves, nationalism isn't the factor that drives research [...] researchers themselves embrace globalism as an ever-growing

dimension of their work and the future of their disciplines' (p. 135). To provide evidence for his thesis, Montgomery accurately tracks the rise and fall of four lingua francas: Greek, Latin in the era of Rome, Arabic, and Latin in Europe up to the Scientific Revolution. This chapter also includes a sub-chapter on China and ends with a comment on the 'modern era', where there was no such unifying lingua franca, but when science progressed regardless. This was owing to the work of multilingual workers (or 'knowledge workers' as they would be called today) who translated knowledge, provided summaries of literature and knowledge in other languages and in doing so critically engaged with them, and provided reports from meetings, conferences and laboratories. Montgomery believes that the era of English as a lingua franca has just begun. Discussions and debate will shift away from issues of 'fairness' and 'marginalisation' to questions about best practices in English-language learning. English will become the language of the most advanced form of knowledge in the natural sciences, and standards of knowledge sharing will be based on whether intelligibility is achieved. Nothing can be predicted with certainty, and political events and upheavals may still bring language change. Yet, previous lingua francas have reigned for several hundreds, or even thousands, of years; as the development of English as a global lingua franca has only just begun, its reign has the potential to last for a considerable time. In Chapter 6, *Does Science Need a Global Language?*, Montgomery provides a clear answer – an unsurprising and resounding 'yes'. The author then reflects on the depth and spread of English in the natural sciences and, in line with the overall inspiration of the book, includes a discussion about 'whether the existence of global English is a good thing'. Ultimately, the answer to this question is 'yes', too, although it is tempered by insights into the 'realities of English and having access to English' as being subject to income, geography, ethnicity, geopolitical events and more. In addition, global English is not believed to resolve cultural differences and expectations, so that intercultural skills (for example, those needed when managing international research teams) will remain important competencies. Montgomery sees that the greatest threat to progress is the unequal distribution of access to English, which can result in damage to the careers and wellbeing of scientists. Here, again, Montgomery believes that researchers should take every opportunity to learn English and institutional gatekeepers, such as editorial boards, should do all they can to review their language policies. Most importantly, he suggests several approaches to teaching English as a part of standard science training, in order to create a global community of scientists.

I found this an intelligent and informative book; it offers plenty of examples, anecdotes and parables. Ample evidence supports the author's major claims and theses. Montgomery is a trained natural scientist, journalist and ghost writer, as well as a translator; as such, he is well positioned to comment on the use of English, its relationship with other languages, and the production and dissemination of knowledge. He is also an excellent writer and confidently steers the reader through complicated historical, linguistic and political events. In linking linguistic developments with changes to individuals' life stories and his own experience, he demonstrates that the personal and political are interconnected, and that the production of knowledge is part of historical and political processes and shifts in power, which are often played out in the daily tragedies, failures and fragilities of real people. This is not a naive

or triumphant book about English as a global force. It is a book written by a modernist and believer in science as a joint, progressive human project. For this reason, as well as for its intellectual breadth, it is well worth a read.

For researchers in the field of Business and Management this work is of particular interest, as this domain has been intrinsically linked to the English language – more so than other social science disciplines – due to the close historical ties between English and trade and commerce, beginning with the language's propagation in the 17th century. The historian and linguist Ostler (2005: 457) describes this period thus: 'the world is opened up to English, but above all to their business and trading enterprise'. These early travels on the part of the English formed a legacy for the later emergence of a professional and formal Business and Management domain and the contemporary dominance not just of the English language but also of the meaning systems tied to it. This in turn led to a legacy of 'micro-political issues that impact upon management and organization research: the status of journals, the social and institutional norms that police who publishes, what, where and with what impact; the capacity of dominant elites and research traditions to marginalize alternative voices and intellectual dissent' (Grey, 2010: 682). The unreflective use of the English language and the Anglo-American meaning systems which it has become inscribed with may well be such a micro-political issue that the community of business and management researchers is yet to articulate. As Ostler (2005: 512) puts it: 'For scientists and engineers, but crucially for business, English has been the language in which the world's know-how is set out'. Therefore, for all EFL researchers, access to learning English is necessary to join the 'Republic of Ideas'. For social scientists within the Business and Management domain, English-language learning needs to be accompanied by developing sensitivity for language as carrying meaning and meaning systems which vary across languages and cultures, even if they are expressed in English.

Since English continues to be taken for granted as the language of Business and Management knowledge, ELF researchers in this domain face ongoing struggles for their ideas to be deemed 'good and valid' when expressed in other languages, let alone published in 'journals that count', which are invariably English-language ones (Tietze and Dick, 2013).

Montgomery observes that a difference between the domains of natural and social science is that 'meaning' is more easily fixed and agreed upon within the former, as it is generally expressible in numbers and equations (Montgomery refers to the famous quote by Galileo according to which the universe was written by God in the language of mathematics). This is compared to the 'slippage' of meaning of words and concepts within the domain of Business and Management and the question of whether they can ever have the same meaning in different languages. Holden and Tansley (2008) provide commentary on how even the term 'management' denotes very different meanings in different languages and cultures, even if this difference in meaning is sometimes obscured by using the same English word.

Yet, despite major differences between natural and social science, the publication of knowledge in journals is not dissimilar to publication in the natural sciences: both are in English and dominated by standards based on a native-speaker model. In this regard, I encourage the gatekeepers of written Business and Management knowledge, such as senior academics, publishers,

editors and editorial boards, as well as authors who devise journal ranking lists, to read the 'brief suggestions' (pp. 177 – 179) which Montgomery puts to the publishing world. Implementing some of these ideas could help to develop English as a unifying language of Business and Management knowledge, while counterbalancing the danger of overriding, rejecting or marginalising meanings that are not easily expressed within its vocabulary, syntax and grammatical order.

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