

**CANDIDATURA AO TÍTULO DE AGREGADO
NA ÁREA DISCIPLINAR DE TRADUÇÃO**

**RELATÓRIO
TRADUÇÃO DO TEXTO TÉCNICO-CIENTÍFICO
(Mestrado em Tradução)**

Karen Bennett

2024

Relatório sobre o programa, os conteúdos e os métodos de ensino da unidade curricular de Tradução do Texto Técnico-Científico do Mestrado em Tradução apresentado à Candidatura ao Título de Agregado na área disciplinar de Tradução da Faculdade de Ciências Sociais e Humanas da Universidade Nova de Lisboa, ao abrigo do Decreto-Lei nº 239/2007 publicado no *Diário da República* de 19 de Junho de 2007.

Table of Contents

1. Introduction	1
2. Scientific and technical discourse	4
2.1. What is a 'scientific text' (<i>texto científico</i>)?	5
2.2. The structure and history of scientific discourse	7
2.3. Scientific text types	11
2.4. Legal translation – a technical discourse?	14
3. Translating SciTech	15
3.1. Translating highly technical texts	17
3.1.1. <i>Grammatical issues</i>	18
3.1.2. <i>Degrees of technicality</i>	22
3.1.3. <i>Epistemic modality</i>	23
3.1.4. <i>Text structure</i>	24
3.2. Translating popular/educational science	25
3.2.1. <i>Register</i>	26
3.2.2. <i>Culturally specific items</i>	27
3.2.3. <i>Deictic references</i>	28
3.2.4. <i>Dialogue</i>	28
3.3. Translating hybrid text types	28
3.4. Collaborative translation	29
3.5. Translation technology	29
3.6. English as a Lingua Franca (ELF)	31
3.7. (Inter)-epistemic translation	33
3.8. Translationality	35
4. The programme	37
4.1. Aims and scope	37
4.2. Course Structure	38
4.2.1. <i>TTC (2015-22)</i>	38
4.2.2. <i>TTT-C (from 2023-24)</i>	40
5. Teaching the programme	41
5.1. Main challenges	41
5.2. Teaching methods	42
5.3. Bibliographies	51
5.4. Materials	54
5.5. Assessment	57
6. Conclusion	59
Bibliography	61

Annexes:

I. Administrative documents:

a) programme and general bibliography (TTT-C 2024)	71
b) instructions for individual assignment	75
c) instructions for alternative assignment	77
d) instructions for collaborative translation	78
e) sample test (TTC 2017-18)	79
f) sample <i>exame de (recurso e) melhoria</i> (TTC 2018-19)	81
g) report on test (TTC 2017-18)	85
h) report on individual assignment (TTC 2020-21)	89

II. Teaching materials:

a) Selected worksheets and exercises	95
b) Powerpoints of presentations (electronic files)	

1. Introduction

This document is a report on the Curricular Unit (UC) *Tradução do Texto Técnico-Científico* of the Master's programme in Translation at the NOVA-FCSH, prepared in compliance with the requirements of Decreto-Lei nº 239/2007 published in the *Diário da República* of 19th June. It is written in English out of convenience, in part because the bibliography is predominantly in English, but also because the course is also taught (mostly) in that language in fulfilment of the Faculty's internationalization policy.

This course was chosen as the subject for my report because it is a field in which I have invested a great deal over the course of my career. My interest in translation and knowledge (*ciência*) was manifested early in my academic career with my PhD thesis entitled *English Academic Discourse: Its Hegemonic Status and Implications for Translation* (University of Lisbon, 2009), itself based upon years of practical experience as a translator of academic texts between Portuguese and English. In fact, it was essentially because of this thesis, and the reputation that I had built up internationally as a specialist in knowledge translation,¹ that I was asked to teach the curricular unit (UC) *Tradução do Texto Científico (TCC)*, when I joined the NOVA FCSH in 2015.

From the outset, there was some uncertainty about what I was supposed to be teaching on this UC. As I pointed out to the course coordinator and other colleagues in informal meetings that we had about the subject in early 2015, the word *científico* is a false cognate between Portuguese and English, bringing important implications for the course content. The fact that there also existed another UC called *Tradução do Texto Técnico (TTT)* implied that *científico* should not be understood in the narrower English sense to refer exclusively to the discourse of subjects of subjects like Physics, Chemistry and Biology, but rather in the broader Portuguese sense of 'academic', or 'pertaining to research', 'specialist knowledge' etc.² However, I knew from my own

¹ Around this time, I published various articles and chapters, as well as an edited volume, on the subject of knowledge translation, mostly focusing on the effects of the English hegemony in academic writing (see Bennett 2006, 2007a, 2007b, 2009b, 2010a, 2010b, 2013, 2014a, 2014b, 2014c, 2014d, 2015a, 2015b). My article 'Epistemicide! The tale of a predatory discourse' published in *The Translator* (Bennett 2007a), remained the second most cited work published by that journal for over ten years and resulted in many invitations to participate in events and publications, as well as spawning new translational studies about epistemicide in different cultural and linguistic contexts.

² The problem was compounded by the fact that on our *Licenciatura* in Translation, the English understanding of the term 'scientific' prevails, since the teaching of SciTech translation (*Práticas de*

work in the field of knowledge translation that there was little point in training our students to translate academic texts from English to Portuguese as, in the globalised world, knowledge flows go in the opposite direction: new knowledge (*ciência*) circulates in English and, with very few exceptions, only established knowledge (popularizations or educational material) is translated into Portuguese (Wright 2011).

In the end, with the support of the Course Coordinator, I decided to create a course that would include elements of *both* the Portuguese and the English understandings of the term, and to problematize the issue in the very first lesson. This seemed to work quite well, and so was the form that the programme took until this year, when *Tradução do Texto Científico* was formally amalgamated with *Tradução do Texto Técnico* to make space for a new UC on Audiovisual Translation (TAV). Now entitled *Tradução do Texto Técnico-Científico (TTT-C)*, this will be taught for the first time in the second semester of the current year (2023-24).

In the meantime, I had continued to produce research in the field of knowledge translation, though broadening the scope considerably. While my early articles and dissertation were concerned above all with exploring the differences between English and Portuguese academic discourse,³ finding historical and cultural reasons to account for them,⁴ discussing the implications for translation practice⁵ and denouncing the ‘epistemicide’ practised in the act of translation through the dominance of English in the field,⁶ my more recent work in the field has been much broader in scope.

Tradução Técnica-Científica) is taught separately from the translation of humanistic and social science texts (*Práticas de Tradução das Ciências Sociais e Humanas*) and indeed business and marketing (*Práticas de Tradução de Assuntos Empresariais*). As many of the MA students have come from the BA course, I felt that this was a potential source of confusion.

³ The dissertation included chapters on the Structure and the History of both discourses, as well as an extended exploration of the complex relationships between them. This included a corpus study of Portuguese academic texts across a range of disciplines produced between 1998 and 2008, whose findings are summarized in my article ‘Academic discourse in Portugal: a whole different ballgame’ (Bennett 2010a), later updated in second corpus study focusing on the changes taking place in the discourse of historiography specifically through the influence of English (2014b). It also included a study of academic style manuals in English (Bennett 2009b) and in Portuguese, and a survey of Portuguese researchers to find out their perceptions of the differences (Bennett 2010b). The three studies relating to Portuguese academic discourse are collected into a short volume entitled *Academic Writing in Portugal* (2011c). Other articles and chapters dealing with the relationship between English and Portuguese in academic text production include Bennett 2006, 2007a, 2007b, 2012, 2013b, 2014c, 2014d, 2015c.

⁴ Articles and chapters with a marked historical focus include 2007b, 2011a, 2011b, 2015b, 2015c.

⁵ Bennett 2007a, 2013a, 2013b.

⁶ In addition to the article ‘Epistemicide’ mentioned above (2007a), see also ‘Towards an epistemological monoculture: mechanisms of epistemicide in European research publication’ (2015a) and the more

Influenced by my growing interest in history and theory of translation. I began to study the role played by translation in the actual *construction* of knowledge as well as its transmission (cf. Bennett, 2023, 2020), and also the translational operations that take place when knowledge that has been created within the framework of one knowledge paradigm is rewritten intralingually or intersemiotically to make sense in another – a process now known as ‘(inter-)epistemic translation’ (Bennett, 2024b, submitted).

All of these issues have found their way into the UC that is the object of this report, with a view to not only preparing translators for the contemporary marketplace, but also hopefully stimulating some of them to pursue research in this burgeoning field. In this report, I shall describe how this is achieved in practice.

The report is organized into five main chapters, framed by this Introduction and a Conclusion. It begins with a discussion of scientific and technical discourse (Chapter 2), its basic structure, history, and importation into Portugal, and the basic text types that can be considered under its rubric. Chapter 3 is concerned with issues relating to the translation of SciTech discourse, including practical problems of a linguistic, cultural or ideological nature, the role of technology and the (controversial) issue of English as a Lingua Franca (ELF), as well as offering an introduction to the new concepts of ‘(inter-)epistemic translation’ and ‘translationality’. Chapter 4 focuses on the Programme itself, its aims, scope and overall design, while Chapter 5 explains how it is taught in practice (the main challenges, teaching methods used, materials and forms of assessment). Finally, the Conclusion considers the future of SciTech translation in the light of the ongoing technological advances.

There is also a section of Annexes including not only administrative documents (the programme as presented to the students, test papers, instructions for the written assignment and *exame de recurso/melhoria*, and examples of the feedback given to students following the assessments) but also teaching materials used (instructions and specialized bibliographies for oral presentations, powerpoints etc).

recent ‘Translating knowledge in the multilingual paradigm: beyond epistemicide’ (2024a), which updates the concept to take account of shifts that had taken place in the domain of language politics and theory and proposed a new way of studying such issues that got beyond linguistic imperialism.

2. Scientific and technical discourse

Scientific discourse first became an object of study in the 1980s when ‘science’ – till then a largely unproblematized notion in the Anglophone world – came under scrutiny from various angles.⁷ At the same time, demand was increasing for training in academic writing, amongst both Anglophone scholars (who began to suspect that proficiency in the field owed more to an understanding of the norms and principles underpinning what was a collectively constructed ‘discourse’, rather than to some Romantic notion of individual creative genius) and scholars from other linguistic and cultural backgrounds, since English was rapidly becoming the hegemonic lingua franca of knowledge production and circulation.⁸ Hence, courses and textbooks began to appear on the subject, aiming both at students in Anglophone countries and at nonnative speakers, with English for Academic Purposes (EAP) fast becoming a sought-after area of what used to be called TEFL (Teaching English as a Foreign Language).

At the time I was preparing my PhD thesis, the field was exploding exponentially, with literally hundreds of publications appearing on the market, ranging from descriptive studies of academic discourse by linguists (e.g. Swales 1990; Flowerdew 2002; Hyland, 2004, 2009) to coursebooks and style manuals,⁹ and specialist journals (e.g. *Journal of English for Academic Purposes*, *Journal of Academic Literacy and Research Skills*, *Journal of Academic Writing*, etc). Most of these used the term ‘academic’ in recognition of the fact that ‘scientific’ has a much narrower range of application in English, as described above. However, in Portuguese at that time, the term ‘*científico*’ was the default option to refer to texts produced in research contexts across disciplines, as can be seen in the titles of the few style manuals that existed at

⁷ Challenges to its claims of neutrality and universality came not only from philosophers of science like Kuhn (1962) and Feyerabend (1975), but also from sociologists like Latour & Woolgar (1979), Knorr-Cetina (1981) and Gilbert & Mulkay (1984), whose ethnographic studies reported on how science was actually produced and reported in practice. At around the same time, poststructuralist currents from France were highlighting the role of codes in not only *mediating* but also *constructing* our knowledge of the outside world (e.g. Foucault 1970, 1972), with some even claiming that scientific knowledge was itself a kind of discourse (Lyotard 1984:3) or ‘language game’ (*Idem*: 9-11).

⁸ This has not always been the case, of course. Till the 1930s, English had been on a more-or-less equal par with French and German, and historically, many languages have served as lingua francas of knowledge in different times and places. See Gordin (2015).

⁹ See Bennett (2009b) for a survey of the style manuals available in English at the time.

that time (e.g. Ceia 1995, Serrano 2004, Madeira and Abreu 2004, D'Oliveira (2007)).¹⁰ Only later did the term '*académico*' begin to be used in humanities context, through the influence of English.¹¹

2.1. What is a scientific text (*texto científico*)?

The uncertainty concerning the object of study of the TTC course, mentioned in the Introduction, has its roots in the historical development of knowledge in the two cultures concerned.¹² Though 'science' in English once had the broader meaning of 'systematic knowledge' that it continues to have in the Romance cultures, its semantic range narrowed after the Scientific Revolution of the seventeenth century until it came to refer exclusively to those disciplines that use empirical methods to study the phenomena of the outside world,¹³ reflecting the centrality that this form of knowledge has in Anglo-Saxon culture. For most 'native speakers'¹⁴ of English, the term encompasses both pure sciences, like physics, chemistry and biology, and applied sciences like engineering and medicine, as well as popularizations or educational texts on such subjects, but emphatically excludes disciplines like history, literary studies, philosophy, art, music etc.¹⁵ Social sciences, for their part, are deemed 'scientific' when

¹⁰ See Appendix D of my dissertation for a review of the Portuguese academic style manuals (Bennett 2009a: 495-512; also 2011c: 117-130).

¹¹ For example, a curricular unit offered on the MA in Modern Languages, Literatures and Cultures at NOVA-FCSH between 2016 and 2021 was called *Metodologias de Investigação e Práticas de Escrita Académica*.

¹² Although there is a considerable body of scholarship available about the development of scientific discourse in English (e.g. Halliday & Martin 1993; Atkinson 1999; Ding 1998), when I first began my PhD there was nothing at all available for Portuguese. Hence, most the claims that I make about Portuguese derive directly from my own research. More detailed accounts can be found in my thesis (Bennett 2009a: 208-251) and various articles (Bennett 2007b, 2010a, 2011a, 2015c).

¹³ For example, *Cambridge Dictionary*'s primary definition of 'science' is '(knowledge from) the careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the results of these activities' (<https://dictionary.cambridge.org/dictionary/english/science>, accessed 24/9/23).

¹⁴ The term 'native speaker' has been placed in inverted commas in recognition of the fact that the traditional division between the native and foreign speaker of a language is no longer theoretically sustainable in the context of the so-called multi- or translingual paradigm (e.g. Canagarajah 2013, Blommaert 2010).

¹⁵ The distinction between arts and sciences is emphasized, in British culture, not only by the existence of different research councils (Science Research Council, Social Science Research Council, Arts and Humanities Research Council), but also by the fact that students, at Bachelor's and Master's level, are awarded different degrees according to whether their subject is considered an art (BA/MA) or a science (BSc/MSc).

they use the empirical methods and the technical discourse characteristic of the hard sciences; humanistic approaches to the social sciences are therefore excluded.

Portugal, on the other hand, like the other Catholic countries of Southern Europe, did not embrace the new empirical episteme for several centuries for political and religious reasons, and instead, older text-based forms of knowledge remained dominant until the late twentieth century. As a result, *ciência/científico* continued to have a much broader range of meaning, applied to all systematic forms of knowledge, including the humanities, arts and social sciences. Hence, a Portuguese historian, philosopher or literary scholar may write an *artigo científico* (academic article), present their work at a *reunião científica* (academic conference), publish in a *revista científica* (academic journal), have their research regulated by a *conselho científico* (research board) and be funded by the *Fundação para a Ciência e Tecnologia* (Foundation for Science and Technology).

A corollary of this is that the Portuguese adjective *científico* is used predominantly to refer to new research, and therefore excludes texts that involve applications of established knowledge (*texto técnico*) or are pedagogical in nature, a distinction which clearly lies behind the separation of TTC and TTT in the first version of the MTRANS programme. This contrasts with the situation in English where all texts produced in the domain of the hard sciences are understood to be technical to some degree or another because they use technical discourse (Halliday & Martin 1993, Martin and Veel 1998). For this reason, in most Anglophone translation contexts, the scientific and the technical are usually lumped together as SciTech (Olohan 2016; Wright 2011; Wright & Wright 1993).¹⁶

However, the distinction has become more complex in recent years due to language contact. In Portuguese, the more restricted English understanding of the term has now begun to prevail in some learned circles (as shown by the adoption of *académico* to refer to knowledge production in the humanities), while in English, the reverse is happening: the fact that English is now used as a Lingua Franca by multilingual scholars means that, in international contexts, it has started to acquire

¹⁶ An exception is the first book by Jody Byrne (2006:7), who separates the scientific from the technical in a way that is much closer to the Romance cultures' understanding of the terms. The widespread availability of this book has caused some confusion amongst our students in this regard (see 5.3 below).

features which ‘native speakers’ do not use, and the Romance understanding of ‘scientific’ is one such term. European funding programmes, for example, notoriously use ‘science’ in the non-English sense. For example, the European COST initiative finances projects in ‘all science and technology fields’,¹⁷ but the fact that this includes humanities subjects shows that the term ‘science’ is being used in the ELF rather than native-speaker sense. These developments made it even more difficult to determine what kind of material should be included in a course entitled *Tradução do Texto Científico*.

However, with the amalgamation of the TTC and TTT courses, this problem has largely disappeared: the designation *técnico-científico* indicates an unambiguous focus on what is known in English as SciTech discourse, that is, the discourse of the hard and applied sciences, whether specialist or popularized. Thus, this will be the focus of what follows.

2.2. The structure and history of scientific discourse

There are various features that distinguish scientific discourse from everyday nontechnical discourse. Among them, we can count the preference for an impersonal style, dominated by passives and other impersonal verb forms; a tendency towards non-explicitness; and of course, the use of technical terminology, which can give the text a very dense feel.

However, as has been amply demonstrated by the Systemic-Functional linguists (e.g. Halliday & Martin 1993; Martin & Veel 1998), the single most important characteristic of scientific discourse, and that which underpins all the others, is its use of nominalization, i.e. the tendency for most of the semantic content to be transported by nouns.

Where the everyday “mother tongue” of commonsense knowledge construes reality as a balanced tension between things and processes, the elaborated register of scientific knowledge reconstrues it as an edifice of things. It holds reality still, to be kept under observation and experimented with; and in doing so, interprets it not as changing with time (as the grammar of clauses interprets it) but as persisting – or rather, persistence – through time, which is the mode of being of a noun (Halliday & Martin, 1993:15).

¹⁷ <https://www.cost.eu/cost-actions/what-are-cost-actions>).

One consequence of this proliferation of noun phrases (*sintagmas nominais*) is that the grammatical structure of sentences tends to be quite simple in technical texts, with the verbs serving merely to express the relationship between the nouns. For example, the apparently complex sentence below, from a geology article, can be analysed into a simple Subject-Verb-Object structure (the verb is 'chronicled'), with the complexity residing entirely in the two noun phrases:

Temporally changing major and trace elements of magmatic rocks from this paleo–arc system chronicled gradual crustal thickening prior to and substantial crustal thickening contemporaneously with crustal shortening.¹⁸

Hence, in order for students to effectively translate technical discourse, they need, above all, to understand how noun phrases work. For this reason, the first two lessons of the course are given over to the grammar of technical discourse, in which I not only explain how the noun phrase (*sintagma nominal*) is structured in English and Portuguese, but also show them how predictable it is to translate such terms between these languages.

According to Halliday and Martin (1993), the shift from a clausal to a nominalized grammar took place in English during the seventeenth century as the scientists of the Royal Society of London set about forging a new discourse that would serve the needs of their natural philosophy. It occurred by means of a process of 'grammatical metaphorization' – effectively intralingual translation – through which information first presented in clausal form was 'semiotically repackaged' into a more compact form to enable it to be used as the starting-point for further argumentation. In an analysis of Isaac Newton's *Treatise on Opticks* (1704), Halliday and Martin (1993:64) show this process in operation, as the scientist first presented his observations in a personal clausal form ('I found moreover, that...'), before repackaging the information contained in the second part of the sentence into a more compact nominalized form which functions as a single lexical item.¹⁹

This kind of semiotic reconstrual underpins the creation of technical terminology and ultimately the architecture of scientific disciplines. What is more, it

¹⁸ From Huschke & Günther, 2003. 'Balancing crustal thickening in arcs by tectonic vs. magmatic means' in *Geology*, Vol. 31, No. 11. (<http://www.gsa-journals.org>)

¹⁹ '... a diverging and separation of the heterogeneous Rays from one another by means of their unequal Refractions...' (Newton, *Treatise on Opticks* 1704, cit. Halliday and Martin 1993: 65).

takes place on three distinct timescales: the *logogenetic* dimension, which is the unfolding of the individual text (when a new concept is being presented to the discourse community for the first time – as in the example from Newton above, but also repeated in research articles today); the *phylogenetic* dimension, involving the development of the system as a whole (i.e. the disciplinary discourse, which is collectively constructed as scientists borrow and build on concepts and terms created by their predecessors); and the *ontogenetic* dimension (representing the linguistic maturation of the individual human being). (Halliday & Martin 1998: 222-223; Martin & Veel 1998: 6-7).

Several other shifts were triggered by the nominalization process. The new focus upon the object of study, rather than upon the scientist observing it, led to the development of impersonal verb forms which erased the human observer: first, the impersonal active, in which the grammatical subject of an Active sentence is a non-human entity (Atkinson 1999),²⁰ and later, the agentless passive (Ding 1998). Nominalization also makes the discourse less explicit in the sense that the relationship between the various parts of the noun phrase is obscured – though the facility that English has for both pre- and post-modification of nouns (see below) means that the degree of explicitness can be manipulated to suit the communicative needs of the individual text. These aspects all raise interesting challenges for translation.

For political and cultural reasons (the dominance of the Catholic Church and presence of conservative political regimes right through to the late twentieth century), Portugal did not have a scientific revolution of its own, which means that Portuguese scientific discourse did not really develop autonomously but was calqued from English at a much later date.²¹ However, the calquing process is constrained to some extent by the grammar of the language, meaning that certain features cannot be replicated unproblematically. In the case of nominalizations, the fact that the Portuguese language does not premodify means that it is unable to manipulate pre- and post-modification for rhetorical purposes in the way that English can, raising challenges for

²⁰ For example, 'this text argues / this research shows....'. This is a very common resource in English but was largely absent from my first corpus of Portuguese academic texts (1998-2008), where active (e.g. '*Os autores defendem...*') or reflexive (e.g. '*No presente texto, defende-se que...*') forms predominated. However, by the time of my second corpus (2009-2013), the impersonal active had started to make its appearance in Portuguese through the influence of English ('*Este texto argumenta que...*').

²¹ See Bennett (2011a) for an in-depth discussion of this.

word order in translation in both directions (see below). On the other hand, the verb system of Portuguese is much richer and more complex than English, due largely to the presence of a third voice, usually known in English as the Reflexive,²² which has traditionally played an important role in academic texts. Common to all Romance languages, this provides a half-way house between the Active and the Passive, and is a resource that is liberally used in academic writing, preferred over and above the *ser*-Passive. What is more, the greater flexibility that Portuguese has with regard to word order means that, in many situations, it is considered preferable to begin the sentence with the verb, a phenomenon known as ‘verbal fronting’ (Johns 1992).²³ This brings complications for translation into English, as discussed below.

Other grammatical features specific to traditional Portuguese academic discourse, and which raise problems for translation into English, include a taste for elaborate highly subordinated syntax, verbless sentences, interpersonal framing devices and multiple negatives, as well as a rhetorical preference for the deferral of the main idea, and a general predilection for verbal abundance and ornamentation.²⁴ However, from the end of the first decade of the new millennium, when Portuguese academics came under pressure to publish internationally, many of these features started to disappear through the influence of English.²⁵ Today, even in humanities subjects, a style is preferred that privileges clarity and economy over verbal profusion and complexity.

However, discourses encode worldviews (Kress 1988: 7), and this shift effectively represents the replacement of the traditional human-centred worldview by

²² Portuguese grammars (e.g. Mateus et al, 1989: 225-6; Cunha & Cintra, 1985: 268) tend to use the term ‘*reflexivo*’ only when the form is used to for an action that is both performed and undergone by the subject(s), alone or reciprocally, preferring to categorise as passive forms the usages described here.

²³ My own corpus studies of Portuguese academic texts (Bennett 2010a, 2014c) showed that verbal fronting was very common until around 2008/9, when the Impersonal Active form started to make its appearance through the influence of English.

²⁴ These are some of the ‘distinguishing discourse features’ that I identified in a corpus of 408 Portuguese academic texts of different genres and disciplines (1,333,890 words), submitted for translation between 1998 and 2008. They are discussed in more detail in my article ‘Academic discourse in Portugal: A whole different ballgame?’ (Bennett 2010a), as well as in my dissertation (Bennett 2009a: 327-392) and in the book *Academic Writing in Portugal: Discourses in Conflict* (2011c: 27-73). Many of the features are common to Romance cultures generally (Bennett and Muresan 2016).

²⁵ A second corpus study of Portuguese historiographic texts submitted for translation between 2009 and 2013 (Bennett 2014c) revealed the erosion of the traditional discourse (which, in the first corpus, had been particularly marked in the discipline of history) and its replacement by a simpler discourse calqued on English.

the objective thing-centred vision implied by EAD. The consequences of this, amply discussed in my various epistemicide articles (Bennett 2007a, 2015a, 2024a), are briefly broached at the beginning of the TTC course in order to give the students a historico-political framework with which to understand the discourse features that they would otherwise take for granted.

2.3. Scientific text types

The question of genre is one which also affects scientific translation considerably, and attention is drawn to it on the course. The Portuguese understanding of the *texto científico* is limited to research genres (academic articles, conference papers, dissertations, research funding proposals and their respective abstracts) but the Anglophone term ‘scientific’ covers any text type in the disciplines considered to be sciences, pure or applied, specialist or non-specialist. This implies not only a whole range of text-types but also a register continuum, ranging from highly technical texts aimed at very specialist expert readers to only slightly technical for the more general reader or student.

Indeed, considerable attention is given on the course to ensuring that students are able to assess the level of technicality of a text, for which a cline is used, ranging from 1 (slightly technical) to 5 (very technical). In a series of exercises dotted through the course, students are asked to attribute a number between 1 and 5 to particular text extracts, and then to reflect on the features that make them technical.²⁶

The scientific text types covered on the TTC course²⁷ included the following:

- *Science research articles*: these represent new knowledge in the process of being negotiated amongst the scientific community. Science research published in a highly specialised journal usually constitutes the highest level of technicality (5 on the cline), though the technicality may drop to 4 in the case of articles published in an interdisciplinary journal, where more explicitness is required. The social sciences and humanities are also less technical than the

²⁶ In this, I am following Wright (2011: 5), rather than Byrne (2006: 7), who has a rather different understanding of ‘technical’, as mentioned above.

²⁷ See Wright (2011) for a more extensive list of SciTech genres.

hard sciences, though subjects like linguistics often emulate the hard sciences in their discourse, producing quite a high level of technicality.

- *Popular science*: this can be found in the form of articles in popular science magazines (like *Scientific American*, *Popular Science*, *National Geographic*, *SuperInteressante*) or general-interest magazines (*Time*, *Visão*, *Sábado*), non-fiction books aimed at the general public, and multimodal channels, such as television documentaries, podcasts and websites. With a much lower level of technicality (3-4 typically), these are, in many cases, inter-epistemic translations of knowledge that has previously been presented to the scientific community in the form of research articles (see 3.7 below). They are often designed to entertain as well as inform, and thus may contain elements of other non-technical discourses, such as journalism and even literary features.
- *Science journalism*: this category involves informative bulletins in newspapers about recent scientific discoveries, usually couched in straightforward informative language. Again, the level of technicality is typically around 3-4. As a rewriting of one or more research articles upstream, such journalism also constitutes a case of inter-epistemic translation.
- *Educational science*: this category encompasses material developed to teach science subjects in universities and schools (textbooks, lectures, Powerpoint presentations etc), and its degree of technicality varies greatly in accordance with the level of the students involved. However, at any level, these kinds of texts usually take great care with the explicitation process, with a careful distinction made between knowledge that the reader is assumed to already have (referred to implicitly as a Given) and material presented as New (presented explicitly). For this reason, such texts offer ample opportunities for the study of the semiotic repackaging described above.
- *Encyclopedia entries*: This represents a distillation of accepted knowledge, presented in a way designed to be comprehensible to different kinds of readers, ranging from the expert professional (pharmacopoeias, medical encyclopaedias) to the general public and even children. The degree of technicality can therefore vary tremendously.

- *Reports*: Common in the applied sciences (e.g. engineering, medicine), these often recount the processes through which specialist knowledge is applied to real-world scenarios: clinical trials, pilot schemes, reports on processes etc. Though they are usually less technical than research articles, they can sometimes achieve a high 4 on the technicality continuum.
- *Clinical guidelines*: designed to inform doctors how to administer a particular drug, these usually have a lower level of technicality than the science research article recounting the development of the drug but are more technical than texts aimed at the general public (around 4 on the spectrum).
- *User manuals*: these may be addressed at the general public (e.g. instructions for using a household appliance) or at expert professionals, with a corresponding difference in the degree of technicality. In some fields, parallel versions of the same manual might exist: for example, the MSD (formally Merck) medical manuals exist in two versions – a professional one for medical practitioners and students, and another for home (or ‘consumer’) use²⁸ – which offers unparalleled opportunities to study inter-epistemic translation of the same text between two different technical registers (see 5.4 below).
- *Hybrid genres*: some technical text genres may also contain other discourses (particularly legal and business/marketing), thereby warranting the term ‘hybrid’. These include (in the first case) legal contracts, patent claims and clinical trial documents, and (in the second) websites and brochures advertising products and services, aimed at potential consumers.

In all cases, attention is drawn in class to the text structure, particularly when this is highly standardised (as in the case of the research article or the patent claim), since it is felt that students will be unable to translate a text effectively if they do not understand the conventions governing how it is put together.

²⁸ <https://www.msdmanuals.com/>

2.4. Legal translation – a technical discourse?

A mention should be made here of legal discourse, which is not explicitly contemplated on the MTRAD programme, but was informally included in the TTT course in order to fulfil a market need.²⁹

A great deal of time and energy has been expended by specialists arguing about whether legal language should be considered a technical discourse or not, and the conclusions they arrive at are largely dependent on how they define ‘technical’.³⁰ As, with Halliday & Martin (1992) and Martin & Veel (1998), I understand ‘technical’ to refer above all to a discourse that is grounded in the scientific paradigm of knowledge, and therefore purports to universality and objectivity. Hence, legal discourse, which is deeply embedded in a particular culture and legal system, should not be considered under this rubric. Instead, I find it more productive to consider it a specialized discourse (like the language of business and marketing).

In addition to this, legal discourse is very different from technical discourse as regards its style and structure. While technical discourse is built around a grammatical mechanism (the nominalization) that enables the construction of technical taxonomies and the coining of new terminology (terms which are then linked together using the simplest possible syntax), legal language is archaic rather than neologistic, and clausal rather than nominalized, with a highly subordinated and ceremonial syntax derived from an earlier phase of the language.

Given this cultural embeddedness, legal texts require a very different translational approach from SciTech texts. While the latter use language in a referential or ideational way, to merely denote entities in the extralinguistic world, legal texts are often performative in nature, in the sense that they change something in the real world (a contract, for example, alters the status of the signatories from the moment that it is signed, indicated, in English, through the presence of terms like ‘hereby’, ‘henceforth’, ‘hereunto’ etc). Such texts have to be translated in a hyper-literal way to ensure that the terms retain the sense they have in the source culture (since the legal act is being celebrated within that legal system and not the system of

²⁹ Simple legal documents, such as certificates and contracts, are the mainstay of much professional translation work, and students are often asked to do this on their internships.

³⁰ See, for example, Cao (2010: 191; 2007: 8), who does consider legal translation to be a type of technical translation, and Byrne (2006: 3) and Wright (2011) who do not.

the target culture). What is more, the translator is visible in the way that she rarely is in technical or even pragmatic texts, adding notes and explanations to account for non-translatable features (seals, stamps, signatures, etc).³¹

Given the importance of legal translation in professional practice, and the absence of formal training in it on the MTRAD programme, I have taken the decision to reserve one or two lessons in the new TTT-C programme for the translation of hybrid texts – that is, texts that contain elements of both technical and legal translation. These are considered in sections 3.3. and 4.2. below.³²

3. Translating Scientific Discourse

One of the points that I make to my students in the first lesson is that, contrary to popular opinion, translating highly technical texts is actually a much easier task than translating everyday language or ‘pragmatic’ texts (let alone literary ones), once the translator has understood how technical discourse operates. This is due to the fact that SciTech terms are not embedded in the broader culture in the way that everyday and literary language terms are and are therefore not subject to the instability of meaning that inevitably occurs when words are used in different contexts in different ways. Instead, terminology is artificially generated and constrained in order to name the entities and concepts that structure a particular discipline, and are deemed by the disciplinary community to be universal and intelligible to specialists around the world irrespective of culture and language.³³ This means that it is theoretically possible to find or coin ‘equivalents’³⁴ in any language that already has a technical discourse.³⁵ For

³¹ The Skopos theorists (e.g. Vermeer 1989, Nord 2006) call this ‘documentary’ translation, as opposed to ‘instrumental’ translation. See Vermeer (1989: 231-232), who includes an interesting example of a text that could be translated in either way, with the ‘documentary’ approach reserved for the legal context.

³² As coordinator of the MTRAD, I have also asked the teacher of TTP to include some work on contracts and certificates, the most common legal documents to be translated in professional practice.

³³ See Merton (1942) on the institutional imperatives of science – universality, disinterestedness, communism and organized skepticism. Though this has been challenged by sociologists of science (e.g. Latour and Woolgar 1979; Knorr-Cetina 1981; Gilbert and Mulkay 1984) and others that emphasise the cultural contingency of actual scientific practice, the narrative that dominates in scientific circles is that of universality.

³⁴ The term ‘equivalence’, much bandied about by the translation scholars of the early linguistic approach (e.g. Vinay & Darbelnet 1958, Nida 1964, Newmark 1984, Baker 1992 etc), has largely fallen into disrepute in Translation Studies generally (see Baker, 2004, for an overview of the arguments). However, in technical terminology it still has a place, for the reasons given, and indeed is a key concept in the subfield of linguistics known as Terminology (e.g. Thelen 2015; Wright and Budin 1997).

speakers of Romance languages, like Portuguese, the task is facilitated by the fact that most SciTech terminology is constructed in English using the Latinate (and occasionally Greek) resources of the language, which means that cognates can easily be found or coined using the word-building facilities available in the language.

Other features of highly technical discourse that make it relatively easy to translate include: the simple sentence structure (as explained above, most of the semantic content is transported by nouns, meaning that the range of verbs is relatively limited and the syntax rarely goes much beyond a simple SVO); the absence of stylistic devices (the scientist is not free to replace terms by synonyms to vary her style, as a literary scholar might, since the term will refer to something very precise in the extralinguistic world);³⁶ and predictable text structures (scientific abstracts and articles, in particular, are produced using rigid templates that allow little room for creativity).

The main challenges for the translator come, therefore, not with ultra-technical discourses aiming at a highly specialised readership, which can be translated almost mechanically, but in texts that reformulate this material in terms that are intelligible to the non-specialist reader. Whether we are considering the physician explaining a disease and its treatment to a patient, the educational text directed at university students or children, or the popular science article aiming to entertain as well as inform, much greater challenges for the translator are raised by the unpacking of nominalizations into loose clausal structures, the replacement of technical terms by everyday or colloquial expressions, the addition of rhetorical or stylistic features to making the text more appealing to the reader, and the inclusion of multimodal elements.

Another problem comes with hybrid text types that blend more than one kind of discourse, mentioned above. Genres such as the patent claim or patient consent form include elements of legal discourse as well as technical, while websites aiming to

³⁵ Languages without a technical discourse of course raise many more challenges. Cases of this are being studied by some of the members of the EPISTRAN project, described in Section 3.7 (see also Bennett 2024b).

³⁶ This has often caused problems for scientists from Romance cultures who have approached scientific writing in a *belles lettres* spirit and seen their texts rejected by international journals as a result. See Serrano (2004) on the case of the French doctors systematically rejected for publication by *The Lancet*.

promote private healthcare or present technical equipment to the consumer will involve elements of marketing as well.

Each of these is considered in more detail below, with particular reference to the kind of difficulties encountered in the EN-PT language combination.

3.1. Translating highly technical texts

Densely technical texts (i.e. those that are at the 5 end of the technicality spectrum, mentioned above), come in various forms. At the most extreme are scientific research papers in fields such as physics, biochemistry, geology etc, which typically include terms that are completely opaque to non-specialists. However, even at the highly technical end there are nuances. An account of new knowledge, when published in a highly specialized journal, is likely to be denser and less explicit than if it is being published in an interdisciplinary journal, where some readers may not have the specialist knowledge necessary to decode the terminology).

The translation of research papers (*textos científicos*) into Portuguese, required by the programme when I first took over TTC, is in fact a very artificial exercise that is rarely done in real life. This is because the only new knowledge that circulates in Portuguese is that which has been produced directly in that language, and occurs mainly in fields related to Portuguese language, culture or literature (in short, humanistic or social science knowledge rather than SciTech, properly speaking). In contrast, there is a considerable demand for translation into English in order to enable the international circulation of knowledge produced in Portugal. Particularly since around 2008, when the Portuguese funding body, the Foundation for Science and Technology, began to pressurize researchers in this direction, many of the scientific journals that used to publish research in Portuguese began to employ translators to put their content into English,³⁷ and some have now phased out Portuguese altogether, demanding that content be submitted directly in English.

In fact, Portuguese scientists typically learn their subject through English textbooks, update their knowledge through reading international journals and

³⁷ Examples include the *Portuguese Journal of Orthopaedics and Traumatology*, for which I worked as a translator between 2006 and 2012, and the *Portuguese Journal of Cardiology*, which employed my supervisee, Phillippa May Bennett (who is currently writing a PhD thesis on the subject).

participating in international conferences, and also often work in international teams, where the lingua franca of everyday communication is English.³⁸ Consequently, the demand for translation into English has gradually dropped since the 1990s (when I was working as a freelance academic translator and building my corpus for my PhD), to be replaced by a demand for revision instead. More recently, this tendency has been exacerbated by the availability of machine translation (see 3.5. below), which can work particularly efficiently with SciTech texts, given their regularity and predictability.

Despite these market trends, I feel that learning how to translate SciTech texts is very useful for our students as it offers insights into the way that this kind of discourse works, which of course is essential for post-editing. Thus, in this section, I would like to focus on some of the specific challenges involved in translating SciTech texts between Portuguese and English, emerging directly from the structural and cultural differences described above.

3.1.1. Grammatical issues

With regards to *nominalizations* (which, as we have seen, lie at the heart of SciTech discourse), the main issue in both directions is word order. Given the recursivity of complex noun phrases (that is, the fact that there are often noun phrases contained within other noun phrases), it becomes essential to be clear about which adjectives belong to which head nouns, and to ensure that they are properly ordered³⁹ and (in Portuguese) properly inflected for number and gender.⁴⁰

However, it is not always easy to determine this. For example, in the term ‘environmental life-cycle assessment’, does the adjective ‘environmental’ modify ‘assessment’, as in *avaliação ambiental do ciclo de vida*) or ‘life cycle’, as in *a avaliação do ciclo de vida ambiental*? Both forms are found in Portuguese specialist texts,

³⁸ The situation is very different in Brazil, where there is a flourishing industry of academic books in translation (Silva 2023).

³⁹ I usually teach them that, in both languages, the order of adjectives is determined by how intrinsic they are to the head noun, with the most intrinsic closest and the least intrinsic furthest away. This of course means that the Portuguese order of adjectives will often be the mirror-opposite of the order in English.

⁴⁰ Examples used in class (Lesson 2, Worksheet 3) include ‘hydrosoluble fluorogenic substrates for plasmin’ (*substratos fluorogénicos hidrossolúveis para plasmina*) and ‘an energy-based approach to earthquake-induced soil liquefaction’ (*uma abordagem energética à liquefação do solo induzida por sismos*).

suggesting that even the experts are not sure about it.⁴¹ In practice, however, the term ‘environmental’ is often left elliptical nowadays in both languages on the understanding that life-cycle assessment is, by definition, environmental.

Translation from Portuguese into English may be even more challenging, as the translator has to decide, in accordance with the role that the noun phrase is playing in the text, whether to pre- or post-modify, or distribute the material equitably before and after the head noun. For example, the engineering term *sistema de ventilação da base das paredes* (which appears in one of the texts translated in class) may be expressed in the more explicit postmodified form as ‘a system of ventilation installed at the base of a wall’ (A), in the more compact pre-modified form as ‘a wall-base ventilation system’ (B), or using compromises such as ‘a ventilation system at the base of a/the wall’ (C) or ‘a ventilation system at the wall base’ (D). All are potentially correct but need to be selected on the basis of pragmatic criteria: (A) would be appropriate the first time the term is mentioned in a text destined for people that have never heard of it before; (B) could be used from the outset in a text destined for specialists familiar with the term, or might appear later in a text destined for non-specialists provided that it had first been expressed in the more explicit postmodified form; (C) and (D) could be used in accordance with whether or not ‘a system of ventilation’ or the base of the wall’ had been mentioned before.⁴²

Related to this are the rather complex grammatical rules that exist in English to ensure that it is clear which parts of the phrase belong together: the need to hyphenate compound adjectives and compound nouns when they are in adjectival position⁴³ (e.g. ‘life-cycle assessment’, ‘earthquake-induced soil liquefaction’, ‘bench-

⁴¹Another issue with this particular term, and others, is whether or not the definite article should be used with ‘life cycle’ (i.e. ‘do ciclo da vida’ or ‘de ciclo de vida’), as again, both forms are found. I use this as an opportunity to stimulate a discussion about the difference between the two, suggesting that the traditional Portuguese use of the definite article with abstract nouns in general contexts may, in SciText contexts, be giving way to the zero article, through influence from English.

⁴² Other examples that I use in class to explain this phenomenon (from the fields of pharmacy, economics and engineering respectively) are *contração induzida por triptanos* (triptan-induced contraction), *reformas do lado da oferta da economia* (supply-side reforms – in this case ‘economic’ would probably be elliptical if the text were a specialist one), and *a aplicação de sistemas de canais quentes num molde* (the application of hot runner systems in a mould). Students are asked to translate these terms into English as a revision exercise at the beginning of Lesson 3.

⁴³ Hyphenation of compound nouns that are not in adjectival position is also a complex matter. I usually explain to the students, using examples from everyday language, that when a new compound appears in the language for the first time, it tends to be presented as separate words; then, when it becomes more

scale flotation cell'), or the rule that a noun in premodifying position is always in the singular (e.g. 'wave energy', 'three-metre scale').

However, I also point out to students that many of the scientists producing these terms do not always know these grammatical rules, which means that terms found in published texts are often incorrectly or erratically hyphenated.⁴⁴ In such situations, though I like to see evidence that they have understood the rule, I don't feel I can penalize wrong usages if a grammatically incorrect form has been enshrined in a technical taxonomy through usage by specialists (e.g. 'bench scale flotation machine', 'wave energy system', 'hot runner system').

A more serious problem facing translators working from English to Portuguese is that, in English, technical terms in their most compact pre-modified form are non-explicit, in the sense that they represent the condensation of technical knowledge familiar to specialists in the field, but, given the grammar of the Portuguese language, have to be unpacked and made explicit in translation through the addition of prepositions, articles etc. A particularly difficult example, which appears in the text on life-cycle assessment translated in Lesson 3, is 'the 498 sector economic input-output tables for the U.S. economy' (where it is unclear if 498 modifies 'sector' or 'tables').

The solution to such problems is intensive research. Students have to be taught to know where and how to search for the answers to these questions, using guesswork to facilitate online searches, and knowing how to patiently and carefully distinguish useful hits from inappropriate ones. They also need to be aware that competing translations may exist for a given term in Portuguese, given that the fixation of authoritative equivalents is something that only takes place after the term has been in circulation for some time; until then, different authors may translate the term from English in different ways, sometimes with grammatical errors, as mentioned above.

generalized, it will be hyphenated, and then in the final stage of its assimilation, when it is no longer perceived as two concepts but as a single idea, it will be written as a single word without a hyphen (e.g. rain coat→rain-coat→raincoat; bath room→bath-room→bathroom). The challenge here is of knowing exactly what stage the term is at with regards to its acceptance as a single concept in the discourse community.

⁴⁴ A classic case is 'on line'. Strictly speaking, when this is postmodifying the head noun as a prepositional phrase (e.g. 'a course taught on line') it should not be hyphenated (through analogy with other prepositional phrases like 'on the table', 'during the flight'), though in adjectival position, it should be ('an on-line course', 'on-flight film') – or indeed presented as a single word ('online'). However, the fact that the spellcheck on Word marks the two-word form as wrong, irrespective of position, illustrates just how widespread is the ignorance of this basic grammar rule.

Hence, I teach students to begin by using their knowledge of how terms are built in EN and PT to guess how a particular term will be rendered in the other language, and then to search for instances of these in reputable sources, making sure that the text-types and register are parallel, and distinguishing European from Brazilian Portuguese where possible.

With regard to verb forms, the big problem here lies with translation into English: Portuguese can reproduce most of the English verb forms typical of SciTech discourse⁴⁵ but the reverse is not the case, as we have seen, as there is no reflexive form in English and that language does not permit verbal fronting. Hence, sentences beginning with a reflexive form have to be completely rewritten to put the subject at the beginning.⁴⁶ When the grammatical subject is complex (as in the following example, taken from the exercise on Aim Statements done at the beginning of Lesson 6), doing so can result in the creation of what is called a ‘top-heavy sentence’ in English, where there is too much information between the subject and the verb (this is usually considered to be bad style in English): *Neste estudo, visa-se avaliar a adequação da Ressonância Magnética (RM) na determinação de indicadores da instabilidade femoro-patelar.*⁴⁷

Finally, students have to be taught to take account of the phenomenon of language change, since SciTech discourse operates at the very vanguard of knowledge where new forms are being coined all the time. My own study of the evolution of Portuguese historiographic discourse (Bennett 2014c) shows that in this domain Portuguese is becoming increasingly like English with simpler sentences, impersonal verb forms, lexis used in a predominantly denotative (rather than figurative) way, and English-style text structure. But even in SciTech proper, Portuguese seems to be losing

⁴⁵ The Impersonal active form was not common in my first corpus study of Portuguese academic discourse (Bennett 2009a, 2010a) but by the time of my second one (Bennett 2014c) had become much more so. Now it is very prevalent.

⁴⁶ The double-subject form, often used by students (e.g. ‘it is defended the use of ... ‘*) is grammatically incorrect in English (Cf Johns 1992).

⁴⁷ Other examples of top-heavy subjects in Portuguese, used in the exercise on Aim Statements (Lesson 6) include: i. *Como se aprendia arquitectura na época em que a profissão se estava ainda a definir, quando se começava a fazer coincidir a actividade de desenhar edifícios com o título de “arquitecto”, é a questão que justifica este texto;* ii. *Estudar a dimensão espacial inscrita nos fenómenos de natureza religiosa, tanto ao nível pessoal como social, eis a finalidade assumida deste trabalho.* In both cases, I suggest to students that they reformulate using a normalization (e.g. ‘The aim/purpose of this text is to...’).

features that were once particular to it. In the domain of grammar, we are seeing usages of the zero article comparable to English, as mentioned above, and reflexive verb forms are giving way to the easier-to-translate 'ser'-passive or impersonal active. In lexis, there is a proliferation of new terms calqued on English, even when this sounds strange to native speakers.

This is of course a highly charged issue which can provoke strong reactions from native Portuguese speakers, particularly colleagues from the humanities who quite legitimately see themselves as the guardians of Portuguese language and culture in the face of a threat from a hegemonic intruder. These colleagues often insist on using specifically Portuguese-sounding translations for ideological reasons.

In my experience, however, expert users of SciTech discourses are usually motivated by the more pragmatic concerns of transparency and communicability, and, as members of an international scientific community, tend to prefer forms that are easily recognizable as calques of English terms. In any case, in lessons, I prefer to retain an open mind on such questions, choosing instead to debate them openly with students when cases come up. In practice, it makes marking their translations very difficult (should I prefer the form that most closely calqued on English or the form that sounds most 'Portuguese', even when this is not really used by domain specialists?), which is why the next edition of the test will include a commentary in which the students are asked to justify their preferred options.

3.1.2. Degrees of technicality

Recognising the precise degree of technicality in the source text in order to be able to reproduce it (or otherwise) in a target text is often a challenge for our students. For this reason, time is given in one of the first lessons to comparing a short text in highly technical discourse with its intralingual translation in less technical discourse (a description of aspirin in clinical guidelines aimed at the practitioner and its equivalent in a manual for the general user [Lesson 2 Ex. 1, Q1]), and also a passage from a highly technical (compact, non-explicit) discourse with one that is slightly more explicit [Idem, Q2]). The students are asked to analyse the differences and to sum them up in a chart, coming up with something like this:

Non-Technical	Technical
Clausal style (info transported equally by nouns, verbs etc)	Nominalized style (info transported by nouns, with verbs limited in range)
Explicit (relations between parts is made clear, i.e. presented as NEW information)	Less explicit (relations between parts are taken as understood, i.e. presented as GIVEN information)
Personal verb forms	Impersonal verb forms
Everyday vocabulary	Technical vocabulary

Despite the impression given by a two-column chart, I point out that this is most definitely not a binary relationship but the extreme ends of a spectrum that includes a whole range of intermediate degrees. For example, Q2 on the exercise given in Lesson 2, Ex. 1 (see Annex II), offers excerpts that are both technical but 2a is slightly more than 2b. The greater implicitness of 2a can be explained by the target readers' familiarity with the key terms. In 2b, the reader is assumed to be someone with a slightly lower level of specialist knowledge (from an adjacent disciplinary area, a student etc) who needs to have the information spelt out.

At a later stage (in the module about medicine), students are asked to intralingually translate between different levels of technicality.⁴⁸ The technicality cline is also mobilized again in the first lesson of the popular science module, when students are asked to analyse a series of popular science extracts in English.

3.1.3. Epistemic modality

Scientific texts of all kinds make systematic use of hedging and boosting devices⁴⁹ to indicate the precise strength of the claims being made. This is an important rhetorical device, since carefully distinguishing between fact and opinion effectively reinforces

⁴⁸ The MSD (formally Merck) manuals, which exist in professional and consumer versions, are a good source of material for this.

⁴⁹ An extensive list of the most common hedges and boosters found in English academic writing is provided by McNery & Kifle in an appendix to their article on the subject (2002:194).

scientists' claims to objectivity, as well as having a stance-creating function,⁵⁰ projecting authorial honesty and modesty (or, conversely, assurance and conviction), demonstrating respect for colleagues' views and readers' face needs, or indicating involvement with the topic and solidarity with readers (Hyland, 1999:101, 2000:112; Swales, 1990:175).

In both Portuguese and English, epistemic modality is achieved in similar ways but there is register difference with regards to some common hedges and boosters: while Portuguese academic writing tends to be dominated by (sometimes very elaborate) 'framing devices' (Bennett 2009a: 351),⁵¹ EAD continues to favour modal verbs (like 'should', 'could', 'must') or adverbs ('probably', 'possibly', 'perhaps') on the grounds that they are more concise and economical.

It is very important that students are trained to recognise and reproduce precise degrees of epistemic modality, since failure to do so may lead to scientifically inaccurate claims (e.g. by stating that something 'is', when the original said it 'may be' or that is 'probably is', or by imposing cause-effect sequences when there was only a weaker correlation).

However, for lack of time, I do not present this explicitly in the lessons, but rather provide explanations during the correction of instances that appear in the translations done in class.

3.1.4. Text structure

For each text genre covered on the course, I always give some time to analysing the text structure, since, in most cases, this will be predetermined and predictable. This analysis includes identifying the different sections of the text and discussing their

⁵⁰ Stance refers to 'the ways that writers project themselves into their texts to communicate their integrity, credibility, involvement, and a relationship to their subject matter and their readers' (Hyland, 1999:101).

⁵¹ Examples from my own 2008 corpus include: 'constitui um facto que' ('it is a fact that'); 'a verdade é que' ('the truth is that'); 'o que é certo é que'/'certo é o facto que'/'resta-nos a certeza de que'/'é incontestável que'/'não parece hoje contestável que...' ('it is certain/indisputable that'); 'não há dúvida que' ('there is no doubt that'); 'é legítimo pensar que' ('it is legitimate to think that'); 'é talvez de admitir que..' ('it may be admitted that'). See also Marques (2022), A. da Silva (2022).

communicative functions, and becoming aware of particular forms of language that are typical of each.

On the TTC version of the course, particular attention was given to the structure of the academic article, given its centrality to the course (and indeed importance for our students, who have to produce something similar for the *componente não letiva*). I find it convenient to work with academic abstracts, since these usually mirror the structure of the full article but are of a more manageable length than a complete article (see 5.2 below).

3.2. Translating popular/educational science

An important aspect of the TT(T)-C course is the translation of popular or educational science. Indeed, of the three forms of assessment, the weightiest (50%) involves the translation into Portuguese of a popular science article of the students' choice, accompanied by a commentary on the difficulties encountered and solutions found. The reason for this weighting is that, as explained above, this kind of translation is a more realistic activity into Portuguese than highly technical texts, which, if translated at all, will flow in the opposite direction. But the activity is also fun for the students, as well as raising important challenges that have implications for all forms of translation.

This is because much popular science (such as the articles published in magazines like *Popular Science* or *Scientific American*, as well as books marketed for younger audiences) is written in a lighthearted journalistic tone, often interpellating the reader in a conversational manner. That is to say, the science is presented not in the abstract universalistic discourse of the specialist, but in a culturally embedded style, replete with first- or third-person narratives, dialogue, colourful descriptions, deictic references etc. The scientists are often personalized and there may be much of the information may be presented in direct speech, as if resulting from an interview.⁵²

Thus, with an entertainment or didactic function at least as important as the informative function, popular science has more in common with journalistic, or even literary translation, than with highly technical translation aimed at expert readers.

⁵² See my article on popular science (Bennett, submitted) for a more exhaustive list of these features. Other descriptions of the specific challenges of translating popular science can be found in Olohan (2016: 173-205) and Musacchio (2017).

3.2.1. Register

Popular science texts usually have some level of technicality, and students are encouraged to identify that level in the source text using the technicality cline, mentioned above. However, the precise level of technicality of the target text will ultimately depend upon the way the translator (or publication) construes the target reader. Hence it is important for translators to have a clear idea of the purpose and target reader before they begin.⁵³

In addition to the technicality spectrum, students need to be made aware of the fact that there exists a parallel spectrum of *formality*, ranging from the exceedingly formal (5 on the cline) to the informal or colloquial (1-2). While this is not an issue in highly technical texts, it becomes so in popular science, where informal discourses often predominate. Understanding just how degrees of formality are manifested in the two languages is an important step towards deciding how to translate them.

Important differences between Portuguese and English in this regard derive from the fact that Portuguese, like the other Romance languages, is less comfortable than English with reproducing features of orality in the written channel. Hence, popular science articles that are written in a very colloquial style in English (2-3 on the formality scale) are often made more formal in Portuguese translation to satisfy target readers' expectations.

Ultimately, though, this will also depend upon the purpose and target reader of the translation, and texts written in a colloquial style cannot be translated without first determining a real-life context of publication. Depending upon the chosen outlet, translators will decide between neutralizing colloquialisms to make the text accessible to a broader public or translating them into something parallel in the target culture, with a view to reproducing the text's stylistic idiosyncrasies. The latter option is by far the most challenging as slang forms are very bound up with particular social groups, times and places, and need to be manipulated carefully in order to avoid incongruities.

Also related to register is the issue of forms of address, which are likewise very difficult to translate, due to the fact that Portuguese has a whole range of alternatives to translate the English 'you'. In addition to the differences that exist between Brazilian

⁵³ For this, I remind them of Skopos theory (c.f. Vermeer 1989; Nord 1997, 2006) that they will have studied on the UC Translation Studies.

and European Portuguese, the question of whether or not the second-person singular should be used in such texts is deeply bound up in identity concerns (age, political inclination, degree of conservatism/modernity), and can provoke impassioned reactions. For this reason, students are asked to theorize carefully their choices in this domain in the light of their chosen Skopos.

3.2.2. Culturally specific items

Much popular science produced in the Anglo-American world, whether in magazines like *Popular Science* or *Scientific American*, or in books aiming at specific readerships, is presented in terms that are very bound up with the culture of reception. This is because the narrative mode features strongly in the genre (not only first- or third-person narratives, used as framing devices to introduce the issue in hand, but also second-person hypothetical narratives of the 'Imagine...' variety⁵⁴).

In some cases, the culturally specific items are isolated terms that can be dealt with on a one-by-one basis: examples include measurements, currencies, place names, food and drink, or one-off references to celebrities, TV programmes or features from popular culture. At other times, they imply entire cultural scenarios that may be utterly alien to the target reader, with sustained references to value systems that may not be shared by the target culture (the text mentioned in footnote 54, above, takes for granted the desirability of living in the suburbs or countryside as opposed to a flat in the inner city, reflecting typically British values that are not necessarily shared by a Portuguese readership).

Of course, dealing with culturally specific terms has been thoroughly theorized in Translation Studies and there are many tried-and-tested strategies for dealing with them, depending upon the translator's Skopos.⁵⁵ In fact, the problem here might actually be the proliferation of terms used to describe such manoeuvres and the fact that different theorists often use different terms to describe similar things. For this

⁵⁴ For example, one of the texts that I use in class begins 'Imagine hiring an economist to sell your house' (extract from *The Undercover Economist*, Tim Harford, London: Abacus. 2007: 158-159). Although this is just a framing device for the main point, which comes later, it describes a housing market that is implicitly British, and therefore very different from a Portuguese scenario.

⁵⁵ The most famous include Vinay and Darbelnet (1958), Nida (1964), Newmark (1988: 81-93), Aixela (1996), Chesterman (2016: 85-114), Pym (2016).

reason, students are encouraged, when analysing their translation choices, to choose one theorist's system and to refer consistently to that.

3.2.3. Deictic references

Popular science articles frequently make reference to the real-life context in which the text was produced and include deictic features that are temporal (e.g. 'in an article published today/ 2 hours ago'), spatial ('in another part of the country') or linguistic (reflexive references to the language in which the original article was written, such as 'the word "X" was used to...'). While this might seem like commonsense, students often have to be trained to notice them and make the required adjustments.

3.2.4. Dialogue

Much popular science involves dialogue, either quoting at length from experts or witnesses, or reproducing longer exchanges in a narrative passage, and this can cause problems for Portuguese students, who may never have been taught how to present dialogue in their own language. The situation is complicated by the fact that at present, there are several competing systems available in Portuguese: single or double inverted commas, as in English; French guillemets, or the traditional dash). What is more, the very choice of system may bring a value charge (of being 'traditional', 'modern', pro-English, pro-French etc) which needs to be carefully negotiated in order to avoid stylistic incongruities.

3.3. Translating hybrid text types

Hybrid text types raise different kinds of challenges and cannot be approached in the same way as the 'simple' SciTech text. Patent claims and informed consent forms contain elements of legal discourse, which (as described in 2.4. above) has to be dealt with more literally, while a website for a private clinic will have elements of marketing (an 'appellative' function, cf. Nord 2006: 138) that are strongly target-oriented, and therefore have to be adapted for the public being addressed.

Though only a couple of lessons are given over to hybrid genres on the TTT-C course, the aim is to make students aware of the competing discourses and help them to approach them in an informed fashion.

3.4. Collaborative translation

One of the myths that is often perpetuated about the translation profession is that translation is a predominantly individual affair, with translators working in isolation at home. However, in real-life professional practice, this model (which is clearly based on a Romantic conception of the literary translator) does not prevail.⁵⁶ Most contemporary translation companies, such as those where many of our students do internships for the non-curricular part of their training, have a complex hierarchical structure in which translators work in teams, overseen by a project manager (who in turn may be overseen by an area manager) and subject to different levels of quality control. It is thus imperative that the translation course gives the students the opportunity to develop the skills needed to work in this way.

I usually do this by giving them the possibility to work in groups of four or five on a longer text. The text in question is a complete academic article, which is divided into sections to be translated by different students. One person in each group acts as the coordinator, responsible for ensuring coherence of style and terminology across the text as a whole. They are encouraged to use translation memories (see 3.5. below) and to prepare systematic glossaries in order to facilitate this task. The students receive a grade as a group, which reflects not only the quality of the translation but also (importantly) the terminological and stylistic consistency across the text as a whole.

3.5. Translation technology

Given the ubiquitousness of translation technology in the professional workplace and the availability of free CAT (Computer-Assisted Translation) and MT (Machine Translation) systems on line, it is essential that our students acquire experience in

⁵⁶ The recent spate of publications on the subject of collaborative translation (e.g. Cordingley & Manning, 2017; Bistué 2016) have highlighted the fact that, in premodern times, collaboration was actually the norm. Leonardo Bruni (1424/6) is often credited with being the first to insist on the need for all the necessary skills to be concentrated in the person of the individual translator.

working with these tools. The MTRAD course does offer a UC which focuses specifically on this (*Informática para a Tradução*) but it is also important that such tools are integrated into other practical lessons. As coordinator of the Master's programme, I have been encouraging all teachers of practical translation courses to embrace this technology.

SciTech discourse, as a form of controlled language, formulaic and predictable, offers itself particularly well to the use of such tools. CAT tools, such as Trados or MemoQ, are particularly useful for the collaborative exercise described in 3.4 above, since they enable complex terminology chains and repeated discourse segments to be stored and retrieved by the various translators working on the project, thereby ensuring coherence across the text as a whole.

As for MT, in the eight years that I have been teaching this course, this has developed exponentially, with free online systems, such as DeepL and GoogleTranslate, now achieving a quality that can rival, or even surpass, the human translator in more technical domains. However, unless students are specifically taught how to use it, and made aware of its limitations, they may fail to approach it in a critical spirit,⁵⁷ leading in some cases to a drop in the quality of their output rather than an increase. For this reason, rather than discouraging its use, I feel that it is imperative to integrate it into lessons, explicitly teaching the need for pre- and post-editing. What is more, many of our students that go on to do internships in translation companies report that, instead of actively translating texts, they are now being asked to post-edit texts that have been translated by computer.

As for AI systems, such as ChatGPT, which burst onto the academic scene last year, causing alarm in many departments, these are perhaps less of a risk in translation practice (where they can be treated in the same way as MT) than for the production of original academic texts.⁵⁸

I have always permitted students to use any tools at their disposal in the production of their translations (including the test) in order to simulate professional

⁵⁷ On the need for users to be trained in machine translation literacy, see Bowker and Ciro (2019).

⁵⁸ See the Internship report by Marina Pinho (2023), which compares the output of different systems, concluding that AI did not do any better than MT systems in actual translation quality.

conditions, but this year, I have decided to specifically focus on MT⁵⁹ in the test by asking the students to translate the text using any system of their choice, and then to carefully edit it, explaining the reasons for the changes made. Categories that they can use for their analysis (e.g. wrong meaning, grammatical mistakes, word order, register etc) will be rehearsed in the feedback given on work done throughout the course. This will hopefully allow me to assess how much they have imbibed about the nature of SciTech discourse and the norms governing it.

3.6. English as a Lingua Franca (ELF)

Since the turn of the millennium, it has been clear that English could no longer be treated in the same way as other languages in translation training and practice (Campbell 2005), as it was now what sociologist Abram de Swaan (2001) terms a 'hyper-central' language,⁶⁰ with a completely different status to its nearest rivals. The demand for it was such that, after the 2004 EU expansion, the requirement that translation into it be done by native speakers was dropped. Instead, the European Commission's translation service began to classify translations according to function, offering a spectrum of services into English from very rough translations done for basic understanding to highly polished translations of texts important for the Commission's public image (Wagner 2005: 221-2); this enabled those at the lower end of the spectrum to be undertaken by non-native speakers, or indeed by MT.

It was not long after this that the first works started appearing clamouring for English as a Lingua Franca, or ELF (that is, the English produced by non-native speakers) to be considered a legitimate variety of English in its own right, thereby breaking the native speaker's hold over what could be considered 'correct' English. Authors such as Jenkins (2007), Seidlhofer (2011) and Baker (2015) argued that the bulk of the English used in international contexts today is produced by nonnative

⁵⁹ In the 2022-23 edition of the course, when I was on sabbatical, the teacher that replaced me focused very heavily on MT.

⁶⁰ De Swaan (2001) describes the mechanism that provoked this using the language of the stock exchange. Its communicative value became such that there was, around this time, a stampede into it, which in turn boosted its value even further. The communicative value (which De Swaan, 2001: 33-40 calls the 'Q-value') is effectively the product of the language's prevalence (defined as the proportion of speakers in the overall language system, and an indicator of the opportunities it offers for direct communication with other speakers) and its centrality (the proportion of multilingual speakers that are proficient in it, an indicator of its connectedness with other languages, and therefore of the opportunities it offers for indirect communication).

speakers, who not only de-culture it, but also inflect it with patterns from their own languages. Unsurprisingly, academic English – studied specifically by Mauranon (2012) and Jenkins (2014) – became a prime target for this.

Scholarly works also appeared around this time exploring the implications of ELF for translation practice (e.g. Taviano 2010, 2014; Bennett 2013a). The main effect of all these developments was that the recommendation that a translator should, as far as possible, ‘translate into his own mother tongue or into a language of which he or she has a mastery equal to that of his or her mother tongue’ (UNESCO 1976: V.14§d), which had governed translation training and practice for over thirty years, was now effectively overturned, at least with regard to this language.

In the case of SciTech discourse, and academic discourse more generally, this makes particular sense. For decades, the editorial committees of international science journals have been dominated by ELF speakers, to the extent that English academic discourse has already begun to acquire features that are alien to ‘native’ speakers (such as the use of ‘scientific’ for all research, irrespective of discipline, mentioned above, or the use of ‘present’ for textual self-referral, as in ‘the present text’). Similarly, in international meetings, ELF is so dominant that there have been reports that the British and Americans (who are notoriously monolingual and often unable to de-culture their speech or indeed recognize usages of it that are different from what they are used to) are now being left out of the conversations.⁶¹

In the light of this, and of the increased demand for translation into English that our students report from their internships, it seems clear to me that we should also be preparing our students to translate into that language on our translation programmes. This already happens in the *Licenciatura*, but the MTRAD was originally conceived to provide training into Portuguese exclusively, and there is formally no space for translation into a foreign language.

I have therefore tried to make room for it on the TT(T)-C course, giving practice in translating into English in the academic module, and also offering some intralingual translation in English in the medical one. This year, for the first time, I plan to offer the

⁶¹See, for example, ‘[Tower of babble: nonnative speakers navigate the world of 'good' and 'bad' English](#)’, C. McCusker and R. Cohen, 25/4/21; or ‘[Native English speakers are the world’s worst communicators](#)’ (BBC Worklife, L. Morrison, 31/10/16 (both accessed 9/2/24).

option of translation into English in the test, perhaps making it compulsory in future editions to reflect market dynamics.

Students have generally shown themselves very receptive to this proposal. In fact, many of the young people on our programmes, who have studied English from a very young age and use it habitually for social purposes in online and other environments, often write English better than they do Portuguese, and have actively asked to be able to translate into that language. Some have already made ELF into the subject of their *componente não letiva*, as in the case of João Grácio (2023), who translated part of the FCSH website into ELF, and Sílvia Zannini (2016), who translated medical texts (an academic article, website for a private clinic and CV) for Portuguese doctors, in each case reflecting on the process in a *trabalho de projeto*.

3.7. (Inter-)epistemic translation

Although I had not realised it when I began teaching the TTC course, the process of converting a highly technical text into a less technical one for consumption by a non-specialist reader is itself a form of translation, not just intralingual translation, but more specifically ‘inter-epistemic translation’, in the sense that it is a translation between two different paradigms of knowledge (the ‘scientific’ world of objective crystallized things, and the everyday form of knowledge represented by clausal structures and non-technical vocabulary).

The term ‘inter-epistemic translation’ was first used by the translation scholar Douglas Robinson in the conclusion to his 2017 work *Translationality*, (2017:200-203) as an extension to Jakobson’s (1959) famous tripartite division of translation into interlingual, intralingual and intersemiotic. In it, Robinson envisages inter-epistemic translation as a whole new area of translation study, involving a range of different operations from the writing of popular science and representation of scientific issues in literary fiction to the study of how knowledges transform over time as epistemological paradigms wax and wane.

Thus, in the Spring of 2023, in response to Robinson’s call, the Translationality strand of CETAPS launched a research project designed to explore the ramifications of this. Called EPISTRAN (*Epistemic Translation: Towards an Ecology of Knowledges*), the project involves a team of researchers from around the world and from a variety of

disciplinary backgrounds (linguists, philosophers, anthropologists, cultural historians and historians of science, literary scholars), oriented by a team of international consultants, all top translation scholars with important work in adjacent areas.⁶²

To date, our initiatives have included a two-day online meeting in July 2023 in which all members of the team discussed their subprojects with the other members and consultants, and an international conference in December 2023, which attracted over 60 scholars from around the world, including people not previously involved in the EPISTRAN project; and we have a series of short online sessions planned for 2024 involving debates and presentations by people that were unable to come to the conference. We are currently preparing a special issue of our journal *Translation Matters* on the subject of (inter-)epistemic translation,⁶³ to come out in Spring 2024, and plan to edit a volume with a reputable international publisher later on.

Works already produced by me under the auspices of the EPISTRAN project include conference papers,⁶⁴ an article about the project as a whole ('Epistemic translation: towards an ecology of knowledges', published online in the journal *Perspectives: Studies in Translation Theory and Practice* in January 2024) and another looking at a work of popular science as a case study of inter-epistemic translation (submitted to *The Translator*). The latter is directly related to the TTC course in that it was inspired by an exercise that I had set for the students in the *Exame de Recurso e Melhoria* (2018-19), in which they were asked to translate a scientific abstract and an excerpt from a popular science article based upon it, and then to reflect about the relationship and differences between the two (see Annex 1).

I am also supervising a PhD candidate (Jennifer Dobson, holder of a grant awarded this year by CETAPS/FCT) whose thesis is about (inter-)epistemic translation

⁶² Prof. Douglas Robinson (Chinese University of Hong Kong, Shenzhen/Hong Kong Baptist University); Prof. Piotr Blumczynski (Queen's University, Belfast); Prof. M^a Carmen África Vidal Claramonte (University of Salamanca); Prof. Michael Cronin (Trinity College, Dublin); Prof. Kobus Marais (University of the Free State, Bloemfontein). See [EPISTRAN website](https://ojs.letras.up.pt/index.php/tm/calls) for biographies.

⁶³ See <https://ojs.letras.up.pt/index.php/tm/calls>

⁶⁴ 'Epistemic translation: Towards an ecology of knowledges', presented at the 7th international conference of IATIS (International Association of Translation and Interpreting Studies). Barcelona, 14-17 September 2021; and 'Introducing EPISTRAN: Translation and the ecology of knowledges', part of a panel about the EPISTRAN project convened by me at the 42nd annual conference of the Portuguese Association of Anglo-Portuguese Studies (*Environments: Ecologies and (In)Hospitalities*), Coimbra 31st March to 2nd April 2022.

(Provisional title: *Paradigm shift through the lens of epistemic translation: a study of Lavoisier's chemical revolution*).

Given the vitality of the concept and the interest it is generating amongst scholars around the world, I plan to give more time to this dimension on the TTC-T course in future. This will involve a more intense focus on popular science as a form of inter-epistemic translation, and the development of linguistic competence in EN and PT to enable the intralingual translation between the highly technical and general knowledge paradigms in each language. One of the objectives is to entice students into the project, something that has in fact begun, since we already have one student from the MTRANS course involved – Carolina Soares, who presented a paper at the December 2023 EPISTRAN conference on translating science, intersemiotically and interepistemically, for children (Soares 2023).

3.8. Translationality

Finally, a word should be said about the concept 'translationality', which is related to inter-epistemic translation and needs to be approached alongside it.

The term originally developed in the life sciences and biotechnology to refer to the tracking of medical research into patient care ('from bench to bedside') but has now been extended to many other fields to describe similar processes of repackaging and repurposing. For example, in education it is used about the transformation of specialist knowledge into forms that are accessible to different constituencies of people, while in public administration it refers to the way policy can be made meaningful for people on the ground.

However, the term only entered the translation scholars' lexicon following the publication of Douglas Robinson's book *Translationality: Essays in the Translational-Medical Humanities* (2017) mentioned above.⁶⁵ In it, he explains that the word is in fact a translation of Popovič's Slovak term *prekladovost*, defined as 'a communicative relation in the communicative chain between the author of the original communicate and the receiver of the translation', and that it has a 'semiotic or modelling character',

⁶⁵ Since then, 'translationality' as a term (according to Robinson's definition) has been developed further by Piotr Blumczynski in his *Experiencing Translationality* (2023), and Cármen Africa Vidal Claramonte in her forthcoming book *Translation and Objects*. I myself am preparing a book about *Translationality in Music* (proposal accepted by Routledge in January 2024).

predicated, crucially, on the ‘inevitability of *change*’ (ix). Thus, translationality is actually about how things metamorphose, become other; it is ‘transformationality: the constant emergingness of everything through embodied, situated, performative interactions’ (Idem: x), or – as I myself put it in the introduction to my research strand – the ‘constant process of becoming that is constitutive of languages, knowledge and cultures’.

One of the most relevant sections of Robinson’s book is the second essay (pp. 61-128) in which he traces the ‘history of medical translations/adaptations (of Galen into Latin in the sixteenth century) to a history of literary translations/adaptations with a strong medical theme (Rabelais into English in the seventeenth and eighteenth centuries)’ (2017: 61). I propose that this can become the model for a whole new attitude to knowledge that will focus on the transmission of scientific concepts, models and theories through time and across space, including its reframing and repackaging for different readerships.

Several of the EPISTRAN subprojects are already looking at this. For example, Elisa Nelissen studies the translational chains in operation in the production of science journalism,⁶⁶ while my own article about popular science mentioned above (Bennett, submitted) identifies a whole series of translational stages both up- and downstream of the two texts that are its main objects of study.

Thus, it is through translation (interlingual, intralingual, intersemiotic, interepistemic) that knowledge of all kinds is transported through time and space, inevitably undergoing changes in accordance with the constraints and expectations of new target cultures and readerships, and adapting as it comes into contact with other knowledges from other sources. Translation is therefore revealed to be far more than a second-hand reproducer of knowledge, as was traditionally understood in the western world. Instead, it is actively *constitutive* of knowledge (Bennett 2023), and as such, deserves to be given a great deal more attention than it has hitherto been accorded.

⁶⁶ In a recently published book chapter, produced under the auspices of a different project, Nelissen and her co-author McMartin (2023) describe how they used a corpus of science reports from three Flemish news outlets, supplemented with semi-structured interviews, to study how news about COVID-19 vaccine studies travelled across geographic and media boundaries, concluding that the nature and form of the coverage is shaped by specific individual, institutional, formal and systemic factors (2023: 106).

4. The Programme

The UC *Tradução do Texto (Técnico)-Científico* is a 2nd cycle course, taken by all students in accordance with their language speciality (in this case English). Occasionally, I also get a student from a different degree programme (e.g. Communication Science, Linguistics, Philosophy), who chooses this course as an option. This meant that I would usually have around 27 or 28 students in the class until 2021-22, when the total annual intake for the MA programme as a whole was reduced (thereafter 22-23). Like all the Master's classes, classes take place in the evening once a week and each lesson lasts three hours (6pm to 9pm).

The UC is taught in a combination of English and Portuguese, in accordance with the material. Some of the initial exercises take place exclusively in English, given its dominance in this domain (see above). However, Portuguese becomes the active language whenever we are discussing translations into that language. Some of the classroom debates may begin in English but drift into Portuguese following the intervention of a student that is not particularly comfortable with English – or indeed the reverse. This informal multilingualism, managed on a lesson-by-lesson basis in accordance with the abilities and preferences of the people present in the room, is compatible with my own attitudes towards language policy in education generally, and may be explicitly justified in class through reference to the so-called 'trans- or multilingual paradigm' (e.g. Canagarajah 2013, Makoni and Pennycook 2007, Blommaerts 2010).

This year (2023-24) the UC will be taught for the first time in its new form as an amalgamation of TTC and TTT.

4.1. Aims and scope

The main aim of the course is to develop the skills needed to translate scientific and technical texts in a contemporary real-life context, while at the same time providing enough theoretical background to enable the students to understand the reasons why particular norms and practices exist. I am also hoping to interest students in translation research, and indeed we have already had some successes in this, as mentioned above.

As explained above, the term ‘scientific’ was interpreted loosely during the first seven years to take account of both the English and the Portuguese understandings of the term: hence, that version of the course encompassed abstracts and research articles in all disciplines (including humanities and social science), as well as medical texts and popular science. The new version of the course, now labelled *Tradução do Texto Técnico-Científico*, will focus more exclusively on the English notion of SciTech, and the text types included in it, though with attention also given to hybrid discourses.

As regards the directionality of translation, the MA as a whole was initially conceived to provide training for translators working into Portuguese, and for this reason, most of the translation done on the course is in that direction. However, given the demand for translators to work into English (as experienced by our students doing internships for the *Componente Não letiva*) and the development of English as a Lingua Franca (ELF) as a variety of English in its own right (see 3.6 above), I have found it useful to provide opportunities for translation to occur in the opposite direction as well. This is likely to increase in the coming years.

Attention is also given to the following subskills:

- Grammatical analysis of scientific/technical discourse in English and Portuguese
- Contrastive analysis of the major text types covered on the programme
- Research techniques (for terminology, text models, background information)
- Intralingual translation between registers (understood as a form of inter-epistemic translation)

Students are also encouraged to reflect critically about the power relationships and ideologies affecting the translation of scientific texts in the contemporary world, and on the role played by MT and AI in the professional translation market.

4.2. Course structure

4.2.1. TTC (2015-2022)

The version of the course that ran until 2022-23, when it was called *Tradução do Texto Científico* (TTC), put a strong emphasis on academic abstracts and articles in order to do justice to the Portuguese understanding of the term *texto científico* as explained above. This enabled many disciplinary discourses (including social sciences and

humanities) to be broached, with attention given to the similarities and differences between them.

However, given the fact that translation flows in the real world do not usually involve the translation of research articles from English to European Portuguese,⁶⁷ attention was also given to texts from the applied sciences (medicine and engineering), and to popular science as representing more realistic translation exercises. This meant that we also managed to include other textual genres, such as reports, clinical guidelines, and patient information and informed consent forms relating to clinical trials (which have components of legal discourse).

The structure of the TTC course was as follows:⁶⁸

Lesson	<i>Tradução do Texto Científico</i> (2015-2022)
1.	Introduction: what is a scientific text?
2.	MODULE A. The grammar of technical discourse
3.	The characteristics of technical discourse; focus on nominalizations
	Impersonal verb forms
	MODULE B. The academic text
4.	Academic abstract: text analysis
5.	Academic abstract: translation
6.	Academic article: collaborative translation
	MODULE C. Medical translation
7.	Wordbuilding: medical terminology
8.	Register in medical texts 1: intralingual translation between registers
9.	Register in medical texts 2: intralingual translation between registers*
10.	Hybrid discourses: clinical trial documents
	MODULE D. Popular science
11.	Text types and register analysis
12.	Analysis and translation**
	MODULE E. Feedback and assessment
13.	Feedback on collaborative assignment (from lesson 6)***
14.	TEST
* in some editions of the course, this was omitted for lack of time or was replaced by a second lesson of analysis and translation in Module D	
** in some editions of the course, there were two lessons devoted to this	
*** in some editions of the course, this was omitted for lack of time and the feedback was given in writing	

⁶⁷ Brazilian is different, as mentioned above. See Silva (2023).

⁶⁸ In the year 2022-3, the course it was taught by another colleague, who approached it differently.

As mentioned above, during the years that TTC was running, it was offered alongside another UC called *Tradução do Texto Técnico* (TTT) taught by a colleague. The two were complementary, in the sense that TTT offered training in the translation of genres that were not covered on TTC, such as legal, business and marketing texts, as well as providing an introduction to audiovisual translation and some aspects of the translation profession. When, in 2023-24, TTC and TTT were amalgamated to make room for a new UC in Audiovisual Translation, the challenge became how to ensure that all those areas were covered on the course as a whole.

4.2.2. TTT-C (from 2023-4)

In the end, the decision was taken to maintain the basic structure of the TTC course (since it already covered much of what is usually understood by SciTech translation) but to try to introduce a broader range of text types in order to give the students some experience of other genres. At the same time, as coordinator of the Masters programme, I also took the opportunity to speak to the teacher of *Tradução do Texto Pragmático* (TTP) to see which items of TTT could be shouldered by her. In the end, it was decided that the students would be given a taste of legal translation in TTT-C in the form of hybrid text types, such as clinical trial documents, patent claims and contracts, which contain technical vocabulary but have a legal function, while business and marketing texts would be inserted into TTP. However, if time permits, I hope to be able to include a website for a private clinic into Module D as an example of a hybrid text involving elements of both medicine and marketing.

Lesson	<i>Tradução do Texto Técnico-Científico</i> (from 2024)
1.	Introduction: issues in SciTech translation
2.	MODULE A. The grammar of technical discourse
3.	The characteristics of technical discourse; focus on nominalizations Impersonal verb forms
	MODULE B. The academic text
4.	Academic abstract: text analysis and comparison
5.	Academic abstract: translation

6.	Academic article: collaborative translation
	MODULE C. Medical translation
7.	Word-building: medical terminology
8.	Register in medical texts: intralingual translation between registers
9.	Hybrid discourses: i) Medical-Legal: contracts, patents
10.	Hybrid discourses: ii) Medical-Marketing: website of private clinic
	MODULE D. Popular science
11.	Text types and register analysis
12.	Analysis and translation
13.	Popular science as (inter-)epistemic translation
14.	TEST

I have also decided to introduce a new lesson at the end of Module D in which I present the concept of inter-epistemic translation using material based on the *Exame de Melhoria e Recurso* (see 5.5. below). This will be an opportunity to disseminate the concept of inter-epistemic translation amongst students, and possibly encourage some of them to explore the topic in their *componente não-letiva*, potentially under the auspices of the EPISTRAN project. (It will also form the subject of my *lição* during the *provas de agregação*).

5. Teaching the programme

5.1. Main challenges

When I first started teaching TTC, I felt some resistance from students to the fact that I was not a native speaker of Portuguese. This was partly due to the fact that they had absorbed the idea that a translator must work into his/her native language,⁶⁹ an issue that I dealt with in the first lesson by confronting it from three angles. Firstly, I pointed out that technical discourse is no one's mother tongue, and that native-speaker intuition is not very helpful unless one also has specialist domain knowledge (indeed, when working with cutting-edge texts in highly technical domains, it is usually a better strategy to distrust one's intuitions and rely on systematic research among parallel

⁶⁹ A consequence of UNESCO's Nairobi Declaration (1976), which held sway in the translation profession for many years, as mentioned above.

documents and databases). Secondly, Portuguese technical terminology is usually derived from English and calqued upon it (as I explain through a brief historical overview), with the result that it can be quite accurately guessed if one understands the principles of word-building in the two languages. Finally, I am open with the students about my own strengths and weaknesses in Portuguese. I explain that I understand very well how the Portuguese language works as a system, having studied it formally in a way that few native speakers have; but that I often trip up on less systematic features of usage (such as prepositions, grammatical gender, and subtleties of word order), particularly when operating in real time. For this reason, I explain, when correcting their work, I make careful use of online sources, particularly parallel texts, and may discuss particularly difficult cases with colleagues or area specialists.

The main practical challenge for the teaching of this course is that students come from a variety of linguistic backgrounds, including some for whom both working languages are foreign. However, the predictable nature of SciTech discourse means that highly technical texts can be approached in a fairly mechanical fashion, which means that such students are not as disadvantaged, in relation to their Portuguese classmates, as they might be in other UCs. On the other hand, these people have more difficulty with the less technical texts covered on the course, such as popular science, which requires not only linguistic but also cultural knowledge.

In some years, we have received students from other degree programmes in this UC, and also some with professional training and experience (a doctor, a lawyer, a biologist). In these cases, I attempt to make use of their specialist knowledge for the benefit of the class, choosing texts for translation that offer opportunities for this.

5.2. Teaching methods

Having been trained as a teacher,⁷⁰ I feel very strongly that students learn better if they are allowed to learn by doing and reflection, rather than by passively absorbing from an authoritative source. This is particularly the case with a practical course like this, which aims to provide training in certain skills. For this reason, my lessons are all very student-centred, and organised around tasks, often done in pairs or in groups,

⁷⁰ In 1984, I did the RSA Preparatory Certificate in the teaching of English as a Foreign Language to Adults (now called CELTA) and in 1988, the full RSA Diploma (now called DELTA).

with systematic feedback in which different options are presented and discussed. Theoretical material (e.g. information about the history and structure of scientific discourse or the development of English as a Lingua Franca) is thus inserted into the discussions that arise during feedback on a task, and only afterwards presented formally in the form of a mini-Powerpoint.

The very first lesson provides a general introduction to the programme. In the TTC (2015-2022) version, I would usually begin by explaining why I was teaching the course, mentioning my extensive experience as a translator and scholar of academic discourse, the professional diploma I hold from the Institute of Linguists in London specialising in Scientific Translation (PT/EN), and also the arguments outlined above about why the translator of SciTech discourse need NOT be a native speaker of Portuguese. After this, the students were invited to translate the title of the course (*Tradução do Texto Científico*) into English in order to draw attention to certain lexical and grammatical problems involved,⁷¹ and to prepare the ground for the next task, which involved discussing, in pairs or small groups, which texts in a list can be considered *textos científicos* in Portuguese and which are ‘scientific texts’ in English. The discrepancy between the two understandings was then summed up and explained in a Powerpoint presentation (PP1), with reference to the historical background.

In the new version (TTT-C) to begin in 2024, I shall replace this discussion exercise with another in which various issues of relevance to the course are raised and debated. These include: the challenges of translating SciTech; translation flows and directionality; English as a Lingua Franca (ELF); translation technology and inter-epistemic translation (see Annex II).

The remainder of the lesson is then devoted to a presentation of the programme, teaching methods, assessment and bibliography, and the students are shown how to enrol on Moodle where all the materials are stored (many of these materials are included in Annex II below).

⁷¹ As well as the fact that ‘scientific/*científico*’ is a false cognate, there is also a grammatical issue, namely the use of the archetypal singular ‘o texto científico’, common in Romance languages. Given the variety of textual genres involved, it would be more natural in English to use a plural (i.e. ‘Translating scientific texts’) or a reformulation (Scientific/SciTech Translation). The official translation of the UC on the faculty website (‘Translation of the Scientific Text’) is therefore an example of English as a Lingua Franca (ELF) in the sense that it is the kind of formulation favoured by speakers of English as an additional language.

MODULE A (Lessons 2-3): The Grammar of Technical Discourse

These two lessons are designed to show students how technical discourse is structured, with a view to persuading them that this kind of translation is actually very predictable, and therefore much easier than they might imagine. They involve a series of analytical exercises done primarily in English, with Portuguese introduced at the end for comparison (a sequencing justified by English's chronological priority, as explained above).

The first exercise involves a comparison of technical and non-technical discourse in English.⁷² Students are given four short extracts divided into two pairs. The first extract in each pair is highly technical discourse (from clinical guidelines for medical practitioners about how to administer acetylsalicylic acid, in the first case, and a research article in the field of biochemistry in the second) while the second one is a rewriting of the same passage in less technical language (instructions for the general public about how to take aspirin, in the first case, and a more explicit rendering for the student in the second). The students are asked to discuss the text genre and target reader, in each case, and then to compare the two extracts to determine how they differ (in terms of grammatical structures, vocabulary, style etc). During the feedback, their answers are systematised in the form of a chart which presents the differences between technical and non-technical discourse (see PP 2), though it is also emphasized that this is not a binary so much as a continuum.

The next exercise involves an analysis of four samples of SciTech discourse from different disciplinary fields, also in English. After determining the discipline of each, the students are asked to analyse the passages by first underlining the main verb, and then circling all examples of noun phrases. This way they are shown how, in highly technical discourses, the semantic content is transported almost entirely by nouns, with verbs serving only to express the relations between those nouns.

The third exercise involves analysis of the structure of noun-phrases. They are given a worksheet with a list of complex noun phrases (some taken from the previous exercise) displayed in such a way as to present the head noun in the central column. The students are then asked to decide, by looking at the examples, what kind of

⁷² See Annex II for these materials.

information can come before and after the head of the noun phrase, before analysing a series of new noun phrases in the same way. Finally, they are asked to translate some of those noun phrases into Portuguese. The feedback focuses on the differences between the way the two languages handle noun phrases (chiefly a matter of word order as Portuguese does not usually accept premodification) and the implications for translation. This is then systematized in the Powerpoint presented at the end of the lesson (PP1).

If the first lesson of Module A was devoted to the nominalization, the second lesson of this module is concerned with impersonal verb forms. The students are given an abstract, in English, from the domain of industrial ecology, on the subject of life-cycle assessment, and asked to underline the main verbs. Then they are asked to discuss with a partner if that verb is transitive or intransitive, and if transitive, whether it is active or passive. The dominance of impersonal forms (passive and impersonal actives) is noted in the feedback, as is the presence of (what systemic-functional linguists call) 'relational' forms such as 'consists' or 'includes'.⁷³

The second exercise on the worksheet involves an excerpt in Portuguese of a text that is also about life-cycle assessment (*análise de ciclo de vida*) and once again, the students are asked to underline and analyse the main verbs. They find that this text contains more examples of the personal active, but also a predominance of reflexive forms (e.g. *abordam-se, faz-se*) over and above the 'ser' passive. They are also invited to note the phenomenon of verbal fronting of passive and reflexive forms, and to discuss the problems raised for translation of this grammatical feature. The differences noted between English and Portuguese in this regard are then systematized in a Powerpoint (PP2).

⁷³ This is systematized in the *Introduction to Functional Grammar* (Halliday 1994). Halliday's model of processes in English, which decorates the cover of the second edition of this grammar, is included in Powerpoint 2 (*The Grammar of Technical Discourse 2: Verb Forms*) to enable students to visualize the area of human experience described by technical discourse. It is explained to them that SciTech discourse (and by extension all academic writing in English, given the 'colonization' described above) occupies the left-hand side of the circle, with a focus on material, existential and relational processes, while Portuguese humanistic discourse occupies the right-hand side (mental, verbal, relational). It is precisely this discrepancy of worldview that makes it so difficult to translate the traditional Portuguese academic discourse of the humanities into an acceptable form of academic English (Bennett 2007a, 2007b, 2015a).

The third and final exercise involves translating the English abstract from the first exercise into Portuguese with particular attention given to the verb forms. This is usually done in pairs and the feedback is given at the beginning of the next lesson.

MODULE B (Lessons 4-6): Academic texts

The first lesson of this module is devoted to academic abstracts, understood to encapsulate in microcosmic form most of the characteristics of the academic article. The link with the previous module is made by our going over, at the beginning of the first lesson, the abstract about life-cycle assessment that was translated for homework.

There follows a discussion about the nature of the academic abstract – its function and relationship to the broader term ‘summary’. Then the students are given a worksheet containing four academic abstracts from different disciplinary fields (including humanities). They are asked first to skim-read the abstracts to determine what disciplinary areas they are from, and then to identify the aim statements in each one and note the wording used and where they are positioned. Subsequent questions are designed to highlight the structure of the abstracts, particularly the difference between the IMRD model used in the empirical sciences and the discursive style used in the humanities. The final questions are concerned with the use of personal versus impersonal structures, and with the use of verb tenses, which are discussed and analysed. For homework, the students are asked to translate two of the abstracts into Portuguese.

The next lesson begins with a revision of the notion of the Aim Statement, and the various structures that can be used to express it in English and in Portuguese. Then the abstract translated for homework is discussed in detail, with students proposing their solutions. The rest of the lesson is used for the translation and feedback of one of the other abstracts from the worksheet used in the previous lesson.

Finally, instructions are given for an exercise of collaborative translation that students will do in groups for formal assessment (see 3.4. above). Though the grade awarded is to the group, rather than to individual students, it will count towards the continuous assessment grade of each person.

The third lesson in this module introduces translation into English and the lesson begins with a discussion about the desirability of training translators to work into ELF (see 3.6 above). On the TTC version of the course, I would then give them an exercise, to do in pairs, involving the translation of six aim statements from Portuguese into English which were all taken from texts of different disciplines that were submitted to me for translation at some point and were chosen because of their difficulty (some are examples of the elaborate discourse that was popular in the traditional Portuguese humanities until recently). After struggling with it for a while, they are encouraged to eliminate all the ornamental features in favour of a more straightforward style, which inevitably provokes a discussion about the tension between remaining faithful to the author's style and domesticating it to ensure publication, which of course was the topic of my epistemicide articles (Bennett 2007a, 2015a).

The rest of the lesson is devoted to preparing for the translation, from Portuguese to English, of an abstract from the field of engineering. The students are first asked to translate the title (itself a complex nominalization) as a way of revising the material done in Module A about noun phrases, and then attention is drawn to the structure of the abstract in order to revise the material given in the previous lesson. They are asked to identify the aim statement, decide whether the abstract is structured according to the IMRD or humanistic/discursive model, and discuss the function of the introduction. They then carry out the translation of the text for homework, to be discussed at the beginning of the following lesson.

MODULE C (Lessons 7-10): Medical texts

This module offers an introduction to medical translation. After a short discussion about the most translated medical genres, the students undertake a word-building exercise, designed to show them the predictability of medical terminology. They are first given a list of common prefixes and suffixes used in English medical terminology and asked to guess their meaning (the fact that English technical discourse is built entirely around Latin and Greek roots of course makes it relatively predictable for speakers of Portuguese). They are then asked to guess the meaning of common terms through prefixes and suffixes, before translating some Portuguese terms into English.

The final exercise asks them to note the spelling changes that typically take place between English and Portuguese of these Latin and Greek roots. For homework, they are given a medical abstract in English to translate into Portuguese.

The next lesson (or next two lessons in the TCT version of the course) focuses on register in medical discourse, which not only builds on the terminology material from the previous week but also returns to the issue of technicality discussed in the first module. The students are asked to suggest technical names for a series of common medical conditions in English (heart attack, lung cancer, kidney stones, cold sore, flu, sore throat, chest infection, tooth decay, stroke, yeast infection) and then to translate both the technical and the non-technical term into Portuguese. The objective is to illustrate that, while English has a Germanic register which it typically draws upon for everyday colloquial terms, reserving the Latinate term for highly technical contexts, Portuguese does not have this facility, with the result that the boundary between the technical and non-technical register is less clear-cut in that language.

The rest of the lesson continues on the subject of register. In some editions of the course, the students were given a short text with instructions for the use of a particular medication (acetylsalicylic acid) in technical English which they are asked to translate into the same register of Portuguese. The resulting Portuguese text is then translated intralinguistically into a less technical register for use by the general public (either as a written text for use on a website or in a brochure, or for oral explanation – students can choose). Finally, the less formal text is translated back into English.

In other editions, students have been asked to analyse the professional and home versions of a MERCK/MSD manual entry (section on strokes) in order to spot the differences between them (in terms of content included or omitted, text organization and language used). If I use this material in future editions of the course (this will depend largely on time availability), the two versions will be presented as inter-epistemic translations, thus making connections with material given in the popular science module.

In some years, whenever time permitted, clinical trial documents (patient information and informed consent forms) were used to give students the opportunity to distinguish between competing discourses in the same document (in this case legal and medical) and to gain practice in the analysis and translation of segments. In the

new version of the course (TTT-C), responding to the need to include more material of a legal nature after the closure of the TTT course (see above), I am planning to include material about the translation of medical contracts and/or pharmaceutical patents,⁷⁴ which of course include elements of legal discourse. If time permits, I may also include a lesson about the translation of websites or publicity material relating to private clinics or medical tourism, in order to give more practice in the discourse of marketing (related to the medical field). These will make part of the new Module D on Hybrid Discourses.

MODULE D (Lessons 11-13): Popular science

Module D introduces the theme of popular science to which the exercises on register (in Lessons 2 and 8) were tending.

In the first of the two lessons, I circulate a series of ten English text extracts representing non-specialist or educational science from a range of different disciplines and genres. These include extracts from: articles from popular science magazines, science information articles from the general press, science blogs, different kinds of non-fiction books aimed at the non-specialist, student textbooks and educational material aimed at different age-groups. The students are given 2-3 minutes in pairs to scan each text in order to identify the text-type and disciplinary field, attribute a number from 1-5 with respect to degree of technicality and degree of formality, and identify any other features worthy of attention (such as the inclusion of captioned images, pull-quotes, subheadings, links to podcasts and Twitter feeds, etc). One of the texts is then chosen for a more detailed analysis, in which features such as forms of address (particularly when the reader is directly interpellated, as frequently happens in popular science), the use of cultural references and socially marked language, etc are discussed with a view to translation into Portuguese. The students translate the passage in pairs for homework, and the next lesson is devoted to discussing their options (for this purpose I prepare a document in which all the translation solutions for certain key paragraphs are presented side-by-side, anonymized).

⁷⁴ This decision was influenced by the fact that one of our students (Jardim 2023) recently did her internship in a company that was dedicated almost exclusively to the translation of patents. It is also helpful that Olohan, in her book *Scientific and Technical Translation*, devotes an entire chapter to the translation of patents (2016: 106-136)

I then present the instructions for the written assignment to be delivered, via Turnitin 2, some two to three weeks hence. I explain that they should think of their assignment in terms of a real-life commission, and briefly revise the main precepts of Skopos theory (which they will have studied in their Translation Studies course). For example, if they choose to translate an article from an American popular science magazine, such as *Popular Science* or *Scientific American*, they need to be clear in their minds about where their translation will be published and translate accordingly (the Brazilian magazine *Super-Interessante* is an obvious outlet but some articles could also be adapted for use in the science sections of Portuguese general-interest magazines such as *Visão* or *Sábado*). If they opt to translate an extract from a book, they are encouraged to scour Portuguese bookshops to identify a publisher that might be interested in publishing a translation of that particular work, and then use websites and other resources to identify a series in which it might be included and/or specific target public.

The extent to which they successfully manage to fulfil the Skopos they have set for themselves thus becomes the main criteria for assessment (see 5.5 below). The degree of adaptation depends upon them, though I have to date discouraged very radical transformations (such as the adaptation of an adult science book for children) on the grounds that they are unlikely to do this well and may therefore jeopardize their grade on the course. However, in the light of my interest in inter-epistemic translation (see below), I may do this in future.

This year, for the first time, I am also planning to add a new lesson at the end of Module D in which I introduce students to the concept of Inter-Epistemic Translation by asking them to consider how popular science might be studied as a translation of knowledge previously presented in a more technical register. For this, I will use the material first included in the *Exame de Recurso e Melhoria* from the year 2018-19 (see Annex 1), which has been reworked as a task, to be carried out in pairs or groups (see Annex II). This will therefore also serve as a way of revising the material done earlier about the difference between technical and non-technical registers. They will also be encouraged to consider how methodologies developed in Descriptive Translation Studies for the study of interlingual translations (which they will be familiar with from the UC Translation Studies) could be applied to the study of popular science as inter-

epistemic translation, with a view to eventually stimulating some of them to follow this up in their *componente não letiva*.

A separate module for feedback and assessment (Module E) was included in the TTC version of the course (2015-2022), but the first lesson was not always given due to lack of time. When it occurred, however, I used it to provide detailed feedback on the collaborative translation launched in Module B, and to discuss with the students how they felt about the course generally, and about questions such as translation into ELF.

This Module has been removed from the new edition of the course (TTT-C), though the last lesson is still reserved for the test (see 5.5 below).

5.3. Bibliographies

The general bibliography included in the programme was selected primarily for its usefulness to our students and availability (either online or in the FCSH library). However, the students are told at the outset that the materials provided by the teacher are sufficient to enable them to pass the course, with the bibliography serving merely as background reading to reinforce or supplement the knowledge acquired in the lessons.

The works listed in the general bibliography can be divided into various groups. The central works are those that provide an introduction to SciTech translation (what it is, how to go about doing it etc). The most accessible short introduction is, to my mind, Sue Ellen Wright's entry on 'Scientific, technical and medical translation' from the *Oxford Handbook of Translation Studies* (2012), which covers a range of subjects explored on this course in just twelve pages: defining the field; specialised language and terminology; technical registers (presented as a continuum from highly technical to less so); text types; translation flows and directionality; English as hegemonic language of science; and language and terminology planning. After this, I recommend Maeve Olohan's book-length work *Scientific and Technical Translation* (2016), available in the library, which covers much of the same ground, but in more depth. With chapters on different text types (e.g. technical instructions, technical data sheets and technical brochures, patents, scientific research articles and abstracts, popular

science), this provides useful background reading for individual modules of the course, and I recommend them as we go along.

Jody Byrne's works *Technical Translation: Usability Strategies for Translating Technical Documentation* (2006) and *Scientific and Technical Translation Explained* (2012) are popular with students as they are easily available and accessible. However, they do tend to generate some confusion since his definitions of the terms 'scientific' and 'technical' are different to the other authors quoted. Instead of perceiving SciTech discourse as a continuum that ranges across different text types and registers, from highly specialized research articles to popularizations and informal scientific conversations, as in Wright (2012, 17.1) and Olohan (2016: 174), Byrne emphasises the differences between them,⁷⁵ making unhelpful claims⁷⁶ that undermine the very structure of my course. This incompatibility is probably due to the changing nature of knowledge in the field (Byrne was probably working with an older model) and his failure to factor in popular science. For this reason, I warn the students to approach these works with care, and not to let themselves be confused by them.

Sue Ellen and Leland Wright's collected volume *Scientific and Technical Translation* (1993) appears on the general bibliography because it is in the library, but students are warned to use it selectively. First published in the American Translators' Association Scholarly Monograph series, it is not a particularly recent book, nor is it really geared towards the needs of students. However, there are one or two chapters that could be helpful, such as Mark Herman's chapter on 'Technical translation style', (pp. 11-20) or Leonard Meraw's chapter on 'Patent claim translation' (pp. 111-122), which I include in the specialized bibliographies for Modules A and C, respectively.

As regards medical translation, the general bibliography includes two works, Fischbach's *Translation and Medicine* (1998) and *Medical Translation Step by Step: Learning by Drafting*, by Montalt Resurrecció and González Davies (2014), both of

⁷⁵ For example: 'Despite the obvious connection between the two, i.e. they both deal with information based, to varying degrees, on the work of scientists, scientific translation is quite distinct from technical translation. Certainly, they both contain specialised terminology and, on the surface, deal with complicated scientific subject matter (to an extent) but it is all too easy to overestimate these apparent similarities at the expense of other, more compelling, differences'. (Byrne 2006: 7).

⁷⁶ For example: '[scientific] texts even border on the literary, using the same devices and strategies as a short-story writer or novelist' (2006:9). Byrne seems to be actually discussing popular science here, rather than the kind of discourse found in a research article, but fails to identify it as such; instead, he understands the use of literary and rhetorical features as a marker of the 'scientific' text as opposed to the 'technical'.

which are in the library. The first of these, like Wright and Wright's (1993) book on *Scientific and Technical Translation* discussed above, was first published by the American Translators' Association in 1998, and shares its defects, so students are advised to approach it selectively. The second, more recent, is much more helpful, offering introductions to professional practice and to medical communication in general, advice about text processing and practical issues, and appendices that list specific translation problems and their solutions (Appendix 1) and a useful list of Latin and Greek roots of medical terminology.

Given the importance of popular science on the course, and in translation practice generally, I have also included a specialised work on this subject, Maria Teresa Musacchio's little book *Translating Popular Science* (2017). However, the students are told that Olohan's chapter on popular science in the book mentioned above (2016: 173-205) is possibly more useful for them, since it is more focused on the practicalities of translation than on the theoretical issues underpinning it.

In addition to the general bibliography, which appears on the programme, on the new version of the programme (TTT-C), I also provide specialized bibliographies for the different modules. These include specific chapters from the more general works, shorter articles and links to websites. For Module A (The Grammar of Technical Discourse), I include Halliday and Martin's seminal work *Writing Science* (1993) and Martin and Veel's *Reading Science* (1998), which followed in its wake. However, given that these are dense works of linguistic analysis, I do warn them that they might find them indigestible, and suggest that my own overviews of their work (in my article 'The Scientific Revolution and its repercussions on the translation of technical discourse', 2011, and the Powerpoint provided) might be more accessible. This module also includes the chapter by Mark Herman (1993), mentioned above, on technical translation style.

As for Module B (The Academic Text), here I include three works: Olohan's chapter on 'Scientific research articles and abstracts' from her book *Scientific and Technical Translation* (2016), which offers a fairly general introduction to the field; my own article 'Academic discourse in Portugal' (2010b), which gives a contrastive vision of the differences between English and Portuguese academic styles; and Scott Montgomery's 2009 article 'English and Science: realities and issues for translation in

the age of an expanding lingua franca', for what it has to say about English as a lingua franca.

The module on Medical Translation (Module C) is best served by Montalt Resurrecció and González Davies' book (2014) on the main bibliography, but given the attention to hybrid discourses in the new version of the course, I have included a couple of works about patents (Chapter 5 of Olohan, 2016, and Meraw, 1993, mentioned above). I also draw the students' attention to websites hosted by various translation service providers, which contain some information about other medical-legal text types, such as different kinds of medical contracts.

As for Module D (Popular Science), this list includes the chapter on Popular Science from Olohan's (2016) book; an article in the online *Journal of Specialised Translation* about translating popular science into Chinese (Liao, 2010), which could be helpful for the Chinese students we have in the class; and finally, my own very recent introduction to inter-epistemic translation (Bennett 2024b), as well as the extract from the end of Douglas Robinson's *Translationality* (2017: 200-203) in which he proposes the concept.

5.4 Materials

All materials for the course are made available on Moodle. There is an Administration section, where students can find the programme and general bibliography, instructions for the written assignment, and the platform (*Turnitin Assignment 2*) where their written assignment will be uploaded. At the end of the course, I also upload documents giving feedback on both the written assignment and test (samples of these documents are given in Annex I).

The teaching materials consist predominantly of worksheets created by me, supplemented by occasional powerpoints (to systematize the information given over the course of a lesson) and a few texts for background reading.

a) Worksheets:

These include mostly exercises of textual analysis and/or translation, for completion in pairs in class or to be done for homework, though there are also some questions for debate to be discussed in pairs or small groups, before being opened up to the

whole class (e.g. Lesson 1), as well as a compilation of popular science extracts and grid for analysis (in Lesson 12). Some of these are available in Annex II.

b) Powerpoints:⁷⁷

These are short presentations (5-10 minutes), usually given at the end of the lesson to systematize the information gleaned from the debates and exercises done during it. In addition to the initial presentation of the course, done in the first lesson, they consist of the following:

1. *Problematizing Scientific Translation*: a summary of the initial debate in Lesson 1 of the TTC version of the course. Though the preliminary discussion exercise will be different in 2024 (TTT-C), I will leave this powerpoint on Moodle for them to consult if they wish.
2. *The Grammar of Technical Discourse I: Nominalizations*: a summary of the conclusions drawn from Exercises 1, 2, and 3 of Lesson 2, including information about the difference between technical and non-technical discourse; the structure of nominalizations; examples of pre- and post-modification; problems for translation; selected references
3. *The Grammar of Technical Discourse II: Verb Forms*: this is a summary of the conclusions drawn from the textual analysis and translation exercises done in Lesson 3, including: a brief explanation of the historical development of SciTech discourse (based on Halliday & Martin 1993 and Bennett 2011); Halliday's model of processes in English (1994) to exemplify the scientific worldview; impersonal verb forms in English and Portuguese; verbal fronting; selected references
4. *The Academic Text: Abstracts*: this is a systematization of the material dealt with in Lesson 4, including: introduction to the academic abstract and to translating abstracts; overview of the basic models for abstracts (IMRD and humanities/text-based model); aim statements (including most common structures in EN and PT); the structures used for the overview section of the humanities model; verb tenses used in the abstract

⁷⁷ These are available as electronic files.

5. *Translating Medical Texts*: a systematization of the material given in Lesson 7, including: knowledge flows in the global translation system; commonly translated medical genres; medical word-building
6. *Register in Medical Translation*: a synthesis of the material given in Lesson 8, including: overview of the technicality spectrum (1-5); common medical text-types distributed by register; intralingual translation (i.e. between registers) in medical contexts; technical vs non-technical medical vocabulary in EN; translating between registers; brief summary of Skopos theory (this should be a revision of material given in the UC Translation Studies), translational medicine (introduction to the concept of translationality/inter-epistemic translation in the medical context).
7. *Translating Popular Science*: synthesis and systematization of the material given in Lessons 10-12, including: definitions; formats; characteristics; the target reader and its influence on style and register; adapting the text to a new target reader in translation; selected references.
8. *(Inter-)Epistemic Translation*: synthesis of material given in Lesson 13, with references and links to EPISTRAN website.

c) Background reading:

These are short texts (articles or chapters) which provide background and further detail to issues covered in lessons. I provide them in pdf form on Moodle when they are particularly important, not easily available, or come from a book that may be in great demand. Examples include Sue Ellen Wright's entry on 'Scientific, technical and medical translation' from the *Oxford Handbook of Translation Studies* (2012), which is presented as a general introduction to the course as a whole; my own articles listed in the specialized bibliographies (Bennett 2010a, 2011a, 2024b), which are difficult for students to access; and the three chapters of Olohan's (2016) book that I considered most relevant. With regard to the lesson on inter-epistemic translation, I also make available pages 200-203 of Douglas Robinson's *Translationality: Essays in the Translational-Medical Humanities* (2017), where the concept is mooted for the first time, and the link to our EPISTRAN project (www.epistran.org).

5.5. Assessment

The assessment is divided into three parts: a test (30%), written assignment (50%), and continuous assessment (20%). The students are told in the introductory lesson that the system has been designed to not only test the absolute level achieved by the end of the course but also to encourage participation and allow for personal development. Hence, students that are hardworking and motivated will be rewarded for their efforts through the continuous assessment component, which reflects participation, motivation, attendance and, above all, progress made. For this purpose, I keep an attendance register each class, as well as a record of the students that have done the homework exercises and made an effort to actively participate in the debates.

Throughout the course, students are asked to do exercises of various kinds and translations of different types of text, alone or in pairs, at home and in class, and the feedback is given orally. In the case of the translations, I invite the class to discuss their options, taking care to distinguish between serious errors (those that fail to communicate some aspect of the content or induce misunderstanding), language or register mistakes, and stylistic issues. The discussion generated gives me idea of the level at which students are operating, as well as of their motivation and commitment to the task.

At one point during the course (usually in Module B), students are also asked to undertake a collaborative translation in order to prepare them for the teamwork that is often required in professional practice (see 3.4). In this case, every member of the group gets the same grade in order to put the focus on team collaboration – indeed I ask them not to tell me who translated which section – and the grade counts towards each student's continuous assessment.

As for the test, which is done in the last lesson, this involves the translation of an academic abstract, which is expected to achieve an absolute publishable standard. Up until 2021-22, the translation was exclusively English to Portuguese, to reflect the dominant orientation of the MTRAD programme,⁷⁸ and students were allowed to choose from a range of different disciplinary areas, including law, social sciences and

⁷⁸ Exceptions were made in years when I had mobility students in the class that did not know Portuguese. In these cases, the abstract was in English, and the translation was done into their mother tongue. I then requested the help of a language teacher from ILNOVA to correct it.

humanities.⁷⁹ They were also allowed to use any available tools or reference materials including CAT tools, MT, online databases, parallel sources etc, in order to reproduce real-life conditions.

From 2024, however, I plan to introduce some changes to the test in order to better reflect not only the curricular change from TTC to TTT-C, but also alterations in the professional domain. Thus, I will no longer offer humanities texts, but instead focus on SciTech subjects. To reflect translation flows and market demands, I am this year offering the option of translation into English, and in future this may completely replace translation into Portuguese. The most significant change, however, will come on the level of translation technology. Students will now be asked to translate the text using a machine translation system of their choice, and then to carefully edit it, explaining in detail the changes that they have made and why. The final mark given will reflect not only the standard of the final translation, but also their reasoning in their comments.

The third and largest part of the assessment is the translation and comment of a popular science text (Individual Assignment). The students are asked to choose a popular science article from an English-language magazine like *Scientific American*, *Popular Science* or *National Geographic*, or a section from a popular or educational science book or website, and to devise a realistic scenario in which it might be translated into Portuguese (for a magazine such as *Super-Interessante*, *Visão*, *Sábado* etc, a Portuguese publisher or book series etc). They should then translate it in accordance with the expectations of and style of the publication and its target reader, and comment on their choices in an extended comment. They may, if they wish, choose to repurpose the text for a completely different public, which brings much greater challenges. I encourage them to see it as an exercise in Skopos theory, which they will have studied in their class Translation Studies, which runs concurrently with TTT-C.

The translation itself is marked in the same way as the other translations on the course, with serious errors (those that impede communication of the message) penalized very harshly and other issues much less so. The comment is worth a third of the total grade: with it I look for whether the student has properly understood the

⁷⁹ I try to reflect students' interests by including disciplinary fields that I know they want to work in.

implications of the cultural relocation and made the appropriate adjustments, on the level of cultural references, register, forms of address etc. The technical terms that appear also have to be correctly translated, of course, with the degree of explicitness determined by the particular communicative context.

Finally, mention should be made of the *Exame de Recurso e Melhoria*, which students sometimes have to do, or may choose to do if they did less well than they had hoped in the main assessment. This takes a different form to the first assessment and rehearses the subject of inter-epistemic translation, which will be introduced explicitly into the course this year for the first time. In a week-long open exam, the students are asked to do three things: i) translate an abstract into Portuguese; ii) translate an extract from a popular science article which is directly related to the research article referred to in the abstract; iii) in a short text, reflect on the relationship between the two texts and the linguistic implications [See Annex II].

The students are given very detailed feedback on the formal parts the assessment. In addition to receiving their translations back with detailed comments and corrections, I prepare and publish on Moodle a report on both the test and the individual assignment in which I comment upon the level of achievement, difficulties found and issues that were penalized. Examples of these reports can be found in Annex I.

6. Conclusion

Despite the potentially conflicting nature of the aims pursued on this course (namely, to prepare students for the real-life translation market, while at the same time introducing them to issues that are being debated in Translation Studies research more broadly), this UC has generally had a good reception amongst students, who rate it highly in the SIMAQ report.⁸⁰ Indeed, many of them go on to do internships in technical domains, while others have chosen to do *trabalhos de projecto* on SciTech

⁸⁰ It typically scores between 5.6 and 5.9 (out of 6) on the *Questionário da Perceção dos Estudantes sobre o Funcionamento da Unidade Curricular*, and receives favourable comments, particularly about the content and methodology.

themes, including translating popular science (Pinto 2016, Agostinho 2019) or philosophy of science (Alves 2019) for a Portuguese readership.

However, given the changing nature of the translation market, it is not clear how long this practical orientation will remain relevant. The projected ‘death of the translator’, due to translation technology and AI, will occur in technical domains before literary ones for the reasons discussed, and students that have done internships in companies specializing in technical fields are already reporting a reduction in actual translation activity, with a concomitant rise in the pre- and post-editing of machine-translated texts.

This TTT-C course, as it is currently conceived, is grounded on the assumption that post-editing will not be effective unless the editor has an in-depth understanding of how the discourse works in the two languages, how such texts are structured rhetorically, and how terminology is generated. It also assumes that trainees still need help in acquiring the skills needed for tasks such as terminological research and project management, and that they still require critical faculties to remain one step ahead of the technology and evaluate its output in an effective manner. However, it is not clear how long this will remain the case. The exponential increase in computer capabilities may render translator training redundant much sooner than we had anticipated, particularly in fields like SciTech.

It is therefore interesting that, just as the translation profession is coming under threat, translation studies as an academic discipline has begun to expand its frontiers. In 2011, Stefano Arduini and Siri Nergaard proposed ‘the inauguration of a transdisciplinary research field with translation as an interpretive as well as operative tool’ (2011: 8), a proposal that was enthusiastically taken up and developed by Edwin Gentzler in his 2017 book *Translation and Rewriting in the Age of Post-Translation Studies*. That same year, Piotr Blumczynski’s book *Ubiquitous Translation* described how translation was already an epistemological resource for specialists in fields as diverse as philosophy, theology, linguistics and anthropology, while Michael Cronin, in his ground-breaking *Eco-Translation*, claimed it could be used ‘to move towards a post-anthropocentric relationship to the world, vital for any notion of ecological survival’ (2017: 5). The following year, Kobus Marais, already famous for his discussions of development as a form of translation (Marais 2014), published his *(Bio-)semiotic*

Theory of Translation, proposing a concrete extension of translation to include the study of ‘all semiotic processes’ ranging from ‘DNA processes through animal interaction and human politics and power, to dreams and other flight of fantasy’ (2018: 5). Then in 2019, a special issue of the journal *The Translator*, edited by Susan Bassnett and David Johnston, announced the start of the ‘Outward Turn’, i.e., the expansion of ideas about translation ‘beyond the linguistic’ in a way that would ‘reinforce TS both as a hub interdiscipline within the academy and as the conjoined theoretical wing of a practice that spans the key human processes of becoming and being, of change and cognition’ (2019: 186).

In the light of these developments, it seems increasingly urgent to train our students to conduct translation research that goes beyond the interlingual, equipping them with the skills needed to describe and predict translational phenomena across a range of different scenarios. Inter-epistemic translation is just one small part of this broader expansion, but with its roots in SciTech, offers an accessible route into the new paradigm from the perspective of the TTT-C course.

The material that I shall be presenting in the *lição* for these *provas de agregação* is an attempt to bring the cutting-edge research that we are undertaking on the EPISTRAN project into the MA translation classroom. It began life as an exercise in the *Exame de Recurso e Melhoria*, designed to test whether students could not only translate specialist and popular science effectively, but also whether they had understood how the different registers operated and could reflect on the relationship between the two. From there, it was a short step to actually developing a methodology for the study of popular science as inter-epistemic translation (Bennett, submitted), based upon methodologies that already exist for the descriptive study of conventional interlingual translations (Lambert and Van Gorp 1985, Toury 2012).

As such, I am hopeful that the experiment that I am attempting in the context of our EPISTRAN project will help to prepare our discipline for the descriptive, theoretical and emancipatory⁸¹ role that it will have in the new paradigm. The introduction of material about inter-epistemic translation into the TTT-C programme of

⁸¹ It has not been possible to develop the emancipatory aspect of inter-epistemic translation in this report, but it is described in some detail on the project website (www.epistran.org) and in my article about it (Bennett 2024b), sustained in the work of Boaventura de Sousa Santos (e.g. 2008, 2016, 2018).

the MTRAD course is a way of preparing the next generation of translation studies researchers for this new reality.

Bibliography

- Aixelá, Javier Franco (1996). 'Culture-specific items in translation'. In *Translation, Power, Subversion*, edited by Alvarez Rodríguez and M. Carmen Africa Vidal, 52–78. Clevedon: Multilingual Matters.
- Agostinho, João Pedro (2019). '*Embracing Mind. The Common Ground of Science & Spirituality*, de B. Alan Wallace e Brian Hodel: Proposta de tradução de uma obra de divulgação científica'. Trabalho de Projecto. MA in Translation. NOVA University of Lisbon.
- Alves, Ricardo Sousa (2019). 'Proposta de tradução do livro *Philosophy of Science: A Very Short Introduction*'. Trabalho de Projecto. MA in Translation. NOVA University of Lisbon.
- Arduini, Stefano, and Nergaard, Siri. (2011) 'Translation: A new paradigm'. *Translation: A Transdisciplinary Journal* 1/1: 8–17
- Atkinson, Dwight (1999). *Scientific Discourse in Sociohistorical Context: The Philosophical Transactions of the Royal Society of London, 1675-1975*. Mahwah, N.J: L. Erlbaum Associates.
- Baker, Mona (1992). *In Other Words: A Coursebook on Translation*. London and New York: Routledge.
- Baker, Mona (2004). 'The Status of Equivalence in Translation Studies: An Appraisal'. In *English-Chinese Comparative Study and Translation*, edited by Zijian, Yang. Shanghai: Foreign Languages Education Press.
- Baker, Will (2015). *Culture and Identity through English as a Lingua Franca: Rethinking Concepts and Goals in Intercultural Communication*. Boston: De Gruyter Mouton.
- Bassnett, Susan and David Johnston, eds. (2019) *The Outward Turn*. Special issue of *The Translator* 25/3.
- Bennett, Karen (2006). 'Critical language study and translation: the case of academic discourse'. In *Translation Studies at the Interface of Disciplines*, J.F. Duarte, A.A. Rosa & T. Seruya (eds), Amsterdam & Philadelphia: John Benjamins. 111-127
- Bennett Karen (2007a). 'Epistemicide! The tale of a predatory discourse'. In S. Cunico & J. Munday (eds), *Translation and Ideology: Cultures and Clashes*. Special issue of *The Translator* 13 (2), pp. 151–69
- Bennett, Karen (2007b). 'Galileo's revenge: ways of construing knowledge and translation strategies in the era of globalization', In Myriam Salaama-Carr (ed.) *Translation and Conflict*, special issue of *Social Semiotics*, 17(2), 2007. 171-193.
- Bennett, Karen (2009a). *English Academic Discourse: Its Hegemonic Status and Implications for Translation*. PhD Thesis. University of Lisbon

- Bennett, Karen (2009b). 'English academic style manuals: a survey'. *Journal of English for Academic Purposes* 8 (1), pp. 43–54.
- Bennett Karen (2010a). 'Academic discourse in Portugal: a whole different ballgame'. *Journal of English for Academic Purposes* 9 (1), pp. 21–32.
- Bennett Karen (2010b). 'Academic writing practices in Portugal: survey of humanities and social science researchers'. *Diacrítica - Série Ciências da Linguagem* 24 (1), pp. 193–209.
- Bennett, Karen (2011a). 'The Scientific Revolution and its repercussions on the translation of technical discourse. In Myriam Salaama-Carr and Maeve Olohan (eds), *Science in Translation*, special issue of *The Translator*, 17 (2). 2011. 189-210
- Bennett, Karen (2011b) 'Emotion in scholarly discourse: denial, deconstruction, reinstatement'. In Fernanda Gil Costa & Igor Furão (eds.), *Estética das Emoções*. V.N.Famalicão: Edições Humus. 271-282.
- Bennett, Karen (2011c). *Academic Writing in Portugal I: Discourses in Conflict*, Coimbra: Coimbra University Press
- Bennett, Karen (2012). 'Footprints in the text: Assessing the impact of translation upon Portuguese historiographic discourse'. In Anthony Pym and Alexandra Assis Rosa (eds), *New Directions in Translation Studies*, special issue of *Anglo-Saxónica* 3(3). 2012. 265-290.
- Bennett Karen (2013a). 'English as a lingua franca in academia: combating epistemicide through translator training'. In S. Taviano (ed.) *English as a Lingua Franca: Implications for Translator and Interpreter Education*. Special Issue of *The Interpreter and Translator Trainer* 7 (2), pp. 169–93.
- Bennett, Karen (2013b). 'The translator as cultural mediator in research publication'. In V. Matarese (ed.) *Supporting Research Writing: Roles and challenges in multilingual settings*, Oxford: Chandos. 93-106.
- Bennett, Karen, ed. (2014a). *The Semiperiphery of Academic Writing: Discourses, Communities and Practices*, London: Palgrave Macmillan
- Bennett, Karen (2014b). 'The political and economic infrastructure of academic practice: The 'semiperiphery' as a category for social and linguistic analysis'. In K. Bennett (ed.) *The Semiperiphery of Academic Writing: Discourses, Communities and Practices*. London: Palgrave Macmillan, pp. 1-12
- Bennett, Karen (2014c). 'The erosion of Portuguese historiographic discourse'. In K. Bennett (ed.) *The Semiperiphery of Academic Writing: Discourses, Communities and Practices*. Basingstoke and New York: Palgrave Macmillan, pp. 13-38.
- Bennett, Karen (2014d). 'Discourses of knowledge: Cultural disjunctions and their implications for the language industries'. *Ibérica*, no. 27: 35–50.
- Bennett, Karen (2015a). 'Towards an epistemological monoculture: mechanisms of epistemicide in European research publication'. In R. Plo Alastrué and C. Pérez-

- Llantada (eds) *English as an Academic and Research Language*. Berlin: De Gruyter Mouton, pp. 9-35.
- Bennett, Karen (2015b). 'The transparency trope: Deconstructing English academic discourse'. *Discourse and Interaction*. 8/2. 2015. 5-19.
- Bennett, Karen (2015c). "'Like a candle under a bushel": rhetorical identities in Portugal and England (16th - 21st centuries)'. *Revista de Estudos Anglo-Portugueses* Vol. 24. 69-83.
- Bennett, Karen (2020). 'Authorship and (self-)translation in academic writing: towards a genetic approach'. In A. Nunes, J. Moura and M. Pacheco Pinto (eds). *Genetic Translation Criticism: Conflict and Collaboration in Liminal Spaces*, London: Bloomsbury, pp. 179-196.
- Bennett, Karen (2023). 'Approaches to knowledge translation'. In R. Meylaerts and K. Marais (eds) *Routledge Handbook of Translation Theory*, London and New York: Routledge, pp. 443-62.
- Bennett, Karen (2024a). 'Translating knowledge in the multilingual paradigm: beyond epistemicide'. In E. Bielsa (ed.) *Translating Academia*. Special Issue of *Social Science Information*.
<https://journals.sagepub.com/doi/10.1177/05390184231222807>
- Bennett Karen (2024b). 'Epistemic translation: Towards an ecology of knowledges'. *Perspectives: Studies in Translation Theory and Practice*.
<https://doi.org/10.1080/0907676X.2023.2294123>
- Bennett, Karen (submitted) 'Popular Science as inter-epistemic translation: A case study'. Submitted to *The Translator*
- Bennett, Karen and Muresan, Laura-Mihaela (2016) 'Rhetorical incompatibilities in academic writing: English versus the Romance Languages'. *Synergy* 12, no. 1. 95-199.
- Bistué, Belén (2013). *Collaborative Translation and Multi-Version Texts in Early Modern Europe. Transculturalisms, 1400-1700*. Surrey and Burlington, VT: Ashgate.
- Blommaert, Jan (2010). *The Sociolinguistics of Globalization*. Cambridge, UK; New York: Cambridge University Press
- Blumczynski, Piotr (2017) *Ubiquitous Translation*. London and New York: Routledge.
- Blumczynski, Piotr (2023) *Experiencing Translationality: Material and Metaphorical Journeys*. New York: Routledge
- Bowker, Lynne, and Jairo Buitrago Ciro (2019). *Machine Translation and Global Research: Towards Improved Machine Translation Literacy in the Scholarly Community*. Bingley: Emerald Publishing.
- Bruni, Leonardo (1424/6). 'On the correct way to translate'. In: *Western Translation Theory from Herodotus to Nietzsche*, ed. Douglas Robinson. Manchester: St Jerome, 2002, pp. 57-60.
- Byrne, Jody (2006). *Technical Translation: Usability Strategies for Translating Technical Documentation*. Dordrecht: Springer.

- Byrne, Jody (2012). *Scientific and Technical Translation Explained*. Manchester: St Jerome.
- Campbell, Stuart (2005) 'English translation and linguistic hegemony in the global era'. In G. Anderman and M. Rogers (eds), *In and Out of English: For Better, for Worse?* Buffalo: Multilingual Matters, pp. 27-38.
- Canagarajah, A. Suresh (2013). *Translingual Practice: Global Englishes and Cosmopolitan Relations*. Abingdon and New York: Routledge.
- Cao, Deborah (2007). *Translating Law*. Clevedon, Buffalo & Toronto: Multilingual Matters.
- Cao, Deborah (2010). 'Legal Translation'. In Y. Gambier & L. Doorslaer, eds. *Handbook of Translation Studies Vol. 1*. Amsterdam and Philadelphia: John Benjamins, pp. 191-195.
- Ceia, Carlos (1995). *Normas para a Apresentação de Trabalhos Científicos*. Lisbon: Presença.
- Chesterman, Andrew (2016). *Memes of Translation: The Spread of Ideas in Translation Theory*. Revised Edition. Amsterdam and Philadelphia: John Benjamins.
- Cordingley, Anthony, and Céline Frigau Manning, eds. (2017). *Collaborative Translation: From the Renaissance to the Digital Age*. London and New York: Bloomsbury.
- Cronin, Michael (2017). *Eco-Translation: Translation and Ecology in the Age of the Anthropocene*. London and New York: Routledge
- Cunha, Celso and Lindley Cintra (1985) *Gramática do Português Contemporânea*, Lisboa: Edições João Sá de Costa.
- Da Silva, Augusto Soares (2022). 'Evidencialidade/mediatividade, modalidade epistémica...'. *Revista de Estudos Linguísticos da Universidade do Porto - N.º Especial*, Vol. 1: 263-294
- De Swaan, Abram (2001). *Words of the World: The Global Language System*. Cambridge and Malden: Polity.
- D'Oliveira, Teresa (2007). *Teses e Dissertações - Recomendações para a Elaboração e Estruturação de Trabalhos Científicos*. Lisbon: Editora R.H
- Ding, Dan (1998) 'Rationality reborn: Historical roots of the passive voice in scientific discourse'. In J. Battalio, ed. *Essays in the Study of Scientific Discourse: Methods, Practice and Pedagogy*. Stamford and London: Ablex, pp. 117-35.
- Feyerabend, Paul (1978 [1975]). *Against Method*. London: Verso.
- Flowerdew, John, ed. (2002) *Academic Discourse*. Harlow: Longman.
- Foucault, Michel. 1970/2002, [1966]. *The Order of Things*. London and New York: Routledge.
- Foucault, Michel. 1972/2002, [1969], *The Archaeology of Knowledge*, translated from the French by A. M. Sheridan Smith, London & New York: Routledge.
- Gentzler, Edwin (2017) *Translation and Rewriting in the Age of Post-Translation Studies*. London and New York: Routledge

- Gilbert, G.N. and Mulkay, Michael (1984). *Opening Pandora's Box: A Sociological Analysis of Scientific Discourse*. Cambridge: Cambridge University Press
- Gordin, Michael D. (2015) *Scientific Babel: How Science Was Done before and after Global English*. Chicago and London: The University of Chicago Press.
- Grácio, João Pedro (2023). 'O uso de CAT Tools no processo de internacionalização de um website'. Trabalho de projecto, MA in Translation. NOVA University of Lisbon.
- Halliday, M.A.K. (1994). *An Introduction to Functional Grammar*, 2nd edition. London: Arnold.
- Halliday, M. A. K., and J. R. Martin (1993) *Writing Science: Literacy and Discursive Power*. Pittsburgh: University of Pittsburgh Press.
- Hyland, Ken (1999) 'Disciplinary discourses: Writer stance in research articles.' In C. Candlin and K. Hyland (eds), *Writing Texts: Processes and Practices*. Harlow: Longman, pp. 99-121.
- Hyland, Ken (2000). *Disciplinary Discourses: Social Interactions in Academic Writing*. Ann Arbor: University of Michigan Press.
- Hyland, Ken (2004) *Disciplinary Discourses: Social Interactions in Academic Writing*. Michigan classics ed. Ann Arbor: University of Michigan Press.
- Hyland, Ken (2009) *Academic Discourse: English in a Global Context*. London and New York: Continuum.
- Jakobson, Roman (1959/2000). 'On linguistic aspects of translation'. In L. Venuti (ed.) *The Translation Studies Reader*, London and New York: Routledge, pp. 113-18.
- Jardim, Pamela F. (2023). 'Tradução de patentes para português: uma experiência de estágio na Clarkemodet'. Internship report. MA in Translation. NOVA University of Lisbon
- Jenkins, Jennifer (2007). *English as a Lingua Franca: Attitude and Identity*. Oxford Applied Linguistics. Oxford: Oxford University Press.
- Jenkins, Jennifer (2014) *English as a Lingua Franca in the International University: The Politics of Academic English Language Policy*. Milton Park, Abingdon, Oxon: Routledge.
- Johns, Tim (1992) 'It is presented initially: Linear dislocation and interlanguage strategies in Brazilian academic abstracts in English and Portuguese'. *Ilha do Desterro* 27: 9–32.
- Knorr-Cetina, Karin (1981) *The Manufacture of Knowledge*. Oxford: Pergamon
- Kress, Günther (1988) *Linguistic Processes in Sociocultural Practice*, Oxford: Oxford University Press
- Kuhn, Thomas S. 1970 [1962]. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press
- Lambert, José and van Gorp, Hendrik (1985). 'On describing translations'. In T. Hermans (ed.) *The Manipulation of Literature: Studies in Literary Translation*, London and Sydney: Croom Helm, pp. 42-53.

- Latour, Bruno and Stephen Woolgar (1979). *Laboratory Life: The Social Construction of Scientific Facts*. Los Angeles: Sage.
- Lyotard, Jean-François (1984 [1979]). *The Postmodern Condition: A Report on Knowledge*, transl. Geoff Bennington and Brian Massumi. Manchester: Manchester University Press
- Madeira, Ana Carla and Maria Manuel Abreu (2004). *Comunicar em Ciência - Como Redigir e Apresentar Trabalhos Científicos*. Lisbon: Escolar Editora
- Makoni, Sinfrey, and Alastair Pennycook, eds. (2007) *Disinventing and Reconstituting Languages*. Clevedon and Buffalo: Multilingual Matters.
- Marais, Kobus (2014) *Translation Theory and Development Studies: A Complexity Theory Approach*. New York: Routledge.
- Marais, Kobus (2018). *A (Bio)Semiotic Theory of Translation: The Emergency of Social-Cultural Reality*. New York and London: Routledge
- Marais, Kobus, ed. (2022). *Translation Beyond Translation Studies*. London: Bloomsbury
- Marques, Rui (2022) 'Modalidade epistémica e persistência'. *Revista de Estudos Linguísticos da Universidade do Porto* - N.º Especial, Vol. 2 - 2022 - 337-358
- Martin, J. R., and Robert Veel, eds. (1998) *Reading Science: Critical and Functional Perspectives on Discourses of Science*. London and New York: Routledge.
- Mateus, Maria Helena M., Ana Maria Brito, Inês Duarte and Isabel Hub Faria (1989), *Gramática da Língua Portuguesa*, 4th edition. Lisboa: Caminho.
- Mauranen, Anna (2012) *Exploring ELF: Academic English Shaped by Non-Native Speakers*. Cambridge: Cambridge University Press.
- McEnery, Tom and Kifle, Nazareth Amselom (2002) 'Epistemic modality in argumentative essays of second-language learners'. In J. Flowerdew (ed.) *Academic Discourse*. London & New York: Longman, pp. 182-195
- McKenny, John and Karen Bennett (2009) 'Critical and corpus approaches to English academic text revision: a case study of articles by Portuguese humanities scholars', *English Text Construction*, 2(2). 228-245.
- McKenny, John and Karen Bennett (2010) 'Polishing papers for publication: palimpsests or procrustean beds?' In A. Frankenburg-Garcia, L. Flowerdew and G. Aston (eds.), *New Trends in Corpora and Language Learning*, Continuum, pp. 247-262
- Merton, Robert K. (1942) 'The normative structure of science'. In R.K. Merton, *The Sociology of Science: Theoretical and Empirical Investigations*, Chicago and London: University of Chicago Press. 267-278
- Montalt Resurrecció, Vicent, and Maria González Davies (2014). *Medical Translation Step by Step: Learning by Drafting*. London; New York: Routledge.
- Montgomery, Scott L. (2009) 'English and science: Realities and issues for translation in the age of an expanding lingua franca'. *Journal of Specialised Translation* 11: 6–16.
- Musacchio, Maria Teresa (2017). *Translating Popular Science*. Padova: CLEUP.

- Nelissen, Elisa, and Jack McMartin (2023). 'Localising Science News Flows in a Global Pandemic: Translational Sourcing Practices in Flemish Reporting on COVID-19 Vaccine Studies'. In P. Blumczynski and S. Wilson (eds), *The Languages of COVID-19: Translational and Multilingual Perspectives on Global Healthcare*, New York: Routledge, pp. 95-109.
- Newmark, Peter (1988) *A Textbook of Translation*. Hemel Hemstead: Prentice Hall.
- Nida, Eugene (1964/2000) 'Principles of correspondence'. In L. Venuti (ed.) *The Translation Studies Handbook*, London and New York: Routledge, pp. 126-40.
- Nord, Christiane (1997). *Translating as a Purposeful Activity: Functionalist Approaches Explained*. Manchester: St. Jerome.
- Nord, Christiane (2006) 'Translating as a purposeful activity: A prospective approach'. *TEFLIN Journal*, 17/2: 131-143.
- Olohan, Maeve (2016) *Scientific and Technical Translation*. Abingdon and New York: Routledge.
- Pinho, Marina (2023) 'Perspectivas e desafios da tradução automática na tradução técnica do inglês para o português brasileiro'. Relatório de Estágio, Master's in Translation. NOVA University of Lisbon.
- Pinto, Sílvia (2016) 'Popular Science: Traduzindo psicologia para revistas portuguesas'. Trabalho de projecto, MA in Translation, NOVA University of Lisbon
<http://hdl.handle.net/10362/20253>.
- Pym, Anthony (2018) 'A typology of translation solutions'. *The Journal of Specialised Translation*, no. 30: 40–65.
- Robinson, Douglas (2017) *Translationality: Essays in the Translational-Medical Humanities*. London and New York: Routledge.
- Santos, Boaventura de Sousa, ed. (2008) *Another Knowledge Is Possible: Beyond Northern Epistemologies*. Volume 3 of *Reinventing Social Emancipation: Toward New Manifestos*. London: Verso
- Santos, Boaventura de Sousa (2016) *Epistemologies of the South: Justice against Epistemicide*. London and New York: Routledge
- Santos, Boaventura de Sousa (2018) *The End of the Cognitive Empire: The Coming of Age of Epistemologies of the South*. Durham: Duke University Press
- Šarčević, Susan. (2000). *Legal Translation and Translation Theory: A Receiver-oriented Approach*. Geneva, Legal Translation: History, Theory/ies, Practice.
- Seidlhofer, Barbara (2011). *Understanding English as a Lingua Franca*. Oxford: Oxford University Press.
- Serrano, Pedro (2004). *Redacção e Apresentação de Trabalhos Científicos*. Lisbon: Relógio d'Água.
- Silva, Gisele D. (2023) *The Translation Process in Brazilian University Presses: An Actor-Network Approach*. Dissertation, PhD in Translation Studies, NOVA University of Lisbon.

- Soares, Carolina (2023) 'Explaining scientific knowledge to children through intersemiotic translation: the case of *Once Upon a Time... Life*'. Paper presented at international conference on *Epistemic Translation: Towards an Ecology of Knowledges*, Lisbon December 14-16.
- Swales, John (1990). *Genre Analysis: English in Academic and Research Settings*. Cambridge: Cambridge University Press.
- Taviano, Stefania (2010). *Translating English as a Lingua Franca*. Firenze: Le Monnier Università.
- Taviano, Stefania, ed. (2013) *English as a Lingua Franca: Implications for Translator and Interpreter Education*. Special Issue of *The Interpreter and Translator Trainer*. Vol. 7, No. 2.
- Thelen, Marcel (2015) 'The interaction between terminology and translation. or where terminology and translation meet'. *Trans-Kom* vol. 8, no. 2: 347–81.
- Toury, Gideon (2012). *Descriptive Translation Studies and Beyond*. Revised Edition. Amsterdam and Philadelphia: John Benjamins.
- UNESCO (1976) *The Recommendation for the Protection and Improvement of the Legal and Social Status of Translations and Translators*.
<https://www.unesco.org/en/legal-affairs/recommendation-legal-protection-translators-and-translations-and-practical-means-improve-status> (last consulted 16/1/24).
- Vermeer, Hans (1989/2000), 'Skopos and commission in translational action'. In L. Venuti (ed.) *The Translation Studies Reader*, translated by A. Chesterman. London and New York: Routledge, pp. 221-32.
- Vidal Claramonte, Mária Carmen África (2024, forthcoming). *Translation and Objects*: New York and London: Routledge.
- Vinay, Jean-Paul. and Jean Darbelnet (1958/2000) 'A methodology for translation'. Translated by J. Sager and M.J. Hamet (1995). In L. Venuti (ed.) *The Translation Studies Reader*. London and New York: Routledge, pp. 84-93.
- Wagner, Emma (2005). 'Translation and/or editing – the way forward?' In G. Anderson and M. Rogers (eds). *In and out of English: For Better, for Worse?* Buffalo: Multilingual Matters, pp. 214-26.
- Wright, Sue Ellen (2011) 'Scientific, technical and medical translation'. In K. Malmkjaer and K. Windle (eds), *Oxford Handbook of Translation Studies*, Oxford: Oxford University Press.
- Wright, Sue Ellen and Gerhard Budin (Eds.) (1997). *Handbook of Terminology Management*. Amsterdam and Philadelphia: J. Benjamins.
- Wright, Sue Ellen, and Leland Wright, eds. (1993) *Scientific and Technical Translation*. Amsterdam and Philadelphia: John Benjamins.
- Zannini, Silvia (2016). 'The interaction between scientific translation and English as a Lingua Franca, and the role of non-native English-speaking translators', *Trabalho de projecto*, MA in Translation, NOVA University of Lisbon.

Annex I: Administrative Documents

Programme and Bibliography: *Tradução do Texto Técnico-Científico*

Teacher: Karen Bennett (kbennett@fcsb.unl.pt)

Timetable: Monday, 6pm-9pm **Room:** C109

Office Hours: Wed. 4-6pm (or by appointment) **Office:** 205 (TA)

Aims:

This course develops the skills needed to translate SciTech texts in a contemporary real-life context. The term SciTech is understood to include a variety of text-types relating to the pure and applied sciences, including: abstracts and research articles, popular science, technical reports, and medical and medico-legal texts of different genres and registers.

Most of the translation will be from English into Portuguese but there will also be an opportunity to translate some text-types into English in order to reflect the dominant flows in the global marketplace and the development in recent years of English as a Lingua Franca (ELF) as a variety of English in its own right.

Attention will be given to the following subskills:

- Grammatical analysis of scientific/technical discourse in English and Portuguese
- Contrastive analysis of the major text types covered
- Research techniques (for terminology, text models, background information)
- Intralingual translation between registers

Students will also be encouraged to reflect critically about the power relationships and ideologies affecting the translation of scientific texts in the contemporary world, and to consider how they affect the practice of translation.

Syllabus:

1. Introduction to scientific discourse:

- the historical development of SciTech discourse in English with the Scientific Revolution of the 17th century and its spread to other languages (including Portuguese) by a process of calque
- the structure of SciTech discourse in English and Portuguese (nominalizations, impersonal verb forms) and the construction of technical terminology

- translation flows of different kinds of scientific text in the contemporary world
2. The scientific research article:
 - academic text organization and rhetoric
 - individual and collaborative translation of scientific abstracts and articles in different disciplinary areas
 3. Medical translation: the formation of medical terminology; intralingual translation between registers (e.g. specialist to non-specialist in the case of manuals, websites or leaflets destined for the patient or general public); hybrid discourses (medico-legal texts and texts related to the marketing of medical/scientific products)
 4. Translation of popular science:
 - introduction to the politics of localization;
 - analysis and translation of different kinds of popular science text, the formality/technicality spectrums;
 - introduction to (inter-)epistemic translation

Calendar:

Start of lessons: 19th Feb. Interruptions: 25th March – 1st April (Easter)

Last lesson (test): 27th May

Provisional Schedule:

Lesson	<i>Tradução do Texto Técnico-Científico (from 2024)</i>
1.	Introduction: issues in SciTech translation
2.	MODULE A. The grammar of technical discourse
3.	The characteristics of technical discourse; focus on nominalizations
	Impersonal verb forms
	MODULE B. The academic text
4.	Academic abstract: text analysis and comparison
5.	Academic abstract: translation
6.	Academic article: collaborative translation
	MODULE C. Medical translation
7.	Word-building: medical terminology
8.	Register in medical texts: intralingual translation between registers
9.	Hybrid discourses: i) Medical-Legal: contracts, patents
10.	Hybrid discourses: ii) Medical-Marketing: website of private clinic
	MODULE D. Popular science
11.	Text types and register analysis
12.	Analysis and translation
13.	Popular science as (inter-)epistemic translation
14.	TEST

Teaching methods:

Teaching is student-centred and primarily task-based, though this practical experience will also be used as a springboard for theoretical/philosophical reflection about issues relating to the generation and transfer of knowledge in the global world.

Assessment:

- written test (30%): assessment and revision of a translation of an academic abstract produced by a machine translation (MT) system
- translation and comment of a popular science text OR descriptive case-study of an inter-epistemic translation (50%)
- continuous assessment (20%): attendance, participation in lessons, homework and team task

General Bibliography:

- Byrne, Jody (2006) *Technical Translation: Usability Strategies for Translating Technical Documentation*. Dordrecht: Springer.
- Byrne, Jody (2012). *Scientific and Technical Translation Explained*. Manchester: St. Jerome Publishing.
- Fischbach, Henry (ed) (1998). *Translation and Medicine*. Amsterdam and Philadelphia: John Benjamins.
- Montalt, Vicent, and Maria González Davies (2014) *Medical Translation Step by Step: Learning by Drafting*. London; New York: Routledge.
- Musacchio, Maria Teresa (2017). *Translating Popular Science*. Padova: CLEUP.
- Olohan, Maeve (2016). *Scientific and Technical Translation*. New York and Abingdon: Routledge
- Wright, Sue Ellen (2011) 'Scientific, technical and medical translation'. In *Oxford Handbook of Translation Studies*, edited by Malmkjaer, Kirsten and Windle, Kevin. Oxford: Oxford University Press.
- Wright, Sue Ellen and Leland Wright (eds) (1993). *Scientific and Technical Translation*. Amsterdam and Philadelphia: John Benjamins.

Specialized bibliographies**Module A: The Grammar of Technical Discourse**

- Bennett, Karen. (2011) 'The Scientific Revolution and its repercussions on the translation of technical discourse'. In M. Salaama-Carr, and M. Olohan, eds. *Science in Translation*. Special issue of *The Translator* 17, No. 2: 189–210.
- Halliday, M. A. K., and J. R. Martin (1993) *Writing Science: Literacy and Discursive Power*. Pittsburgh: University of Pittsburgh Press

Herman, Mark (1993). Technical translation style: Clarity, concision, correctness'. In S.E. Wright and L. Wright, eds. *Scientific and Technical Translation*. Amsterdam and Philadelphia: John Benjamins, pp. 11-20.

Martin, J. R., and Robert Veel, eds. (1998) *Reading Science: Critical and Functional Perspectives on Discourses of Science*. London and New York: Routledge

Module B: The Academic Text

Bennett, Karen (2010) 'Academic discourse in Portugal: a whole different ballgame'. *Journal of English for Academic Purposes* 9 (1), 21–32.

Bennett, Karen (2011) *Academic Writing in Portugal I: Discourses in Conflict*, Coimbra: Coimbra University Press

Montgomery, Scott L. (2009) 'English and Science: realities and issues for translation in the age of an expanding lingua franca'. *Journal of Specialised Translation* 11: 6–16.

Olohan, Maeve (2016) 'Scientific research articles and abstracts'. Ch. 6 of *Scientific and Technical Translation*. Abingdon and New York: Routledge, pp.137-172.

Module C: Medical Translation

Meraw, Leonard (1993) 'Patent claim translation'. In S.E. Wright and L. Wright, eds. *Scientific and Technical Translation*. Amsterdam and Philadelphia: John Benjamins, 111-122.

Montalt, Vicent, and Maria González Davies (2014) *Medical Translation Step by Step: Learning by Drafting*. London; New York: Routledge

Olohan, Maeve (2016) 'Patents'. Ch. 5 of *Scientific and Technical Translation*. Abingdon and New York: Routledge, pp. 106-136.

Module D: Popular Science

Bennett Karen (2024) 'Epistemic translation: towards an ecology of knowledges'. *Perspectives: Studies in Translation Theory and Practice*
<https://doi.org/10.1080/0907676X.2023.2294123>

Liao, Min-Hsiu, 2010. 'Translating (popular) science into Chinese: An interactive perspective'. *The Journal of Specialised Translation*, 13. 2010: 44-60.
https://jostrans.soap2.ch/issue13/art_liao.php

Musacchio, Maria Teresa (2017). *Translating Popular Science*. Padova: CLEUP.

Olohan, Maeve (2016) 'Popular science'. Ch. 7 of *Scientific and Technical Translation*. Abingdon and New York: Routledge, pp. 173-205.

Instructions for Individual Assignment: Translation and Comment

This assignment will involve the individual translation into Portuguese of a popular science text of the type analysed in Lessons 11-12 (i.e. a 1000-1500 word extract from a book, article or blog in any disciplinary area aimed at the general public, students or young people) preceded by a short introduction (500-1000 words) in which you describe the real-life conditions under which such a translation may be commissioned, discuss your translation strategy and analyse the cultural and linguistic problems raised by the text in that context.

You may use one of the texts analysed in class or choose something different, though in that case you are advised to check with the teacher first to make sure that it is suitable.

Your work (including the original text) should be uploaded onto Moodle no later than **10th June**. Late deliveries will be penalized.

Marks will be allocated as follows:

A. INTRODUCTORY TEXT: 10 points

This text should provide a real-life context for the translation and discuss strategies and problems in the light of that context.

- **Context:** suggest a situation in which such a translation could be realistically commissioned (e.g. a specific journal or publisher) and analyse the target public (including its. background knowledge of the subject and expectations) and purpose of the translation in that context.
- **Strategy:** the strategy that you adopt should depend upon the context, purpose and target public you have defined.
- **Problems:** identify some specific problems raised by this text and discuss ways in which you might deal with them.

B. TRANSLATION: 20 points (subdivided as follows):

- **Transfer of content: 10 points**

This will be judged in accordance with your stated strategy (above). Errors that induce miscomprehension or which fail to transmit the meaning of the source text will be penalized heavily, as will any omissions or unnecessary additions (unless justified in your introduction).

- **Coherence and cohesion: 5 points**

The translation must be able to function as an autonomous text, with coherence of style and vocabulary, and cohesion between the various parts at all ranks.

- **Style and register: 5 points**

Register is particularly important in this task, as you will need to suit your style very precisely to the target public, aiming also to reproduce any particularities of the source text that are appropriate.

Alternative assignment: Case-study of inter-epistemic translation

Students may choose this alternative assignment instead of the individual translation with comment presented earlier.

This alternative assignment will involve a descriptive study of a work of popular science (including educational science, scientific journalism or science for children), which may be in verbal or multimodal form, as an inter-epistemic translation of specialist science. You should attempt to compare the popular science work with the science text or texts on which it is based, analysing the content (what information has been transferred, omitted or added), framing devices (e.g. paratexts, introductory sequences) and language used.

Your study, which should be around 3000 words long, and in English or Portuguese, should be uploaded onto Moodle no later than **10th June**. Late deliveries will be penalized.

Marks will be allocated for Content (quality of the analysis, textual organization) and Expression (coherence and cohesion, linguistic accuracy, style/register etc).

Instructions for Collaborative Translation

The attached text (“Grade retention in primary school and antisocial behaviour in adolescence”) is to be translated into Portuguese as a collaborative exercise using any means at your disposal. The aim is to achieve a quality suitable for publication in a Portuguese specialist journal.

The text has been divided up into four parts as follows:

Part 1. Introduction and Aims

Part 2. Method

Part 3. Results (1)

Part 4. Results (2) and Conclusion

The translation will be done in groups of 4-5 students working together, with each student responsible for a different section. The members of the group need to liaise with each other to ensure that the vocabulary and style are standardised across the article as a whole.

The complete translation should be uploaded onto Moodle by **22nd April**. You may if you wish appoint a coordinator for the whole project, though that person should not make any alterations without the consent of the students responsible for the section in question.

Each group will be awarded a mark out of 20, which will count towards the continuous assessment grade of each member of that group. It is thus up to you to make sure that everyone pulls their weight and that the translation is not just done by one person.

The marks will be allocated as follows:

TRANSFER OF CONTENT: 10 points

Errors that induce miscomprehension or which fail to transmit the meaning of the source text will be penalized heavily, as will any omissions or unnecessary additions.

COHERENCE AND COHESION: 5 points

The whole text must be coherent in terms of style and vocabulary, with cohesion between the various parts at all ranks.

STYLE AND REGISTER: 5 points

The final Portuguese text should read smoothly (as if the text had been written directly in that language) and the register should be appropriate for the target publication.

TEST

Translate ONE of the following abstracts. You may use any aids, tools or reference material you like but the translation must be entirely your own work (i.e. you may not consult third parties about translation options).

[Future editions of the test will include an option for translation from Portuguese into English, or this may even become the default mode. It will also require students to do the translation using an MT system of their choice, which they will edit and comment on].

Please upload your translation onto Moodle in a Word file with your own name in the filename at the end of the lesson.

1.

This paper examines a five-year initiative by the UK's public service broadcaster, the BBC, to reinvigorate civic engagement at a time of declining public participation in politics. The Action Network project, originally called iCan, ran from 2003 to 2008 and was one of the most high-profile and ambitious attempts by a public service broadcaster to foster e-Participation through online civic commons. This study analyzes Action Network within the context of conceptualizations of the Internet as a networked, distributed and participatory environment and the shift towards what scholars describe as a networked public sphere. It suggests that the project did not have the impact anticipated as it was borne out of a paternalistic broadcast legacy, out of step with the trend towards distributed and collaborative online discourse that reassesses the notion that the public is simply a resource to be managed. This paper argues that the BBC experience provides lessons in how the media, and specifically public service broadcasters, can contribute towards greater political participation and democratic dialogue through the Internet by adopting Web 2.0 approaches that enable citizens to engage on different levels and at different times, depending on contexts.

2.

This paper is concerned with the evolutionary process of the global governance of labour migration, which has led to the progressive privatisation and commodification of international labour mobility. The focus is on the effects of such change on working conditions for migrants. In particular, the analysis is concerned with legal conceptualisations of labour mobility and their repercussions on the normative process of migration governance. For people on the move, the journey almost always entails sacrifices and uncertainty. The possible costs range from the emotional cost of separation from families and friends to high monetary fees. The stakes can include the physical dangers of working in dangerous occupations, or even a risk of death, such as in the case of illegal border crossings. Nevertheless, millions of people are still attempting

movement, facing these costs or risks, in order to improve their living standards and those of their families. The implications for international human rights law are striking. Thus, attention is drawn to the human rights of all migrant workers, and more specifically to the protection and development of basic labour rights in the framework of international organisations. Ultimately, the main point of this study is to evaluate the extent to which the freedom to choose where to work and to do so in decent conditions is a current legal reality at both the national and international levels.

3.

The objective of the present study was to analyze the acute hormonal, immunological and enzymatic responses of professional basketball players to a basketball game. The sample was composed of eight basketball athletes, with a minimum of 4 years' experience in basketball. A real game was simulated with a total duration of 40 minutes, divided into two halves of 20 minutes each and an interval of 10 minutes between halves. Blood samples were collected before and immediately after the game (20 ml, vacuum tube system). The variables analyzed were: testosterone and cortisol hormones, total leukocytes, neutrophils, lymphocytes, monocytes and the enzymes creatine kinase (CK) and lactate dehydrogenase (LDH). Statistical analysis was with descriptive statistics and the Student's t test for paired samples to $p \leq 0.05$. The pre- (13.34 nmol/L and 301.97 nmol/L) and post-game (17.34 nmol/L and 395.91 nmol/L) levels of testosterone and cortisol were statistically different, with higher levels after the game for both hormones. The immune cell counts exhibited significant differences for total leukocytes (6393.75 nmol/L and 9158.75 nmol/L) and neutrophils (3532.5 nmol/L and 6392.62 nmol/L), with levels being higher after the game. No statistical differences were observed for the enzymatic variables. Therefore, based on the markers analyzed, testosterone and cortisol exhibited pronounced increases after the game, and the same behavior was observed for total leukocytes and neutrophils

4.

This examination of the mobilization-repression nexus in high-capacity authoritarian regimes draws on examples from China, Russia, Iran, and several Middle Eastern states to develop a framework for analyzing state violence and how political oppositions are organized. The study examines middle and low levels of state violence, the provincial and municipal organization of party and regime, and the police, private militias, and thugs as low-level enforcers, and focuses on: (1) the complexity of the state's apparatus of repression and control and how different levels exercise different forms of violence against activists; (2) the creativity of the opposition's actions to voice its demands and avoid repression and surveillance; and (3) the recursive relationship between the two, a dark dance between state and opposition with high stakes for both. Hierarchical analysis at national, provincial, and local levels, and lateral analysis across these levels, where elite interests frequently diverge, show that intersections and gaps on both axes can create lapses in social control and openings for the opposition. These free spaces of speech and innovative action give rise to novel ways to keep oppositional sentiments in the public forum. The article offers several propositions for analyzing repression and state violence at various levels, and describes the various ways that these free spaces occur.

EXAME DE MELHORIA

Answer **ALL THREE** of the following questions. You may use any aids, tools or reference material you like but the translation must be entirely your own work.

Please present your work in a single Word file with your own name in the filename and upload it onto Moodle by 11.55pm on the night of Friday 5th July.

1. Translate the following scientific abstract⁸² into Portuguese for publication in a Portuguese specialist journal.

The relation between children's lie-telling and their social and cognitive development was examined. Children (3–8 years) were told not to peek at a toy. Most children peeked and later lied about peeking. Children's subsequent verbal statements were not always consistent with their initial denial and leaked critical information revealing their deceit. Children's conceptual moral understanding of lies, executive functioning, and theory-of-mind understanding were also assessed. Children's initial false denials were related to their first-order belief understanding and their inhibitory control. Children's ability to maintain their lies was related to their second-order belief understanding. Children's lying was related to their moral evaluations. These findings suggest that social and cognitive factors may play an important role in children's lie-telling abilities.

2. Translate the following (abridged) article⁸³ into Portuguese for publication in the magazine *Superinteressante*.

⁸² Talwar, V. and Lee, K. 2008. 'Social and Cognitive Correlates of Children's Lying Behavior'. *Child Development* 79/4: 866-881. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8624.2008.01164.x/full>

Why We Lie: The Science Behind Our Deceptive Ways

In the fall of 1989 Princeton University welcomed into its freshman class a young man named Alexi Santana, whose life story the admissions committee had found extraordinarily compelling.

He had barely received any formal schooling. He had spent his adolescence almost entirely on his own, living outdoors in Utah, where he'd herded cattle, raised sheep, and read philosophy. Running in the Mojave Desert, he had trained himself to be a distance runner.

Santana quickly became something of a star on campus. Academically too he did well, earning A's in nearly every course. His reserved manner and unusual background suffused him with an enigmatic appeal. When a suite mate asked Santana how his bed always seemed to be perfectly made, he answered that he slept on the floor. It seemed perfectly logical that someone who had spent much of his life sleeping outdoors would have no fondness for a bed.

Except that Santana's story was a lie. About 18 months after he enrolled, a woman recognized him as somebody she'd known as Jay Huntsman at Palo Alto High School in California six years earlier. But even that wasn't his real name. Princeton officials eventually learned that he was actually James Hogue, a 31-year-old who had served a prison sentence in Utah for possession of stolen tools and bike parts. He was taken away from Princeton in handcuffs.

In the years since, Hogue has been arrested several times on theft charges. In November, when he was arrested for stealing in Aspen, Colorado, he tried to pass himself off as someone else.

The history of humankind is strewn with crafty and seasoned liars like Hogue. Many are criminals who spin lies and weave deceptions to gain unjust rewards—as the financier Bernie Madoff did for years, duping investors out of billions of dollars until his Ponzi scheme collapsed. Some are politicians who lie to come to power or cling to it, as Richard Nixon famously did when he denied any role in the Watergate scandal.

Sometimes people lie to inflate their image—a motivation that might best explain President Donald Trump's demonstrably false assertion that his Inauguration crowd was bigger than President Barack Obama's first one. People lie to cover up bad behavior, as American swimmer Ryan Lochte did during the 2016 Summer Olympics by claiming to have been robbed at gunpoint at a gas station when, in fact, he and his teammates, drunk after a party, had been confronted by armed security guards after damaging property. Even academic science—a

⁸³ Yudhijit Bhattacharjee, 'Why We Lie: The Science Behind Our Deceptive Ways' *National Geographic* (June 2017). Available at: <http://www.nationalgeographic.com/magazine/2017/06/lying-hoax-false-fibs-science/>

world largely inhabited by people devoted to the pursuit of truth—has been shown to contain a rogues’ gallery of deceivers, such as physicist Jan Hendrik Schön, whose purported breakthroughs in molecular semiconductor research proved to be fraudulent.

These liars earned notoriety because of how egregious, brazen, or damaging their falsehoods were. But their deceit doesn’t make them as much of an aberration as we might think. The lies that impostors, swindlers, and boasting politicians tell merely sit at the apex of a pyramid of untruths that have characterized human behavior for eons.

Lying, it turns out, is something that most of us are very adept at. We lie with ease, in ways big and small, to strangers, co-workers, friends, and loved ones. Our capacity for dishonesty is as fundamental to us as our need to trust others, which ironically makes us terrible at detecting lies. Being deceitful is woven into our very fabric, so much so that it would be truthful to say that to lie is human.

/.../

That human beings should universally possess a talent for deceiving one another shouldn’t surprise us. Researchers speculate that lying as a behavior arose not long after the emergence of language. The ability to manipulate others without using physical force likely conferred an advantage in the competition for resources and mates, akin to the evolution of deceptive strategies in the animal kingdom, such as camouflage. “Lying is so easy compared to other ways of gaining power,” notes Sissela Bok, an ethicist at Harvard University who’s one of the most prominent thinkers on the subject. “It’s much easier to lie in order to get somebody’s money or wealth than to hit them over the head or rob a bank.”

As lying has come to be recognized as a deeply ingrained human trait, social science researchers and neuroscientists have sought to illuminate the nature and roots of the behavior. How and when do we learn to lie? What are the psychological and neurobiological underpinnings of dishonesty? Where do most of us draw the line? Researchers are learning that we’re prone to believe some lies even when they’re unambiguously contradicted by clear evidence. These insights suggest that our proclivity for deceiving others, and our vulnerability to being deceived, are especially consequential in the age of social media. Our ability as a society to separate truth from lies is under unprecedented threat.

/.../ While parents often find their children’s lies troubling—for they signal the beginning of a loss of innocence—Kang Lee, a psychologist at the University of Toronto, sees the emergence of the behavior in toddlers as a reassuring sign that their cognitive growth is on track.

To study lying in children, Lee and his colleagues use a simple experiment. They ask kids to guess the identity of toys hidden from their view, based on an audio clue. For the first few toys, the clue is obvious—a bark for a dog, a meow for a cat—and the children answer easily. Then the sound played has nothing to do with the toy. “So you play Beethoven, but the toy’s a car,” Lee explains. The experimenter leaves the room on the pretext of taking a phone call—a lie for the sake of science—and asks the child not to peek at the toy. Returning, the experimenter asks the child for the answer, following up with the question: “Did you peek or not?”

Most children can't resist peeking, Lee and his researchers have found by monitoring hidden cameras. The percentage of the children who peek and then lie about it depends on their age. Among two-year-old transgressors, only 30 percent are untruthful. Among three-year-olds, 50 percent lie. And by eight, about 80 percent claim they didn't peek.

Kids also get better at lying as they get older. In guessing the toy that they secretly looked at, three- and four-year-olds typically blurt out the right answer, without realizing that this reveals their transgression and lying. At seven or eight, kids learn to mask their lying by deliberately giving a wrong answer or trying to make their answer seem like a reasoned guess.

Five- and six-year-old kids fall in between. In one study Lee used Barney the dinosaur as the toy. A five-year-old girl who denied having looked at the toy, which was hidden under a cloth, told Lee she wanted to feel it before guessing. "So she puts her hand underneath the cloth, closes her eyes, and says, 'Ah, I know it's Barney,'" Lee recounts. "I ask, 'Why?' She says, 'Because it feels purple.'"

What drives this increase in lying sophistication is the development of a child's ability to put himself or herself in someone else's shoes. Known as theory of mind, this is the facility we acquire for understanding the beliefs, intentions, and knowledge of others. Also fundamental to lying is the brain's executive function: the abilities required for planning, attention, and self-control. The two-year-olds who lied in Lee's experiments performed better on tests of theory of mind and executive function than those who didn't. Even at 16, kids who were proficient liars outperformed poor liars. On the other hand, kids on the autism spectrum—known to be delayed in developing a robust theory of mind—are not very good at lying.

/.../

3. Write a short commentary (500-700 words) reflecting upon the differences between the two texts and the particular problems that each one raises for the Portuguese translator.

Report on Test

This test was designed to test your ability to:

- Understand an academic text in a subject in which you were (probably) not an expert using your linguistic knowledge of the structure of English technical discourse combined with specialist knowledge gleaned from research on line
- Transfer that content into Portuguese as accurately as possible, producing a discourse appropriate to the expert community in that language
- Use online resources to research technical vocabulary and problems of a scientific/philosophical nature that might arise.

Marking policy

Serious alterations in meaning were penalized quite heavily, and are commented on in the margin of your text. Minor alterations are highlighted in yellow, as are options that might not be consensual. These were taken into consideration in the grade but not penalized heavily.

Style

As regards style, I rewarded students who had made an effort to reformulate their text in accordance with Portuguese norms (e.g. use of verbal fronting, reflexives, complex syntax, framing devices, gerunds, magisterial 'we'; avoidance of bald existentials etc). However, given the fact that that Portuguese academic discourse is changing to become more like English, I did not actively penalize people that had followed the English sentence structure *unless it resulted in a formulation that was obviously clumsy or misleading*.

Question 1. Online civic commons

This was the most difficult question, which was done by 3 people, with varying degrees of success.

The main problem was that the text is deliberately employing trendy 'buzzwords' which have not yet acquired consensual equivalents in Portuguese: e.g. *online civic commons, civic engagement, networked public sphere, collaborative online discourse* etc. Buzzwords are used in scientific disciplines to enhance the prestige and relevance of the research (particularly when the aim is to acquire funding), as they make it appear cutting-edge and engaged in the most up-to-date discourses. However, if there is not yet an equivalent in Portuguese, the translator has to choose between: a) translating the function, thereby losing the buzzword appeal; b) transferring the buzzword (i.e. leaving in English), but risking unintelligibility; c) creating a new

buzzword in Portuguese (though an author would have to have a certain authority to get away with this).

Buzzwords:

- 'online civic commons': 'commons' in English were originally pieces of open land for public use (*baldios*), before the land enclosures (privatization); nowadays the word is being used metaphorically to refer to internet spaces that are free and public (e.g. 'creative commons licenses'). Usually the term 'creative commons' is untranslated in Portuguese because it has become a legal term that refers specifically to legislation that does not exist in Portuguese. However, in this text, 'civic commons' does not have legal force. Most people opted for a functional equivalent: *promover a e-Participação de comunidades cívicas online/ criar espaços cívicos online*
- 'civic engagement': to my ears, the preferred term would be '*participação cívica*', but as 'participation' was used in the same sentence in another collocation, you had to find something else. I accepted '*empenho cívico*' and '*engajamento cívico*' (though the latter is more Brazilian), but not '*envolvimento civil*', which has a different meaning.
- 'distributed and collaborative online discourse': *discurso* is now being used in Portuguese with the sense it has in English (*discurso online colaborativo e distribuído*), though I also accepted *dialogo*
- 'networked public sphere': *esfera/ espaço pública(o) interligada(o) /interconectada(o)/ em rede*

Other vocabulary issues:

- 'five-year initiative': *quinquenal* is better than *de cinco anos*, or *com uma duração de cinco anos*, because it avoids the clumsy sequence of four prepositional phrases
- 'public service broadcaster': as this word was repeated in consecutive sentences, I rewarded attempts at repackaging, i.e. using a more formal term the first time (e.g. *organismo/serviço público de radiodifusão*) and then a shorter form (*emissora pública*) the second time.
- 'period of declining public participation in politics': *numa altura em que a participação do público na política estava em declínio; período de declínio /duma diminuição de taxas de participação pública na política* (if you nominalized and postmodified with *em declínio*, it altered the rhetorical force and created word order problems)
- 'borne out of' is a spelling mistake: it should have been 'born out of' (because 'borne', meaning 'supported', would require the preposition 'by'). Although it had not been my intention to trick you (I didn't notice it, actually), it happens frequently in real life that we are given source texts with mistakes. For this reason, I rewarded anyone that spotted it and made the adjustment.

Grammatical issues:

As regards the structure, this abstract used the kind of parallel aim statements/overview structure that we had analysed in class, therefore I hoped you

would repeat the parallelism in your translation (whether you used fronted reflexives, passives or impersonal actives). Most people successively did this.

- *examina-se uma iniciativa /.../ com o objetivo*: this changes the meaning of the sentence as it makes it sound as if the purpose linker belongs to the first verb, when in fact it belongs to 'initiative' (i.e. 'uma iniciativa para')
- 'conceptualizations of the Internet...': this is deliberately in the plural: in this kind of left-wing sociological discourse, many words that were grammatically singular are now pluralized in recognition of multiplicity and diversity)

Question 2. Labour migration

This was the most popular question, which 15 people chose to answer.

Terms:

- 'governance': I preferred '*governança*' (or even '*governança*o') above more general-purpose words like '*gestão*' (which has commercial overtones). 'Governance' is a fashionable buzzword in the social sciences, and has started to make its way into Portuguese, as you'll see in the following sites: <https://www.significados.com.br/governanca/>; <https://ciberduvidas.iscte-iul.pt/consultorio/perguntas/governanca-e-governacao/32687/> . If you put 'governança' and 'migração laboral' into Google, you'll see that you get lots of hits.
- 'migrants': this refers generally to people that are moving from one place to another all around the globe (i.e. '*migrantes*'). Changing it to '*imigrantes*' is a serious mistake, as it centralizes the debate on a particular geographic territory (Portugal?) into which foreigners are coming: this evokes the politically charged discourse on 'immigration', which is completely different from the academic study of 'migration'. Choosing '*emigrante*' is less serious, though it does exclude internal migrants (which is an issue in some parts of the world).
- 'people on the move': *peças em trânsito* / *populações deslocadas* (or just *migrantes*)
- 'living standards': this refers to material conditions ('*nível/condições de vida*'), and is therefore not the same as 'quality of life', which is usually used about non-materialistic aspects
- 'striking': in this context, you need a word that collocates with 'implications' and is not too emotive (e.g. *significativas*)
- Legal terms (e.g. *direitos básicos vs fundamentais*; *jurisprudência*): be very careful with these! They are very tightly defined and their inaccurate use can bring legal problems for a translator.

Grammatical issues:

- 'the focus is on the effects...': a literal translation creates grammatical problems (singular or plural verb?). We had some interesting reformulations: *Tem como principal foco os efeitos...* / *Focar-se-á nos efeitos...* / *Centrar-nos-emos nos efeitos...* / *O principal enfoque será nos efeitos...*
- 'the effects of such change on working conditions for migrants': this was misunderstood by some people. 'Such change' refers back to the privatization

and commodification of labour mobility mentioned in the previous sentence and the effects that they have(had) upon working conditions. However, sometimes attempts to make this explicit resulted in a narrowing of the temporal range, as in *os efeitos que tais mudanças produziram* or *os efeitos que essa transformação tem* (when the sense could equally be universal present, current present or present perfect).

Question 3. Biochemistry

This was the easiest translation and was well done by the six people that chose it.

The technical terminology was obviously an issue, although it was all available on line. The main problem was the grouping of information (and in the list of variables, you were not helped by the fact that the author failed to put an 'and' between lymphocytes and monocytes, which would have made things clearer):

- i) 'total' qualifies not only leukocytes but also (probably) neutrophils, lymphocytes and monocytes;
- ii) creatine kinase (CK) and lactate dehydrogenase (LDH) are both enzymes, which meant you needed to group them together, after the conjunction ('e').
- iii) the statistical analysis was done using BOTH descriptive statistics AND the Student's t test for paired samples to $p \leq 0.05$.

Question 4.

This text was not as difficult as it looked, at first sight. It was chosen by three people.

Terms:

- 'mobilization-repression nexus': this is packaged in the original as a technical term, but there's little on-line evidence that such a term exists beyond this author's use of it, hence the more explicit but less technical form that everyone chose was fine (*relação entre a mobilização e a repressão*)
- 'high-capacity authoritarian regimes': this does exist as a technical term in English (clearly a metaphorical usage of 'high-capacity' borrowed from technological domains), though it doesn't seem to have come into Portuguese yet. However, I don't see why you shouldn't calque something on the same basis (*regimes autoritários de/com elevada capacidade*)
- 'thugs': violent males that operate outside the law (*bandidos, rufias, arruaceiros*)
- 'recursive relationship': *relação recursiva* (technical term)
- 'oppositional sentiments': *de contestação/oposição*, but not '*da oposição*' (which would restrict it to the official opposition)

Grammar:

- 'Hierarchical analysis at national, provincial, and local levels, and lateral analysis across these levels, where elite interests frequently diverge, show...': this complex sentence would work better in Portuguese with verbal fronting (*É demonstrado, por meio de... , que...*)

Report on Individual Assignment

The individual assignment was effectively an exercise in **localization**, designed to see if you could adapt a text to a new target culture and public, and reflect upon the problems raised by this process. Thus, it was important to explain in the commentary **who the text was intended for** (ideally, a specific publication in which it could be published and a profile of the reader of that journal). If you failed to do that, I had nothing with which to gauge the appropriateness of your choices (and it was not enough to simply say the target reader was the same as in the ST – the very fact of belonging to another culture would mean that your reader inhabits a different symbolic universe to the ST reader and may thus have quite different expectations and background knowledge).

Obviously, if you had identified a particular magazine or website as your target, then it was not necessary to specify a readership beyond that identified by the publication. I did appreciate it, however, when people specifically reproduced the description of the target reader provided by the publication or analysed the contents of it in order to gauge the tastes and educational level of that public.

On the other hand, it did not make much sense to stipulate a particular publication and then describe a target reader that was different from that identified by it (one person named the magazine *Visão* as the publication, and then went on to specify the target readership as primarily young people). Nor did it make sense to translate a text that identifies a specific reader (such as the parents of adolescents, as occurred in one case) but then choose a media outlet that has a different readership - unless, of course, the text is adapted accordingly. Finally, there was one person who stated that the target public would be made of as made up of linguists, overlooking the fact that such specialists are not going to get their information about their subject from popular science articles.

Related to this is the question of style and register, which had to be suitable for the target publication. Decisions about formality and technicality, as well as forms of address, could have been made by analysing the style normally used in that magazine or paper.

Commentary

In addition to providing me with information about the projected context of publication, I had been hoping that your commentary would explore the issues raised by this transposition in some detail. It would have made sense to organize this part of your text into sections, each dealing with a different kind of problem/issue in broad terms, and giving some concrete examples of each from the translation you did. Some people did this very well but others failed to identify any valid issues at all; some spoke so generally and without examples that they could have been discussing a quite different text, while others offered a long list of very detailed points that had no internal coherence. The kinds of comments I was looking for might have had to do with:

- *Cultural issues*: these included not only tangible things such as measurements, currencies, place names, food and drink, etc, but also issues from the symbolic domain, such as references to celebrities, TV programmes or features from popular

culture. If you chose to invoke Portuguese cultural reality instead, you needed to check that your facts were correct and that the particular claim being made was actually relevant to Portugal.

- *Technical questions*: almost all the texts had some technical issues which you had to deal with (including, in some cases, complex nominalizations). Deciding on the precise level of technicality to use is always a problem with this kind of text and will depend primarily on how you construe your target reader, or upon the policy of the chosen publication.
- *Register issues*: a characteristic of popular science is that it draws on a mixture of discourses, typically borrowing elements from conversational journalism, and narrative or descriptive genres, as well as technical domains. Successfully distinguishing between these is one of the challenges of this kind of translation. There is often a tendency for inexperienced translators to neutralize such markers, focusing exclusively on the denotative meaning at the expense of the subtext; however, as in popular science the entertainment function is often very important, such strategies were penalized (unless there was a clear attempt to compensate in some other way)
- *Interpersonal issues*: many popular science texts aim to create a rapport with the reader using techniques such as direct interpellation, rhetorical questions, implicit identification, etc. Forms of address are notoriously complex in Portuguese and need to be problematized (amongst these assignments, there included the use of the 'tu' form, 3rd person singular and 3rd person plural, as well as reformulations using the 1st person plural – I need to know the reasons for your choice).
- *Strength of claims*: scientific texts of all kinds make systematic use of hedging devices in order to indicate the precise strength of the claims being made. It is very important to retain these, as removing them may lead to scientifically inaccurate claims (e.g. by stating that something 'is', when the original said it 'may be' or that is 'probably is', or by imposing cause-effect sequences when there was only a weaker correlation).
- *Deictic issues*: deictic information is material that refers to something in the real-life context in which the text was produced. It includes temporal references (e.g. 'in an article published today/ 2 hours ago'), place references ('in another part of the country'), references to other parts of the (longer) text from which the extract was taken ('in Chapter 1' / 'as we have already seen') and reflexive references to the language in which the original article is written ('the word "X" was used to...'). Naturally, all of these things lose their referents the moment that they are translated for publication in another place and time. I was looking for evidence that you were attentive to such matters and dealt with them intelligently.
- *Dealing with dialogue*: much popular science involves quoting at length from experts or witnesses. Portuguese has at present several competing systems for punctuating dialogue (i.e. the English and American systems, French guillemets, dashes rather than inverted commas, etc). You should have given me reasons for selecting the one you did, and briefly discuss the other options available. You should also aim to use it consistently and correctly (which was not always the case).
- *False friends*: i.e. cognates that do not have the same precise referents in English and Portuguese (e.g. America, evidence, drugs, eventually, education, college, clinic, science, suburban, etc). The problem nowadays is that some terms that were once

false friends with English are now gradually ceasing to be so, due to the influence of Anglophone culture on Portuguese. In these cases, I was hoping that you would have reflected upon the exact meaning used in the ST and the sense that you are activating in your translation, with reference to these sociocultural changes.

- *TL Polysemy*: in the scientific/philosophical domain, there are many cases of words that have split into separate meanings in English but retained both senses in a single word in Portuguese (e.g. economics/economy; experience/experiment; history/story; consciousness/conscience; expose/expound). These can cause ambiguity in the target text and so need to be problematized.

Things you shouldn't have included in your commentary:

- Reflections about the nature of popular science in general and/or recommendations from 'experts' about how it is to be translated
- The procedure you used to do the translation (reference works consulted, editing process etc)
- A summary of Skopos Theory
- References to theoretical works prescribing how translation should be done in general terms (organising the commentary in accordance with the techniques listed by theorists such as Vinay & Darbelnet or Peter Newmark produces a very distorted discussion)

The translation

The texts chosen varied tremendously in their degree of difficulty. I rewarded people who had decided to grapple with particularly challenging texts, provided they did so thoughtfully, on the grounds that risk-taking is a good strategy for a translation trainee (in the sense that we learn most from taking risks and making mistakes – playing safe does not enable progress in the same way).

It is important when translating popular science to be able to distinguish between the scientific facts, and the interpersonal or aesthetic features that have been added in order to make it more appealing. You must be rigorously accurate in your translation of factual information; this is non-negotiable, and failure to do so may result in court processes in the real world. The other part, however – the style, register, aesthetic or literary touches etc – will depend on how you construe your target reader and the function that you have attributed to your new text.

Other matters:

- *Numbers, measurements, currencies etc*: these have to be localized too, of course. Did you decide to simply convert or use both systems? round up or be precise? (you should have reflected about this in your commentary).
- *Proper names (organizations etc)*: the choice of whether to translate or not will depend on the target reader and/or the policy of the publication for which the translation is aimed (if you'd chosen a specific publication, you could simply make use of their default editorial style). However, as a general rule, I would translate if it's easy to do so, and provide a functional description alongside the name in English whenever it's not.
- *Register markers*: Most of these texts contained many markers of informality/orality, such as verb contractions, ellipsis (e.g. 'turns out that'), phrasal verbs (roped in/ figure

out/check out/mess with/ kick off/crop up /tag along/ramp up/pick up etc), abbreviations (taters/yep!/stats/critters/medschool/rehabbers/anti-vax/critters/omg), soft forms of swear words (freakin'/frickin') etc. However, there were also traces of other registers in some of the texts, such as childish words (poop/squish) or mock archaic forms (unbeknown/behoved/came a-knocking/"Worry not!"). All of these should have been discussed in the Introduction. I expected you to be able to identify the register used in the ST and then to make a reasoned decision about the kind of register to use in the translation (which may or may not have been in the same, depending on your chosen readership).

- *Direct questions*: in written Portuguese, it is usually not enough to simply put a question mark on the end of a declarative sentence to make it interrogative, particularly when sentences are long, because the reader may not realise it's a question for some lines. It's advisable to introduce some device to mark the fact that it's a question at the beginning of sentence (e.g. "Será que...?")
- *Technical terms*: most of the time you should not try to invent your own (for, unless you are a specialist in the field, you could be doing a very serious falsification). If you cannot find them in the dictionaries or databases, the best thing is to take an inspired guess on the basis of your knowledge of how the language works, and then seek that out on a search engine. In most cases it's possible to find the term on line somehow. If not, then you could present a literal translation of the ST term in inverted commas, in order to showing that it's a new coinage.
- *Linguistic inclusiveness*: one or two people that opted to address the reader using the polite 3rd person singular form found them faced with the gender dilemma – that is to say, should they follow the (till now) conventional practice of assuming a male reader or use one or other of the inclusive forms that have been developed to avoid sexism? Portuguese is only now starting to adopt policies of linguistic inclusiveness like English, so your decision should have been based on the policy of the chosen publication. Whatever your decision, I would have liked to see this question problematized and justified in your introduction.
- *Idiomatic expressions*: these are very common in popular science texts and serve as an indication of the type of reader targeted by the original text. These cannot usually be translated literally. Common strategies are to search for a cultural equivalent (though this must appeal to your own target reader) or to neutralise the idiomatic component and transfer the basic sense (in some cases, you can compensate for losses elsewhere in the text).
- *Quotations and allusions*: Quotations from popular culture, whether reproduced directly ("party like it's 1999", "a galaxy far far away", "four legs good, two legs bad") or manipulated to suit the author's communicative purposes (e.g. "Is it a bird? Is it a bat?" "multi-billion-dollar question", "far from the maddening crowd") should try to make use of the accepted TC equivalent, when that exists; if it doesn't, then you will have to reflect on whether to keep the quotation in the SL, gloss it, do your own translation or simply remove it as irrelevant. As for quotations from erudite culture, the usual procedure is to use an 'official' published translation and reference it in your text. If you choose not to do this, for some reason, you should justify this decision in your commentary (e.g. if the published translation was clearly aiming to do something

different to what you need the translation to do, and therefore doesn't have the required effect in the particular context).

- *Rhetorical effects*: popular science often makes use of various rhetorical effects in order to attract readers. These include: alliteration ("tater in tow", "battle for a bite", "curious cuttlefish", "cartoonish critters"); rhyme ("the brain explained"); personification (physical forces "jostling for position" and "arranging a truce"/ "teenage worms"); parallelism ("unfit for sale/fit for the furry patients"/"failed star vs successful star")
- *Unpacking of noun phrases*: e.g. 'human data access' ('access to human data' or 'access to data by humans?'); 'Moroccan pirate castle' ('castle for Moroccan pirates' or 'Moroccan castle for pirates?')

As well as translation issues, there were also some problems as regards expression in Portuguese. These included:

- *Interference from English*: e.g. reproduction of English word order, omission of the definite article, overuse of personal pronouns etc.
- *False friends*: 'eventually', 'evidência', 'concentrar-se', 'casual'
- *Punctuation*: misuse of comma and semi-colon, overuse of brackets (PT prefers the dash to brackets), failure to mark words being discussed with inverted commas
- *Verb tenses*: the English Present Perfect is usually translated by the Preterito Perfeito (Unspecified Past function) or the Present tense (for the Unfinished Past function), rather than the 'tenha feito' form

Correction strategy:

I highlighted serious translation errors in pink and language issues in blue, commenting in the margin on anything I thought important (good or bad). In most cases, things that are highlighted in yellow are mostly things that need to be reconsidered but are not sufficiently important to warrant a comment. They may include grammatical or spelling issues, or may simply indicate that I did not think that this was the best way to translate the word or phrase in question. Red asterisks indicate that something has been left out. This might be content, or it might be a grammatical item (like an article or preposition).

ANNEX II: TEACHING MATERIALS

[NB. This exercise will be replaced by the following one in the 2024 edition]

Scientific Translation: Questions for debate

1. Which of the following texts would be considered *textos científicos* (in Portuguese)? And 'scientific texts' (in English)?

- *Article in a scientific journal presenting the results of cutting-edge research in astronomy*
- *Book about stars for the general public*
- *Physics textbook for undergraduate students*
- *Book about astrology for the general public*
- *Article in an academic journal presenting the results of research in history*
- *Article in an academic journal presenting the results of research in sociology*
- *Article in an architecture magazine*
- *Article in a law journal*
- *Report about clinical trials*
- *Patient information leaflet about medication*
- *Clinical guidelines*
- *Website presenting information and advice about legal matters for the general public*
- *Website presenting information and advice about medical matters for the general public*

2. What is the difference (in English and in Portuguese) between a scientific text/*texto científico* and a technical text/*texto técnico*?

3. How would you classify the language used in the following texts (on a scale of technicality from 1 to 5 in which 5 represents very technical language and 1 everyday language?) How are these differences manifested grammatically, lexically and as regards text organization?

- *Article in a physics journal presenting cutting-edge research*
- *Book about stars for the general public*
- *Physics textbook for undergraduate students*
- *Report of clinical trials*
- *Patient information leaflet about medication*
- *Clinical guidelines*

4. In the current translation market, what do you think is the predominant direction of translation for the texts listed above (English to Portuguese or Portuguese to English)?

5. Portuguese scientific/academic discourse is changing through influence of English. Can you give some examples of some of the semantic and syntactical changes that have occurred in recent years?

[This exercise will replace the previous one from the 2024 edition of the course]

SciTech Translation: Questions for debate

1. The English term 'scientific' is a false friend with its Portuguese cognate *científico*. Can you explain why? What kinds of texts would be considered scientific texts/*textos científicos* in each language?
2. What is the difference between a *texto científico* and a *texto técnico* in Portuguese? And between a scientific and a technical text in English?
3. The following text-types are examples of hybrid discourses in the sense that they mix scientific discourse with a quite different discourse. What are the discourses in question?
 - websites advertising a private clinic
 - patient consent forms
 - patent claims
4. In the global translation market, what do you think is the predominant direction of translation (English to Portuguese or Portuguese to English?) for the following text-types:
 - scientific research articles
 - popular science articles and books
 - student textbooks
 - clinical guidelines for physicians
 - websites or publicity material advertising medical tourism
 - clinical trial documentation
 - patent claims
5. What do you think are the major challenges of translating SciTech texts? Which are more difficult: highly technical texts or popularizations?
6. What do you understand by English as a Lingua Franca (ELF)? How is it different from native-speaker varieties? Do you think you should be taught to translate into it?
7. How useful do you think CAT and MT tools will be for SciTech translation? Which kinds of text types
8. What do you think (inter-)epistemic translation might be?

Ex. 1. Register Comparison

I. Below you have four short text excerpts, organized into pairs. Where might you see each extract? What the text genre? Who is the target reader?

II. Now compare versions a) and b) in each case. How do they differ linguistically (e.g. grammatical structures, vocabulary, style, etc)?

1a) Acetylsalicylic acid may be used to provide temporary relief from minor arthritic pain and inflammation. Additionally, an aspirin regimen under medical supervision may be followed for cerebrovascular accident prevention. It may even forestall fatalities if ingested at the onset of a cardiac arrest.

b) You can take aspirin for your arthritis. It should help both the pain and the swelling for a while. You can also take it regularly to prevent strokes, though ask your doctor about this first. If you take it at the first sign of a heart attack, it could save your life.

2 a) The rapid internalization of CFTR seems to be mediated by clathrin-coated pits in both polarized and non-polarized cells. Accordingly, the expression of CFTR was detected in isolated clathrin-coated vesicles.

b) CFTR is internalized very quickly, apparently by means of pits coated in clathrin, which occur in both polarized and non-polarized cells. We detected CFTR expression in isolated clathrin-coated vesicles.

Ex. 2. The Grammar of Technical Discourse

Look at the following examples of technical discourse. What subject areas are they from?

- i) Underline the main verb in each sentence**
- ii) Circle the complex noun phrases**

1) The rapid internalization of CFTR seems to be mediated by clathrin-coated pits in both polarized and non-polarized cells. Accordingly, the expression of CFTR was detected in isolated clathrin-coated vesicles. Endocytosis of CFTR was inhibited by PKA-dependent and protein-kinase-C-dependent phosphorylation and caused the diminution of the internal CFTR pool.

2) A non-finite clause typically occurs without any other explicit marker of its dependent status. Hence when a non-finite clause occurs without a conjunction, there is no doubt about its hypotactic relation in a clause complex; but there may be no indication of its logical-semantic function.

3) Further studies will be conducted on multi-component systems of fatty acid and ethoxylated non-ionic surfactants with a du Noüy-ring tensiometer. Experiments using a bench-scale flotation cell will also be performed.

4) Temporally changing major and trace elements of magmatic rocks from this paleo-arc system chronicled gradual crustal thickening prior to and substantial crustal thickening contemporaneously with crustal shortening.

Ex. 3. Complex noun phrases

Traditionally in scientific discourse, most of the information is transported by *Noun Phrases (Nominalizations)*, with verbs merely linking those concepts together. Consider this example from Geology which consists of 2 complex noun phrases linked together by the simple verb 'chronicled'.

Temporally-changing major and trace elements of magmatic rocks from this paleo-arc system *chronicled* gradual crustal thickening prior to and substantial crustal thickening contemporaneously with crustal shortening.

In some subjects, there has been a tendency in recent years to cultivate a simpler, more clausal-based grammar. However, complex nominalizations are still extremely common. They are used for: i) the construction of technical terminology; ii) packaging of information over the course of a text in order to allow the argument to move forward in logical steps.

Study the following examples from different technical areas:

malignant kidney	neoplasm	
environmental life-cycle	assessment	
water-soluble fluorogenic	substrates	
wave energy	systems	
a five-year	degree	in chemical engineering
wireless sensor	networks	
energy	harvesting	for wireless sensor networks
earthquake-induced soil	liquefaction	
an energy-based	approach	to earthquake-induced soil liquefaction
new	drugs	in cancer treatment

1. The main noun around which the noun phrase is constructed is called the *head*. This appears in the central column of the chart. What kind of grammatical structures can come:

a) before the head?

b) after the head?

Why do you think complex noun phrases are potentially problematic for Portuguese speakers?

2. Identify the main head in the following noun phrases:

i. sustainable governance of marine ecosystems

ii. bacterial response to the marine environment

iii. the diving depth of sperm whales

iv. the behavioural responses of the Guiana dolphin to tourist activities in an estuarine beach

v. the introduction of heterocyclic rings in several points of the backbone structure

vi. the role of mathematical modelling and simulation in the treatment of cancer

vii. the impact of PCM drywalls on the annual heating and cooling energy savings of a lightweight air-conditioned steel-framed residential single-zone building

viii. the analysis of the relationship between two continuous quantitative variables using simple linear regression

3. Now translate the following into Portuguese:

i. environmental life-cycle assessment

ii. hydrosoluble fluorogenic substrates for plasmin

iii. an energy-based approach to earthquake-induced soil liquefaction

iv. energy harvesting for wireless sensor networks

v. sustainable governance of marine systems

vi. the rapid internalization of CFTRs

What problems did you encounter in this translation exercise?

Impersonal Verb Forms

1. Look at the following abstract about life-cycle assessment. Identify the main verbs and say whether each one is transitive or intransitive, and if transitive, whether it is active or passive. If it is intransitive, try to identify what kind of process it is using Halliday's model.

Life-cycle assessment (LCA) facilitates a systems view in environmental evaluation of products, materials, and processes. Life-cycle assessment attempts to quantify environmental burdens over the entire life cycle of a product from raw material extraction, manufacturing, and use to ultimate disposal. However, current methods for LCA suffer from problems of subjective boundary definition, inflexibility, high cost, data confidentiality, and aggregation.

This paper proposes alternative models to conduct quick, cost effective, and yet comprehensive life-cycle assessments. The core of the analytical model consists of the 498-sector economic input-output tables for the U.S. economy augmented with various sector-level environmental impact vectors. The environmental impacts covered include global warming, acidification, energy use, non-renewable ores consumption, eutrophication, conventional pollutant emissions and toxic releases to the environment. Alternative models are proposed for environmental assessment of individual products, processes, and life-cycle stages by selective disaggregation of aggregate input-output data or by creation of hypothetical new commodity sectors. To demonstrate the method, a case study comparing the life-cycle environmental performance of steel and plastic automobile fuel tank systems is presented.

Joshi, S. 2000. 'Product environmental life-cycle assessment using input-output techniques', *Journal of Industrial Ecology* 3: 2/3, 95-120-

Available on line at: <https://www.msu.edu/user/satish/JIE%20article-joshi-published.pdf> (accessed 1/3/15)

2. Now look at the following Portuguese text on the same subject. Do the same thing?

ANÁLISE DE CICLO DE VIDA (ACV)

Este documento pretende ser uma ferramenta educacional para todos aqueles que desejem aprender os conceitos básicos ou como conduzir uma Análise de Ciclo de Vida (ACV). Após uma breve história da ACV, será feita uma descrição geral, seguida duma abordagem e discussão dos principais componentes da ACV. Nos últimos capítulos abordam-se, de forma genérica, quatro dos métodos mais utilizados em estudos de análise de impacte do ciclo de vida (AICV) e faz-se uma breve referência ao software e bases de dados disponíveis no mercado para elaboração de estudos ACV.

Penso que as instituições académicas bem como todas as empresas públicas ou privadas podem beneficiar da aprendizagem de como incorporar a performance ambiental nos seus processos de tomada de decisão.

Rodrigues Ferreira, J.V. 2004. *Análise de ciclo de vida dos produtos*, Instituto Politécnico de Viseu. Available on line at: <http://www.estgv.ipv.pt/PaginasPessoais/jvf/Gest%C3%A3o%20Ambiental%20-%20An%C3%A1lise%20de%20Ciclo%20de%20Vida.pdf> . Accessed 1/3/15.

3. Now translate Text 1 into Portuguese.

Academic Abstracts: Reading and Analysis

A. This article surveys a range of musicological approaches to musical performance. It first addresses the place of Western art music within the world of performance at large; it then considers the retrospective means by which musicologists have investigated individual performances and the manifold issues related to them. The discussion turns thereafter to the practical application of research to performance. A case study of Chopin's <i>Nocturne in E-flat major Op. 9 No. 2</i> demonstrates how the gaps between research and practice might be bridged to enhance the moment of truth that each performance represents. Emphasis is placed on the need for both mediation and a contextualized understanding of whatever it is that historical, analytical and other modes of research might offer the performer.	C. Using a revised version of Bogardus' social distance scale, this research examines social distance toward other ethnic groups & races from the perspectives of Latinos, African Americans, & whites residing in an increasingly affluent suburban NC county. Analyses indicate that blacks & whites report closer social distance to each other than to any other racial or ethnic group. Blacks express greater social distance toward Mexicans than do whites. Mexicans report greater social distance toward African Americans than toward whites. Willingness to marry members of other racial & ethnic groups mirror these same patterns.
B. There are few models that describe learner behaviour during the simultaneous processing of several types of information, yet this is the defining characteristic of the use of multimedia tools, which bring together media in different informational formats (fixed or moving images, sound, text). Following studies in cognitive psychology concerning the increase in the ability to form mental images of words, this article aims at defining how different multimedia presentation modes affect the learning of foreign language vocabulary (Russian). 60 college students learned Russian phrases and then participated in a recall experiment where the multimedia presentation of the phrases was varied. An effect was observed on word memorisation in the different information presentation modes, suggesting better processing when there is co-referencing of the different sources, especially when the encoding and tests modes are the same. In addition to these experimental results, some principles for the design of multimodal learning tools are discussed. (PsycINFO Database Record (c) 2000 APA, all rights reserved)	D. Multihoming is increasingly being employed by large enterprises and data centers to extract good performance and reliability from their ISP connections. Multihomed end networks today can employ a variety of <i>route control</i> products to optimize their Internet access performance and reliability. However, little is known about the tangible benefits that such products can offer, the mechanisms they employ and their trade-offs. This paper makes two important contributions. First, we present a study of the potential improvements in Internet round-trip times (RTTs) and transfer speeds from employing multihoming route control. Our analysis shows that multihoming to three or more ISPs and cleverly scheduling traffic across the ISPs can improve Internet RTTs and throughputs by up to 25% and 20%, respectively. However, a careful selection of ISPs is important to realize the performance improvements. Second, focusing on large enterprises, we propose and evaluate a wide range of route control mechanisms and evaluate their design trade-offs. We implement the proposed schemes on a Linux-based Web proxy and perform a trace-based evaluation of their performance. We show that both passive and active measurement-based techniques are equally effective and could improve the Web response times of enterprise networks by up to 25% on average, compared to using a single ISP. We also outline several "best common practices" for the design of route control products.

Reading and Analysis

1. Skim the abstracts quickly and decide what disciplinary areas they are from. How did you arrive at this conclusion.
2. Identify the aim statements in each article. Where are they positioned? How are they worded?
3. What is the function of the Introduction in Abstracts B and D?
4. Which of the abstracts explicitly describe a Method?
5. Which of the abstracts explicitly present Results?
6. Analyse the structure of Abstracts A and B.
7. Do these abstracts use personal or impersonal structures?
8. What verb tenses are used in each of the abstracts? Why?

Sources: **A.** Rink, J., 'In Respect of Performance: The View from Musicology'. In *Psychology of Music*, 2003 31: 273-302. **B.** Dubois, M. & I. Vial, 'Multimedia design: the effects of relating multimodal information'. In *Journal of Computer Assisted Learning*, 16: 157-165. **C.** Randall, N.H. & S. Delbridge, 'Perceptions of Social Distance in an Ethnically Fluid Community'. In *Sociological Spectrum*, 25:1, 2005: 103-122. **D.** Akella, A., B. Maggs, S. Seshan & A. Shaikh. 'On the Performance Benefits of Multihoming Route Control'. In *IEEE/ACM Transactions On Networking*, Vol. 16, No. 1, February 2008.

Aim Statements

The following aim statements have been taken from Portuguese academic articles in different disciplines. Translate them into English:

- 1) Neste estudo, visa-se avaliar a adequação da Ressonância Magnética (RM) na determinação de indicadores da instabilidade femoro-patelar.
- 2) Estas páginas visam oferecer uma visão de conjunto sobre a sociedade portuguesa que se ia formando no início do século XVI, consequência de mais de século e meio de alargamento do território.
- 3) Os autores descrevem um caso clínico de um homem, 69 anos, caucasiano, com prótese vascular na bifurcação da aorta abdominal.
- 4) A presente comunicação tem por objetivo mostrar um caso pessoal, a partir do desenho, enquanto experiência vivida no âmbito da cultura portuguesa.
- 5) Como se aprendia arquitetura na época em que a profissão se estava ainda a definir, quando se começava a fazer coincidir a actividade de desenhar edifícios com o título de “arquiteto”, é a questão que justifica este texto.
- 6) Estudar a dimensão espacial inscrita nos fenómenos de natureza religiosa, tanto ao nível pessoal como social, eis a finalidade assumida deste trabalho.

Translate the following abstract into English. You might first like to think about the grammar of the title, which is a single complex nominalization. Where is the head noun? How many prepositional phrases are there? Which nouns do each of them belong to?

Influência do isolamento térmico de paredes de elevada espessura e massa no consumo energético e no conforto térmico de edifícios rurais reabilitados

Palavras-chaves: Reabilitação; Fachadas; Conforto; Consumo de Energia.

Resumo:

Os edifícios rurais constituem um legado de importância histórica, cultural, social e arquitetónico. No entanto, quer a regulamentação quer a prática construtiva tem tratado de forma desajustada este tipo de edifícios. Com o objetivo de avaliar se a regulamentação térmica e suas exigências são ajustadas, este artigo tem por objetivo caracterizar experimentalmente e numericamente o desempenho térmico e o conforto de edifícios rurais reabilitados utilizando como base uma construção típica do Norte de Portugal.

Neste artigo apresenta-se a validação experimental do modelo de simulação numérica avançada aplicada a edifícios rurais, bem como os resultados do desempenho térmico para cinco cidades de Portugal com o objectivo de avaliar a necessidade de isolar as paredes de pedra com elevada espessura e grande massa.

Com base neste estudo é possível afirmar que na impossibilidade de isolar pelo exterior o isolamento pelo interior aumenta o desconforto de Verão. Por outro lado, quando o aquecimento é intermitente o benefício energético resultante de um forte isolamento das paredes é muito reduzido.

MEDICAL VOCABULARY

A. Guess the meaning of these common Prefixes and Suffixes. What will they be in Portuguese?

Prefixes	Suffixes
pharmaco-	-genetic
uro-	-pathy
rhino-	-itis
nephro-	-ology
veno-	-otomy
cyto-	-osis
thrombo-	-graphy
naso-	-philia
dys-	-morph
crypto-	-oma
photo-	-scope
poly-	-derm
syn-	-plasty

B. Guess the meaning of the following words. What will they be in Portuguese?

Phototherapy	Venography
Pharmacogenetic	Thrombocytosis
Urochrome	Nasopharyngoscope
Rhinitis	Phonocardiography
Nephrosis	Intragastric

C. Translate the following into English:

Farmacodinâmica	Dermatófita
Uropatia	Clorofila
Rinologia	Fotobiótico
Nefrotomia	Metafase
Trombofilia	Poliquístico
Disfasia	Sinovioma
Citomorfolgia	Criptofalmia

D. Looking at the above lists, can you deduce the spelling changes that have to be made between Portuguese and English

Portuguese	English
<i>f</i>	<i>f</i> ; _____
_____	<i>y</i> ; <i>i</i>
<i>tr</i>	<i>tr</i> ; _____
<i>r</i>	<i>r</i> ; _____
<i>cr</i>	<i>cr</i> ; _____
_____	<i>ic</i> ; <i>ics</i>
<i>-ia</i>	- _____
<i>qu</i>	_____; _____

Vascular complications of supracondylar fractures of the humerus in children

Introduction: Vascular injuries in children are generally associated to fractures. In the arm, supracondylar fractures pose the greatest risk, given the anatomical proximity between the vasculo-nervous and bone structures. The reported incidence is between 10-20%.

Material and Methods: In the review undertaken between April 2002 and April 2009, a total of 15 cases of supracondylar fractures of the humerus, Gartland Type III, were treated in our institution with closed reduction and percutaneous fixation with Kirshner wires. Four children went on to develop vascular injuries of the arm related to the fractures, corresponding to a vascular injury rate of 26%.

Results: In three cases, there was arterial entrapment after closed reduction. Surgery consisted of the interposition of an inverted ipsilateral median vein. In the other case, the injury was directly related with the trauma. One patient presented with compartment syndrome. In this case, surgery consisted of arterial reconstruction associated with closed reduction and percutaneous fixation with Kirschner wires. To date, all patients have made complete functional recovery.

Conclusion: When a vascular injury is suspected in supracondylar fractures of the humerus with bone displacement, management requires an open approach to the focus with arterial exploration. Rapid intervention is essential to prevent sequelae. Neurovascular assessment pre- and postoperatively is essential to detect and fix vascular complications. It is important that the anaesthetic technique does not mask neurological symptoms, so nerve blocks should not be used.

Keywords:

Supracondylar fractures of the humerus, vascular injury

Register in Medical Translation

Discussion/Vocabulary

i. What are the technical names in English for the following conditions?

Heart attack Lung cancer Kidney stones Cold sore Flu Sore throat
Chest infection Tooth decay Stroke Yeast Infection (gynaecology)

ii. Translate both (technical and non-technical terms) into Portuguese. What conclusions can you draw?

Translation Exercises

1. How would you classify the level of technicality of this text (on a scale of 0-5)?

Acetylsalicylic acid may be used to provide temporary relief from minor arthritic pain and inflammation. Additionally, an aspirin regimen under medical supervision may be followed for cerebrovascular accident prevention. It may even forestall fatalities if ingested at the onset of a cardiac arrest.

Which of the following are characteristics of technical register (in English)? Is this the same in Portuguese?

impersonal forms use of personal pronouns nominalizations
clausal grammar Latinate vocabulary Anglo-Saxon/Germanic vocabulary

2. Translate the text into Portuguese maintaining the same register.

3. Now translate your PT text intralinguistically into a less technical register (for use on a health website for the general public OR for oral explanation).

4. Translate your non-technical PT text into English for use in a similar context.

Popular science as (inter-)epistemic translation

Look quickly at the following two texts. What is the relationship between them?

- A. Bhattacharjee, Yudhijit (2017) 'Why we lie: The science behind our deceptive ways'
National Geographic (June 2017).
<http://www.nationalgeographic.com/magazine/2017/06/lying-hoax-fibs-science/>.
Accessed 29/8/2023.
- B. Talwar, Victoria and Lee, Kang (2008) 'Social and cognitive correlates of children's lying behavior', *Child Development* 79/4: 866-881.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3483871/>

Now look at them more carefully.

1. In terms of content and text structure, what do they have in common? How are they different?
2. What devices have been used to rhetorically reframe the research for these different audiences (look particularly at the paratexts and introductory sequences)?
3. Compare the following passages from A and B in which the methodology used in the experiment is described. How is the language different?

TEXT A

[just above the picture labelled 'The Impersonator' in the online version]

To study lying in children, Lee and his colleagues use a simple experiment. They ask kids to guess the identity of toys hidden from their view, based on an audio clue. For the first few toys, the clue is obvious—a bark for a dog, a meow for a cat—and the children answer easily. Then the sound played has nothing to do with the toy. "So you play Beethoven, but the toy's a car," Lee explains. The experimenter leaves the room on the pretext of taking a phone call—a lie for the sake of science—and asks the child not to peek at the toy. Returning, the experimenter asks the child for the answer, following up with the question: "Did you peek or not?"

TEXT B

[p. 869, bottom of second column] 'In the current study, to assess their lying behavior, children between 3 and 8 years of age participated in a temptation resistance paradigm similar to that used in the previous studies' →

[p. 866, bottom of second column] 'The most frequently used method to study lying in children (e.g. Lewis et al. 1989; Polak & Harris, 1999; Talwar & Lee, 2002a; Talwar, Gordon & Lee, 2007) is the temptation resistance paradigm pioneered by Sears, Rau, and Alpert (1965). In this paradigm, children are typically told explicitly by a researcher not to peek at or play with a toy when left alone. Due to children's curiosity and difficulty to resist temptation (hence, the name of the paradigm), most children tend to disobey the researcher's instruction. Upon returning, the researcher asks children whether they have peeked at or played with the toy. (Talwar and Lee, 2008: 866)'

DISCUSSION

Do you think it might be possible to use the concepts and tools from Descriptive Translation Studies⁸⁴ to study popular science as 'inter-epistemic' translation of specialist science? How would it be different from studying conventional interlingual translations? Is this a legitimate extension of Translation Studies as a discipline?

⁸⁴ See, for example: Gideon Toury (2012). *Descriptive Translation Studies and Beyond*. Revised Edition. Amsterdam and Philadelphia: John Benjamins; José Lambert and Hendrik van Gorp (1985). 'On describing translations'. In T. Hermans (ed.) *The Manipulation of Literature: Studies in Literary Translation*, London and Sydney: Croom Helm, pp. 42-53.