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Balanced multilingualism in science

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1 Introduction: Making the role of language visible

English has increasingly, already for a long time, become the international language of science. Other languages that served as international before, are losing ground in international communication. A sign of this in Europe is that twenty years ago, *Acta Physica Hungarica*, *Anales de Física*, *Il Nuovo Cimento*, *Journal de Physique*, *Portugaliae Physica* and *Zeitschrift für Physik* merged into the **European Physical Journal**, which publishes in English only. English is now widely accepted and practiced as the international scientific language, even in the social sciences and humanities.

Nevertheless, science also needs to communicate with society. When at work, science is always needed, prioritized, funded, organized, performed, communicated, interpreted, applied and taught in certain societal and cultural contexts. Different languages are spoken and written in these contexts. For this reason, no hegemonic language in science has ever been practiced alone, and Global English cannot be expected to dominate alone (Gordin, 2015). To fulfil its responsibilities, science needs to be multilingual.

The role of language in the practice and communication of science can easily become *invisible* at the international level as countries come together to formulate and implement research policies. At this level, a shared international language is needed for formulation and implementation. Two examples: The **EU Framework Programme for Research and Innovation and the European Research Area** "aim at breaking down barriers to create a genuine single market for knowledge, research and innovation". **The European Research Council** "will enable the best ideas and talents to be recognised from a larger pool than exists at national level". Not only are the formulations in English. The implementations will have to be in English as well. We usually see no problem with this. A shared international language seems necessary to achieve the aims of exchanging knowledge in a single 'market' and of recognizing and supporting excellence across countries. Perhaps therefore, the topic of language is not mentioned in any of these policies or in the underlying official documents. The role of language is invisible.

Let us then confront these two well-known and highly prioritized aims and instruments in European research and innovation policy with three other aims and instruments that are on the rise as priorities on the European level as well. The idea of **Responsible Research and Innovation** (RRI), which is official European Policy within Horizon 2010, "implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society." RRI also means "enabling easier access to scientific results", which is similar to the ambition of the **Open Science Agenda**, as well as to the ambition of **Citizen Science**, which "can refer to the ability of the public to understand science and engage with scientists." As far as I understand, to fulfil its responsibilities according to these ambitions, science needs to be multilingual for the reasons I gave above. However, again, the topic of language is not mentioned in any of these policies or in the underlying official documents. Even here, the role of language is invisible.

Language is invisible also in the Work Programme 2018-2020 for *Science with and for Society* (European Commission, 2017). Not even the word

'language' is mentioned. In the connected database of RRI Tools, there are no documents or resources that can be retrieved with a search for 'language'. Language is only a filter for searches which immediately demonstrates that almost all documents and resources are in the English language. It is as if the use of language in research is invisible everywhere in the policies of how research should interact with and serve society.

Only by giving attention to the role of language in science communication, it is possible to see that the above-mentioned two groups of ambitions, policies and implementations are actually in conflict with each other. An important element in the realization of the EU framework programmes and the European Research Council is international competition among proposals and a selection process based on international peer review. It seems unavoidable that these processes will be influenced by mainstream research evaluation criteria and procedures that in practice select and incentivise publishing in English in the most influential journals covered by the commercial citation indexes. Equally unavoidable, the same evaluation criteria and procedures will give less value to the multilingual and multimedial communication practices needed to realize the other group of policies (RRI; Open Science; Citizen Science). This type of conflict between international research evaluation regimes and science at work in the interaction with local needs has been demonstrated in several studies recently, e.g. Piñeiro; Hicks (2015), Bianco *et al.* (2016), and Chavarro *et al.* (2017).

Although in practice in conflict with each other, both groups of EU policies and implementations build upon legitimate concerns in research policy about the quality and societal relevance of research. These concerns and policies are not meant to compete with each other. Nevertheless, they represent a typical tension in research policy everywhere. The two groups of ambitions and implementations in Europe are just an example of a tension that can be seen in many parts of the world, also within individual countries. In this article, I will present and illustrate what could be part of the solution to this general problem, which is how to align legitimate policies that in practice compete with each other at the moment.

I propose *balanced multilingualism* as a basis for governing the tensions between strategies for internationalization and excellence in research on the one hand and strategies for societal relevance and participation on the other. I will demonstrate that balanced multilingualism can be a dynamic and empirically based concept with which it will be possible to promote both types of strategies at the same time.

In the following, I will first illustrate and define the concept of balanced multilingualism. I will then present two examples of how the concept has already influenced policies for research funding and scholarly publishing. I conclude by summarizing the requirements for making use of the concept to align policies that now tend to contradict each other.

2 The concept of balanced multilingualism

Here, I will illustrate what *balanced multilingualism* in science might mean in a certain context and then go on to define the concept.

I recently contributed to an international symposium on *Research Evaluation: Issues, methods and tools* (<http://colloque.csefrs.ma/en/>) in Rabat, Morocco. It was hosted by the Moroccan Higher Council of Education, Training and Scientific Research and had three official languages: Arab, English, and French. Arab and French are international languages in research from the perspective of most of the contributors and attendants, who were from countries where these languages serve as first or second language: North and West Africa, Middle East, France, and Quebec in Canada. Some of us also needed English as a conference language. To this multilingual situation, which was facilitated by simultaneous translation, can be added that the first day of the conference was attended by Moroccan media as well as students and research managers from Moroccan institutions who were there to learn from the expertise. This bridging between the conference and society could not happen without the use of Arab language.

Several contributions to the symposium increased our understanding of the importance of Arab and French as international languages in this part of the world. In all African countries where French is a second language by tradition, it is still very useful in research collaboration and for the mobility of researchers between these countries and in the relation to France. In addition, the importance of Arab as an international language was convincingly demonstrated by the president of the Arab Council for the Social Sciences and other social scientists from Arab speaking countries. They have a shared agenda for responding to specific societal needs and challenges, and they publish in shared journals within the Arab speaking world.

My example demonstrates that at least three different *international* scientific languages are useful for Moroccan research. Many other parts of the world are served with additional international languages in research. Spanish is an example of one of those international languages. In some areas of research, and for some communication purposes, scholarly journals in published in Spanish with authors and readers across Spanish speaking countries may be even more important than journals publishing in English (Chavarro, 2017).

There was a general agreement at the symposium in Rabat that Moroccan science needs further internationalization. Two indicators for the measurement of the process were discussed. One of them is the number and proportion of Moroccan articles in 'indexed' journals (meaning: Web of Science or Scopus). The other is the number and proportion of articles in the same journals with affiliations in both Morocco and another country. These two indicators would, in practice, stimulate and measure a movement away from the present multilingual situation towards a monolingual situation with English as the scientific language. Moroccan research would then become more detached from societal needs and the existing collaborative networks. Unfortunately, there was little time to discuss these possibly unintended outcomes at the symposium. The suggested indicators were presented as inevitable because they are used 'internationally' by so many other countries.

With the concept of balanced multilingualism, I wish to dissolve the simple dichotomy between English on one side and any other language on the other and replace the present hierarchy of values and incentives with a more useful and realistic concept for understanding and promoting globalization of science and societally responsible research at the same time:

Balanced multilingualism is to consider all the communication purposes in all different areas of research, and all the languages needed to fulfil these purposes, in a holistic manner without exclusions or priorities. *Balanced multilingualism* is also to establish instruments for documenting and measuring the use of language for all the different purposes in research, thereby providing the basis for the monitoring of further globalization of research in a more responsible direction.

Balanced multilingualism is a *dynamic* concept. Returning to the example of Morocco, balanced multilingualism would be to take into consideration the present use of Arab, Berber,¹ English and French for different purposes, and to be able to document their usage in all contexts. Morocco already has a national bibliographic database in Casablanca with coverage of Moroccan literature far beyond the coverage of articles from Morocco in Web of Science and Scopus. This database could be further developed as an empirical basis for the monitoring and stimulation of a balanced multilingualism. Only using Web of Science or Scopus would stimulate the development in only one direction and make the rest of the scholarly literature invisible. Even if the policy or need of the country is to gradually increase the use of English and publish in international journals, the broader empirical basis for monitoring and stimulation is needed. Increased use of English would then be a question of reaching a *new balance* in which the other three languages could still be used in contexts where they serve the purpose more efficiently.

I will now use two examples from my own country to demonstrate how the concept of balanced multilingualism can be used to promote more responsible practices in research funding and scholarly publishing.

3 Ranking journals while keeping a balance

The scepticism towards rankings of scientific journals, particularly towards the use of Journal Impact Factor (and similar indicators), seems to increase just as much as the widespread use of the same type of rankings and indicators in funding and evaluation of research (Zhang *et al.*, 2017). Would it be possible to reach a more constructive compromise by taking the perspective of balanced multilingualism?

Journal rankings and indicators are mostly based on data from Scopus or Web of Science. Journals that are not included in these databases are often at the bottom of the evaluation hierarchy, e.g. in the Czech Republic (Good *et al.*, 2014) and Poland (Kulczycki; Rozkosz, 2017). There is also a widespread use of a hierarchy according to impact factors *within* Web of Science or Scopus, e.g. in the *sexenio* in Spain (Piñeiro; Hicks, 2015) or in the BOF key in Flanders, Belgium (Debackere; Glänzel, 2004).

These journal rankings and indicators are in practice working against what would be a balanced multilingualism in research. Part of the problem is the Anglo-American bias in the selection of journals (Archambault *et al.*, 2006), but a more balanced representation of language use in science will be difficult to achieve. The commercial citation databases are necessarily selective, not only for commercial reasons, but also with reference to information retrieval theory (Bradford's law of scattering, the idea of 'core journals') and the efficiency of citation indexing (Garfield, 1979). This kind of selectivity reinforces itself by choosing the international journals with the contents of the most world-wide interest. Furthermore, most of the scepticism towards journal rankings are based on other considerations than language use. As an example, the San Francisco Declaration on Research Assessment (DORA) (2012) is more concerned that individual articles are assessed by only looking at where they are published, and about the abuse of Journal Impact Factors in funding, appointment, and promotion considerations. Moreover, most scientists who are sceptical towards impact factors will still maintain that some journals are more important than others, thereby reflecting the general idea that science is international and needs to communicate across language barriers. On top of this come the official policies of internationalization, cf. the European examples discussed in the introduction. A balanced multilingualism does not have much chance here, it seems.

There is a compromise, however, that may support balanced multilingualism. It is the so-called 'Norwegian model', which I developed for the Norwegian government some years ago, only for institutional funding, not for research evaluation (Sivertsen, 2016a). It has also been adopted by the Danish and Finnish governments and locally by universities in Ireland and Sweden, and it has inspired the development of a specific bibliographic database for the humanities and social sciences in Flanders, Belgium.

Finland has adopted the model by including publications for students and general audiences (Giménez-Toledo *et al.*, 2016). In the other countries, it only includes scholarly and scientific journals and book publishers applying peer review. This limitation is contrary to the idea of a balanced multilingualism. Still, the Norwegian model has no hierarchy referring to language, database coverage or impact factors. Instead, there is a simple hierarchy with only two levels. There is a top level named 'level 2' and a normal level named 'level 1'. The application of these level represents the balance between incentives for internationalization and societal relevance.

Level 2, representing only up to 20 per cent of the total of publications in the field, may include only the most internationally prestigious publication channels in a field. These are the only *criteria*. In physics, the few journals on level 2 will all be in English, have high impact factors and be covered by Scopus or Web of Science. But these are *not* the criteria. Many of the journals on level 1 will also have high impact factors, publish in English and be covered by Scopus or Web of Science. In the field of Spanish philology, on the other hand, the journals on level 2 may be in the language of the field of study, and they need not have impact factors or be included in Scopus or Web of Science.

In this model, level 2 is a response to the idea that some journals are more important than others and that there is need for globalization of science. However, this incentive is limited by the 20 per cent criterium. On level 1, journals in any language can be included, and they are all valued the same. The effect is that there is no hierarchy for 80 per cent of the publications in a field. Journals in the native language are valued the same as 'international' journals. Level 1 will include any scholarly or scientific publication channel at any time if they meet certain quality criteria, irrespective of coverage in other certain databases. As an example, new Open Access journals are welcome if they fulfil the criteria.

The academic community is involved in decision-making on both levels by participating in disciplinary panels. There are web pages in English explaining how this is organized in **Denmark**, **Finland** (<http://www.julkaisufoorumi.fi/en/publication-forum>), and **Norway**. A multilingual balance was found as the effects of the model in Norway were evaluated extensively in 2014 (Aagaard *et al.*, 2015). Another study found the model more legitimate and inclusive than the traditional criteria based on citations and impact factors (Ahlgren *et al.*, 2012).

Be aware that the described compromise for a balanced ranking is not easy to achieve. Scientists who are against rankings, or who will not publish in more than one language, may be against it. The same may be the case for scientists who favour rankings based on impact factors.

4 Opening scholarly journals in the social sciences and humanities

The social sciences and humanities (SSH) are often considered a 'problem' in research evaluation and scholarly publishing due to their diversified publication patterns with languages and publication types with a more limited coverage in commercial databases (Nederhof, 2006; Sivertsen; van Leeuwen, 2014). This 'problem' can be completely turned around from the perspective of balanced multilingualism. The SSH can be regarded as an example to follow for the sciences rather than an example to depart from, as having good practices rather than practices that are becoming obsolete. Here, we will regard the SSH as an *exemplum virtutis*, a model of virtue worthy of imitation, in communication with society.

The SSH not only study culture and society, but also collaborate with, influence and improve culture and society in domains such as democratic development, policy design, public administration, international affairs, migration, integration, understanding of different languages and cultures, education at all levels, cultural life, media and information, and history as the 'memory of societies'. In doing so, the SSH seem to be more 'local' than the sciences. Nevertheless, many of the SSH disciplines have been international and multilingual in language use and communication for more than two thousand years. But they were always international within the societal and cultural contexts that they belonged to. Rather than being considered as 'local' as opposed to 'international', the communication practices of the SSH can be valued as an example of combining international excellence with local relevance in a multilingual approach to research communication. There is evidence that each individual researcher in the SSH is *normally at least bilingual* in scholarly publication practices (Sivertsen, 2016b). There is also evidence that the SSH more often than the sciences publish for students, professions, public debate and a wider audience in their native language (Kyvik, 2005).

In the three countries that have adopted it, the 'Norwegian model' described above is connected to a national bibliographic database with a complete coverage of all scholarly and scientific publications from institutions that are included in the funding scheme. Based on complete data, it is possible to demonstrate that around half of the scholarly articles in the SSH are in the native language, and that these publications are concentrated in relatively few national journals (Sivertsen; Larsen, 2012). We will now combine these facts with the agenda of Open Access.

As described above, the SSH are typically collaborating with, influencing and improving culture and society. To achieve this, their scholarly publishing is partly in the native languages. Thereby, they represent areas of research and research communication that are immediately

meaningful to make openly accessible for a wide readership in society. Given that a large share of the journal articles in the SSH from a country's institutions can be made available by opening relatively few journals, there is a potential for Open Access with wide effects immediately.

Four years ago, I wrote a report to the Research Council of Norway in which I described this potential and suggested a solution (Sivertsen, 2013). It was a study of 76 national SSH journals, their contents and authors, and their roles in communication. The report concluded with a proposal for a new business model: Only the central, most respected and most needed national SSH journals publishing in Norwegian are selected. There is no individual author payment because the types of publications and contributors in these journals are diverse. The contents are not only original research articles, but also debates, essays, and book reviews, and some contributors come from institutions outside of academia. Consequently, instead of individual author payment, the selected journals are funded partly by the government, partly by a consortium of research institutions that frequently publish in the journals. The selection of journals and the model itself is monitored by a national panel appointed by the deans of the humanities and social sciences.

This Open Access model for the SSH was launched by the Norwegian government in a white paper on the humanities in Norway (Norwegian Government, 2017) and is now being implemented. The implication is that the majority of SSH journal articles in the native language in a whole country is made publicly available by only one operation. This 'flip over' operation does not promote globalization in science, but it promotes the societal relevance of the SSH, which is just as important from the perspective of balanced multilingualism. There are other Open Access initiatives for the SSH on the international scene, e.g. new mega journals and scholarly book series, that will promote globalization and there play a different role in research communication than native language publishing can achieve.

Beware that this compromise is not easy to achieve either. On the one hand, there may be fear among scholars that research quality might be reduced by taking away the subscription model. On the other hand, active supporters of Open Access will often —paradoxically— take the same perspective as the main multinational commercial publishers and regard native language journals in the SSH as of little interest. The reason may be the tension between the two different aims of this movement, opening science for the public and at the same time challenge the regime of a few multinational commercial players.

Anyhow, the above described model for opening SSH journals in a society's spoken language might become useful wherever research organizations and their funders can find common interest in Open Access on a local, regional or national level. The efficiency of the model comes partly from the fact that it will mostly concern journals that are not yet bought up and owned by the commercial providers.

5 Conclusions: What to do

The perspective of balanced multilingualism may allow the policies for increasing quality, globalization and societal responsibility in research to come together with less contradictions in practice. Applying balanced multilingualism as a dynamic and empirically-based concept may allow for a monitored and stimulated progress for all policies. The requirements are that:

- All the communication purposes in all different areas of research, and all the languages needed to fulfil these purposes, are considered in a holistic manner without exclusions or priorities.
- Instruments are established for documenting and measuring the use of language for all the different purposes in research, thereby providing the basis for the monitoring of further globalization of research in a more responsible direction.
- The same instruments are used for documentation in relation to evaluation and funding criteria in research, thereby not only stimulating international publishing in prestigious journals, but also societally relevant and responsible research and innovation.

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Notes

¹ Berber is a widely spoken second native language that recently became official according to the Moroccan constitution, however still without the same status in practice as Arab has. Balanced multilingualism can also help to monitor and improve the practice and status of less privileged native languages
