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COMMUNICATING SCIENCE IN INTERNATIONAL ENGLISH:  
SCHOLARLY JOURNALS, PUBLICATION PRAXIS,  
LANGUAGE DOMAIN LOSS AND BENEFITS

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Abstract

The leading role of English as the international language of scientific communication has been extensively studied. Available data show that English exerts powerful effects in publication praxis since the use of a common idiom, or *Lingua Franca*, serves two main assets: to gain international visibility, funding and career advancement and to cater for the worldwide communication of ideas among subjects with different linguistic backgrounds. Aim of this paper is to discuss contemporary publication praxis following specific datasets: the growth of scholarly journals, the publication output in English compared to other national languages, how this situation affects communication in writing and in reading for scholarly research.

Key words: International English, academic reading, academic writing, *Lingua Franca*.

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Contents

Abstract 45

Contents 46

1. Introduction 46

2. Data on publication output 47

3. The predominance of English in scholarly publications 49

4. The effect on scholars' reading and writing behaviour 51

5. Domain loss: benefit and backwash 53

6. Conclusion 55

References 56

1. Introduction

State of the art in applied linguistics and in bibliometric studies reckons the strategic role played by English as the international means of scientific communication among speakers of different linguistic backgrounds. Today English is, in fact, extensively employed as a *Lingua Franca* in the globalised world of academia to spread findings either in writing (i.e. research articles or other written formats such as reports, case-report, letters to the editors and short communications), in the spoken form by means of scientific interaction with researchers (i.e. face-to-face and online conference presentations or seminars) or as the language of instruction in university settings where English is not the official language of the country, as in the case of talks or lectures from visiting professors in exchange study projects, as for example the Erasmus programmes in Europe (Cianflone, 2012a; Ferguson, 2007; Jenkins, 2007; Hyland, 2009).

The impact of English as a *Lingua Franca* in international research settings has several effects in academic and scientific publishing and can be analyzed following different strands: the publication output (i. e. the number of existing scholarly journals, the number of articles published and the yearly ratio journal/articles); the predominance of English over other national languages; the effects of the publication output on reading and writing practices; the benefit and the backwash of the English-driven situation.

## 2. Data on publication output

In publishing, the leading role of English in scientific domains has been extensively studied and the impact of this language in academic and in research settings is well documented. Analysts, in fact, have highlighted the steady increase in the number of scholarly journals and, consequently, in the number of research papers published every year.

Larsen and von Ins (2010) in their investigation of the publishing practices in the 1907-2007 period have shown the rise of publications not only in the print format but also through online media such as open access journals, open archives, institutional repositories and personal homepages. Available data on the growth and on the number of journals offer a rich set of figures and give some interesting cues that deserve consideration.

In 1960, for example, 60,000 journals were recorded, with no distinction between refereed and non-refereed journals. Peer-reviewing practices as they are intended today, in fact, were not the norm in the 1960s since this type of editorial assessment was introduced in 1966, and took some time to be considered a common editorial procedure by the scientific community (Larsen & von Ins, 2010). Journals' count raised along the years so that by 1996 about 165,000 periodicals of different types (that is un-refereed and refereed) were printed. 250,000 periodicals were said to be published in 2005, with an additional figure of 4,300 open access journals (van Dalen & Klamer, 2005; Larsen & von Ins, 2010; Mabe and Amin, 2001 & 2002; Ware & Mabe, 2009).

The bulk of research published in online-only journals and in self-archiving repositories is predicted to grow not only because it is encouraged by digitalization procedures but also because a different attitude on the researchers' part is evident (Swan & Brown, 2005). In recent surveys on the impact of open access journals (Björk, Welling et al., 2010) and on the role played by English (Ferguson, 2007; Ferguson et al., 2011), researchers showed that in some disciplines, e.g. the earth sciences, medicine, biochemistry, chemistry and physics, online publication is accepted and subscribed by many members of the above mentioned communities to gain visibility and for the easy access to research data it offers to the scholarly audience at large (Björk et al., 2010).

The growth in the number of journals published worldwide has resulted, as a consequence, in the intensification of scholarly output, mainly in the form of papers of different types, such as research articles, abstracts, letters, reports and reviews, just to quote the most common formats. 1,350,000 papers were printed or released online in 2006, while data related to 2009 report that 1,5 million samples in medical, scientific and technical disciplines were available to worldwide readership (Björk, Roos & Lauri, 2009; Ware & Mabe, 2009). The most updated survey on the amount of documents accessible to scholars from different disciplinary fields gives larger counts and states that 11 million scholarly products are now online (Newman, 2011). This count should not be considered too large as it includes different genres such as research articles, case-reports, conference abstracts, short communications, letters, reviews, and editorials.

This impressive amount of articles is predicted to grow in future years for three reasons: the increasing number of students looking for university education, the academization of disciplines and the contribution from Asia and from emerging countries to the scholarly debate. As concerns the first issue, the widened access to Higher Education is predicted to add up to the bulk of published research since the population of university students will generate written papers to fulfill the requirements for Master theses or for PhD dissertations (Hyland, 2009). As concerns the second issue, as shown by Hyland (2009), the increase of the publication output should be linked to the academicization of disciplines such as nursing and social work, each one requiring its own sets of texts to be inserted in the reading lists. Then, publications are predicted to rise because of the contribution given by scholars from India (Benfield & Howard, 2000; Ferguson, 2007;

Hyland, 2009; Salager-Meyer, 2008; Ware & Mabe, 2009). These academics often leave their home countries to be enrolled in leading UK and US universities to gain the “been to America” status once back home (Swales, 2004). To this, the involvement of researchers from the so called emerging countries, namely China, South Korea, Taiwan and Singapore, not to talk of Latin America, should be added. These scholars occupy a leading position in available publication rates (see Ferguson, 2007); they also seem to prefer publications co-authored with non-Asian scholars and published in international journals to spread results (Shelton, Foland & Gorelskyy, 2009).

### 3. The predominance of English in scholarly publications

Many surveys have demonstrated the increasing role of English as the language of scientific publication, and the predominance of this *Lingua Franca* over other national idioms. Ferguson (2007) reports that in 1995 only a relatively small number of papers were published in other national languages, with 87.2% of papers in biology, chemistry, medicine and physics written in English. In medicine and in related biomedical disciplinary fields statistical data corroborate this situation. In fact, the number of scholarly articles written in English in the medical branch, shifted from 72.2% in 1980 to 88.6% of published articles in 1996 (Benfield & Howard, 2000). Giannoni (2008) indicates how medical research published from 1986 to 2005 in French, German, Italian and Spanish dramatically sunk to a 3.8% of the total number of entries in *PubMed*. Two further examples concerning the state of the art in veterinary medicine in Italy and the state of the art in food science in Netherlands can be quoted. In the former field, data show that 95% of research from Italian veterinary academics is published in English (Cianflone, 2012b); in the latter field, food scientists from a Dutch institute dealing with nutrition and food related topics consider English and the publication of research in international journals an added value (Cianflone, 2012a).

The trend towards the Anglicization of publication praxis has soared in the following decade so that the role of English as a *Lingua Franca* is now attested well beyond the 96% threshold, with a total reliance on English in sectors related to the experimental

and to the health sciences (Ferguson, 2007; Fernandez Polo & Cal Carvela, 2009) and in those disciplines of the so called hard science group (Cianflone, 2012a). Hyland corroborates this Anglo-centric perspective and states that among the journals published in 2007, and listed in the *Science Citation Index*, 68% had adopted English, with the total amount of articles in this language being around 90% of the total volume (Hyland, 2009). In the latest available survey Larsen & von Ins (2010) provide larger figures. These authors, in fact, indicate that at present 96.5% of all published papers are in English. These data are confirmed, among others, by the editorial choice of many non-native English speaking contributors whose work is published in *Lingua Franca* English. An example can be considered the case of researchers from Central and Eastern Europe. These seem to subscribe to this Anglicized perspective even when they deal with local research topics (Bartol, 2010).

This role of English has an impact on the editorial practices of many journals, too. As a necessity, in fact, many European and non-European journals to keep pace with this “English-driven” trend and to gain international reputation and world-wide readership within the increasingly globalized audience, have adopted the editorial strategy of selecting English as the official language of publication (Swales, 2004). Some journals have also translated the title in English. An often quoted example is the German *Angewandte Chemie*, re-titled *Applied Chemistry* (Ferguson, 2007). This editorial choice can also be detected elsewhere in Europe, as shown by two journals. In the first case, the *Italian Journal of Food Science* employs English as the official language of publication and in its title, although it is published in Italy (Cianflone, Di Bella & Dugo, 2011). In the case of the *Journal of Central European Agriculture*, one cannot talk of editorial policy but of contributors’ preference to publish in English research on agricultural topics related to central and eastern European regions to gain global readership (Bartol, 2010).

Although English is the medium of publication, in several disciplinary fields it exerts a lessened impact. In some specialties like the Arts, the Humanities, Law, national idioms are still a common means of publication because in these sectors research mainly deals with topics culturally rooted in local traditions (Ferguson, 2007; Fernandez Polo & Cal Carvela, 2009; Larsen & von Ins, 2010).

#### 4. The effect on scholars' reading and writing behaviour

The growth of available articles exposes researchers to overload access in the sense that scholars have a consistent set of data to manage and to rely on. This surplus has originated a shift in products' access, in the reading for research purposes and in the ways research articles are written.

The number of online research products scholars access is today estimated in the range of 1.5/1.8 billion downloads per year (Ware & Mabe, 2009; Mabe 2010). The first profound effect of the use of computerized and digitalized retrieval systems is a change in the ways researchers locate the documents they deem necessary for their work. Today literature is mainly found by direct search within journals' homepages, by direct navigation within specialized search platforms or by means of the alerting services offered by online journals (Ware & Mabe, 2009).

Reading has changed in many different ways, too. To start with, the consequence of the rise in publication outputs has gradually pushed up the number of scholarly articles read per year (Renear & Palmer, 2009). In 1977, the mean number of articles read by academics was estimated in ca. 150 articles, with a shift to 271 readings in the 2004-2006 period (King, Tenopir, & Clark, 2006; Ware & Mabe, 2009). A feature that seems unchanged regards the number of articles read per discipline. Medical researchers are said to view the highest number of articles, whereas researchers in the Humanities seem to show the lowest access. This different estimate has been linked to disciplinary practices. In biological and medical fields, in fact, discoveries are consistent and are mainly published in journals, while in the Humanities research is discussed in more traditional venues such as monographs or book-chapters (Ware & Mabe, 2009), although this trend was recently tackled by journals (Mabe, 2010).

Article output has also changed the amount of time devoted to reading. It was calculated that in the 1990s scholars spent 50 minutes; now the time devoted to reading has dramatically sunk to 30 minutes (King & al., 2006; Renear & Palmer, 2009). This decline is the result of horizontal reading strategies that help researchers to manage the

bulk of available online literature and to examine it as quickly as possible (Renear & Palmer, 2009). Today few scientists, if at all, read all the papers published on a given topic (Bornmann, 2011). When building their own reference list, they shift to indexes, reviews or, better, to those online navigation resources where key-search items are filed under specific headings such as topic, author, year of publication, keywords or title (Renear et al., 2009). Then, they browse the selected documents and summarize and extrapolate relevant information, thus collecting fragments or data chunks (Cianflone, 2012a). Such chunks condense important facts, that is hypotheses, methods, results, conclusions (de Ribaupiere & Falquet, 2011), that will, at last, congregate in the new written piece that adds up to the corpus of extant literature and that interconnects new ideas to the already existing stream of knowledge (Hyland, 2010).

As regards writing practices, the need to publish findings as quickly as possible to gain visibility and recognition, usually measured in citations by the other members of the disciplinary community they belong to, results in editorial bias of two different types: the “atomization” of results and the use of a catchy register (Bornmann, 2011; Fanelli, 2012).

In the first case, the editorial bias regards the way results are spread. To raise their own output, researchers rather than discussing findings in one single paper, scatter results by slicing them like salami and by “atomizing” data in several articles published in different journals (Bornmann, 2011; Cianflone, 2012a; Fanelli, 2012; van Dalen & Klamer, 2005).

In the second case, analysts have evidenced a change of the written register. Writing, in fact, seems increasingly characterized by a catchy style far from the detached prose that is the foundation of scientific discourse and by a high proportion of positive data and of “catching” adjectives. This trend is exemplified by the loss of negative sentences, by the increase of value-laden adjectives, by the presence of attractive phrases and by the discussion of positive results over non-positive ones (Bornmann, 2010; Cianflone, 2012a; van Dalen & Klamer, 2005; Pautasso, 2010). This behaviour is evident in all disciplines and is considered a means not only to attract busy readers’ attention, but also to secure research funds by rising the number of citations in high impact journals (Bornmann, 2010; van Dalen & Klamer, 2005). Four recently published surveys



confirm this trend. The first study (Fanelli, 2012), based on a randomized sample of research articles in different disciplines along the 1990-2007 period, reported the prevalence of positive findings over non-positive ones in 85.9% of the examined items. The second investigation (Pautasso, 2010) surveyed the presence of “no significant difference/s” and of “no statistically significant difference/s” in the titles and in the abstracts of natural, medical and social science papers. Findings stressed the decreasing presence of these chunks in scholarly abstracts over a forty-year period and were interpreted as a stylistic shift towards the selective discussion of positive data. The third survey (Fraser & Martin, 2009) highlighted the consistent occurrence of value-laden adjectives, such as “crucial”, “unique”, “important”, in research papers published in biomedical journals from 1985 to 2005, thus resulting in a written mode where a more sensationalistic style is explained in terms of the pressures many researchers feel when shaping their research papers. This writing style was also detected in the fourth survey based on research papers in economics, where the increased use of the adjective “new”, in strings such as “new paradigm”, “new perspective” and “new theory”, was noted for the 1969-2003 period (van Dalen & Klamer, 2005).

These four studies confirm a shift from the standard of scientific objectivity. They also attest the increasing incidence of a strategy designed to meet the compelling necessity of grabbing readers’ attention because authors encounter growing publication pressures epitomized by the “publish or perish” saying. The effect does not lead to the distortion of data, although it facilitates the insertion of subjective values when reporting findings in a written piece that should be characterized by a detached style.

##### 5. Domain loss: benefit and backwash

The last aspect related to the “English-driven” trend sketched in the preceding paragraphs deals with the domain loss of the other national languages before English. As discussed in the preceding paragraphs, this situation is evident in several disciplinary fields of the hard sciences, and has been interpreted in terms of linguistic impoverishment. Bibliometric

data seem to corroborate this perspective. Even though the overall amount of scholarly research papers has more than doubled, a distinctive trait is the preference given to publication in English rather than in the other national languages.

Some applied linguists (see Ferguson, 2007, for a review of literature) have complained that this situation would lead to linguistic atrophy and to the lexical impoverishment of national languages. Scientists of the younger generations, in fact, are predicted to lose the basic skill of discussing and of writing research findings in their native languages, an estimate corroborated by the lack of non-English university textbooks in many domains such as physics, chemistry and in many medical sub-fields of specialization, as can be the case of veterinary medicine (Cianflone, 2012a).

A part from the depauperization of the national languages, it should be noted that the supremacy of English as a *Lingua Franca* offers benefits in terms of visibility and of the exchange of ideas on a global level. Results not published in English can be undervalued (Salager-Meyer, 2008) because any work written in languages other than English is not easily accessed by scholars who do not speak the language in which the research was published. The idea of translating relevant papers or of offering language editing services free of charge (Benfield & Feak, 2006), or paid by the universities researchers work with (Ferguson et al., 2011) is not feasible because of the economic costs that far outrun the benefits. In reply to those who fear for language loss, it should be stressed that in spite of everything, national idioms will be used to discuss topics dealing with regional key-points of interest published in local journals. An example that corroborates this hypothesis is evident from the data concerning the output and the publication procedures of African researchers (Tijssen, 2007). This survey showed that local journals were selected as a publication venue when papers had a focus on domestic research lines, whereas topics considered of worldwide interest were reported in international journals.

To define the predominant role of English when communicate Science, many linguists have described English either as a *Lingua Franca* or as a *Lingua Frankensteinina*. The former tag implies a positive attitude towards the role English plays in international research settings in terms of scholarly and scientific progress (Jenkins, 2007; McKay, 2002); the latter, or *lingua frankensteinina* (Phillipson, 2008), is used when this

Anglicized situation is linked to imperialistic concerns of power and of cultural dominion. The former opinion ensures positive effects. At present, the benefits offered by English as a *Lingua Franca* seem to prevail. Easy accessibility of texts by means of a common language, in fact, gives visibility and can benefit the single researcher or his/her research group and the academic institution where the research was carried out. Worldwide visibility, in turn, brings approval from the members of the community (Hyland, 2009) and universal recognition. It also leads to academic promotion, in terms of research funds and to professional advancement within one's own department or faculty (Bornmann, 2011; Swales, 2004).

## 6. Conclusion

The aim of this paper was to discuss the state of the art in current scientific publication praxis and to summarize available bibliometric data on the different assets that characterize contemporary scientific communication. Results show that the number of scholarly research published in journals has steadily increased; that scientists consider English, used as a *Lingua Franca*, a convenient means to reach a wider audience and that findings are increasingly discussed by means of a more journalistic style connected to the race for priority and to the struggle for funding and for career advancement (Fanelli, 2012; Swales, 2004). Since English in academia will continue to be the dominant language of scientific communication (Ferguson, 2011), language practitioners' main goal should be to educate future experts cope with what non-native English speakers consider the English language burden (Benfield & Feak, 2006). This educational objective, already met by initiatives pivoted on the development of academic literacy and on research in the ESP/EAP field, has identified communicative practices based on the academic genres commonly employed by experts. Policy makers in university settings should consider *Lingua Franca* a priority and should fund the development of pedagogic materials based on cultural needs, that is on the requests originating from local contexts, in line with the use of scientific English in international contexts.

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