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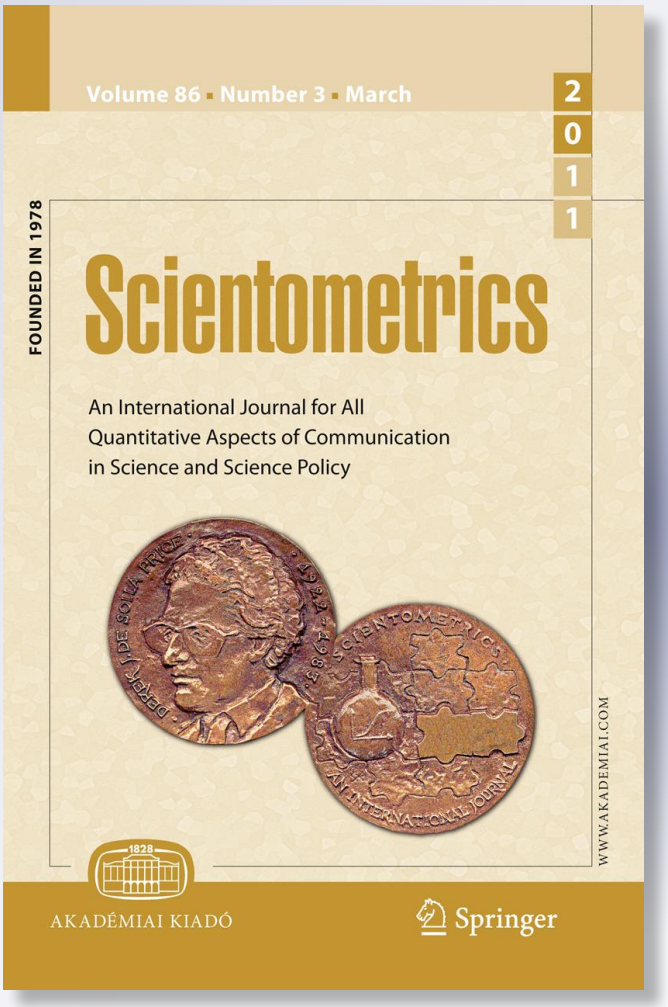


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# Scholarly gratitude in five geographical contexts: a diachronic and cross-generic approach of the acknowledgment paratext in medical discourse (1950–2010)

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**Abstract** This study analyzed the use of acknowledgements in medical articles published in five countries (Venezuela, Spain, France, UK and USA) from 1950 to 2010. For each country, we selected 54 papers (18 research papers, 18 reviews and 18 case reports), evenly distributed over six decades, from two medical journals with the highest impact factors. Only papers written by native speakers in the national language were included. The evolution of the frequency and length of acknowledgments was analyzed. Of 270 articles studied, 127 (47%) had acknowledgments. The presence of acknowledgments was associated with country ($p = 0.001$), this section being more common and longer in US and UK journals. Acknowledgments were most common in research papers (70 vs. 40% in case reports and 31% in reviews, $p < 0.001$). Reviews without acknowledgments were significantly more common than those with (69 vs. 31%), but there was no trend in case reports. Altogether, articles with acknowledgments predominated only after 2000. Since the frequency of use of acknowledgments remained stable over time in US and UK journals but increased in non-Anglophone journals, the overall increase is attributed to the change in non-English publications. Authors acknowledged sub-authorship more in English language journals than in those published in the national language in France, Spain and Venezuela. However, the practice of acknowledging is increasing in non-Anglophone journals. We conclude that the concept of intellectual indebtedness does not only differ from one geographical context to another, but also over time and from one academic genre to another.

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## Introduction: some historical background

Like apologising, condoling, greeting or congratulating, acknowledgments are illocutionary acts that occur in response to social expectations. Acknowledging in research publications, for example, refers to influential contributions to the reported scientific work. Moreover, by giving credit to contributors in the cooperative and, in turn, competitive world of scholarly researching and publishing, acknowledgments are, like citation practices and authorship, a form of academic recognition that repays intellectual debt. But, whereas citations are formal expressions of debt, acknowledgments are more personal, singular and private expressions of appreciation and contribution. As Giannoni (2002) argues, by interacting with a book or an article, acknowledgments transform written discourse from monologue to conversation, retrace the development of the book/article, and underscore the fact that scientific knowledge is not simply out there to be 'discovered' but is created by a community of scholars. In that sense, we can assert that the acknowledgment textual space is the only part of a book or of a scientific paper where research can be qualified as dialogic and contingent.

Apparently, published acknowledgments found their origin in the thanks expressed to patrons and powerful benefactors in the covering letters accompanying scientific articles (Atkinson 1999). According to Giannoni (2006a), book acknowledgments constitute the earliest form of written acknowledgments within the research genre system, originating from the "front matter" printed in seventieth century monographs which ranged from prefatory epistles and advertisements to forewords and dedications to patrons and friends. For example, in his study of the *Physical Review* from 1893 to 1980, Bazerman (1988) found a few personal testimonials to friends and mentors occasionally interspersed in the text. These soon disappeared, only to resurface during the 1920s in a form more concerned with institutional loyalty than intellectual debt. Acknowledgments then developed rather erratically, emerged in the 1940s and became a standard practice in the 1960s (Hyland 2004; Bazerman 1988; Giannoni 2002).

Acknowledgments are now an important feature of the scholarly communication process and appear in over half of all published research articles (Cronin et al. 1992) and virtually in all those in the sciences, at least—and it is important to underscore this from the outset—in the Anglo-American academic world. Results of survey data underline their importance: Cronin and Overfelt (1994), for instance, report that over 50% of their surveyed 280 academics generally read acknowledgments when scanning a paper, often to make a preliminary assessment of the paper, and 90% are aware of having been acknowledged themselves, a few even keeping a formal record for institutional evaluation. What is more, the proportion of acknowledgment-bearing journal articles in philosophy, psychology and chemistry is now at 83% in *Mind* and 96% in the *Journal of the American Chemical Society* (Cronin et al. 2003, 2004). This is why Cronin and Overfelt (1994, p. 183) argue that acknowledgments are "not trivial, meta-textual flourishes; rather, they are formal records of often significant intellectual influence" which point to strong networks of association among researchers.

In his *Research Genres*, Swales (2004) laments the fact that space constraints prevented him from presenting the results of investigation that deals with part-genres such as

abstracts and acknowledgments, implying thereby that these two part-genres are important sections of the *research article* and that they deserve researchers' (e.g., applied linguists') attention. Although Hyland (2003) qualifies acknowledgments as a Cinderella genre, he reckons at the same time that acknowledgments have a considerable socio-pragmatic relevance that makes them integral to the research record. He further holds the opinion that acknowledgments are much more than a simple catalogue of indebtedness in the sense that they define collaboration and interdependence among scholars.

Let us analyze in more details what acknowledgments represent for applied linguists and information scientists, the two discourse communities that have conducted studies on acknowledgments.

## Acknowledgments: plain 'thank-you' cards?

As Salager-Meyer et al. (2009) explain, for applied linguists and genre analysts, acknowledgments are seen as a neglected "part genre" (Swales 2004, p. 31) which forms part of "the paraphernalia of today's research articles" (Hyland 2003, p. 253). According to Hyland (2003), acknowledgments are, as we said before, a "Cinderella genre"[1] in the sense that they are a taken-for-granted part of the background, "a practice of unrecognised and disregarded value" (Hyland 2003, p. 242) "whose importance to research students has been overlooked in the literature" (Hyland 2004, p. 306). This opinion is shared by Giannoni (2002, p. 9) who refers to acknowledgments as a "minor and largely overlooked academic genre", and by Cronin et al. (1993, p. 38) who consider them as a long neglected textual artifact that belongs to the "academic auditors' armamentarium". For his part, Genette (1997) classifies acknowledgments as "paratexts" alongside titles, headings, prefaces, illustrations and dedications.

Among the linguistico-rhetorical studies that have addressed the issue of acknowledgment in academic writing, we can cite, on the one hand, the research conducted on the use and structure of acknowledgments in PhD and MA theses (Gesuato 2003, 2004; Hyland 2003, 2004; Hyland and Tse 2004), and, on the other, the cross-linguistic research on acknowledgment behavior in Italian- and English-written research articles (Giannoni 1998, 2002) and in digital and print editions of academic monographs written in English (Giannoni 2005, 2006a, b). Giannoni (2006a) also analysed the presence of rhetorical elements such as irony, hyperbole and emotivity in English-medium acknowledgments.

For information and social scientists, acknowledgments are rather "exchange of gifts" (McCain 1991, p. 495), "expressions of solidarity" characteristic of schools organised as mentor systems (Ben-Ari 1987, p. 137), "supercitations" (Edge 1979, p. 118), "trusted assessorship in action" (Mullins 1973, p. 32) that reflect, on the one hand, sub-author collaboration (Patel 1973, p. 81) and, on the other, cognitive partnership or distributed cognition in action (i.e., the explosion of teamwork in general and large scale collaboration in particular), thus highlighting trends in collaboration beyond co-authorship.

The social significance of acknowledgment practices has been analyzed in a variety of disciplines, e.g., in biology, psychology, political science and chemistry (Heffner 1979); in genetics (McCain 1991); in information science, psychology, history, philosophy and sociology (Cronin 1995); in biology and economics (Laband and Tollison 2000); in computer science (Giles and Councill 2004), and in mainstream/academic medicine versus

[1] Hyland (2004) provides powerful reasons for considering the acknowledgment section in PhD and MA theses as a genre in its own right.

complementary/alternative medicine (Salager-Meyer et al. 2006). These studies have revealed disciplinary variations in the frequency of acknowledgments, suggesting a continuum across the soft-hard spectrum with virtually all articles in the hard sciences bearing an acknowledgment section. These patterns mirror recognized disciplinary working practices and the way knowledge is constructed in different fields. Philosophers, for instance, do not tend to interact closely with others and their texts show a low frequency of acknowledgments. Conversely, hard scientists exhibit highly developed webs of exchange and collegiate interaction. The above mentioned body of cross-disciplinary research on acknowledgments thus showed that the structure of acknowledgments differs as well from one discipline to another, researchers in the humanities and social sciences writing more elaborate acknowledgments than their hard science counterparts.

The significance of acknowledgment practices has also been examined from a diachronic standpoint. Bazerman (1988, 1994), for instance, chronicled the evolution of the acknowledgment in nineteenth and twentieth centuries in the journal literature of experimental physics, showing how acknowledgments became, to paraphrase Grafton (1997 in Cronin 2005, p. 56) "an integral part of the rhetoric of narration and annotation." For their part, Cronin (1995) and Cronin et al. (2003, 2004) have reviewed a range of acknowledgment studies in such fields as history, information, psychology, philosophy and sociology and have shown a sharp increase in acknowledgment use over the twentieth century, especially since the 1970s.

From this brief review of the literature, it is thus quite clear that the humble acknowledgment paratext has emerged as a well-established facet of the scholar's rhetorical repertoire and a more or less institutionalised practice across scientific fields. It also points to the importance of acknowledgments in research and in academic/scholarly publishing where researchers, as Cronin so aptly puts it (2005, p. 96), "dutifully discharge their intellectual debts via acknowledgments just as dutifully as they include relevant works in the reference lists and bibliographies that accompany their publications."

Except for Giannoni (2002), this ample body of research—both that conducted by applied linguists and that carried out by information scientists—deals with *English*-medium *research articles*. This is why both Hyland (2003) and Giannoni (2006b) uphold the opinion, on the one hand, that it would be useful to extend the analysis of acknowledgments to acknowledgments written by *non-native English writers* and in *other languages*, and that, on the other, there has been little systematic analysis on the *evolution* of the acknowledgment paratext. Cronin (2005, p. 63) goes a step further and argues that "systematic investigation is required along with some explanation of the extent to which *genre* and *place of publication* influence rates of sub-authorship".[2] It should finally be mentioned that Cronin and Franks (2006) contend that both information scientists and sociolinguists should conduct further research so as to detail context-specific acknowledgment practices and their associated rhetorico-pragmatic trends across disciplines and languages.

The present pilot study –that is a follow up of Salager-Meyer et al. (2009)–attempts to redress these gaps by examining the influence of three qualitative variables (article genre, place of publication and time) over two acknowledgment-related quantitative variables: the frequency and length of the acknowledgment paratext in medical articles published over a 60-year period (1950–2010) and in five different places of publication (see "Corpus and methods" below). Indeed, as Connor (2004) convincingly argues, cross-linguistic/cultural discourse analysts would need to go beyond the texts as products and beyond their own

[2] "Sub-authorship" (Patel 1973) refers to acknowledgees, i.e., the persons who are mentioned in the acknowledgment paratext.

speculations by accessing the *contexts* of production of the texts (see also Moreno 2010). "There is no way in which language can be context—less", assert Barton and Hamilton (1998, p. 6).

## Corpus and method

The acknowledgment data were collected as part of a larger study on acknowledgment etiquette and behavior in medical discourse. The corpus analyzed here covered three well-established genres of medical writing, i.e., research papers—the most "prestigious genre" (Swales 2004, p. 217)—, review articles and case reports drawn from the most authoritative medical journals published in five different places or geographical contexts (or countries), viz., France, Spain, The United Kingdom (UK), The United States of America (USA) and Venezuela (see Appendix).

In terms of representativity and reputation, the source journals are among the most highly regarded journals in their respective countries of origin.[3] The English-language journals are all listed in the *Science Citation Index (SCI),* MEDLINE, *Index Medicus* and Core Medical Journals (AIM). They have an international readership and are those with the highest impact factors in the world (see Appendix). The non-English-medium journals are all indexed in the best non Anglo-American databases (e.g., Latindex, SciELO, Pascal, LILACS, EMBASE, BIREME, etc.). Although the French, Venezuelan and Castilian Spanish journals have much lower impact factors, are not all listed in the SCI (it is widely acknowledged that the SCI is dominated by USA publications, Zore-Armanda 2005, Lysenko 2007), and although they are mostly addressed to French- and Spanish-speaking readers, they still have quite a wide readership.[4] Anyway, we would like to add here that it is well-known that, outside the Anglo-American academic world and especially in developing countries, the impact factor is not a realistic variable with which to evaluate and compare journals (Carameli and Rocha e Silva 2010).

All the journals selected adopted a strict peer review policy, which, although not the panacea (e.g., Budden 2010), makes them comparable, endorsing the journal trustworthiness and the validity, scientific rigor and quality of individual articles. We can therefore safely argue that the journals consulted are comparable in caliber and reputation. Regarding our choice of sources, we would finally like to mention that our study is not the first one that compares journals written in national languages with English-language journals (Valero-Garcés 1996; Martin Martin 2003; Mur Dueñas 2007; Hirano 2009; Sheldon 2009; to cite just a few).

More specifically, the corpus of this pilot study is made up of three articles per genre and per decade (1950–2010) in each context, which gives us a total of 18 articles of each genre per context. Since we examined three genres in each context, we have a total of 54 articles per context, and since we examine five contexts, we have a grand total of 270 randomly selected articles. The value and importance of pilot studies—hence, of working with relatively small corpora—has been underlined by several scholars, such as Banks

[3] We do, of course, recognize that a single journal, no matter how respectable, persistent or long-standing, is not necessarily representative of disciplinary publications practices.

[4] Outside France, French-language journals are mostly read in francophone Canada and Africa. As for Spanish-language journals, they have quite a wide readership. Indeed, as Sheldon (2009) puts forth, Spanish is the world's third most spoken language, ranking second in terms of native speakers. Approximately 400 million people in 21 countries speak Spanish in the world and Spanish is also widely spoken in the USA (by about 60 million people).

(2005), Belcher (2005), Flowerdew (2005) and Meyer (2006), among others. Banks (2005, p. 208) for example, asserts that "small scale studies can act as pilot studies for larger scale research, pointing the way in which these should be directed."

The articles selected were all written by native French-, Spanish- or English speakers.[5] Since the journals do not contain any information on the authors' first language, we had to make assumptions based on the first author's surname and institutional affiliation. While these assumptions may not be completely accurate, they are the only available selection criteria that have been—and still are—adopted by renowned applied/contrastive linguists.

Native speaker authors were thus distinguished from non-native speaker authors using Wood's (2001) "strict" criterion (not his less stringent "broad" criterion): first authors must have names "native to the countries concerned" and be affiliated with an institution in countries where French, Spanish or English is spoken as the first language. In case of ambiguity (when it was not possible to decide on the NES or NNES status), the article was discarded.

Finally, in order to determine the percentage of acknowledgment-bearing articles, we first of all scrutinized all selected articles to discover any acknowledgment statement either at the beginning of the text or at the end of the article in the typical acknowledgment section. We then counted the number of words making up each one of the recorded acknowledgments, and, so as to assess whether the between- and within- group differences observed were statistically significant or not, we analyzed our results by means of $\chi^2$ tests. The alpha value was set up at 0.05.

## Results

It must be emphasized, first of all, that the results of this pilot study may not be representative of US, UK, Castilian and Venezuelan Spanish acknowledgments, since a limited sample of texts was analyzed. Hence, the results that follow should be considered as preliminary results only that should be corroborated by larger samples. We believe, however, that the features found not only give some insight into the behavior of acknowledgments in the different geographical contexts analyzed, but that they also give a fairly robust idea of how to direct further research on the variables herein analyzed.

### Acknowledgment-bearing articles

A total of 127 acknowledgments was recorded over the six decades, which means that only 47% of the articles carry an acknowledgment statement, the majority of them being found in the Anglo-American context (cf. Table 1 first row), more so in the USA context (83.3% of the articles from that context carry an acknowledgment section) than in the UK one (70% of the articles in the UK context carry an acknowledgment section). By contrast, in the three remaining contexts, acknowledgment-bearing articles hardly reach 30% of the total number of articles examined in each context.

Table 1 (row 2) also shows that it is in the USA context where the percentage of acknowledgment-bearing articles in relation to the total number of acknowledgment-bearing articles registered in our five corpora is the greatest (35.4%), followed by the UK context (29.9%) and by the three non-Anglo-American corpora that hardly account for

[5] A distinction was obviously made between Venezuela and Spain.

**Table 1** Number and percentages of ACK-bearing articles, total number of words in and average length of ACK-section in each context

| Contexts | France | Spain | UK | USA | Venezuela | Total |
|---|---|---|---|---|---|---|
| Total no. and % of ACK-bearing articles[a] | 14 (26%) | 15 (27.8%) | 38 (70%) | 45 (83.3%) | 15 (27.8%) | 127 articles over 270 (47%) |
| % of ACK-bearing articles[b] | 11% | 11.8% | 29.9% | 35.4% | 11.8% | 100% |
| Total number of words in ACK | 458 (6.4%) | 463 (6.5%) | 2.309 (32.4%) | 3.210 (45.12%) | 674 (9.5%) | 7.114 |
| Average length of ACK | 32.7 | 30.9 | 60.8 | 71.3 | 45 | |

*ACK* acknowledgment

[a] Percentage calculated over the total number of ACK-bearing articles in *each* context

[b] Percentage calculated over the total number of ACK-bearing articles recorded *in the five contexts* (N = 127)

12% each of the total number of articles with acknowledgments recorded in our five corpora.

Figure 1 further illustrates the fact that it is in the Anglo-American context *only* where the percentage of articles with acknowledgments is significantly greater than that of articles

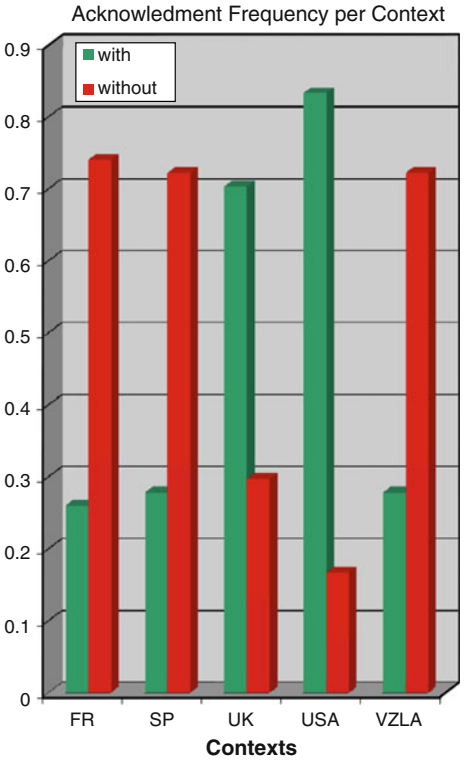


**Fig. 1** Acknowledgment Frequency per Context

*without* acknowledgments ($p = 0.000$ in both the UK and USA samples). Conversely, in the French, Spanish and Venezuelan samples, articles that do *not* include an acknowledgment section significantly outnumber those that include such a section ($p = 0.001$, $p = 0.002$ and $p = 0.002$, respectively). As for *between*-context analyses, Fig. 1 shows that acknowledgment-bearing articles in the Anglo-American context significantly outweigh those recorded in the French, Spanish and Venezuelan contexts ($p = 0.0001$, 0.0001 and 0.0002, respectively). By contrast, non-acknowledgment bearing articles in the three non Anglo-American contexts significantly outnumber non-acknowledgment bearing articles in the two Anglo contexts ($p = 0.0001$).

## Evolution of acknowledgment-bearing articles

If we consider our data from a diachronic standpoint, Fig. 2 readily shows that it is only in the last decade analyzed (2000–2010)—i.e., the first decade of the twenty-first century—where the difference between the percentage of articles with acknowledgments is significantly greater than that of the articles without acknowledgments ($p = 0.025$). In all the previous decades indeed (1950–2000), although the percentage of the articles that did not

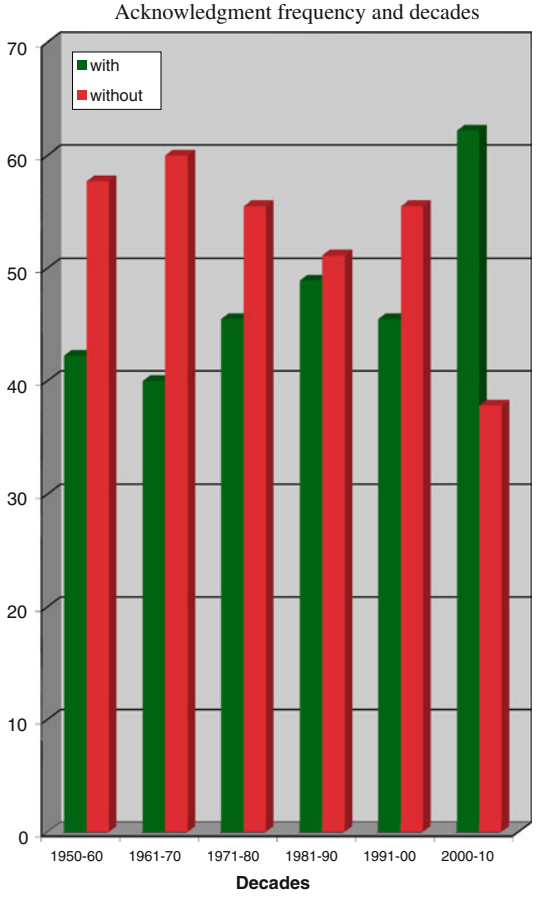


**Fig. 2** Acknowledgment frequency and decades

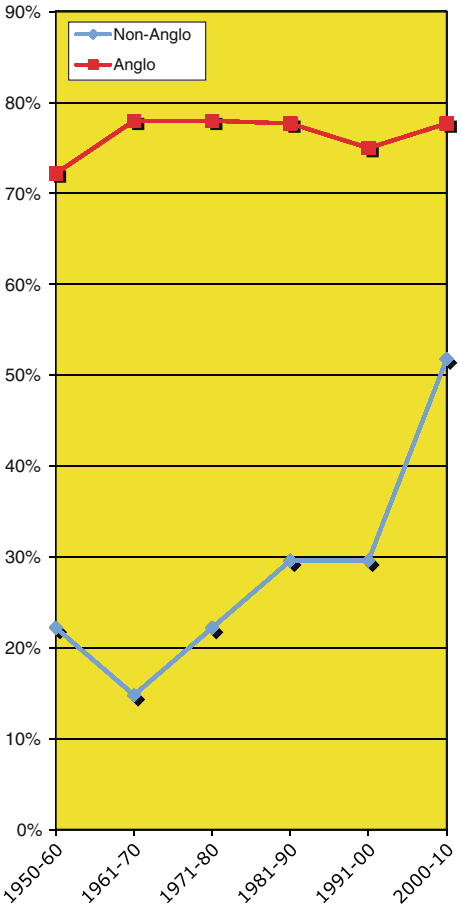


**Fig. 3** Evolution of ACK-bearing articles in the Anglo-American and the non-Anglo-American contexts (1950–2010). All genres combined

carry an acknowledgment section was greater than that of acknowledgment-bearing ones, the difference between the percentage of the two types of articles (those with acknowledgments and those without acknowledgments) was never statistically significant.

As for Fig. 3, it displays an interesting finding: it shows that it is the non-Anglo-American samples that are responsible for the overall significant increase of the acknowledgment-bearing articles in the 2000–2010 decade. The percentage of articles with acknowledgments in the Anglo-American contexts is indeed quite stable over the 60 years studied (between 70 and 80% in each decade). Not so in the non-Anglo-American contexts where their percentage, from the 1970s on, but especially from the 1990s on, steadily increases over time to the point where, in the 2000–2010 period, it reaches 52% of all the non-Anglo-American acknowledgment-bearing articles recorded in that period, a twofold increase in comparison with the 1950–1960 decade.

## Length of acknowledgments

Table 1 (third row) also indicates that the 127 acknowledgments recorded make up a total of 7.114 running words that are very unevenly distributed across the five contexts. Here

again, the greatest number of words making up the acknowledgment section is found in the Anglo-American context, its maximum value being recorded in the USA sample (3.210 words). Indeed, the UK and USA samples combined account for almost 80% of the total number of words making up the 127 acknowledgments. The average length of the acknowledgment (Table 1, fourth row) is consequently much higher in the USA sample (71.3 words in average) and in the UK corpus (60.8 words in average) than in the remaining three contexts. As a matter of fact, it is twice that recorded in the non-Anglo-American samples (about 30 words per acknowledgment in the French and Spanish context and 45 in the Venezuelan one).

## Evolution of the length of acknowledgments

Regarding the evolution of the number of words per acknowledgments, Fig. 4 indicates once more that the Anglo-American academic world differentiates itself from the remaining contexts. Indeed, the number of words making up the acknowledgments in the UK and the US samples increased almost steadily over the six decades: from 217 words in the 1950s to 969 in the first decade of the twenty-first century for the US sample (an almost fourfold increase) and from 252 words in the 1950s to 546 in the 2000–2010 decade for the

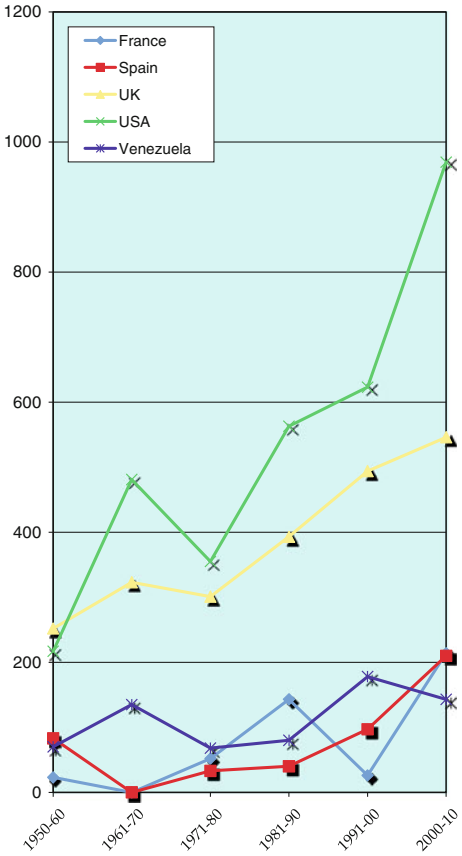


**Fig. 4** Evolution of the number of words per context: 1950–2010

UK sample (a twofold increase). By contrast, the French and Venezuelan sample displayed an "up and down" erratic behaviour, and the average number of words making up their acknowledgment section was always inferior to 200. The case of the Castilian Spanish sample is interesting in the sense that it follows the Anglo-American pattern, but at a much lower level: although the length of the acknowledgment sections of the Spanish sample was always very inferior to that recorded in the US and UK samples, it displayed a three-fold increase over time: from 83 words in the 1950s to 210 in the first decade of the twenty-first century.

## Acknowledgments and genres

With respect to genres, Fig. 5 indicates that the total number of acknowledgment-bearing articles is much more frequent in the research papers than in the remaining two genres. As a matter of fact, it is in this genre only where the difference between the percentage of acknowledgment-bearing articles is significantly greater than that of the non- acknowledgment-bearing articles ($p = 0.000$). The exact inverse relationship is observed in the review paper genre where the number of articles that do *not* carry an acknowledgment section significantly outnumbers the number of articles with an acknowledgment section ($p = 0.000$). As for case reports, the difference between both kinds of articles (those with an acknowledgment section and those without) is not significant. It is also interesting to remark that the difference between the percentage of acknowledgment-bearing articles recorded in research papers and that observed in review articles and case reports is

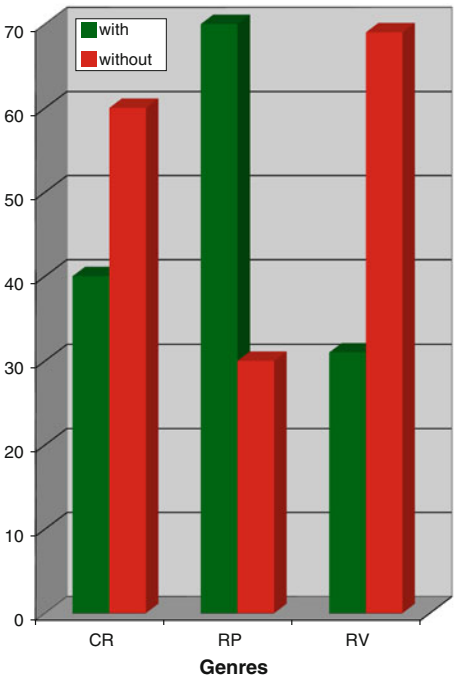


**Fig. 5** Acknowledgment frequency per genre

statistically significant ($p = 0.0001$ and 0.0042, respectively) as well as the difference between the percentage of non-acknowledgment-bearing articles recorded in review articles and that recorded in research papers ($p = 0.0001$).

Figure 6 displays further interesting genre-related findings. In this figure, we grouped together the genre-related results obtained in *the two Anglo-American* contexts (the UK and the USA samples) and we compared them with the genre-related results obtained in *the three non Anglo-American contexts*. Figure 6 clearly indicates that in the three genres, the percentage of acknowledgment-bearing articles is significantly superior in the Anglo-American samples than it is in the non-Anglo-American ones ($p = 0.0082$ for research papers and $p = 0.0001$ for review articles and case reports).

The last genre-related finding has to do with the length of the acknowledgment paratext in the three genres. Figure 7 clearly shows that research paper acknowledgments are much longer (54% of the total number of words recorded in the 127 acknowledgments) than those recorded in case reports (25% of the total number of words recorded in the 127 acknowledgments), on the one hand, and review articles (21% of the total number of words recorded in the 127 acknowledgments), on the other. The statistical test of significance shows that the length of research paper acknowledgments is significantly greater than that of the remaining two genres ($p = 0.0011$ when compared to the length of acknowledgments in case reports and $p = 0.0001$ when compared to the length of acknowledgments in review articles).

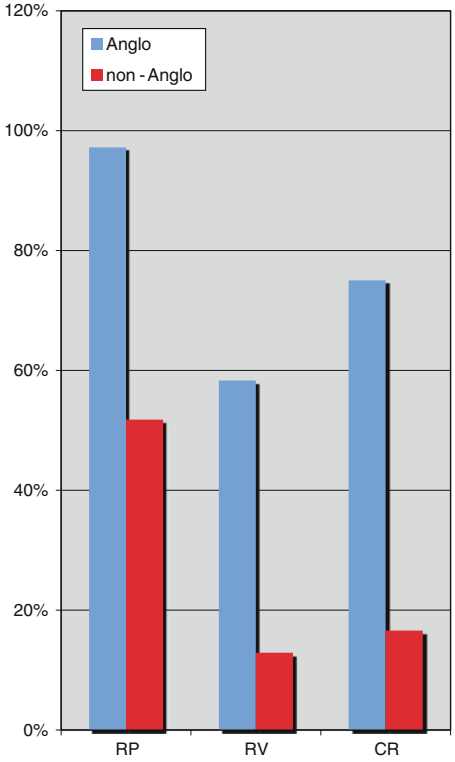


**Fig. 6** Overall percentage of ACK-bearing articles in the Anglo-American and non-Anglo-American contexts

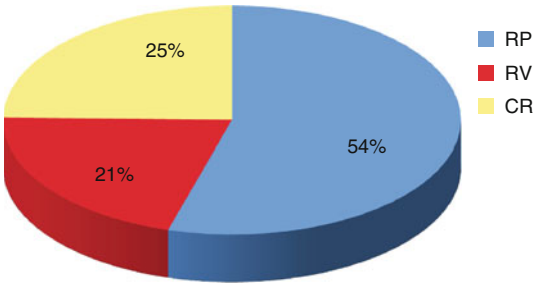


**Fig. 7** Proportion of words in the three genres

## Discussion

### Overall intensity of acknowledgements

The overall intensity of acknowledgments in medical articles reported here (47%) is very similar to that reported by Cronin et al. (2003, 2004) in psychology research articles (49%), but much less than that reported in their chemistry analysis of acknowledgments (75%), in genetics (McCain 1991) where the percentage is even higher (95%), and in MA and Ph.D dissertations where 90% of the texts are reported to contain an acknowledgment statement (Hyland 2003). In all likelihood, the lower frequency of acknowledgment-carrying articles in our sample is due to the fact that our study, although a pilot study only, is the first one that takes into consideration *several* medical *genres*, i.e., not only did we examine research papers (the primary research articles and dominant textual form across disciplines), but we also examined review articles and case reports (See "Acknowledgments and textual genre" below). What is more, the articles we examined were published both within and outside the Anglo-American world. Our contention is that these two factors (the analysis of several genres and of non-English medium sources) account for the differences observed between the findings of previous research and those reported here as regards acknowledgment intensity. Had we examined *English*-medium experimental research papers only—especially multi-centre clinical trials—, the percentage of article-bearing acknowledgments would have been much greater. As a matter of fact, *overall*, 97.2% of the research papers making up our *Anglo-American* sample carry an acknowledgment section, and 100% of them do in the 2001–2010 time band.

The fact that the great majority of the 127 acknowledgments recorded were found in the two Anglo-American contexts (83% in the USA sample and 70% in the UK sample vs. less than 30% in the non-Anglo-American contexts) and that English-medium acknowledgment-bearing articles *in each genre* outnumbered those of the non-Anglo-American contexts clearly shows that acknowledgment is an Anglo-American phenomenon that is far from being universally adopted. This finding suggests that non-Anglo-American scientists do not seem to interact with others as closely as their Anglo-American counterparts did and still do (at least, they did not report so), although the percentage of acknowledgment-bearing articles in the non-Anglo-American world increased in the 2001–2010 period.[6]

[6] A subsequent paper will deal with rates of authorship and sub-authorship, with the different types of collaboration (local, regional and international) and with the cognitive content of acknowledgments in the same corpora as those examined here.

## Length of acknowledgments

Although our results are based on a relatively small sample of acknowledgments, our quantitative data also indicate that acknowledgments are not only more frequent but also on average much longer (twice as long) in the Anglo-American contexts than they are in the non-Anglo-American ones, the acknowledgment section reaching almost 1,000 words in the USA sample and about 550 words in the UK sample in the 2001–2010 decade, whereas it never exceeded 200 words in the Spanish- and French-medium samples over the six decades examined here. The average acknowledgment length obtained from our *Anglo-American* sample of *medical* articles is superior to that recorded by Giannoni (1998) in his corpus of *hard sciences* articles (42 words, see Giannoni 2006a) and of *linguistics* research papers (55 words). It is worthwhile mentioning here that the acknowledgment sections of English-medium soft science papers have been found to be on average 30% longer than those of English-medium hard science papers (Giannoni 2006a). In M.A. and Ph.D dissertations written in English, acknowledgments are even longer (160 words on average, see Hyland 2003).[7]

What is more, it is in the Anglo-American articles where the acknowledgment length has been found to increase most rapidly. Indeed, over time, it exhibits a fourfold increase in the US corpus and a twofold one in the UK sample, the most dramatic rise being recorded in the US sample in the 2001–2010 time band. This may reflect two things: (1) the increasingly complex collaborative networks and webs of socio-cognitive ties in the Anglo-American contexts, what Cronin and Franks (2006, p. 1909) refers to as "polycephalous science",[8] and (2) the publication of increasingly detailed guidelines regarding authorship and sub-authorship,[9] the objective of which is to try to eradicate two quite common flaws in scientific research—ghost and guest authorship that remains an issue in many disciplines (Bennett and Taylor 2003, De Faoite 2010).[10,11]

[7] The soft science fields Giannoni examined were applied linguistics, economics and social sciences (acknowledgment sections were 67 words on average), whereas the hard science disciplines were mathematics, medicine and biology (acknowledgment sections were 42 words on average).

[8] Kassirer and Angell (1991) report that a manuscript published in the *New England Journal of Medicine* included a five-page acknowledgment section listing 63 institutions, 155 physicians, and 51 members of seven different committees.

[9] These guidelines were first published in 1979 by the International Steering Committee— the International Committee of Medical Journal Editors (ICMJE) (2006) came into existence in 1982 only—under the title "Uniform Requirements for Manuscripts" (URM). These required the presence of an acknowledgment section and were last revised in 2008. In 2009, the "Good Publication Guidelines" were published by the International Society for Medical Publication Professionals (Graf et al. 2009) that recommend that all articles include an acknowledgment section which should *fully* recognize the contributions and role of all individuals not listed as authors (see also Jubb 2010 as regards acknowledging the funders of research).

[10] Proof of the fact that authorship is a very important issue in biomedical research is that the last issue of the journal *The Write Stuff* (Vol. 19, No. 1, 2010), the official publication of the European Medical Writers Association, is entirely devoted to authorship-related problems.

[11] Ghost authorship occurs when anyone who wrote the protocol, conducted the statistical analyses or wrote the manuscript is not listed as an author. By contrast, guest, honorary, gift or unjustified authorship results in people being listed as authors whose contribution to the piece is unclear and perhaps even non-existent. A survey in *The Lancet* (2005) indicated that 32% of scientists are willing to gift-authorship to increase their papers chance of publication or boost their careers. In 2009, a group studied six leading general medical journals (Fiore 2009) and showed that 20.6% of articles had evidence of honorary authors who did not contribute to the paper but were listed out of courtesy or because their name carried prestige. Other recent studies indicate that the problem has not gone away (Ilakovac et al. 2007; Wager 2007).

An interesting situation is that of the Castilian Spanish sample. Although the acknowledgments length increase recorded in that sample is far from being as dramatic as it is in the US context, it is interesting to observe that its evolution curve is very similar to that observed in the US corpus, the sharpest increase being observed in both samples in the 2001–2010 time band. This similarity with the Anglo-American samples cannot but remind us of the evolution of a rhetorical feature of academic writing that has been quite extensively studied as well: that of academic criticism (Salager-Meyer et al. 2003). Research into that socio-pragmatic phenomenon has indeed shown that today's Spanish scientific prose closely resembles its Anglo-American counterpart as far as the use of indirect (hedged) criticism is concerned. It would then seem that today's Spanish researchers tend to follow the formal Anglo-American guidelines more closely than their French and Venezuelan counterparts do.

## Evolution of acknowledgments frequency

Our quantitative data also showed that the percentage of acknowledgment-bearing articles in the *Anglo-American* context has not increased over the 60 years studied. On the contrary, except for the 1950–1960 time band, their frequency remained rather stable, especially from the 1960s on when, as we said in the Introduction of this paper, acknowledgments became standard practice, at least in the Anglo-American academic world. This finding stands in contrast with that of previous research (Mackintosh 1972 in sociology and physics, and Cronin 1995 in psychology, philosophy, sociology, library science and history) that noted a 20–60% increase (depending on the discipline) in the frequency of the acknowledgment section in papers published between 1945 and 1969 in the disciplines analyzed by Macintosh, and between 1970 and 1990 in the fields studied by Cronin. The reason for this difference, we believe, lies in the fact that, in most scholarly journals, acknowledgments progressively became mandatory, whereas they have been mandatory in English-medium *medical* journals since the publication of the UMR in the late 1970s (see footnote 10). This means that Anglo-American *medical* researchers, contrary to those in other fields, have always been more prone to acknowledge those who might have had an influence upon the final draft of the published article, and the guidelines clearly remind them that they have to do so. Unfortunately, these guidelines do not prevent the use of ghost/gift authorship, especially in the case of industry-sponsored research (see footnote 11).

What is interesting to note is the steady increase in the *frequency* of acknowledgment-bearing articles in the *non-English* speaking academic world where they exhibit a low 15% in the 1960s and reach a medium–high 52% in the first decade of the twenty-first century. Of course, this percentage is still very low when compared to that observed in the Anglo-American contexts in that last decade (78%, all genres combined), but still, it is a significant increase that seems to reveal a growing awareness of the importance of the practice of affixing an acknowledgment section to academic journal articles. In short, it appears that non-English-speaking scientists progressively became acknowledgers over the course of the twentieth century, but more so in the first decade of the twenty-first century, although *only* half of them include an acknowledgment section in their articles.

Regarding *today's* situation, we would now like to put forth two hypotheses that could explain the difference observed in the frequency and length of acknowledgments between the Anglo-American corpora, on the one hand, and the three non-Anglo-American ones, on the other.

The first hypothesis is that researchers who publish in non Anglo-American journals perhaps do not pay much attention to acknowledgment guidelines or ignore them altogether (Salager-Meyer et al. 2009). This is not such a far-fetched hypothesis because several studies have shown the ignorance of ICMJE guidelines in non-English-speaking contexts and have pointed out that definitions of authorship and authors' behaviour vary in different countries (Louis et al. 2008). For example, in their qualitative analysis of French medical journals, Pignatelli et al. (2005) and Letrilliart and Schott (2007) observed differences between editors' criteria and researchers' practice when compared to US journals. Bhopal et al. (1997), for their part, report that French and even British researchers consider the guidelines established by the ICMJE far too rigid and irrelevant. As a consequence, and behind closed doors, French and British scientists confess ignoring them altogether, which means that gift and ghost authorship is very frequent. As Pignatelli et al. (2005) contend, what makes this a very serious problem in the French medical community, at least, is that such a practice is seen as normal behaviour in most cases. Reyes et al. (2001) also report low researchers' compliance with guidelines criteria established by a Chilean medical journal, and a very similar situation is described in Chinese medical journals (Whenhui et al. 2001), and in Asian cultures in general where gifting authorship is not a condemned practice because it is intimately related to Asian values (Salita 2010).[12]

Giannoni (2006b) also reports that the acknowledgment section is not a standard part of Russian publishing etiquette, and when Marusic and Marusic (2010) started collecting information on authors' contribution in their own journal, the *Croatian Medical Journal*, they were surprised to discover that many authors did not qualify the criteria for authorship (For the four authorship criteria, see Graf et al. 2009). Our study is thus the first one that brings *quantitative* support to the fact that authors' compliance with editorial requirements and researchers' behaviour vary from one publication context to another.

The second hypothesis is intimately related to the first one. We could indeed speculate that, in the non-Anglo-American context, the lack of acknowledgment means that all the persons who contributed to the research reported appear as co-authors (i.e., not as acknowledgees) whether their contribution was really intellectually meaningful or not, thereby contributing to the spread of "*polyauthoritis giftosa*" (Kapoor 1995; cited in Modi et al. 2008, p. 6; Salager-Meyer et al. 2009). Some of these co-authors would perhaps not qualify for authorship in core English-language journals. There is so much pressure indeed in the Spanish-speaking world (much more than in its French counterpart) to publish in high-impact, refereed and internationally indexed periodicals that scientists need to appear as co-authors in the greatest number of scientific papers possible (Curry and Lillis 2004; Gómez et al. 2006; Salita 2010). We could therefore speculate that this new disease rightly called "impactitis" (van Diest et al. 2001), coupled with the requirements of academic promotion that are based on quantity rather than on quality, are in part responsible for the opacity of the way in which authorship and acknowledgments are attributed in the non-English speaking world. As Salita (2010, p. 37) emphatically puts it: "The publish or perish phenomenon is so widely spread in academia that issues of authorship and related malpractices seem likely to be universal".

It would be interesting to know how Spanish, Venezuelan and French researchers behave when submitting their research to English-language journals. Do they more frequently include an acknowledgment section in their research papers? Does this section tend to be longer? Would there be a difference between medical journals published in English in

[12] The four Asian values mentioned by Salita (2010, p. 37) are: (1) courtesy to or respect for authority, (2) gratitude or indebtedness, (3) diplomatic gesture, and (4) social pressures and harmonious relationships.

non-English speaking countries and those published in the English-speaking world where impactitis is endemic and where the debate over the "tyranny of the impact factor" (Smith 2009, p. 1) has triggered heated—sometimes even contentious—debate (Pelderman 2007)?[13] Our previous research (Salager-Meyer et al. 2009) indicated that NNES tend to behave in the same way (acknowledgment-wise) whether they publish in US/UK journals or in national language journals, but this should be corroborated by further studies based on larger samples.

## Acknowledgements and textual genre

As our *genre*-related findings clearly indicate, the frequency of acknowledgments is greater in research papers than it is in review articles or in case reports. We can thus claim that acknowledgments are genre-dependent and that Cronin's claim (2005, p. 105) that "most recognized genres of academic writing include acknowledgments" is not corroborated by our study. The low frequency of acknowledgments in review articles in the five contexts when compared to that recorded in research papers is due to the fact that review articles (whether they be narrative or systematic reviews[14]) are in general solicited papers written by one or more scientific experts in the topic that do not imply as much teamwork, large-scale collaboration and cognitive partnership as experimental research papers do. In other words, because the aim of the expert authors of review articles is to design literature searches, evaluate them for inclusion/exclusion and finally interpret them, the review article genre does not require the experimental (team)work and collegiate interaction research papers and, to a much lesser extent, case reports do require. This distributed cognitive partnership, so characteristic of experimental research papers, could thus explain why acknowledgments in research papers are much longer than they are in review articles.

## Conclusions

Before stating the conclusions that can be drawn from the present research, we would like to underscore the fact that, given both the restricted sample and the complex universe of discourse for which it has been drawn, any conclusion must necessarily be tentative.

Our cross-generic and diachronic study of both English- and non English-medium acknowledgment paratexts in medical discourse has indicated that these indicators of "sub-authorship collaboration" (Cronin and Franks 2006, p. 1912) are and have always been an Anglo-American phenomenon that is far from being universally adopted. This defining feature does not only refer to the frequency of use of acknowledgments but also to their average length that has kept increasing over the years, underlining thereby the increasing collaborative behavior and collegiate interdependence of Anglo-American science. As Cronin and Franks (2006) contend, collaboration, project teams and networks have become the organizational staples of contemporary scientific research. But this is true about and

[13] Richard Smith (2009, p. 1) argues that, although a routine practice, impact factor calculations are wholly unscientific. There is very little correlation indeed, posits Smith, between the impact of a journal and the impact of articles it publishes because the impact factor of the journal is driven by a few articles that are very highly cited.

[14] Systematic reviews are publications in which there is a methodology by which searches are conducted and literature included for evaluation. By contrast, non-systematic or narrative reviews describe a topic and have softer methodology and criteria for article inclusion.

applicable to Anglo-American science only. Outside this circle, affixing "thank you cards" to scientific papers is not such a widespread practice, except perhaps, in the case of Spanish researchers who are becoming more assiduous, it seems, in recognizing their debts towards their colleagues. The findings of the present study have also shown that the humble acknowledgment section is *genre*-determined in the sense that its frequency and length are much greater in research papers (with their strong associated networks among researchers) than in review articles and case reports.

Audience size has been held responsible for certain aspects of intercultural variability (e.g., Burgess 2002; Moreno 2008; Van Bonn and Swales 2007). In view of the fact that the frequency and length of the acknowledgment paratext has always been greater, as we just said, in the Anglo-American academic community, we could speculate that the size of the scientific community and that of the audience/readership have a bearing on the frequency and length of "backstage solidarity" (Goffman 1959, p. 17; cited in Cronin and Franks 2006, p. 1915) statements, the Anglo-American academic community and audience being much wider than their French, Spanish and Venezuelan counterparts.

Caution is however in order here because the samples we examined were quite small indeed. As a consequence, the results from this study can only be considered as indicative. Larger samples are needed to be able to support more robust claims regarding researchers' acknowledgment behavior in English-medium and non-English medium medical journals over time.

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## Appendix

List of journals consulted, impact factor and indexation

*France*

Decade 1: *Journal d'Urologie médicale et chirurgicale* (No impact factor was found because the journal ceased being published in 1985)
Decades 2–6: *La Presse médicale* (Impact factor: 0.441)

*La presse médicale* Indexed in: MEDLINE/PubMed, Current Contents/Life Sciences, Current Contents/Clinical Medicine, EMBASE, Excerpta Medica, Science Citation Index (SCI), PASCAL (INIST-CNRS), Scopus.

*Spain*

Decade 1: *Revista española de las enfermedades del aparato digestivo y de la nutrición* (Impact factor: 0.305)

Indexed in: EMBASE, Medline, Biological Abstracts, CAB Abstracts, CINHAL full texts, Currents contexts: Current Contents: Clinical Medicine, Directory of Open Access Journals (DOAJ), Excerpta Medica, IBECS, IME (Indice Médico Español), SciELO, Science Citation Index Expanded, Scopus, SENIOR.
Decades 2–6: *Medicina Clínica* (Impact factor: 1.346)

Indexed in: Science Citation Index, Current Contents, Index Medicus, Excerpt Medica, EMBASE, Medline.

*United Kingdom*

*The British Medical Journal* (Impact factor: 13.66, year 2009)
Indexed in: MedLine, Core Clinical Journals, Abridged Index Medicus (AIM), PubMed, Science Citation Index (SCI).

*USA*

Decade 1*: American Heart Journal* (Impact factor: 4.357, year 2010)
Indexed in: MedLine, Core Clinical Journals, Abridged Index Medicus (AIM), PubMed.
Decades 2–6: *The New England Journal of Medicine* (Impact factor: 50.017. Year 2008)
Indexed in: MedLine, Core Clinical Journals, Abridged Index Medicus (AIM), PubMed, Science Citation Index (SCI).

*Venezuela*

Decade 1: *Acta Científica Venezolana* (0.705)
Indexed in: Agricola Aquatic Science and Fishery; Biological Abstracts; Biblioteca Regional de Medicina (BIREME); Bowker Serial Directories; Current titles in Ocean, Coastal, Lake & Waterway Sciences; Current Awareness in Biological Sciences (Serie de 12 títulos); International Bibliography of Periodical Literature (IBZ); Index Medicus; Mathematical Reviews; Periodica CICHUNAM; University Microfilm International; Zentralblat fur Mathematik.
Decades 2–6: *Revista de Obstetricia y Ginecología de Venezuela* (Impact factor: 0.0390)
Indexed in: LILACS, Index Medicus, Medical Subject Heading, Latindex, SCielo.

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