

## Artículo publicado (2009)

**2009 Salager-Meyer, F., M.A. Alcaraz Ariza and M. Pabón Berbesí** “Backstage solidarity in Spanish- and English- written medical research papers: publication context and the acknowledgment paratext. **JASIST (Journal of the American Association of Information Science and Technology)** Vol. 60(2), p. 307-317.

\*\*\*\*\*

### **“Backstage solidarity” in Spanish- and English- written medical research papers: publication context and the acknowledgment paratext<sup>1</sup>**

**Corresponding author:** Françoise Salager-Meyer, Facultad de Medicina, Universidad de Los Andes, Mérida. Venezuela. Telephone/fax 0058 274 2660289. Email: francoise.sm@gmail.com

María Ángeles Alcaraz Ariza, Facultad de Filología Inglesa, Universidad de Alicante, Campus de San Vicente del Raspeig. Spain. Phone.: 0034 965 90 9791, Fax.: 965 90 3800. e-mail: ariza@ua.es.

Maryelis Pabón Berbesí, Facultad de Humanidades y Educación, Universidad de Los Andes. Mérida. Venezuela. Telephone/fax: 0058 274 2401880. email: maryelis@ula.ve

## ABSTRACT

The purpose of this paper is to analyze the acknowledgment (ACK) paratext of medical research articles written in English and Spanish in three geographical contexts: Venezuela, Spain and the United States of America. We thus randomly selected 150 research papers from leading medical journals in each country. The frequency and length of ACKs, the number of named and unnamed acknowledgees, the reasons why they were acknowledged, the number of grants received and the sources of funding were recorded. The motivations that underpinned each ACK were classified according to Cronin's (1995) and Giles and Council's (2004) typology. Results were analyzed by means of Chi-square tests. Our results show that ACKs from the English-language corpus are significantly more frequent and longer than those from both the Spanish and Venezuelan

samples. The number of persons acknowledged and of grants received was also significantly greater in the US sample than in the two Spanish-language corpora. Differences were found in the number and types of funding sources. Moreover, in the three corpora technical/instrumental assistance was more frequently acknowledged than peers' ideational input. A small-scale ethnographic research was conducted with Spanish and Venezuelan researchers in order to get first-hand feedback on the motivations that could lie behind their ACK behavior. We conclude that "backstage solidarity" (Goffman 1959, cited in Cronin and Franks 2006) significantly differs from one context to another and that the communicative and socio-cultural conventions of academic contributorship are not only discipline-dependent but also language- and context- dependent.

## **1. Introduction**

Although scientific internationalization and 'collaborativeness' are two concepts intimately related to the increasing professionalization of science that appeared in the early years of the 19<sup>th</sup> century (Beaver & Rosen, 1978), the phenomenon of multiple authorship (more than two authors) in scientific publications dates back to a few decades only. Indeed, traditionally, research papers used to be signed by one author only (two, at the most), but the increase both in the number of scientists and in the complexity of research work progressively led to authorship proliferation and the concept of mass authorship, especially in the hard sciences (National Science Board, 2004; Cronin 2005; Meadows, 2005) and biomedical research (e.g., Weeks et al., 2004; Durani et al., 2007; Modi et al., 2008), a phenomenon called "mega-authorship" (Kretschmer & Rousseau, 2001: 612), "hyperauthorship" (Cronin, 2002: 560) or "mass recognition" (Morris et al., 2005). Original articles with six or more authors are now the norm, and, as Modi et al. (2008: 6) aver, "the single/dual author article has become all but a historical curiosity". No wonder, then that it has recently been suggested that the concept of "authorship" be replaced by that of "contributors" and "guarantors"<sup>2</sup> because not all significant contributions warrant authorship (Rennie et al., 1997), and those that do not should be recorded in the scholarly article's paratext, i.e., in the acknowledgment (ACK) section.

This problem is especially crucial within the biomedical community where “ghost”<sup>3</sup> and “gift” (honorific) authorship in large, multicenter clinical trials has attracted the ire of the mass media and of those campaigning for ethics in the dissemination of medical research information, where it is estimated that between 10 and 50% of research is ghost-written (cf. Wooley et al., 2006).<sup>4</sup> As a matter of fact, Langdon-Neuner (2008) reckons that ACKs are the solution to the problem of ghostwriting. Her argument is that authors are not only responsible for the content of their papers but also for acknowledging any assistance they received while conducting their research. They are therefore responsible for deciding whether a “ghost” remains in the underworld or is brought to light in the ACK paratext.

In order to try to find a solution to this ‘gift/ghost’ problem (see endnote 3), a number of guidelines aimed at transparency have been recently published by medical journal organizations, viz., the International Committee of Medical Journal Editors (ICMJE, 2006) and the European Medical Writers Association (Jacob and Wager 2005). The ICMJE guidelines (<http://www.icmje.org/>) consider an author to be someone who has made substantial intellectual contribution to a published study. Three criteria have to be fulfilled to warrant authorship: 1) a substantial contribution needs to have been made to the conception and design, acquisition of data, or analysis and interpretation of data. 2) The author must have drafted the article, or revised it critically for important intellectual content. 3) Lastly, to qualify, the author must also approve the final version of the article to be published.

These guidelines, however, seem to be largely ignored because the practical task of eliminating bogus (fake or “ghost”) authorship is, as Sokol (2008: 478) argues, a daunting one that requires “a change in mentality across the medical hierarchy, from old school consultants to newly minted doctors.”

At any rate, whether ACKs are necessary to exorcise ghosts or not, the aforesaid indicates how ACKs have slowly become a constitutive paratextual feature of the modern research article (cf. Salager-Meyer et al., 2006 for a brief history of ACKs in academic writing). It has also been argued that ACKs play such an important role in today’s scholarly communication that they should be used conjointly with established

bibliometric indicators (such as citations) in a researcher's academic audit process (Cronin, 1995; Giles & Councill, 2004).

### **Acknowledgments: the communicative equivalent of a simple 'thank-you note'?**

For applied linguists and genre analysts, ACKs are seen as a neglected "part genre" (Swales, 2004: 31) which forms part of "the paraphernalia of today's research articles" (Hyland, 2003: 253). In Hyland's parlance, ACKs are a "Cinderella genre"<sup>5</sup> in the sense that they are a taken-for-granted part of the background, "a practice of unrecognised and disregarded value" (Hyland, 2003: 242) "whose importance to research students has been overlooked in the literature" (Hyland, 2004: 306). This opinion is shared by Giannoni (2002: 9) who refers to ACKs as a "minor and largely overlooked academic genre", and by Cronin et al. (1995: 38) who consider them as a long neglected textual artifact that belongs to the "academic auditors' armamentarium". For his part, Genette (1997) classified ACKs as "paratexts" alongside titles, headings, prefaces, illustrations and dedications.

As far as we know, only a few linguistico-rhetorical studies have addressed the issue of ACK in academic writing. On the one hand, Hyland's research on the generic move structure of ACKs in PhD and MA theses (Hyland, 2003; 2004; Hyland & Tse, 2004), and, on the other, Giannoni's cross-linguistic research on ACK behavior in Italian- and English-written research articles (Giannoni, 1998; 2002) and academic books (Giannoni, 2005).

For information and social scientists, ACKs are rather viewed as "exchange of gifts" (McCain, 1991: 495), "expressions of solidarity" characteristic of schools organised as mentor systems (Ben-Ari, 1987: 137), "supercitations" (Edge, 1979: 118), "trusted assessorship in action" (Mullins, 1973: 32) that reflect, on the one hand, sub-author collaboration (Patel, 1973: 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.

Scholars have also documented the social significance of ACK practices in a variety of disciplines, e.g., Heffner (1979) in biology, psychology, political science and

chemistry; McCain (1991) in genetics; Cronin (1995) in information science, psychology, history, philosophy and sociology; Laband & Tollison (2000) in biology and economics; Giles & Council (2004) in computer science, and Salager-Meyer et al. (2006) in mainstream/academic medicine vs. complementary/alternative medicine.

Whichever the label adopted, Hyland (2003) pertinently observes that ACKs are perhaps the most explicitly interactional genre of the academy in the sense that they form a bridge between the personal and the public, the social and the professional, the academic and the lay. A bridge, indeed, and a rhetorical collegial space where authors repay their “intellectual indebtedness” (Davis & Cronin, 1993: 591)

From this review of the literature, it is thus abundantly clear that the humble ACK paratext has emerged as a well-established facet of the scholar’s rhetorical repertoire and a more or less institutionalised practice across scientific fields.

However, in spite of the fact that the importance of ACKs in today’s scholarly communication are now well documented by scholars from a variety of different disciplines (see above), Hyland (2003) believes that much work remains to be done and research needs to be extended to other disciplines and languages. Cronin & Franks (2006) uphold the same opinion by arguing that both information scientists and sociolinguists should conduct further research so as to detail context-specific ACK practices and their associated rhetorico-pragmatic trends across disciplines and languages.

## **2. PURPOSE**

The above review of the literature shows that all the studies (except Giannoni’s) dealing with ACKs have been conducted on research published in **English**-language journals. In order to extend this line of research and fill the above-mentioned conceptual gap, the present study was undertaken with the aim of determining in which ways the publication context exerts an influence on the frequency, length and content of ACKs. Towards that end, we analysed the ACK textual spaces that accompany medical research papers (RPs) written in two different languages (Spanish and English) and published in three different geographical contexts: Venezuela, Spain and the United States of America. We hope that our endeavour will provide further insight into subauthorship contribution to the

construction of scientific knowledge and scholarly production in these three different contexts.

### **3. CORPUS and METHOD**

In studies of this kind, it is recommended to draw the sample texts from top-ranking journals because, as Connor (2004) argues, the articles published in these journals have undergone a strict peer review and editorial scrutiny. Such a procedure thus assures that the articles selected are fairly representative of the journal genre in content and style or, in Bazerman's parlance, that the texts are "situationally effective" (Bazerman, 1994: 23) and are the result of an "expert performance" (Bazerman, 1994: 131).

Following these recommendations, we randomly selected 150 RPs published between 2005 and 2007 and distributed as follows: 50 from three Spanish-language medical journals published in Venezuela, 50 from two Spanish-language medical journals published in Spain, and 50 from two English -language journals published in the United States of America (this latter corpus will be abbreviated hereafter as the "US sample" or "US corpus"). These are leading medical journals in their respective country of origin, are all indexed in several international databases and all require that the persons/centers/entities that collaborated or supported the research be acknowledged (see Appendix).

Our article selection procedure and the similar textual concept (the ACK section) analyzed thus allow us to state that our three corpora are parallel/comparable/equivalent<sup>6</sup> to the maximum degree (Moreno, 2008), and that the *tertio comparationis* criterion recommended in studies of this kind (cf. Connor & Moreno, 2005) is amply met.

Table 1 displays the geographical origin of the papers published in the three samples.

#### **3.1. Methods used and variables analysed**

All selected papers were scrutinized to discover any ACK set apart at either the beginning or end of each RP. Medical journals indeed have different editorial policies regarding the presentation of ACKs, and although most ACK sections are generally found in clearly identifiable article-ending sections, these sections are not always labelled. Regarding

their etiquette, ACKs may be “compound entities” (Cronin et al., 2004: 162) where authors may, for example, thank peers for ideas, federal and/or industrial funding agencies for financial support and colleagues for moral support. Funding bodies, however, are sometimes thanked in a separate textual space preceded by the heading ‘Funding’. In cases where the funding support formed part of a textual space in its own right, we counted both paratexts (ACK and funding) together.

The number and length (total number of running words making up the ACK/funding space) were recorded. In each ACK section, we also recorded the number of acknowledgees mentioned by name and the unnamed entities credited along with the reasons why they were acknowledged. The number of funded RPs, and the number and source(s) of the grants received were also recorded in each ACK paratext.

### **3.2. Detailed content analysis of ACK**

The next step consisted in the analysis of the motivations that underpin the ACK in each paper. Because ACKs embody a wide range of relationships among people, agencies, institutions and research centers, we classified all ACKs according to the seven-part typology designed by Cronin (1995):

- 1) Financial support, i.e., recognition of external and/or intra-mural funding of national and/or international private and/or public educational institutions, federal/governmental research agencies and/or industrial (e.g., pharmaceutical industry) sources/sponsors.
- 2) Instrumental / technical support, e.g., providing access to tools, facilities, specimen samples, technologies and infrastructural resource; furnishing technical expertise, help in data collection/entry/management, sample preparation, etc.
- 3) Conceptual support, also called “academic support” (Hyland, 2003: 244) or “peer-interactive communication (PIC)” (McCain, 1991: 512), such as proffering thanks for advice and discussion, comments on the manuscript, critical insight, intellectual guidance, valuable suggestions, assessment on study soundness, etc.
- 4) Editorial/linguistic support, i.e., editing, proofreading or translating the manuscript.
- 5) Clerical support, i.e., secretarial services.
- 6) Moral support: e.g., thanking someone for his/her enthusiasm, dedication, wisdom.

7) Unclassifiable when it proved impossible to categorize an ACK according to any of the above categories whether it be for inherent ambiguity, vagueness or lack of contextual clues.

The frequency of the above ACK categories in the Venezuelan, Spanish and US corpora was calculated by recording the number of ACK paratexts that mentioned them. A sample of ten ACKs was analysed independently by the team members to compare their respective interpretations and ACK rationale classification. There was a high degree of agreement: on a check of inter-rater reliability, the three raters had an agreement rate of 92%, and in the few cases where there was disagreement, a specialist informant acted as referee.

Chi-square tests were used to assess whether the quantitative differences recorded in the three corpora regarding ACK frequency and length, and the frequency of ACK categories (see the above seven-part typology) were statistically significant. Alpha value was set at  $p = .05$ .

## **4. RESULTS**

### **4.1. ACK frequency and length**

As can be seen in Table 2, the highest frequency of ACKs was recorded in the US sample, where 82% of the RPs include an ACK section. Statistically significant differences were found between the frequency of ACKs recorded in the US sample and those observed in the Venezuelan sample (44%) and the Spanish sample (26%),  $p = .0007$  and  $.0001$ , respectively.

Regarding ACK average length, Table 1 shows that the longest was found in the US sample (83 words per ACK) and the shortest in its Venezuelan counterpart (31 words). The Spanish sample is found in mid-position with a mean of 54 words per ACK.

It is interesting to note, on the one hand, that of the nine US research papers that do not include any ACK section, six occur in papers written by non-native English speakers (NNES) from Italy, France, Germany, India, Japan and Denmark, and, on the other, that the shortest ACKs in the US sample accompany RPs whose authors (or, at least, the first author) are/is NNES<sup>7</sup>.

#### **4.2. Named and unnamed acknowledgees**

The mean number of named acknowledgees is the highest in the US corpus (6.3 per ACK), about four times as much as the means recorded in both the Venezuelan and Spanish samples (1.6 acknowledgee per ACK in each sample).

Unidentified acknowledgees were found in the three corpora, although much more frequently in the US corpus (39% of the ACKs in the US corpus proffer thanks to unidentified persons) than in the Venezuelan and the Spanish samples where respectively only 18% and 15% of ACKs mention unnamed persons. These are either patients who took part in the study or hospital staff (study personnel, general practitioners, residents, and/or nurses) who helped in recruiting patients and/or in collecting data. In one US research paper only did we find that unidentified statisticians and epidemiologists were thanked for their expertise<sup>8</sup>.

From a purely linguistic standpoint, the same laudatory adjectives (*helpful, insightful, invaluable, generous, etc.*) are used in the three corpora to refer to the help provided by the acknowledgees, although a perhaps more emotionally-charged tone was recorded in both Spanish-written corpora (more frequently in the Venezuelan sample, though) where the collaboration provided is sometimes qualified as “*absolutamente desinteresada*” (absolutely disinterested), “*muy gentil*” (most kind) and/or “*muy generosa*” (very generous), and where the authors are “*sinceramente agradecidos*” (sincerely grateful). Such emotionally-charged adjectives and boosting adverbs were rarely found in the US sample.

#### **4.3. Funding bodies and grants**

A quantitative and qualitative difference in the number and nature of the grants that supported the RPs analyzed was observed in the three corpora. On the one hand, a far greater number of papers published in the US sample were supported by grants (72% in the US corpus vs. 26% for the Venezuelan sample and only 4% for the Spanish one). The difference between the data recorded in the US sample and those observed in the Venezuelan and Spanish samples was found to be statistically significant ( $p = .0001$ ). It is interesting to note that of the 14 unfunded RPs from the US sample, eight were written by NNES.

Not only is the number of funded papers far greater in the US sample, but the number of grants per funded RP is also much higher in the US sample: 3.3 grants in average per funded RP vs. 1.1 for the Venezuelan sample and 1.0 for the Spanish corpus.

From a qualitative standpoint, interesting differences were found as well. As Table 2 shows, the majority of the grants that supported the US research papers came from extramural private agencies (56% of all the grants awarded) —mainly from the pharmaceutical industry, e.g., Novartis, Pfizer, Astra Zeneca, Sanofi— and, to a lesser extent, from National Institutes of Health and governmental research agencies (44% of all the grants recorded in the US sample). Interestingly, the grants mentioned in the US research papers written by NNES authors were mainly awarded by ministries and university research centers.

By contrast, **all** the grants from the Venezuelan sample either came from intramural sources (university research centers or other educational institutions) or from national research councils. It is interesting to note that these entities are almost always acknowledged, because Venezuelan funding bodies make it a requirement that their name and grant number be acknowledged in any publication based on the funded project. If researchers do not follow this rule, they take the risk of being refused funding for their future research. Sanofi was thanked only once in one paper from the Venezuelan sample for having provided the researchers with free drug samples, not for having awarded a grant to conduct the research. As for the Spanish sample, the only two grants recorded in the whole corpus came from national research centers.

#### **4.4. Breakdown of ACK categories**

As Figure 1 shows, the frequency of financial gratitude recorded in the US sample is significantly greater (72% of the US research papers mention some kind of financial support) than that recorded in the Venezuelan (26%) and the Spanish (14%) samples ( $p = .0001$  in both cases). Moreover, in the US corpus, financial recognition significantly outweighs any other ACK category ( $p = .0002$  when compared to the second most frequent ACK category, i.e., technical/instrumental). The same holds true for the Venezuelan sample, but here the difference between financial and technical recognition (26% vs. 14%, respectively) is not significant.<sup>9</sup>

Interestingly, the great majority (over 70%) of the ACKs from the Venezuelan corpus that mention some kind of financial support only mention such a support. Nothing else. By contrast, not a single case of mere financial recognition was recorded in the US sample.

Instrumental/technical recognition is the second main motivation of ACKs in both the Venezuelan (14%) and the US samples (34%), but it is by far the most prominent motivation of ACK in the Spanish sample: 57% of the ACKs from the Spanish sample document some sort of technical/instrumental recognition. The frequency of this ACK category in the Spanish sample is significantly greater from those recorded in the other two corpora ( $p = .0001$ ).

The third most frequent ACK motivation in the three samples corresponds to the conceptual/intellectual category of ACKs (peer interactive communication or PIC), but it is much less frequent than the two previously mentioned categories, even in the US sample, where only 24% of the RPs analyzed acknowledge some sort of intellectual input. It is much less frequently mentioned in the Spanish and Venezuelan samples (14% and 8%, respectively). At any rate, it is significantly more frequent in the US corpus than in the other two corpora ( $p = .0047$ ).

Editorial/linguistics assistance is of some importance in the US and Venezuelan corpus, where 12% and 10% of the papers do acknowledge such an assistance. We will comment on the qualitative aspect of this editorial/linguistic assistance in the discussion section of this paper.

## **5. Discussion**

### **5.1. Frequency and length of ACK sections and journal “instructions for authors”**

By systematically decomposing the ACKs paratexts in the Venezuelan, Spanish and US corpora, sharp differences were evidenced among the three publication contexts. First of all, our quantitative data clearly reveal that, in absolutely all respects, the highest figures were recorded in the US sample of ACKs. This is the sample where ACK paratexts are not only most frequently encountered and the longest, but also where they report the greatest number of acknowledgees and of grants received. It is interesting to note that the

average length of ACKs recorded in the Venezuelan and Spanish samples is very similar to that reported by Giannoni (2002) in his study of linguistics RPs.

The very high frequency of ACKs in our US sample of medical RPs is consistent with previous studies of ACKs in other ‘hard’ scientific fields published in Anglo-American journals, such as genetics (McCain, 1991), chemistry (Cronin et al., 2004), computer science (Giles & Councill, 2004), but also in some ‘soft sciences’ such as psychology and sociology (Cronin, 1995).<sup>10</sup>

As we stated in the Methods section and in the Appendix of this paper, all the journals consulted require that the persons/centers/entities that collaborated or supported the research be acknowledged. It should be mentioned, however, that the information provided by the English-language journals is much more detailed than that given by their Spanish-language counterparts. This is a clear reflection of the fact that it is in the Anglo-American biomedical research world and literature, where the issue about authorship and contributorship is most hotly debated (see Introduction of this paper).

The fact that, for reasons of power and/or prestige, NES as well as NNES researchers would rather see their names in the authors’ by-lines of papers published in English-language journals than in ACK sections that nobody, or hardly anybody, will read, may in part explain why guidelines are much stricter in Anglo-American scholarly journals. This, in turn, could account for the differences observed between the US sample of ACKs, on the one hand, and the two Spanish-written samples, on the other.

But we would like to put forth two further hypotheses that could also explain the difference observed in the frequency and length of ACKs between the English-written corpus and the two Spanish-written ones. The first hypothesis is that researchers who publish in Spanish-language journals perhaps do not pay much attention to ACK guidelines or ignore them altogether. After all, as Pignatelli et al. (2005) remark, definitions of authorship and authors’ behaviour vary in different countries. In their analysis of French medical journals, these authors indeed observed differences between editors’ criteria and researchers’ practice when compared to US journals.

As a matter of fact, French and even British researchers (Bhopal et al., 1997) consider the guidelines established by the International Committee of Medical Journal Editors 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. Longer authors' by-lines indeed mean shorter (or no) ACK paratexts. 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 behavior 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 (Wenhui et al., 2001). Our study thus lends further support to the fact that authors' compliance with editorial requirements and researchers' behavior vary from one publication context to another.

The second hypothesis is intimately related to the first one. We could indeed speculate that all the persons who contributed to the research reported in our Spanish-written samples —especially in the Venezuelan one— perhaps 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: 6). Some of these co-authors would perhaps not qualify for authorship in core English-language journals. There is so much pressure in the Spanish-speaking world 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 & Lillis, 2004; Gómez et al., 2006). 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 ACKs are attributed in the non-English speaking world.

It would be interesting to know how Spanish and Venezuelan researchers behave when submitting their research to English-language journals. Do they more frequently include an ACK section in their RPs? Does this section tend to be longer? Would there be a difference between medical journals published in English in non-English speaking countries and those published in the English-speaking world where *impactitis* is endemic and where the debate over the impact factor issue has triggered heated —sometimes even contentious— debate (Pelderman, 2007)? The US sample we analysed did not allow us to

answer this question because of the 50 US research papers examined, only one was written by Spanish-speaking scientists from Spain. However, the results of our research suggest that NNEs scientists' ACK behavior differs from that of their NES counterparts even when publishing in English-language journals. This would answer the question asked at the beginning of this paragraph, but further research is surely needed to confirm this finding.

## 5.2. Funding

Stark differences were also observed in the amount of grants and other financial support received by the RPs published in the three corpora, papers from the US corpus being much more frequently and substantially funded than those from the Spanish-language journals. This is not surprising because in 2000, and in the United States of America alone, the pharmaceutical industry financed over 62% of biomedical research (about US\$30 billion as reported by Bekelman & Gross, 2003). What is more, in the USA the proportion of industry-funded medical research has almost doubled since 1980 (Henry & Lexchin, 2002). We contend that the number of grants recorded would have even be higher had we examined clinical trials only.

The qualitative difference observed regarding the sources of funding, especially between the US and the Venezuelan samples, also clearly reflects the fact that in the developed world, about 70% of medical research is financed by the **private** sector (this figure, however, may differ from one developed country to another), whereas it is the **public** sector that (meagrely) supports scientific research in developing countries (Nour, 2005; Salager-Meyer, 2008).

Our quantitative data on funding also mirrors the fact that the European Union invests much less in health research than the USA. In 2004, for example, in the US the non-industrial sector spent twice as much as Europe on biomedical research and almost three times as much when adjusted for the size of the two populations (Groves, 2008)<sup>11</sup>. What is more, within Europe, health research must compete for its slice of the science funding pie, especially with physicists who are very influential in European policy, which is not the case in the USA.

### 5.3. Gratitude leitmotifs: concreteness and materiality

The concreteness or materiality of ACK paratexts in the Venezuelan, Spanish and English (US) biomedical literature is clearly evidenced by our data on the frequency of the different categories of ACKs. Indeed, in the three corpora, our study showed that acknowledgment of financial and technical/instrumental assistance is much more important than peers' ideational input (PIC). We can thus claim that these two ACK categories — financial and technical/instrumental— are the two ACK “leitmotifs” (a very adequate term we borrowed from Cronin & Franks, 2006) of medical research.

The editorial/linguistic expression of gratitude recorded in the Venezuelan and US samples deserves our attention too. In the Venezuelan sample, such gratitude is mentioned in the three research papers written in English by Spanish-speaking scientists (See Table 2). The ACK motivation is thus straightforward: the authors thank the person who proofread or translated their manuscripts. (As an aside, one could wonder whether these three papers had first been submitted to an English-language —more prestigious— journal, rejected, and then resubmitted to a less visible Spanish-language journal.)

By contrast, the ACKs documenting editorial assistance in the US corpus are quite ambiguous. Thanking a person for his/her “editorial support or assistance” or for “reviewing” or “preparing” the manuscript seems to be characteristic of US medical RPs, but one does not really know what this assistance refers to. Since editorial support was only mentioned in the ACK section of clinical trials supported by the pharmaceutical industry, we strongly suspect that medical (ghost?) writers were thanked for writing up or “helping to prepare” the manuscript (cf. Introduction).

At any rate, our quantitative results regarding the frequency of the different categories of ACK are quite at variance with those reached by previous ACK research in other fields where PIC was found to be the most frequently acknowledged support. In astronomy (Verner, 1994; reported in Cronin, 1995: 34), library and information science (Cronin et al., 1993), computer science (Giles & Councill, 2004), and papers published in *Cell* (Cronin & Franks, 2005), PIC plays such an important role that some researchers have even considered it to be at least as valuable as citations (Edge, 1979; McCain, 1991; Cronin et al., 1993). In other ‘softer’ fields, such as history, sociology, philosophy and psychology (Cronin, 1995; Cronin et al., 2003) and in PhD dissertations and MA theses

(Hyland, 2003) across a range of hard and soft disciplines, conceptual support or academic assistance was also found to predominate.

The above discussion leads us to argue that the concrete and materialistic nature of the content of ACK paratexts in biomedical research is a clear reflection of the highly technical nature of biomedical research, on the one hand, and, on the other, of the importance of the “ritualised genuflection” (Cronin, 1995: 14) towards funding bodies and supporting institutions. The fact that financial support is acknowledged more frequently in biomedical papers than it is in other disciplines is also linked to the following factors: 1) biomedical research projects are more expensive and cannot be conducted without specific funding; 2) most (if not all) funding bodies mandate to be acknowledged (see Section 4.3 above), and 3) most (if not all) biomedical journals require that authors mention any source of financial support in their paper in order to ensure transparency and avoid conflicts of interest.<sup>12</sup>

All this, in turn, mirrors the fact that research published in English-language medical journals —as most such research in the hard and some “hard” soft sciences today— is an enterprise that involves interdependence, teamwork and frequent material collaboration among peers. All this lends further support to the hypothesis that the communicative and sociocultural conventions of academic contributorship —as reflected by ACK behavior— are discipline dependent (Cronin, 2005; Hyland, 2000). We would now like to argue that the present research shows that these conventions also strongly depend on the research publication and language context.

### **Getting first-hand feedback: personal interviews and email correspondence with Spanish and Venezuelan researchers**

In order to test our hypotheses regarding the motivations that could lie behind Venezuelan and Spanish researchers’ ACK behaviour, we interviewed and/or e-mailed a short questionnaire to seven fully-fledged medical researchers from Venezuela and three from Spain. Although no generalisation can be drawn from such a small sample of interviewees, their answers are very illustrative. Here are some of them:

- For well-known reasons, many persons who did not actually participate in the research appear as co-authors, e.g., heads of our university laboratories. (S and V). Interestingly, French medical researchers tend to behave in the same way (Pignatelli et al., 2005).
- We do not proffer thanks because we consider ourselves “too good” to thank anyone (V)
- We do not pay much attention to journal guidelines (S and V).
- We tend to mention our colleagues as co-authors even if their contribution was minimal so that they will in turn include our names in their future publications (V).
- If a neurologist needs a radiologist to take X-rays from patients, and if the neurologist writes a paper from the study, he will usually include the radiologist in the list of co-authors, not in the ACK section, even though the radiologist’s contribution was limited to taking X-rays (S). Again, all this for CV purposes (S).
- I always had the impression that the ACK section is much less frequent in our (Spanish) medical journals than in the Anglo ones. And when an author includes it, it is usually to mention a scholarship or some sort of public funding (V).
- In Spain most medical research is conducted in public hospitals. In university (teaching) hospitals as well. (This explains the origin of the funds received)
- We should acknowledge the persons (nurses, secretaries, technicians, proofreaders, etc.) who helped in one way or another in the research, but it is not always the case. They are most frequently omitted (S and V).

## **6. Conclusions**

We have here examined the frequency and content of the ACK paratext in three different research publication contexts: Venezuela, Spain and the United States of America. The paratextual findings reported here tellingly underscore the fact that “backstage solidarity” (Goffman, 1959; cited in Cronin & Franks, 2006) significantly differs from one context to the other.

Social and information scientists quite rightly refer to the inherently collective nature of contemporary research and to the complex web of interpersonal debts the construction of knowledge implies. Our data indicate that the structural complexity of the sociocognitive ties between professional peers as revealed by research paper ACK paratexts is much more an integral facet and a ritualized politeness expression of research

reported in US journals than it is in their Spanish-language counterparts. In the latter, indeed, ACK sections are not only much less frequent but also much less “nurtured” as far as public debt payment for the services rendered is concerned.

We could perhaps wonder how important it is to Spanish-speaking scientists to thank their colleagues for their collaboration/or and expertise. What is the influence of language and culture here?<sup>13</sup> A close look at the ACK paratexts of the RPs written by NNES and published in the US journals analyzed here seems to indicate that NNES’ behavior differs from that of NES, even when they publish in English-language journals. This suggests that the size of the audience and that of the academic community researchers belong to —two factors that have been put forth to explain intercultural variability (e.g., Burgess, 2002; Moreno, 2008) — cannot be held responsible for the differences observed in the present study, but we would need a much larger sample to corroborate this hypothesis.

We could also wonder whether, in the Spanish-speaking academic world, because of the intense pressure to publish at all costs, teamwork would not only be expressed in the authorship by-lines to the detriment of the ACK paratext, a section which has not (yet) become an institutionalized practice in the Spanish-speaking world, as our interviewees’ remarks so clearly underline.

In his enlightening book *The Hand of Science*, Cronin (2005) convincingly claims that the ways in which, and reasons for which, scholars acknowledge their peers vary greatly, thus reflecting inherent differences in epistemic disciplinary and discursive cultures. No doubt; but we should not forget that the extensive body of research that led Cronin and his colleagues to make such an assertion is based on linguistic samples written in English. Science exists outside the Anglo-American world and is reported in languages other than English. As Pignatelli et al. (2005) argue, most studies concerning the question of authorship have been conducted in English-speaking countries, and there is a need for French guidelines on authorship and ACK to be proposed and implemented. A similar remark could very well be applied in the Spanish-speaking academic world.

The results of the present research strongly suggest that the publication context plays an important role on the way the politics of exchange is conveyed in medical research. Further cross-linguistic, cross-disciplinary, cross-generic synchronic and

diachronic research is certainly needed to confirm or disprove the findings herein reported. It would provide valuable historical and experimental data on the exploration of the “less visible” in scholarly reporting.

## **LIST OF REFERENCES**

- Bazerman, C. (1994). *Constructing Experience*. Carbondale: Southern Illinois University Press.
- Beaver, D. B., & Rosen, R. (1978). Studies in scientific collaboration. Part I. The professional origin of scientific authorship. *Scientometrics*, 1, 65-84.
- Bekelman, J. E., & Gross, C. P. (2003). Scope and Impact of Financial Conflicts of Interest in Biomedical Research: A Systematic Review. *JAMA*, 289, 454-465.
- Ben-Ari, E. (1987). On Acknowledgments in Ethnographies. *Journal of Anthropological Research.*, 43(1), 63-84.
- Bhopal, R., Rankin, J., & McColl, E. (1997). The vexed question of authorship: views of researchers in a British medical faculty. *British Medical Journal*, 314, 1009-1012.
- Burgess, S. (2002). Packed houses and intimate gatherings: audience and rhetorical structure. In J. Flowerdew & C. N. Candlin (Eds.), *Academic Discourse* (pp. 197-215). London: Longman.
- Castelnuovo, G. (2008). Time for the single researcher impact factor. *British Medical Journal*, 336, 789.
- Connor, U. (2004). Intercultural Rhetoric Research: Beyond Texts. *Journal of English for Academic Purposes*, 3(4), 291-305.
- Connor, U., & Moreno, A. (2005). *Tertium comparationis*: a vital component in contrastive rhetoric research. In P. Bruthiaux, D. Atkinson, W. Eggington, W. Grabe & V. Ramanathan (Eds.), *Directions in Applied Linguistics: Essays in Honor of Robert B. Kaplan* (pp. 153-164). Clevedon: Multilingual Matters.
- Cronin, B. (1995). *The Scholar's Courtesy. The Role of Acknowledgments in the Primary Communication Process*. Los Angeles: Taylor Graham.
- Cronin, B. (2002). Hyperauthorship: a postmodern perversion or evidence of a structural shift in scholarly communication practice. *Journal of the American Society for Information Science and Technology*, 52(7), 558-569.

- Cronin, B. (2005). *The Hand of Science: Academic Writing and Its Rewards*. Lanham (MD): Scarecrow Press.
- Cronin, B., McKenzie, G., & Stifler, L. (1992). Patterns of Acknowledgments». *Journal of Documentation*, 48(2), 107-122.
- Cronin, B., McKenzie, G., & Rubio, L. (1993). The Norms of Acknowledgments in Four Humanities and Social Sciences Disciplines. *Journal of Documentation*, 49(1), 29-43.
- Cronin, B., Shaw, D., & La Barre, K. (2004). Visible, Less Visible and Invisible: Patterns of Collaboration in 20th Century Chemistry. *Journal of the American Society for Information Science and Technology*, 55(2), 160-168.
- Cronin, B., & Franks, S. (2006). Trading cultures: resources mobilization and service rendering in the life sciences as revealed in the journal articles' paratext. *Journal of the American Society for Information Science and Technology*, 57(14), 1909-1918.
- Curry, M. J., & Lillis, T. (2004). Multilingual scholars and the imperative to publish in English: negotiating interests, demands and rewards". *TESOL Quarterly*, 38(4), 663-689.
- Davis, C., & Cronin, B. (1993). Acknowledgments and Intellectual Indebtedness: A Bibliometric Conjecture. *Journal of the American Society for Information Science and Technology*, 44(10), 590-592.
- Durani, P., Rimouche, S., & Ross, G. (2007). How many plastic surgeons does it take to write a research article? Authorship proliferation in and internationalization of the plastic surgery literature. *Journal of Plastic Reconstruction and Aesthetic Surgery*, 60, 956-957.
- Edge, D. (1979). Quantitative Measures of Communication in Science. *History of Science*, 19, 102-134.
- Flowerdew, L. (2005). An Integration of Corpus-based and Genre-based Approaches to Text Analysis in EAP/ESP: Countering Criticisms against Corpus-based Methodologies. *English for Specific Purposes*, 24(3), 321-32.
- Genette, G. (1997). *Palimpsests: Literature in the second degree*. Lincoln: University of Nebraska Press.
- Giannoni, D. S. (1998). The Genre of Journal Acknowledgments: Findings of a Cross-disciplinary Investigation. *Linguistica e Filología*, 6, 61-84.
- Gianonni, D. S. (2002). Worlds of Gratitude: A Contrastive Study of Acknowledgment Texts in English and Italian Research Articles. *Applied Linguistics*, 23(1), 1-31.

- Giannoni, D. S.. (2005). Evaluation in academic book acknowledgements (Bas) across texts and disciplines. Paper presented at the XV European Symposium on Languages for Specific Purposes. Bergamo (Italy), 29-08/2-09/2005.
- Giles, C. L., & Councill, I. G. (2004). Who Gets Acknowledged: Measuring Scientific Contributions through Automatic Acknowledgment Indexing. *Proceedings of the National Academy of Science*, 101(51), 17599-17604.
- Goffman, E. (1959). *The Presentation of Self in Everyday Life*. New York: Doubleday.
- Gómez, I., Sancho, R., Bordons, M. & Fernández, M. T. (2006). La I+D en España a través de sus publicaciones y patentes. In J. Sebastián & E. Muñoz (Eds.), *Radiografía de la Investigación Pública en España* (pp. 275-302). Madrid: Biblioteca Nueva.
- Gøtzsche, P.C., Hróbjartsson, A., Krogh Johansen, H., Haahr M.T., Altman, D.G., Chan, A.W. (2007) Ghost Authorship in Industry-Initiated Randomised Trials. *Public Library of Science*. Paper available at: <http://medicine.plosjournals.org/perlserv/?request=get-document&doi=10.1371%2Fjournal.pmed.0040019&ct=1>
- Groves, T. (2008). Stronger European medical research. *British Medical Journal*, 336, 341-342.
- Heffner, A. G. (1979). Authorship Recognition of Subordinates in Collaborative Research. *Social Studies of Science*, 12, 535-558.
- Henry, D., & Lexchin, J. (2002). The Pharmaceutical Industry as a Medicines Provider. *The Lancet*, 360, 1590-1595.
- International Committee of Medical Journal Editors (ICMJE). (2006). II.A.2. Contributors listed in acknowledgments. Retrieved January 14, 2008, from <http://www.icmje.org>.
- Hyland, K. (2000). *Disciplinary Discourses: Social Interactions in Academic Writing*. London: Pearson Education.
- Hyland, K. (2003). Dissertation Acknowledgments: The Anatomy of a Cinderella Genre. *Written Communication*, 20(3), 242-268.
- Hyland, K. (2004). Graduates' Gratitude: The Generic Structure of Dissertation Acknowledgments. *English for Specific Purposes*, 23(3), 303-24.

- Hyland, K., & Polly, T. (2004). "I would like to thank my supervisor": Acknowledgments in Graduate Dissertations. *International Journal of Applied Linguistics*, 14(2), 259-275.
- Jacob, A., & Wager, E. (2005). European Medical Writers Association (EMWA) guidelines on the role of medical writers in developing peer-reviewed publications. *Current Medical Research Opinion*, 21(2), 317-321.
- Kapoor, V. K. (1995). Polyauthoritis giftosa. *The Lancet*, 346, 1039.
- Kertschmer, H., & Rousseau, R. (2001). Author inflation leads to a breakdown of Lotka's law. *Journal of the American Society for Information Science and Technology*, 52(8), 610-614.
- Laband, D. N., & Tollison, R. D. (2000). Intellectual collaboration. *Journal of Political Economy*, 108(3), 632-662.
- Langdon-Neuner, E. (2008). Medical Ghost-writing. *Journalology*, 6(1), 257-273.
- Mauranen, A. (1993). *Cultural Differences in Academic Rhetoric: A Text Linguistic Study*. Frankfurt am Mein: Peter Lang.
- McCain, K. W. (1991). Communication, Competition and Secrecy: The Production and Dissemination of Research-related Information on Genetics. *Science, Technologies and Human Values*, 16(4), 491-516.
- Meadows, J. (2005). Differences between the Sciences in their Handling of the Research Literature. *European Science Editing*, 31(4), 113-116.
- Modi, P., Hassan, A., Teng, J., & Chitwood, W. R. (2008). How many cardiac surgeons does it take to write a research article? Seventy years of authorship proliferation and internationalization in the cardiothoracic surgical literature. *The Journal of Thoracic and Cardiovascular Surgery*, 136, 4-6.
- Moreno, A. I. (2008). The importance of comparable corpora in cross-cultural studies. In U. Connor, E. Nagelhout & W. Rozycki (Eds.), *Contrastive Rhetoric: Reaching to Intercultural Rhetoric* ( pp. 25-41). Amsterdam: John Benjamins.
- Morris, S. A., Golstein, M. L., & Deyong, C. F. (2005). Manifestation of research teams in journal literature: a growth model of papers, authors, collaboration, co-authorship, weak ties and Lotka's law. *Journal of the American Society for Information Science and Technology*, 58(12), 1764-1782.

- Mullins, N. C. (1973). *Theories and Theory Groups in American Sociology*. New York: Harper & Row.
- National Science Board (2004). *Science and engineering indicators*. Retrieved November 15, 2007, from <http://www.nsf.gov/sbe/srs/seind04/>
- Nour, S. S. (2005). Science and technology development indicators in the Arab region: a comparative study of Arab Gulf and Mediterranean countries. *Science, Technology and Society*, 10(2), 249-274.
- Patel, N. (1973). Collaboration in the professional growth of American sociology. *Social Science Information*, 12(6), 77-92.
- Pelderman, A. K. S. (2007). Keep your hands off our impact factor. *European Science Editing*, 33(4), 98-99.
- Pérez-Llantada Auría, M<sup>a</sup> C. (2006). An interview with Charles Meyer. *IBÉRICA*, 12, 127-134.
- Pignatelli, B., Maisonneuve, H., & Chapuis, F. (2005). Authorship ignorance: views of researchers in French clinical settings. *Journal of Medical Ethics*, 31, 578-581.
- Rennie, D., Yank, V., & Emmanuel, L. (1997). When authorship fails. A proposal to make contributors accountable. *JAMA*, 278, 579-85.
- Reyes, H., Jacard, M., & Herskovic, V. (2001). Authorship in a medical journal from a developing country. Retrieved October 22, 2007, from [http://www.ama-assn.org/public/peer/prc\\_program2001.htm](http://www.ama-assn.org/public/peer/prc_program2001.htm)
- Salager-Meyer, F. (2008). Scientific publishing in peripheral (a.k.a. developing) countries: challenges for the future. *Journal of English for Academic Purposes*, In press.
- Salager-Meyer, F., Alcaraz Ariza, M. Á., Pabón, M., & Zambrano, N. (2006). Paying one's intellectual debt: acknowledgments in scientific/conventional and complementary/alternative medicine. In M. Gotti & F. Salager-Meyer (Eds.), *Advances in Medical Discourse: Oral and Written Contexts*. (pp. 407-431). Bern: Peter Lang.
- Sokol, D. (2008). The dilemma of authorship. *British Medical Journal*, 336, 478.
- Swales, J. (2004). *Research Genres: Exploration and Applications*. Cambridge: Cambridge University Press.
- Van Diest, P. J., Holzel, H., Burnett, D., & Crocker, J. (2001). Impactitis: new cures for an old disease. *Journal of Clinical Pathology*, 54, 817-819.

- Verner, D. A. (1994). Personal communication (cf. Cronin 1995: 34).
- Webber, P. (2005). Interactive Features in Medical Conference Monologue. *English for Specific Purposes*, 24(2), 157-181.
- Weeks, W. B., Wallace, A. E., & Kimberly, B. C. (2004). Changes in authorship patterns in prestigious US medical journals. *Social Science and Medicine*. 59, 1949-1954.
- Whenhui, L., Shouchu, Q., & Yue, Q. (2001). Authorship of Published Medical Papers in Three Chinese Medical Journals. Retrieved October 22, 2007, from [http://www.ama-assn.org/public/peer/prc\\_program2001.htm](http://www.ama-assn.org/public/peer/prc_program2001.htm)
- Wooley, K. L., Ely, J. A., Wooley, M. J., Findlay, L., Lynch, F. A., Choi, Y., & McDonald, J. M. (2006). Declaration of medical writing assistance in international peer-reviewed publications. *JAMA*, 296, 932-934.

## APPENDIX

### **Journals consulted with their respective indexation and guidelines concerning the acknowledgement paratext**

#### **1. Journals published in the UNITED STATES OF AMERICA (US sample)**

##### **1.1. Annals of Internal Medicine**

*Publication of* American College of Physicians

*Abstracted/Indexed in* 48 indexes, including EMBASE, MEDLINE®, SCI, SSCI, Science Citation Index, Scopus

*ACK guidelines:*

Acknowledge only persons who have contributed to the scientific content or provided technical support. Authors should obtain written permission from anyone that they wish to list in the Acknowledgments section. The corresponding author must also affirm that he or she has listed everyone who contributed significantly to the work in the Acknowledgments.

##### **1.2. The American Journal of Medicine**

*Publication of* The Association of Professors of Medicine

*Abstracted/Indexed in* 48 indexes, including EMBASE, MEDLINE®, SCI, SSCI, Science Citation Index, Scopus

*ACK guidelines:* Acknowledgments, including **grant** support, should be placed at the end of the text. Each author must have participated in the writing of the manuscript, and have seen and approved the submitted version. Further, each author should have been involved in the conception and design of the study, or the analysis of the data.

#### **2. Journals published in SPAIN**

**2.1. Medicina Clínica.** Accepts papers in Spanish and English

*Indexed in:* Science Citation Index (SCI), MEDLINE (Index Medicus), Current Contents, BIOSIS (Biological Abstracts), EMBASE (Excerpta Medica)

*ACK guidelines:* When necessary, the persons/centres/entities that collaborated or supported the research will be acknowledged. In case of commercial involvement, this should also be mentioned in the acknowledgment section.

## **2.2 Medicina Intensiva**

*Publication of the* Sociedad Española de Medicina Intensiva, Crítica y Unidades Coronarias (SEMICYUC)

*Indexed in:* MEDLINE (Index Medicus), Scopus, Excerpta Medica/EMBASE (Holland)

*ACK guidelines:* All sources of **funding** must be mentioned, as well as their involvement in the study design, collection, analysis or interpretation of data, drafting of the manuscript or decision to submit it for publishing. If funding sources played no role, it should be stated that they "had no participation in the study design, collection, analysis or interpretation of data, drafting of the manuscript or decision to submit it for publication."

## **3. Journals published in VENEZUELA**

The three of them accept papers written in Spanish, Portuguese and English

### **3. 1. Investigación Clínica**

*Publication of the* Clinical Research Center "Dr. Américo Negrette". School of Medicine. Zulia University.

*Indexed in* 28 indexes including SciELO (Scientific Electronic Library Online), LILACS (Literatura Latinoamericana y del Caribe en Ciencias de la Salud), Index Medicus/MEDLINE (USA) and Excerpta Medica/EMBASE (Holland)

*ACK guidelines*

Define authorship criteria. The persons who have obtained the funds to conduct the research, who have collected data or who supervise the research group do not qualify for authorship. The group members who do not fulfill authorship criteria should be listed in the acknowledgment section with their approval. The research group as a whole should decide on the order in which the co-authors appear in the bylines.

### **3.2. Revista Venezolana de Oncología**

*Publication of* the Sociedad Venezolana de Onconología

*Indexed in:* 19 indexes including SciELO, LILACS, LIVECS (Literatura Venezolana en Ciencias de la Salud), REVENCYT LATINDEX (Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal)

*ACK guidelines:* Should list all those persons who collaborated in the study but who do not qualify as authors.

### 3.3. Revista de Obstetricia y Ginecología de Venezuela

*Publication of* the Sociedad de Obstetricia y Ginecología de Venezuela

*Indexed in:* 10 indexes including SciELO, LILACS and Index Medicus

*ACK guidelines:*

Should mention all those persons who collaborated in the research but who do not qualify as authors. Financial support should also be mentioned.

---

#### <sup>1</sup> Acknowledgments

This research was supported by M-792-04-06 from the University of The Andes Research Center. We are most grateful to Dr. Abdel Fuenmayor P. for his insightful comments on an earlier version of this paper. We would also like to thank Drs. Abdel Fuenmayor Jr, Ignacio García, Fernando Navarro, José Luis Hernández, Edgar Nieto, Trino Baptista, Julián Aguirre, Mar Blanes Martínez, María José Santana Maján and Francisco Javier Mataix Climent who so kindly answered our questionnaires and/or accepted to be interviewed regarding their ACK behavior. **We would also like to thank the two anonymous reviewers for their insightful comments on an earlier draft of this paper.**

<sup>2</sup> ‘Contributors’ would refer to those who made significant and useful contribution to the research, and ‘guarantor’ to the person who would take overall responsibility for the work.

<sup>3</sup> The expression *medical ghostwriter* is a relatively new term in medicine, different from the ghost-writing of autobiographies, fiction and political speeches in the sense that the former is a medical writer paid by the pharmaceutical industry, contract research organizations and/or medical communication agencies that serve the industry. Some medical writers are employed by the industry or its service agencies while others are self employed and work under contracts. **In science, then, "ghost authors" are people who contribute to the research but are not given authorship credit for whatever reason, while "gift authors" are individuals who make no contributions but still receive authorship credit.**

<sup>4</sup> The problem is that it is difficult to know exactly how many papers are ghostwritten. However, Gotzsche et al. (2007) recently found that, from the 44 publications based on clinical trials they looked at, 31 had ghost statisticans. See <http://medicine.plosjournals.org/perlserv/?request=getdocument&doi=10.1371/journal.pmed.0040019>.

<sup>3</sup> Hyland (2004) provides powerful reasons for considering the ACK section in PhD and MA theses as a genre in its own right.

<sup>4</sup> *Parallel corpora* are defined as sets of comparable original texts written independently in two or more languages, and the notion of comparability is equated to the concept of *equivalence* (Connor and Moreno, 2005: 155).

<sup>7</sup> The authors of these RPs are based in countries where English is not spoken as a native language.

<sup>8</sup> These usually appear in the authors’ bylines.

---

<sup>9</sup> Considering alternatives for the impact factor “algorithm” Castelnuovo (2008) suggests the "single researcher impact factor" which takes into account the merits and contributions of all the scientific activities of each single researcher instead of measuring impact factor numbers only.

<sup>10</sup> Cross-disciplinary studies of ACK (Cronin et al., 1992; Cronin, 1995) have shown that philosophers and historians are much less assiduous in crediting the multifarious contributions of behind-the-scene actors. Cronin (1995) rightly argues that the cross-disciplinary differences observed in ACK frequency could suggest a gradation from soft to hard subject matters. Biomedicine certainly aligns itself along the hard disciplines, at least as is revealed by the ACK sections of papers published in the top ranking US journals we examined here.

<sup>11</sup> In 2004, the US non-industrial sector spent around 0.40% of its gross domestic product on biomedical research compared with 0.17% in the then EU 15 member states (before the accession of 10 candidate countries on May 1<sup>st</sup> 2004). As Groves (2008) points out, the difference would have been much greater if all EU countries were included.

<sup>13</sup> It is a fact that Venezuelans in general do not express their gratitude as frequently as English- (or French) native speakers do. The concept of ‘politeness’ is certainly not the same in Venezuela as it is in France, the United Kingdom or Spain.