
Quantifying the Burden of Writing Research Articles in a Second Language: Data From Mexican Scientists

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David I. Hanauer¹ and Karen Englander²

Abstract

This article provides quantitative data to establish the relative, perceived burden of writing research articles in English as a second language. Previous qualitative research has shown that scientists writing English in a second language face difficulties but has not established parameters for the degree of this difficulty. A total of 141 Mexican, Spanish-speaking scientists from a range of scientific disciplines participated in a survey which directly compared writing scientific research articles in Spanish and English as a second language. The survey questions defined burden in relation to perceived difficulty, dissatisfaction, and anxiety. The results revealed that the experience of writing a scientific research article in English as a second language is significantly different than the experience writing in a first language and that this writing process was perceived as 24% more difficult and generated 11% more dissatisfaction and 21% more anxiety. The findings suggest that the use of English as a second language is the cause of this increased burden.

Keywords

research article, science, writing, second language, difficulty

¹Indiana University of Pennsylvania, Indiana, PA, USA

²Universidad Autonoma de Baja California, Ensenada, Mexico

Corresponding Author:

David I. Hanauer, Professor of English, Graduate Studies in Composition and TESOL,
215D Leonard Hall, Indiana University of Pennsylvania, Indiana, PA 15705, USA
Email: Hanauer@iup.edu

The world of scientific publication is dominated by the English language (Ammon, 1998, 2006; Hamel, 2007; Tsunoda, 1983). Research over the last three decades has shown a continual increase in the percentage of scientific publications in English from 66% in the 1980s (St. John, 1987) to 89% or 90% at the end of the 20th century (Ammon, 1998; Martel, 2001). The situation is such that Hamel (2007) has made the claim that there is a rapid trend toward English monoculturalism in scientific publication. However, while the vast majority of scientific publication might be in English, the scientists producing knowledge and who desire to disseminate their findings are not necessarily first-language English speakers. The majority of the world's scientists (Organization for Economic Cooperation and Development, 2009) are second-language speakers of English who are writing research articles in English as a second language.

Research has established that scientists who are required to publish their scientific research in English as a second language face difficulties (Ammon, 1998, 2006; Flowerdew, 2007; Hanauer & Englander, 2009; Salager-Meyer, 2008). However, it is an open question to what degree writing science in English as a second language is more difficult than writing science in a first language. In other words, the actual increased burden of writing science articles in English as a second language as understood by the second language scientists themselves has not been quantified. Furthermore, there have been claims that the difficulties faced by second-language scientists result from disciplinary rather than linguistic problems (Swales, 2004). The aim of this article is to provide quantitative data to establish the relative burden of writing research articles in English as a second language as perceived by scientists who publish research articles in both first and second languages.

Difficulties in Second-Language Science Writing

Writing science in English as a second language has been researched from the experiential perspective of the writers and by means of analysis of the texts they produce. Each of these avenues of research provides important data on the challenges of writing science when English is not the native language. Although two small-scale studies (Cho, 2009; Matsumoto, 1995) report that some expert Korean and Japanese scientists do not find English to be a barrier to publication, the great majority of research reports a variety of difficulties.

The language of English itself is reported as being difficult for scientists to write when it is not their native language. Uzuner's (2008) comprehensive meta-analysis of 39 studies states that scientists working in a second

language have difficulty with decreased vocabulary, complications with syntax, unclear modality, and inappropriate usage of idiomatic expressions. Additional recent studies with Korean (Cho, 2009), Polish (Duszak & Lewkowicz, 2008), and Armenian scientists (Sahakyan, 2006, cited in Duszak & Lewkowicz, 2008) continue to document that linguistic difficulties occur for scientists when writing research articles in a second language.

The process of writing is reported as being difficult as well. It is slow, laborious, time-consuming, and tedious (Curry & Lillis, 2004; Flowerdew, 1999; Lillis & Curry, 2010; Silva, 1993). Impediments include extensive writing in a first language before translation into English (Duszak & Lewkowicz, 2008; Englander, 2009; Gosden, 1996; St. John, 1987); searching for and borrowing words and phrases from other researcher's manuscripts (Flowerdew & Li, 2007; St. John, 1987); and seeking out native English-speaking friends and colleagues to read draft versions (Clavero, 2010). When scientists reproduce their science manuscripts from a first language into English, they have reported needing to simplify their ideas because of an inability to express them in English (Pérez-Llantada, Plo, & Ferguson, 2011) and feeling dissatisfied with their English version (Englander, 2009; St. John, 1987). The writing process can be especially long because second-language scientists commonly subject their manuscripts to multiple rounds of revision before and after submission to a journal (Burrough-Boenisch, 2003).

Aside from reports of scientists' experiences in the studies above, another avenue of research has examined how the textual conventions of scientific writing differ across languages. Contrastive analytical studies demonstrate that differences may occur in the rhetorical relationship between the writer and the reader (Carrió-Pastor, 2006; Gosden, 1996; Yakhontova, 2002). The persuasive sections of a research article, that is, the Introduction and Discussion, textually are especially troublesome (Martín-Martín, 2008; St. John, 1987; Swales & Feak, 2004). Appropriateness for claims and their support is a delicate, nuanced activity that requires significant degrees of control over linguistic expression (Carrió-Pastor, 2006). Cultural and linguistic differences are manifested, for example, in the typical amount of hedging (Cho, 2004; ElMalik & Nesi, 2008) or boosting (Englander, 2009; Flowerdew, 1999) and the manner of critique of others' research (Harwood & Hadley, 2004; Moreno, 2010; Moreno & Suárez, 2008). These differences sometimes render nonnative English speakers' manuscripts to be considered "poor" or "awkward" when they are reviewed by journal editors (Clavero, 2011; Englander, 2006; Gosden, 2003).

The scientific research article itself has become a well-codified genre (Gross, Harmon, & Reidy, 2002; Zerbe, 2007) apart from language and

cultural differences. There is no evidence that there are linguistic or cultural differences regarding the purpose of the foundational Introduction-Method-Results-Discussion sections within scientific research articles (Swales, 2004). Overall, scientific articles within a given discipline are much more similar to each other than different (Salager-Meyer, 2008). In other words, the function of reporting science is consistent and it is based on the same principles of the scientific method (Lillis & Curry, 2010). Thus, in spite of the rhetorical differences discussed earlier, the basic structure and social function of the scientific research article is consistent across languages.

This consistency underlies a position sometimes taken in the field: Problems in writing a scientific research article is more of a disciplinary issue than a linguistic one. For example, Swales (2004) claims that “the difficulties typically experienced by [nonnative-English-speaking] academics in writing in English are (certain mechanics such as article usage aside) *au fond* pretty similar to those typically experienced by native speakers” (p. 52). The difficulties for native-English academics include identifying the appropriate level of claim (Myers, 1990), writing quickly and with the best possible choice of wording (Swales, 2004), and managing anxiety and interactions with journal editors (Casanave & Vandrick, 2003). The disciplinary argument proposes that it is the conventions of scientific writing itself rather than language that poses the main difficulty for all scientists.

Thus, the existing literature raises an interesting question. On the one hand, there are a series of studies which present qualitative data which strongly suggest that scientists do face difficulties in writing scientific research articles in a second language. At the same time, an argument has been proposed that these difficulties are a result of disciplinary conventions of learning scientific writing and that they are not so different from those who write science in their first language. The research reported in this article addresses this situation by designing a study that isolates language as a variable for consideration in scientific writing and provides quantifiable data on the self-reported, relative burden of this variable. In other words, the study reported here is able to establish the degree to which writing a research article in a second language is perceived by scientists as involving increased difficulty and thus provides evidence to address the question concerning whether these difficulties are disciplinary or linguistic.

Research Questions

Research Question: Does the experience of writing a research article in English as a second language involve the perception of increased

degrees of burden when compared with the experience of first-language science writing?

- a. To what degree is writing a scientific article in English as a second language perceived to be more difficult than writing a scientific article in a first language?
- b. To what degree does writing a scientific article in English as a second language generate more dissatisfaction than writing a scientific article in a first language?
- c. To what degree does writing a scientific article in English as a second language generate more anxiety than writing a scientific article in a first language?

Method

This study used a quantitative survey design. As set out in the research questions above, the aim of this study was to quantify the perceived burden of writing science in English as a second language. Two conceptual components contributed to the development of an appropriate design for the survey used in this study. First the concept of writing burden was explicated. Burden was seen as consisting of three related but different components: self-perceived difficulty, anxiety, and dissatisfaction. Accordingly, the design aimed to elicit information about all three of these components.

The second conceptual component was the idea that a differential D-score approach should be used. A D-score refers to a design in which the difference between two manifestations of the same measure is the issue of interest. In the present case, this addressed the self-reported perceptions of the difference between first-language and second-language science writing. In order to operationalize this idea, a set of parallel questions with rating scales in relation to the difficulties, degrees of satisfaction, and levels of anxiety associated with scientific writing in both first and second languages were constructed. By asking the same questions in relation to writing science in the second-language English and the first-language Spanish and by considering the difference between the ratings for each of these components, it is possible to quantify the self-reported and perceived burden of writing science in a second language. This design isolates the component of language in science writing and allows the quantification of the self-perceived, difference between the experiences of first- and second-language science writing.

Participants. This study was conducted in Mexico. The survey was sent to 385 first-language Spanish-speaking, Mexican scientists from two higher education institutions in Mexico. In all, 148 of these scientists returned the

survey (a response rate of 38%) and participated in this study. These participants came from a major research institute and a state university. The scientists were from the fields of biology, physics, mathematics, computer science, oceanology, environmental science, biotechnology, geology, seismology, applied geophysics, optics, electronics, telecommunications, physical oceanography, biological oceanography, ecology, aquaculture, biotechnology, experimental microbiology, and biology of conservation. Engineers and social scientists were not included in this study. Their seniority ranged from 6 months postdissertation to 34 years. Only 5 scientists reported publishing exclusively in English, but the vast majority (75%) published at least half of their research work in English.

Tool. The tool for this study was a questionnaire consisting of 6 major questions and associated rating scales. The questionnaire was presented to the participants in Spanish. The questions dealt with the burden of writing scientific research articles in a second language and were set out as parallel questions. The specific questions used (in their English translation) were as follows:

1. On the scale below, rank the degree to which you find it easy or difficult to write a scientific article **in Spanish** for a major journal.
Very Easy | 1 2 3 4 5 6 7 | Very Difficult
2. On the scale below, rank the degree to which you find it easy or difficult to write a scientific article **in English** for publication in a major journal.
Very Easy | 1 2 3 4 5 6 7 | Very Difficult
3. On the scale below, rank the degree to which you are satisfied that your writing **in Spanish** conveys the scientific research that you have conducted.
Very Satisfied | 1 2 3 4 5 6 7 | Very Dissatisfied
4. On the scale below, rank the degree to which you are satisfied that your writing **in English** conveys the scientific research that you have conducted.
Very Satisfied | 1 2 3 4 5 6 7 | Very Dissatisfied
5. On the scale below, rate the degree to which writing a scientific article **in Spanish** for a major journal causes you to feel anxiety.
No Anxiety | 1 2 3 4 5 6 7 | Severe Anxiety
6. On the scale below, rate the degree to which writing a scientific article **in English** for a major journal causes you to feel anxiety.
No Anxiety | 1 2 3 4 5 6 7 | Severe Anxiety

Table 1. Means and Standard Deviations for Self-Perception Ratings on Questions of Difficulty, Satisfaction, and Anxiety in First Language (Spanish) and Second Language (English) Scientific Writing ($n = 141$)

Question	<i>M</i>	<i>SD</i>
Difficulty in Spanish	2.92	2.21
Difficulty in English	4.60	2.16
Dissatisfaction in Spanish	2.69	2.28
Dissatisfaction in English	3.47	2.49
Anxiety in Spanish	3.07	2.32
Anxiety in English	4.55	2.29

The questionnaires were completed and returned to the researchers voluntarily and anonymously.

Results

The aim of this study is to quantify the burden experienced by scientists when they write scientific research articles in English as a second language. Table 1 presents the means and standard deviations for the three measures of difficulty, dissatisfaction, and anxiety in writing science research articles in English and Spanish. As can be seen in Table 1, the ratings in English are persistently higher than those in Spanish. On a 7-point scale with higher scores reflecting increased burden, self-perception ratings of English science writing were 24% higher for difficulty (1.68 points difference), 11% higher for dissatisfaction (0.78 points difference), and 21% higher for anxiety (1.48 points difference). These results present descriptive data and some initial quantification of the burden involved in writing a research article in English.

These descriptive data were further analyzed using inferential statistics. The aim of this analysis was to establish whether the rating in English as a second language and Spanish as a first language were systematically different. Having isolated the factor of language in the writing of research articles through the specific design of parallel questions, this analysis allows statements to be made that establish whether language is a significant factor in the writing of research articles in English as a second language. The descriptive data have shown second-language scientists report an increased burden for English as a second language in the writing of research articles, the inferential statistics establish whether this reported increased burden is systematic and significant.

Accordingly, to evaluate the above analysis of the descriptive data, a one-way MANOVA was calculated using language (English/Spanish) as the independent variable and difficulty, dissatisfaction, and anxiety as three dependent variables. Hotellings's T^2 multivariate generalization of the univariate t value was used. The MANOVA revealed a highly significant effect for language (Hotellings's $T^2 = 17.934, p < .000$). To further explore this significant effect for language, univariate F tests were calculated to determine which variables contributed to the overall difference. Significant differences were found for all three variables: difficulty $F(1, 279) = 41.03, p < .000$; dissatisfaction $F(1, 279) = 7.51, p < .007$; and anxiety $F(1, 279) = 28.91, p < .000$. The descriptive and inferential statistics establish that the experience of writing scientific research articles in a second language is significantly different from the experience of writing in a first language and that this involves an additional burden on the second-language scientist. Specifically, for these self-reported data, this burden can be quantified as consisting of a 24% increase in perceived difficulty, an 11% increase in dissatisfaction, and a 21% increase in anxiety.

Discussion

The purpose of this investigation was to provide quantifiable data through which the perceived burden of writing a research article in English as a second language could be established. Furthermore, the aim of this study was to address the question whether the difficulties in writing a research article in English as a second language were disciplinary or linguistic. As described in the literature review, there are abundant qualitative data that suggest that scientists writing in a second language face difficulties. However, to date this had not been quantified and there was a question as whether this could be explained in relation to disciplinary conventions.

The data in this study differentiate between the disciplinary and linguistic aspects of the previously reported difficulties and support the idea that the added burden of second-language science writing is linguistic in nature. As the participants in this study responded in parallel questions to the perceived difficulty, anxiety, and dissatisfaction of writing in their first and second languages, any differences found can only be related to the factor of their perceptions of writing in a second language. In other words, as the disciplinary function of writing a science article is consistent between both questions, it is unlikely that this is the factor that contributed to added burden found in the responses of the scientists concerning their second-language science writing. The data presented here clearly demonstrate and quantify the self-reported and perceived added burden of writing research articles in English as a second language.

These findings support the qualitative data presented by other researchers. The difficulties faced by second-language scientists such as those summarized by Uzuner (2008), Flowerdew (1999), Flowerdew and Li (2007), St. John (1987), and Salager-Meyer (2008) can be attributed to linguistic difficulties and as a result of working in a second language. Qualitative research with non-Anglophone scholars reports greater difficulty in writing quickly, writing appropriately, accessing up-to-date resources, and accessing the networks that facilitate English-language publication (Lillis & Curry, 2010). What the current study does is to assign these difficulties clearly to the linguistic component and specify the self-reported and perceived degree of increased burden while supporting the underlying finding of previous studies that English science writing involves difficulties.

On a different level, this study also deepens our understanding of the affective dimension of scientific writing. Previous research has addressed this to a limited extent. Sending a manuscript out for peer review always carries some level of anxiety. All articles are “manifestly riddled with emotions and emotional risks [because] work is . . . received within a context not only of intellectual but also emotional acceptance and rejection” (Powell, 1996, p. 2). Anxiety is mentioned in some studies, including autobiographical accounts of scholarly publishing (Belcher & Connor, 2001). As with other results, the findings of the current study differentiate between disciplinary anxiety and anxiety caused by writing science in a second language. The scientists in this current study report that they do experience anxiety when writing in their first language (3.07 on a 7-point scale), but that anxiety jumps up 21% when writing in a second language.

A further contribution of this study is the examination of satisfaction and dissatisfaction with a second-language scientist’s final published article. The qualitative study by Englander (2009) found that the changes required by journal reviewers created dissatisfaction with the published version. Two of the three scientists in that case study lamented that they liked their original manuscripts better than the ones they were able to publish. The recent article by Pérez-Llantada et al. (2011) is titled “You Don’t Say What You Know, Only What You Can” and captures the dissatisfaction that senior academics in Spain report in trying to write and publish what they really mean. In our study, the amount of dissatisfaction with the final article is less high than the factors of difficulty and anxiety (3.07 on a 7-point scale). Nonetheless, the scientists report 11% greater dissatisfaction than the articles that they publish in their first language.

The current study moves the field forward by quantifying the self-reported and perceived difficulties of writing a research article in English as a second language and situating these difficulties as a linguistic variable.

However, some issues are still unresolved. As discussed in the literature review above, two small-scale studies with Japanese and Korean expert scientists have reported that some scientists do not feel that English is a barrier to publication (Cho, 2009; Matsumoto, 1995). This points to the likelihood that there could be differences among scientists in relation to their perception of burden. These differences may result from exposure to English, seniority, linguistic, and ethnic community. In other words, there is a need for further research to explore exactly these differences among the communities of second-language scientists.

An obvious limitation of the current study is that it focuses on scientists only in Mexico. While the population explored in this study does represent a range of scientific fields and scientists, the fact that they come from Mexico and they speak Spanish may have influenced the results. In this sense, the findings are limited to the self-reported and perceived burden of Mexican scientists and perhaps not to all scientists writing in a second language. Accordingly, it would be very helpful if we had similar data that addressed scientists from a much wider range of countries. It would be especially useful if the same tool were used, which would allow comparable data to emerge.

A different issue of diversity relates to the disciplinary community of the scientist. Some fields such as physics provide almost no opportunity to publish in a language other than English. Fields such as geology and fisheries still maintain somewhat robust Spanish-language journals, so they offer more opportunities for scientists to avoid having to write in English. The correlation between disciplinary publishing opportunities and the burden of writing in the foreign language are underexplored. Furthermore, there are differences in the actual features of research articles in different fields. Thus, an article in theoretical physics may involve extensive use of mathematical equations and rather limited amounts of written text. The current data set does cover a range of disciplines but does not differentiate between them. Future research should look directly at scientists in different disciplines and explore their self-reported and perceived levels of difficulty, anxiety, and dissatisfaction in science writing.

Final Comments

The aim of this study was to quantify the self-reported and perceived burden faced by scientists writing research articles in English as a second language. The study through its research design isolates the variable of language in writing science and establishes that the experience of writing a scientific research article in English as a second language is significantly different than the experience of writing in a first language and that this writing process is perceived as 24% more difficult, generates 11% more dissatisfaction, and 21% more

anxiety. As a result of the way the study was designed, the added burden is related to the use of English as a second language.

This study supports previous qualitative findings on the difficulties faced by second-language scientists and suggests that this issue needs to be addressed directly and not hidden in an argument concerning the acquisition of disciplinary knowledge. Our results and those of others show that the difficulties of writing science in a second language involve the self-perception of a significant added burden. Even highly prolific and proficient scholars who speak English as a nonnative language note that gaining English proficiency (Ammon, 2001) and creating an English-language scholarly record (Benfield & Howard, 2000) represents an additional burden of investment, time, and effort from which native English speakers are largely exempt. What this study has done is establish some quantitative guidelines for measuring the perception of the added burden of writing a scientific research article in a second language as understood by scientists who publish in their first and second languages. Hopefully, these results will lead others to address the seriousness of this issue.

Declaration of Conflicting Interests

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References

- Ammon, U. (1998). *Ist Deutsch noch internationale Wissenschaftssprache? Englisch auch für die Lehre an den deutschsprachigen Hochschulen*. Berlin, Germany: de Gruyter.
- Ammon, U. (2001). *The dominance of English as a language of science: Effects on other languages and language communities*. Berlin, Germany: Mouton de Gruyter.
- Ammon, U. (2006). Language planning for international scientific communication: An overview of questions and potential solutions. *Current Issues in Language Planning*, 7(1), 1-30.
- Belcher, D., & Connor, U. (Eds.). (2001). *Reflections on multiliterate lives*. Clevedon, England: Multilingual Matters.
- Benfield, J. R., & Howard, K. M. (2000). The language of science. *European Journal of Cardio-Thoracic Surgery*, 18, 642-648.
- Burrough-Boenisch, J. (2003). Shapers of published NNS research articles. *Journal of Second Language Writing*, 12, 223-243.

- Carrió-Pastor, M. L. (2006). *La variación en el uso de las expresiones certeza en los textos científicos* [The variation in the use of certain expressions in scientific texts] *Barcelona English Language and Literature Studies*, 1-13.
- Casanave, C. P., & Vandrick, S. (Eds.). (2003). *Writing for scholarly publication: Behind the scenes in language education*. Mahwah, NJ: Erlbaum.
- Cho, D. W. (2009). Science journal paper writing in an EFL context: The case of Korea. *English for Specific Purposes*, 28, 230-239.
- Cho, S. (2004). Challenges of entering discourse communities through publishing in English: Perspectives of nonnative-speaking doctoral students in the United States of America. *Journal of Language, Identity and Education*, 3(1), 47-72.
- Clavero, M. (2010). "Awkward wording. Rephrase": Linguistic injustice in ecological journals. *Trends in Ecology and Evolution*, 25, 552-553.
- Clavero, M. (2011). Unfortunately, linguistic injustice matters. *Trends in Ecology and Evolution*, 26(4), 156-157.
- Curry, M. J., & Lillis, T. (2004). Multilingual scholars and the imperative to publish in English: Negotiating interests, demands, and rewards. *TESOL Quarterly*, 38, 663-688.
- Duszak, A., & Lewkowicz, J. (2008). Publishing academic texts in English: A Polish perspective. *English for Academic Purposes*, 7, 108-120.
- ElMalik, A. T., & Nesi, H. (2008). Publishing research in a second language: The case of Sudanese contributors to international medical journals. *English for Academic Purposes*, 7, 87-96.
- Englander, K. (2006). Revision of scientific manuscripts by nonnative-English-speaking scientists in response to journal editors' language critiques. *Journal of Applied Linguistics*, 3, 129-161.
- Englander, K. (2009). Transformation of the identities of nonnative English speaking scientists. *Journal of Language, Identity and Education*, 8, 35-53.
- Flowerdew, J. (1999). Problems in writing for scholarly publication: The case of Hong Kong. *Journal of Second Language Writing*, 8, 243-264.
- Flowerdew, J. (2007). The non-Anglophone scholar on the periphery of scholarly publication. *AILA Review*, 20, 14-27.
- Flowerdew, J., & Li, Y. (2007). Language re-use among Chinese apprentice scientists writing for publication. *Applied Linguistics*, 28, 440-463.
- Gosden, H. (1996). Verbal reports of Japanese novices' research writing practices in English. *Journal of Second Language Writing*, 5, 109-128.
- Gosden, H. (2003). "Why not give us the full story?": Functions of referees' comments in peer reviews of scientific research papers. *English for Academic Purposes*, 2, 87-101.

- Gross, A. G., Harmon, J. E., & Reidy, M. S. (2002). *Communicating science: The scientific article for the 17th century to the present*. West Lafayette, IN: Parlor Press.
- Hamel, R. E. (2007). The dominance of English in the international scientific periodical literature and the future of language use in science. *AILA Review*, 20, 53-71.
- Hanauer, D., & Englander, K. (2009, March). *Quantifying the burden of writing a research article in English as a second language: Data from scientists in Mexico*. Denver, CO: American Association of Applied Linguistics.
- Harwood, N., & Hadley, G. (2004). Demystifying institutional practices: Critical pragmatism and the teaching of academic writing. *English for Specific Purposes*, 23, 355-377.
- Lillis, T., & Curry, M. J. (2010). *Academic writing in a global context: The politics and practices of publishing in English*. London, UK: Routledge.
- Martel, A. (2001). When does knowledge have national language? Language policy-making for science and technology. In U. Ammon (Ed.), *The dominance of English as a language of science: Effects on other languages and language communities* (pp. 27-58). Berlin, Germany: Mouton de Gruyter.
- Martín-Martín, P. (2008). The mitigation of scientific claims in research papers: A comparative study. *International Journal of English Studies*, 8, 133-152.
- Matsumoto, K. (1995). Research paper writing strategies of professional Japanese EFL writers. *TESL Canada Journal*, 13, 17-27.
- Moreno, A. I. (2010). Researching into English for research publication purposes from an applied intercultural perspective. In M. F. Ruiz-Garrido, J. C. Palmer-Silveira, & I. Fortanet-Gómez (Eds.), *English for professional and academic purposes* (pp. 57-71). Amsterdam, Netherlands: Rodopi.
- Moreno, A. I., & Suárez, L. (2008). A study of critical attitude across English and Spanish academic book reviews. *English for Academic Purposes*, 7(1), 15-26.
- Myers, G. (1990). *Writing biology: Texts in the social construction of scientific knowledge*. Madison: University of Wisconsin Press.
- Organization for Economic Cooperation and Development. (2009). *Higher education to 2030: Volume 2, Globalization*. Washington, DC: Author.
- Pérez-Llantada, C., Plo, R., & Ferguson, G. R. (2011). "You don't say what you know, only what you can": The perceptions and practices of senior Spanish academics regarding research dissemination in English. *English for Specific Purposes*, 30, 18-30.
- Powell, C. (1996). "Whose voice? Whose feelings?": Emotions—The theory and practice of feminist methodology. In K. Carter & S. Delamont (Eds.), *Qualitative research: The emotional dimension* (pp. 1-22). Aldershot, UK: Avebury.
- Salager-Meyer, F. (2008). Scientific publishing in developing countries: Challenges for the future. *Journal of English for Academic Purposes*, 7, 121-132.

- Silva, T. (1993). Toward an understanding of the distinct nature of L2 writing: The ESL research and its implications. *TESOL Quarterly*, 27, 657-675.
- St. John, M. (1987). Writing processes of Spanish scientists publishing in English. *English for Specific Purposes*, 6, 113-120.
- Swales, J. M. (2004). *Research genres: Explorations and applications*. Cambridge, UK: Cambridge University Press.
- Swales, J. M., & Feak, C. B. (2004). *Academic writing for graduate students, second edition: Essential tasks and skills*. Ann Arbor: University of Michigan Press.
- Tsunoda, M. (1983). Les langues internationales dans les publications scientifique: Le francais et les langue scientifiques de demain [International languages in the literature: The French language and scientists of tomorrow]. *Sophia Linguistica*, 13, 144-155.
- Uzunur, S. (2008). Multilingual scholars' participation in core/global academic communities: A literature review. *English for Academic Purposes*, 7, 250-263.
- Yakhontova, T. (2002). "Selling" or "telling"? The issue of cultural variation in research genres. In J. Flowerdew (Ed.), *Academic discourse* (pp. 216-232). Harlow, UK: Pearson.
- Zerbe, M. J. (2007). *Composition and the rhetoric of science: Engaging the dominant discourse*. Carbondale: Southern Illinois University Press.

Bios

David I. Hanauer, PhD, is the assessment coordinator of the PHIRE (Phage Hunters Integrating Research and Education) Program situated in the Hatful Laboratory at the University of Pittsburgh and a professor of English in the doctoral program for Composition and TESOL at Indiana University of Pennsylvania.

Karen Englander, PhD, supports the scientific writing of faculty and graduate students in Mexico through courses, mentoring, and editing and has held hands-on workshops at the American Association for the Advancement of Science conference. She is a professor in the undergraduate and graduate teacher education programs at the Universidad Autónoma de Baja California, Ensenada, Mexico.