A BLURRED SNAPSHOT OF ADVANCES IN TRANSLATION PROCESS RESEARCH

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Abstract

This article offers an overview of some advances in cognitive and psycholinguistic approaches to translation and interpreting process research between 2006 and 2013, in order to provide context to the contributions to this volume. It provides some figures on publications and initiatives and then focuses on competence and expertise; writing; mental load and linguistic complexity; advances in research methods; revision and metacognition; cognition beyond conscious, rational thought; and recontextualized empirical research. The article closes with some notes on the overall trends in the area, within the sample of contributions, and on publishing.

Resumen

Este artículo brinda un panorama de los avances en las investigaciones sobre los procesos de traducción e interpretación desde enfoques cognitivos y psicolingüísticos entre 2006 y 2013, con el fin de contextualizar las restantes contribuciones a este monográfico. Ofrece algunas cifras sobre publicaciones e iniciativas y luego se centra en la competencia y la pericia, la redacción, la carga mental y la complejidad lingüística, los avances en los métodos de investigación, la revisión y la metacognición, la cognición más allá del pensamiento racional y consciente, y la recontextualización de la investigación empírica. Para concluir se ofrecen algunas notas sobre las tendencias generales en el área, en las publicaciones de la muestra y en el campo de la edición académica.

Keywords: Translation and interpreting. Cognition. Process. Empirical research. Research methods.

Palabras clave: Traducción e Interpretación. Cognición. Proceso. Investigación empírica. Metodología.

In 2006, translation and interpreting scholars gathered in Ljubljana at an EST Congress with the motto *Why Translation Studies Matters*, where many partial answers were provided to this question. Federici (2013: 106) summarizes such answers by stating that "Translation matters now more than ever before because research is uncovering alternative, previously under-researched areas in which translating has an impact." This applies to all areas of Translation Studies (TS) but perhaps even more to a cluster of closely-knit research trends dealing with mental aspects of translating and interpreting, with factors affecting the behavior and performance of human translators and interpreters, and with scientific research. They globally cover cognitive and psycholinguistic approaches to translation and interpreting, and Translation Process Research. They are not the same, but I will simply and loosely use TPR to refer to these combined, often tangled and overlapping territories.

This text will be pursuing two aims. First and foremost, it seeks to contextualize the contributions in this volume. Second, it attempts to offer a panoramic view of advances in TPR. Fortunately, and also unfairly, the first aim restricts the scope of the second one, because it will leave out many topics simply because no direct reference is made to them in this volume (like in the case of reading). Even so it would be literally impossible to review all TPR publications in the space of one article. I thus chose a timeframe of eight years, starting in 2006, the year the question was posed. In doing so, many important, even seminal papers for the evolution of the area will inevitably be left outside. However, this span is also roughly the time a student takes to start and complete an MA and a PhD, and start publishing. Since such young researchers propel many research efforts, there should be some noticeable progress.

Furthermore, an effort was made to restrict this account to contributions published as articles in indexed journals or as chapters in edited volumes. This is no place to address how research quality is determined, how translation and interpreting journals are ranked, or how edited books sometimes achieve higher standards through careful and coherent selection of contributors and thorough editing. Suffice it to say that, by accepted standards, the quality of the research covered can reasonably be assumed to be quite good. In

sum, what this text is offering is a very partial snapshot of a number of inter-woven research trends in constant movement, so the snapshot will naturally be blurred.

The following sections will focus on competence and expertise (2), mental load and linguistic complexity (3), advances in research methods (4), writing (5), revision and metacognition (6), cognition beyond conscious, rational thought (7), and recontextualized research (8). The article closes with a corollary where a blurred snapshot is provided (9). Let us first have a look at some TPR initiatives and figures about some TPR publications through the period (1).

1. An upsurge of efforts and publications

Between 2006 and 2013, at least 11 books compiled more than 100 chapters devoted to TPR:

— 2007. *Interpreting Studies and Beyond* (Pöchhacker, Jakobsen & Mees, eds.)
— 2008. *Looking at eyes. Eye-Tracking Studies of Reading and Translation Processing.* (Göpferich, Jakobsen & Mees, eds.)
— 2009: *Behind the Mind: Methods, Models & Results in Translation Process Research* (Göpferich, Jakobsen & Mees, eds.)
— 2009. *Efforts and Models in Interpreting and Translation Research* (Hansen, Chesterman & Gerzymisch-Arbogast, eds.)
— 2009. *Methodology, Technology and Innovation in Translation Process Research* (Mees, Alves & Göpferich, eds.)
— 2010. *New Approaches in Translation Process Research* (Alves, Mees & Göpferich, eds.)
— 2010. *Translation and Cognition* (Shreve & Angelone, eds.)
— 2011. *Advances in Interpreting Research. Inquiry in Action* (Nicodemus & Swabey, eds.)
— 2011. *Cognitive Explorations of Translation* (O'Brien, ed.)
— 2011. *Methods and Strategies of Process Research: Integrative Approaches in Translation Studies* (Alvstad, Hild & Tiselius, eds.)
— 2013. *Cognitive Linguistics and Translation. Advances in some theoretical models and applications* (Rojo & Ibarretxe-Antuñano, eds.)

Most books in the list were published by John Benjamins or by Samfundslit-teratur. Several journals published special issues like this one, e.g., *Across Languages & Cultures* 12/2 (2011), *Target* 25/1 (2013) and *Translation and*

Interpreting Studies 8/2 (2013). There were also dedicated sections in the *Journal of Translation Studies* 10/1 (2007), *Hermes* 42 (2009) and in the *Journal of Writing Research* 5/1 (2013). Regular issues in indexed translation and interpreting journals often included papers in this area, which added up to at least 200 between 2006 and 2013 (table 1).[1]

journal	year	06	07	08	09	10	11	12	13	total
Meta		2	9	4	5	1	2	10	0	**33**
Interpreting		4	6	1	1	2	9	2	2	**27**
Target		3	2	1	1	2	2	4	*11	**26**
Across Languages & Cultures		2	3	3	0	2	*7	4	0	**21**
TIS		5	1	3	0	1	1	0	*8	**19**
Perspectives		1	2	2	1	0	2	5	3	**16**
The Translator		1	2	2	0	1	2	2	1	**11**
Hermes		0	0	0	3	6	0	1	0	**10**
TTR		1	2	3	0	0	3	0	0	**9**
The Interp. & Trans. Trainer		0	0	0	7	1	0	0	1	**9**
Babel		0	0	1	3	1	0	1	2	**8**
Machine Translation		1	1	0	1	1	3	0	0	**7**
New Voices in TS		0	0	0	1	0	0	0	2	**3**
Translation Studies		0	0	1	0	0	0	0	0	**1**
total journal articles/year		**20**	**28**	**21**	**23**	**18**	**31**	**29**	**30**	**200**
trans-kom		0	0	4	1	1	0	3	1	**10**
book chapters		0	8	7	23	23	28	0	18	**107**
Total contributions		**20**	**36**	**32**	**47**	**42**	**59**	**32**	**49**	**317**

Table 1. TPR papers in SJR indexed T&I journals and selected books, 2006–2013 (* journal special issues)

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1. Journals with SJR index according to the online EST list (JCR only includes *Interpreting* and *Target*). *Translation and Literature* yielded no results. Data from *New Voices in Translation Studies* only covers full articles, not dissertation abstracts (1 in 2007; 1 in 2011; 2 in 2012; 5 in 2013). Data from *trans-kom* are offered as an ilustration of an open, online, non-indexed journal. Book chapter figures include contributions to the EST congress proceedings.

Figures in table 1 logically imply a selection and other TPR colleagues might reach slightly different figures, but the aim is not to offer a precise and exhaustive account, but rather a panoramic overview of tendencies, and the tendency—a steady growth both in terms of quantity and of quality—would probably be quite similar in other counts.[2] Regarding quantity, when all journals listed by the EST are considered (more than one hundred), articles in non-TS venues are computed, and single-authored books and published dissertations are added to the bottom line, TPR publications actually may have been twice as many as the total figure in Table 1. As for research quality, it has been a constant concern in TS, in general, and in TPR in particular, in the last years. *Cadernos de Traduçao* 1/17 (2006) and *The Interpreter & Translator Trainer* 3/1 (2009) dealt with (empirical) research training, and at least four books on empirical research methods have been published since 2006: Göpferich (2008), Hale & Napier (2013), Rojo (2013) and Saldanha & O'Brien (2013). Special emphasis on TPR was given in the PhD Summer Schools of Universitat Autònoma de Barcelona in 2010, 2011 and 2012, and the CBS offered PhD Summer courses in 2011, 2012 and 2013.

With all of the above, it can be no surprise that our area has also gained visibility. The proceedings of EST congresses were comparatively rich with TPR articles, and dedicated panels and workshops featured in all AIETI, ATISA and IATIS conferences throughout the period, and in the conference "Research Models in Translation Studies II" (Manchester 2011). This growing interest in TPR also shows, for instance, in that Miriam Shlesinger held the CETRA chair in 2007, and Arnt Lykke Jakobsen will do so in 2014. There were also TPR panels in other international conferences, such as AILA (Essen 2008), AESLA (Salamanca 2011), the 20th International Symposium on Theoretical and Applied Linguistics (Thessaloniki 2011), and ABRAPT (Florianópolis 2013). There were also smaller, more focused venues. The CBS organized at least two workshops, on expertise in translation and post-editing research and application (2012) and on speech and gaze in translation (2013), and Aston University organized two online TPR meetings in 2011 and 2013.

This was the context in which Susanne Göpferich called for the first TPR workshop (TPRW1, University of Graz, Austria; 2009), where 16 presentations were offered by researchers from 9 countries, and later published in different ways. In 2011, Göpferich called for a TPRW2 (University of Giessen,

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2. For example, Javier Franco (personal communication) tells me that searching in BITRA with my own criteria yields 5 more books and 218 articles. To date, BITRA lists 514 TPR texts published during this period.

Germany). This second meeting saw 15 papers presented by researchers from 11 countries, which would be published in different venues as well. TPRW3 was organized by the PETRA Research Group and held in Puerto de Mogán (Gran Canaria, Spain; 2013). As in previous editions, the total number of attendees was between 30 and 40, many of them presenting their works. In this case, the workshop was formally a section of the AIETI6 conference that immediately followed, and some TPRW3 attendees presented their papers in one of the 5 TPR panels of the general conference. Thus, this volume includes a selection of TPR contributions to AIETI6 by authors who attended TPRW3. Let us see what were the topics addressed. We will start with competence and expertise, perhaps the most popular TPR notions in TS.

2. Competence and expertise

These two concepts are closely intertwined in the literature, and many researchers will use either one or both to mean whatever it is that leads some people to translate or interpret well. PACTE (2000) offered the most popular definition of competence, described as "the underlying system of knowledge and skills needed to be able to translate." Lesznyák (2007) reviews and classifies nine popular competence models and states that none of them is inherently better, and that choosing one or another depends on the aims of the researcher or trainer. Just to further complicate things, scholars may, intentionally or inadvertently, use the term to refer to different understandings of competence. Even so, some competence models do stand out from the rest because they are based on empirical research, such as PACTE's—something that Lesznyák also underscores. Interestingly, some of the outliers in Lesznyák's review, that also seem to belong to Pym's (2003) category of "competence as no such thing," seem closer to the tradition of expertise research.

Expertise is a research construct from cognitive psychology to underpin the potential range of cognitive, motivational and personal traits, habits and dispositions that will yield sustained outstanding performance. Determining sustained outstanding performance in translation and interpreting, or what characteristics translation and interpreting experts share is not an easy endeavor. Anyway, translation and interpreting expertise do not have a precise content because it will depend on the details of the task and on circumstances in the environment. Popular expertise and competence approaches in TPR tend to agree in that they are envisioned as clusters of specialized cognitive abilities, and tend to differ as to their sources, their internal coherence, the psychological reality of their postulated sub-constructs, and the possibility to operationalize them.

Let us start with expertise in interpreting (review in Liu 2009). In our timeframe, Köpke & Nespoulous (2006) tested a variety of memory tasks in trainee and expert interpreters and two control groups, with special attention to both semantic and phonological capacities. Their results show no difference between (trainee and professional) interpreters and the control groups in some memory tasks, whereas in some other working-memory (WM) tasks trainee interpreters slightly outperformed professionals. They did find significant group effects supporting that the Central Executive or focalized attention play a key role in interpreting.[3] Köpke & Nespoulous hypothesize that, once a certain degree of expertise has been attained, the high specialization of simultaneous interpreting skills might no longer depend on WM but rather on specific routines or highly specialized schemes.

Tiselius & Jenset (2011) explored whether 9 subjects evenly distributed between those with no experience (NE), with short experience (SE) and with a very long experience (LE) in interpreting showed performance differences in reported processing problems, instances of monitoring, and interpreting strategies. In processing problems, the NE struggled more with comprehension and simultaneity issues; the SE, with finding linguistic equivalents; and the LE, with input rate and syntactic processing. The LE displayed more control of the accuracy before utterance than the NE and SE, and the SE were better than the NE in time management issues. As for strategies, the LE favored overgeneralization and the NE, creative interpreting. All differences were statistically significant. The interpretings were rated as to their informativeness and intelligibility. In informativeness, there appears to be a cumulative benefit of experience, while in intelligibility, experience vs. lack of experience has an effect, but once a minimum experience threshold is reached, there is no added effect. Tiselius & Jenset suggest that the ability to monitor and accuracy in delivery are candidate components of performance that might be used as indicators of expertise.

In translation, Jääskeläinen (2010) reviews and reinterprets TPR evidences in the light of the expertise framework. She notes that in earlier studies, sometimes translation trainees and untrained bilinguals outperformed professionals. This may be so because not all professionals are experts, but also because of the subjects' specialties (a notion with different understandings and implications in research and the professional world), and because subjects

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3. In Baddeley's model of memory, the *central executive* in a flexible attentional system that coordinates, distributes and regulates cognitive resources. It is responsible for aspects such as planning performance, linking scattered bits of information, task-switching, inhibiting automatic responses and focalizing attention.

with steady work in familiar situations might stagnate their development and become routine experts (who tend to perform very well only in those familiar situations). Inflexibility, over-confidence and bias are other reasons why professionals and experts might fail in TPR tests. Automaticity, usually regarded as a trait of expertise, does not necessarily make translation easier for experts, since mental resources freed by automatization are often devoted to addressing other difficulties and issues in the task. Strong monitoring skills are also associated to experts.

Dragsted, Hansen & Sørensen (2009) seem to confirm some points of Jääskeläinen's analysis. They studied the behaviors of three expert translators with different levels of experience on speech recognition in three tasks and under heavy laboratory conditions: sight translation, sight translation with speech recognition, and written translation. They found that only the translator used to speech recognition differed from the other two in time consumption and general behavior. The authors suggest that the most demanding complication of the translation process was not the drafting of the text, but the constant monitoring and editing of TT output.

As for research on competence, Alves & Gonçalves (2007) build on PACTE's competence model, on Relevance Theory and on connectionist approaches to cognition to suggest a *general translator's competence,* comprising all knowledge, abilities and strategies mastered by translators that lead to adequate performance. They also suggest a *specific translator's competence* that is directly proportional to the production of contextual effects generated from two counterpart SL-TL units and also directly proportional to the overlapping of the two sets of effects, i.e., to the maximization of their interpretive resemblance. In their view, competence is not a *component* of the translator's mind, but a particular cognitive configuration that gradually develops from the dynamics experienced by the translator.

Göpferich (2009) lays out a model of translation competence as a referential framework for her longitudinal research project TransComp. In view of their early findings, Göpferich et al. (2011) underscore problems such as comparing groups of subjects with assumed levels of competence. Göpferich (2013) applies Dynamic Systems Theory to discuss the results of the TransComp project, focusing on the strategic sub-competence. They found that in nearly all decision-making categories, the students are considerably less successful than the professionals. In particular, the professionals invested less effort but were more successful in low-effort decision-making (routines) than the students, whereas in high-effort decisions (problem-solving), the professionals' success rate was only slightly higher than the students'. As

for the longitudinal perspective, students did not reveal progress in their problem-solving strategies and their creativity and routine values between semesters 1–4. With regard to the variables analyzed, professionals were not found to have yet achieved expertise, which Göpferich describes as the highest level of competence.

PACTE has thoroughly researched its competence model by contrasting the behaviors and products of 35 professional translators and 24 language teachers. PACTE (2008) focused on the 'knowledge of translation' sub-competence. In order to measure it, they developed a Dynamic Translation Index, by classifying and scoring the answers to a questionnaire on the subjects' beliefs and knowledge about translation. Two poles were considered: a dynamic approach (comprising textual, communicative and functionalist concepts) and a static approach (that combines linguistic and literalist notions). Translators turned out to have a much more dynamic approach to translation methods than language teachers do. PACTE (2008) also checked the efficacy of the translation process, as an indicator for the strategic sub-competence. No group effects were found, but further analysis of the 15 best subjects in each group yielded significantly better scores for the translators.

In PACTE's model, decision-making entails activating sub-competences while at task, so it reflects both strategic and instrumental sub-competences. PACTE (2009) studied the acceptability of translation solutions and decision-making. When translating into their L1, translators generally outperformed language teachers. When translating into their L2, translators were still somewhat better, but the difference was not important. Only 26% of the translators with the best L2 > L1 score obtained a comparable score in the L1 > L2 task. PACTE (2009) also reports on sequences of actions, where they distinguished between *internal support* (drawing on one's own mental resources) and *external support* (using reference materials) and two intermediate categories. They found that language teachers tend to rely more on internal support and that translators tend to consult materials but take their decisions mainly based on internal support. Translating into the L2 triggered many more decisions based on reference materials in both groups.

PACTE (2011a) found that translation problems identified by subjects varied greatly depending on the individual and that directionality plays a role in the definition of the difficulty of translation problems. The subjects' perception of the overall difficulty of a ST and the acceptability of their solutions to translation problems were unrelated. PACTE (2011a) also concluded that the characterization of translation problems does not seem to be a feature of

translation competence. In this volume, PACTE presents its results on the acquisition of declarative knowledge of translation.

3. Writing

Advances in forensic stylistics have proved that texts and speech producers display certain idiosyncratic regularities. This is also true for translators and interpreters who, for example, may prefer certain lexico-grammatical features and a more or less varied lexical choice (Shlesinger 2009). Henriksen (2007) shows that the variable stock of formulaic language that EU interpreters use is acquired as part of their process of professional socialization and that it often correlates with higher value judgments about their abilities.

Comparing monolingual writing and translating was a pending subject in TPR that key logging finally made possible. Text segments processed at once, usually flanked by pauses, are often viewed as a cognitive or processing unit. Hence, pauses have usually been interpreted as potential indicators of mental activity related to the text segments neighboring that pause. Immonen (2006) compared the distribution of pausing time in fluent monolingual writing and in translation by 18 professional translators. The writing task was based on a brochure and the subjects also had a copy of the magazine where the text would be published. Immonen found that, in both tasks, pause duration is longest between paragraphs and successively decreases when it separates smaller linguistic units. When the tasks were contrasted, translating displayed a particular pattern: pauses in paragraph and sentence boundaries, which are assumed to be used mostly for macro-planning, were considerably shorter than in monolingual writing, whereas pauses at clause level and lower, where word choice and grammatical structures are decided, were longer.

Immonen & Mäkisalo (2010) studied the same data to focus on pause length in phrases (categorized as to their type, function, and length) and in clauses, categorized as to their type. In general, translators seem prone to process enough text to be able to start writing and to pause longer during the actual writing of the text. In monolingual writing, pauses preceding subordinate clauses tend to be much shorter than those preceding main clauses. When translating, both types of pauses are roughly of the same length. Hence, when translating, subordinate clauses seem to be processed as separate clauses. When phrases are considered, Immonen & Mäkisalo suggest that verb phrases are probably processed during sentence initial pauses, whereas noun phrases—which demand more processing time than verb phrases— and adpositional phrases (e.g., prepositional phrases) seem to be processed locally and may result in (longer) phrase medial pauses.

One of the main potential differences between free monolingual writing and translating is that, in the latter, the coordination of reading and writing should tax translators' cognitive resources. Dragsted & Hansen (2008) found that, when translating, the reading and writing activities did not match and that pauses seemed to signal coordination efforts to move from comprehension to production modes. In a follow-up study, Dragsted (2010) suggested that there are differences in coordination between professionals and translation trainees: Professionals would continuously shift between ST and TT, and their comprehension and production processes would overlap; in contrast, students would favor sequential activities, probably to reduce cognitive effort.

With a similar approach to that in her previous studies, Immonen (2011) compared the monolingual writing processes and the translating processes of 28 translators, this time individually before the group was considered. She found no correlation between the processes of both tasks in individuals, who also displayed a large variation in their processing units. Differences between monolingual writing and translating were in general more important at syntactic processing, probably due to the search for equivalents to accommodate SL structures to the TL.

We can thus hypothesize that translating and monolingual writing are similar in several respects, but that they also entail behavioral differences related to their goals and to the coordination of reading and writing. Could skills developed for one task transfer or support the other task? Göpferich, in this volume, explores whether the subjects' ability to express themselves in their L1 and their L2 are different, and whether translation exercises are useful to improve writing skills.

4. Mental load and linguistic complexity[4]

Mental resources, or mental capacity, are generally assumed to be limited. Mental load refers to the portion of the limited central-processing capacity engaged on task execution. During complex mental activities, the amount of information and interactions that are processed simultaneously can overload and even deplete this finite amount of mental resources. Research on mental load has implicitly been present since the beginnings of interpreting research, but the fullest current version is Gile's effort model, that many contributions try to redress or enlarge.

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4. *Cognitive effort* is the usual term in translation research, and so is *cognitive load* in interpreting research. Here *mental load* is used to refer to both. An introduction to the subject in TPR in Muñoz (2012).

Wu & Wang (2009) argue that sometimes expert interpreters will outperform beyond the postulated limitations of cognitive resources, and also that interpreters stand out from other people in their central executive management functions, rather than in their memory capacity. Departing from the recursive nature of the chunks that can be held active in memory, they suggest that each discourse segment is actually processed as a discourse of its own, and they draw from Van Dyck's theory of macro-structures and Halliday's functional grammar to formulate three recursive discourse-transformational rules for deletion, construction and generalization that help explain performance beyond conjectured limitations.

Gile's efforts model is based on the notion that mental resources form a single, undifferentiated pool. In contrast, Seeber (2011) draws from the hypothesis that cognitive resources are multiple and may conflict more when they share some particular processing dimension. Seeber offers a conflict matrix to predict the amount of overlap and interference between cognitive tasks. His Cognitive Load Model reflects and quantifies mental load as a function of both input and output features, which Seeber illustrates with estimations of cognitive resource allocation in coincident and diverging syntactic structures (SVO/non-SVO). Seeber (2013) reviews and discusses analytical, subjective, performance and psycho-physiological methods to identify, isolate and measure mental load. He favors pupillometry as a means to objectively measure cognitive load, although he cautions that it requires comprehensive data preparation. Also, pupillometry seems more reliable when assessing local mental load induced by short stimuli (sentence level and below) and does not help to attribute mental load to individual component tasks.

Pym (2009) reanalyzes the data from one of Gile's experiments. He focuses on omissions, whose corresponding ST segments he classes as high risk or low risk, depending on their threat to achieving the communicative aim of the discourse. Pym suggests that cognitive management at interpreting also responds to contextual factors such as the aims of the discourse, the strategies of the speakers, and the variable risks of the text items. He hopes for a slightly larger framework that will fit translators as well and he lists several points in common between translation and interpreting, such as time constraints, overlapping of efforts, online repairs, multi-tasking, and also documentation and use of electronic tools. This is what many researchers have tried to do, often studying mental load in post-editing and in sight-translation, and linking it to linguistic complexity.

O'Brien (2006) explored how to assess mental load when post-editing MT output by using Translog (to focus on pauses) and Campbell's Choice Network

Analysis (CNA), which rests upon the hypothesis that the differences in TO segments from the same ST segments point to the degree of difficulty of such ST segments. O'Brien found that pauses are somewhat useful as indicators of mental load in post editing, but also that it is very difficult to correlate mental load with pauses, source text difficulty and target text quality. Other methods, she concludes, are necessary to supplement pause analysis, such as CNA and other aspects of keyboard monitoring. Jensen (2009) ranked three texts as to their results in seven readability indices, in word frequency calculations, and in the counts of some instances of figurative language (idioms, metaphors, metonyms) and found that all indicators offered similar results. His work is inconclusive, but raises several interesting questions and suggestions for further research, such as whether idioms, metaphors and metonyms are, on the whole, more difficult to translate than literal expressions.

Metaphor was already a popular topic in TPR (review in Schäffner & Shuttleworth 2013), and the potential difficulties it may pose to translators have also been studied. Rydning & Lachaud (2011) found that subjects achieved more conceptual clarity with literal meanings than with figurative meanings, and that conceptual clarity was also higher with primary metaphors than with complex metaphors, although they also detected more conceptual clarity in literal primary meanings than in complex primary meanings. Sjørup (2011) discovered that eye fixation times were longer for metaphors than for literal expressions (see next section). She argued that it was not clear whether differences were due to comprehension or to production, but found that subjects preferred translating metaphors with direct metaphorical equivalents and also argued that paraphrasing probably involves higher mental loads. Zheng & Xiang (2013) found that metaphors slowed down production and compromised quality, and that such results were related to comprehension and to the reallocation of cognitive resources.

Other research efforts related to text complexity and mental load concentrate on syntax. Shreve, Lacruz & Angelone (2010, 2011) found sight translation to be more sensitive to cognitive disruptions due to syntactic complexity and also that subjects were more affected by visual interference when sight translating. Hild (2011) compared the performance of experts and novices when interpreting two texts that had been profiled according to several syntactic parameters. She found that all parameters affected the performance of the novices, and that redundancy seems to modulate such effects in experts. Meuleman & Van Besien (2009) found interesting behavioral correlations in the choice of coping strategies in interpreting: the subjects in their tests preferred tailing when they had to cope with high-speed delivery,

and segmentation when they had to deal with complex syntax. Dragsted (2012) studied the number of alternative renditions of words in the translations of the same ST (i.e., CNA) by eight translator trainees and found highly significant correlations between high target text variability and high fixation counts, long gaze time and long pauses. Chmiel & Mazur (2013) eye-tracked interpreting students at two stages of training when sight-translating and found readability to be potentially a more important factor in processing than the distinction between simple/complex sentence structure and also SVO/non-SVO word order. This is the area to which Alves, Gonçalves & Szpak have contributed in this volume. Using Relevance Theory as a referential framework, they focus on the potential differences in mental load caused by processing open and closed word classes.

5. Advances in research methods

Reliability, validity, and appropriate use of research tools and methods have been a primary concern for TPR researchers since the nineties. Research methods are of course part of all empirical reports, but 13% of the papers in the sample centered on them.

Within introspective methods, Sun (2011) finds no strong evidence suggesting that thinking aloud significantly changes or influences the translation process. Nevertheless, Jääskeläinen (2011) argues for a systematic study of verbal report methods and presents a project to test the validity of thinking aloud. Englund Dimitrova & Tiselius (2009) explore retrospection in simultaneous interpreting and in translation and describe the differences in the results, although they caution that subjects were inexperienced students. They conclude that retrospective data cannot be taken as sole evidence for cognitive processes or strategy use, but that it can yield interesting results when combined with other methods (see also Hansen 2006). Ehrensberger-Dow & Künzli (2010) compared thinking aloud and retrospection. They suggest that thinking aloud may yield more information on revision, and that retrospection may be better suited to access explicit information on the use of sources, strategies and problem solving. In any case, they agree that combining several data sources is essential to accurately interpret and categorize verbalizations. However, Sun (2011) also notes that different data-collection procedures serve different purposes and that multi-method approaches, now often regarded as optimal, may also have some disadvantages.

In sum, there are still conflicting views on the use of introspective methods and more research and reflection seem in order. In this volume, Englund Dimitrova & Tiselius present a follow-up study in which they contrast

retrospective data with process data from professional and trainee translators and interpreters working on the same text. The cue for retrospection in this case was a transcription of the TO, and not the process data, so as to ensure they were tapping from long-term memory.

Pavlović (2009) retakes the dialog and joint protocols used by Séguinot, House, Hönig and (mainly) Kussmaul by the end of the 1980s and the beginning of the 1990s, which she terms *collaborative translation protocols.* They are transcriptions of the recorded communicative exchanges of people translating the same source text together, who base their decisions on mutual consensus. Hence, they not only tap on individual processes, but also on the interaction between the subjects involved. Following Séguinot, Pavlović argues that rationalizations do not invalidate the approach. This might be generalized to all introspective methods in TPR. They may not grant access to "real" mental processes, but they provide extremely valuable data to support inferences and hypotheses on conjectured mental processes, a kind of information that is hard to impossible to access with observational methods. Furthermore, they may also let researchers know how subjects envision their processes, which may in turn impinge on the ways the carry out their tasks (see section 7).

As for observational methods, many methodological papers deal with the use of the latest newcomer, eye tracking, or with the combination of eye tracking with other data-collection procedures (e.g., Jakobsen 2011; Lachaud 2011).[5] O'Brien (2009) addresses several problems in using eye-trackers and suggests solutions for most of them. She also notes that the equipment is relatively expensive and that what and how participants translate (e.g., text length, font size) may challenge ecological validity. Sometimes potential problems are not inherent to the tool or the procedure itself, but to decisions taken when they are used. One of the indicators used in eye-tracking studies is gaze fixation, i.e., where and for how long do subjects set their eyes while at task. For example, Sharmin et al. (2008) found that text complexity led to more frequent fixations, whereas when subjects translated under time pressure, fixations were shorter. Gaze-fixation measurements entail decisions as to their minimal duration and also as to the area to be considered a unit. The chosen values are referred to as *filter settings* or simply *filters.* Alves, Pagano & da Silva (2009) show that using different filters has a strong impact on the results, and they underline the need to standardize parameters to include and exclude data, in order to allow for reliable comparisons across data samples.

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5. For a recent review of TPR studies using eye-trackers, see Alves, Gonçalves & Szpak (2012).

In this volume, Hvelplund offers a general introduction to eye tracking and a summary of usage recommendations and cautions that zooms on the challenges in the analysis and interpretation of eye-tracking data.

Eye-tracking has fostered new studies on reading-for-translating and on the coordination of reading and writing. For instance, Castro (2008) and Jakobsen & Jensen (2008) studied behavioral differences in four reading tasks—from unmotivated reading to reading while performing written translation—and found consistent increases in task duration, eye fixation frequency, gaze time and average fixation duration (see also Dragsted, Hansen & Sørensen 2009).

6. Revision and metacognition

In 2006, Shih could only point to a few studies on [end-] revision, even though, she remarked, [self-] revision behaviors were constantly observed in process studies (review in Mossop 2007). Shih found that translators revised their output mostly twice, mainly right after producing their first drafts and rarely beyond overnight. Her interviewees confirmed most criteria in trainers' checklists and also added new categories that showed that they had developed their own revision habits from experience and feedback. Since 2006, revision has been the subject of several studies mainly related to a hypothesized tendency to over-revise and to the differences between end-revision vs online revision (revising while drafting).

Künzli (2007) found a tendency to over-revise in professionals, who also missed many errors, and also a large inter- and intra-individual variation that he related to motivation and a lack of an appropriate task definition and of established revision procedures. Malkiel (2009) studied self-corrections in 16 translation trainees—each half with a different L1—who translated two texts, one in each language. She did not find any ST or directionality effect (but see Alves, Pagano & da Silva 2009 for the opposite result). Only 20% of self-corrections were predictable, in that they corresponded to phenomena that usually posit difficulties in that language pair, and most self-corrections were word and phrase replacements with synonyms. This she linked with a combination of a mature attitude to translating and a lack of self-confidence due to a rudimentary appreciation of what professional translation entails.

Koby (2007) studied computer editing in a mixed sample of professional and non-professional informants in order to find tendencies in on-line revision or end-revision. He found both styles to be equally fast, although online revision was more efficient. Antunović & Pavlović (2011) studied online versus end- self-revision in 10 translation trainees working from the

L2 and L3 into their L1. They concluded that the relative duration of drafting and post-drafting activities, and the distribution of self-correction over these phases were independent of SL command; they rather seemed related to individual subjects' habitual behavior, so they might be a defining trait of translators' styles. The number of self-revisions undertaken per one problem, though, was higher when translating from the L3.

The revision categories in Shih (2006)—who condenses and enlarges previous proposals—and the tendencies to over-revise found in many studies point to a concentration on the TT when revising. Are there differences in quality between revisions that contrast ST/TT and those made by only using the TT? This is what Marashi & Okhowat (2013) set out to determine. To this purpose, 40 editors where handed a TT, and half of them were also provided with the ST. There was no significant difference between the frequency of the editing comments, nor in the quality of the final versions, evaluated by two independent raters. Interestingly, editors in both groups stated that accuracy was their most important criterion, so the authors conclude that editors do not essentially need to have a thorough mastery of the source language, but would rather benefit from training in TL editing.

Künzli (2007) and other authors point out that revision is very relevant to translator training. Before syllabi are changed, however, it is worth considering how to optimally articulate revision in training programs. For instance, revising entails assessment, and Robinson, López & Tercedor (2006) investigated the results of introducing self- and peer-assessment in an online translation course. They found that, while learning outcomes remain constant, the new assessment procedures increase students' awareness of the translation process. Fernández & Zabalbeascoa (2012) found a positive correlation between the performance of translator trainees and the quality of their self-evaluation in a metacognitive questionnaire.

Dam-Jensen & Heine (2009) suggest how translation process research methods can be used as pedagogical tools in order to increase students' understanding of themselves, as learners, thinkers and problem solvers. Pym (2009) reports on three "lousy" experiments carried out in class for pedagogical purposes, whereby students can draw their own conclusions about their own developing abilities and set their own short-term learning goals (see also Hansen 2006 and Massey & Ehrensberger-Dow 2011). Angelone (2013) combined the previous research topics —i.e., revision and the application of research tools in translator training— in order to explore the efficacy of (Gile's) Integrated Problem and Decision Reporting logs, recorded verbalizations, and screen recordings as revision tools to recognize problems and

mitigate errors. Six students translated 9 ST of ca. 250 words while alternatively using each of the research tools. Then they analyzed the protocols they had created, looking for problem indicators, and finally they entered revisions at will and turned in final versions. TTs were analyzed for errors and, when cross-referenced with the tool they had used, screen recording turned out the most efficacious self-reflection activity type for purposes of error mitigation, perhaps because the guided visual attention promoted by screen recordings catalyzes a heightened state of cognitive awareness. In this volume, Shreve, Angelone & Lacruz report on a partial replication of Angelone's experiment, now focused on other-revision, instead of on self-revision.

7. Cognition beyond conscious, rational thought

 "There is nothing more practical than a good theory." This quote is attributed to Kurt Lewin, the father of modern social psychology, and it is appropriate to start this section because one of the most notable advances in the last years has been theoretical. It is a change of perspective that has brought about a whole range of effects and expansions in TPR. In the last years, many TPR researchers have gradually abandoned the view of the mind as a computer, which had isolated the study of the mind from both its neurological foundations and its personal, social, and cultural framings (see criticisms in Vandaele 2007; Muñoz 2010a; Halverson 2013; Risku & Windhager 2013). Advances in the neurological foundations are still modest (see, however, Diamond & Shreve 2010, Lehr 2010; Moser-Mercer 2010; Hervais-Adelman, Moser-Mercer & Golestani 2011; García 2012), but reinstating the human, social and cultural dimensions of cognition has had an enormous impact, by fostering quite a number of new research trends.

Translation strategies, problem-solving, decision-making and creativity rightly continue to attract much interest (e.g., Halverson 2007; Jääskeläinen 2009; Pavlović 2010; Horváth 2010; Bayer-Hohenwarter 2012), but now the enormous variation found in subjects' behavior can be addressed from the perspective of their emotions, intuitions and individual behavioral styles. Durieux (2007) explains that decision-making is not the result of pure rational thought and strict inference rules. The process is conditioned by human cognitive limitations, the availability of information, and the time span available to make such decisions. Decision-making is also governed by emotions and controlled by selective attention in a cycle that Durieux sketches as *perception > appraisal > emotion > selective attention > information processing > decision*. Davou (2007) also argues that primary appraisals of the emotional impact of the information precede information processing and set the mode in which it will be processed.

She states that negative emotions may increase processing effort and decrease available cognitive resources whereas positive emotions will expand attention and creativity. In this volume, Rojo & Ramos report on a reaction time experiment to test whether the translation process slows down when translating words and expressions contrary to the translator's political stance.

Uncertainty has been the subject of some recent research efforts. One way to define uncertainty is as a lack of information about an event. Uncertainty may lead to an aversive state often linked to feelings of anxiety and stress, so people tend to try to reduce it. Angelone (2010) explored behavioral indicators associated with uncertainty management in translation. He found that these indicators are often bundled in triads of problem-recognition, solution-proposal, and solution-evaluation, which may be interrupted. He also found an expertise effect not in the quantity, but in the ways subjects use metacognition to regulate problem solving. In a follow-up study, Angelone & Shreve (2011) argue that TT quality may be associated to the patterns found in the translators' metacognitive management of uncertainty.

Another assumption of traditional views on decision-making and problem-solving is that they are conscious processes. Hubscher-Davidson (2013) argues that if knowledge acquired consciously can be interiorized or automatized through practice, then nonconscious information processing is a valid resource for problem solving. Thus, she discusses intuition as a potentially vital component of translator behavior that could help to predict effectiveness. She illustrates this by analyzing extracts from the TAP of a student who participated in a previous experiment that involved translating and answering the Myers Briggs Type Indicator questionnaire to measure preferences for holistic intuition or for abstract, rational thought.

Both emotions and intuition draw from past experiences of the subjects. Could there be systematic differences in the ways the tasks are carried out that depend on accumulated experience and knowledge? Van Besien & Meuleman (2008) studied the behaviors of two interpreters and concluded that some local strategies, such as anticipation, were equally distributed, whereas others, such as transcoding and backtracking, showed personal preferences. Such personal preferences also seem to comprise the way they use global strategies, such as additions and omissions. The authors suggest that these differences point to two interpreting styles (see also Kajzer-Wietrzny 2013; for translation, see Dragsted & Carl 2013). PACTE (2011b) focuses on the ways subjects approach the translation of whole texts and lower linguistic units comprised in such texts, with retrospective interviews and also by means of a questionnaire where subjects stated their priorities in the task. Then they

cross-referenced these results with those of the Dynamic Translation Index (see section 2). They found close relationships between subjects' approach and beliefs. In other words, conscious and also implicit beliefs have a bearing in translators' styles and in their decision-making. Following this trend, in this volume Presas & Martín de León study the role of implicit theories [beliefs] in decision-making. Combining several data-collection procedures and tasks, they trace translator trainees' theories about translation and their evolution, and try to discern to what extent they influence the translation process (and, in current work, their outcomes).

Schrijver, Van Vaerenbergh & Van Waes (2012) explore *transediting* in students' translation processes. In its original understanding, transediting seems to refer to the operations carried out by translators in order to adapt their TTs to (a) the standards of efficiency in expression in the TL; (b) the intended function of the TT in their new context; and (c) the needs and conventions of the intended addressees. The authors see connections between transediting and House's *covert translation,* Nord's *instrumental translation*, and even Gutt's *indirect translation,* so the need for a separate concept is questionable (cf. Schäffner 2012). In any case, they found that the subjects varied as to the phase (pre-writing, writing, and post-writing) where they would perform certain transediting operations, such as macro-level restructuring and additions, and ascribed such differences to the subjects' working styles. Most operations belonged to situational and cultural transediting (types b and c above). Interestingly, no clear link was found between the use of transediting and the subjects' declarative knowledge and experience. So, what is it that makes translators and interpreters adapt their production to their envisioned addressees? In this volume, Apfelthaler reviews studies on target audience orientation and claims that such orientation might be related to cognitive empathy, which he is now researching with a multi-method approach that he describes in detail.

8. Recontextualized research

Risku (2010) argues that once we move from information processing in laboratory settings to full real actions mediated by technologies in specific environments, we need to enlarge our research interests to cover areas such as agent cooperation, tool usage and the interplay with the environment. For example, Roziner & Shlesinger (2010) evaluated the use of remote interpreting in large multilingual institutions and found small effects on the quality of the interpreting and on interpreters' physical health and levels of stress, but also considerable psychological effects, e.g., an increase in feelings of

isolation and alienation. Mouzourakis (2006) suggests that interpreter alienation is associated with lack of concentration and motivation and that, in remote interpreting, alienation is determined by the interpreters' perception of the meeting room as mediated by image displays.

Mouzourakis (2006) notes that such psychological effects and related physical complaints are not unique to remote interpreting, but rather shared by all human operators working in virtual environments. Translating is a paramount example of teleworking, and virtual environments and the interaction with electronic tools have a powerful effect on translators' behavior and mental processing.[6] For instance, Plassard (2007) shows that distribution lists have modified traditional individual approaches to translation problem solving, for now problems may also be tackled and solved collectively. In order to study changes in the ways people work, Mouzourakis (2006) cogently argues that we need to define a minimum common set of parameters so as to be able to compare normal or baseline conditions with the modified conditions of actual working practices or new forms of language mediation—he actually refers to comparing interpreting with remote interpreting, but this can be generalized to all tasks researched in TPR.

By taking translation and interpreting out of the laboratory, we have found that perhaps we do not know so much about actual working practices. For example, Ma & Wu (2008) found that the generalized assumption that interpreters will reach higher accuracy when planning before or during task execution might not be totally justified. In this volume, Risku shows the complex social network freelance translators are part of, and how they will externalize parts of the process and thus transform the "internal" processing into an interaction with self-produced outer stimuli.

Restoring the subjects' working environments in research has also paved the way to study real work content in translation agencies and the interaction between agents in the process, such as their communication patterns in translation projects and booth teamwork (e.g., Kuznik & Verd 2010; Zehrer 2012; Chmiel 2008). Once full-fledged cognition (rather than individual, rational, conscious information-processing) has been reinstated in the study of the translation and interpreting processes, research methods—often devised for studying isolated, minimal units in laboratory settings— need to be reconsidered. Hansen (2010) suggests TPR should go beyond quantitative data to adopt a more integrative approach involving the subjects' life story as well (but see House 2013). Hubscher-Davidson (2011) convincingly argues that, alongside

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6. Christensen (2011) reviews studies on mental processing when using CAT tools.

quantitative methods, TPR scholars might benefit from using ethnographic methods to better tap less tangible aspects of the translation process, such as translators' self-concepts, perspectives and intentions, their visualizations or their emotional and intuitive behaviors. Nevertheless, while it is obvious that translation and interpreting processes comprise more elements and factors than what can be operationalized in a task trimmed for laboratory conditions, it is also true that such conditions often yield interesting and useful results. The question is not whether one method is better than another one, but whether they do justice to a particular research aim.

In this period, multi-method approaches to data collection have already blurred the distinction between introspection and observation, and between quantitative and qualitative research, by combining them all. Also, the opposition between process and product research, which used to be the backbone argument for the budding TPR strand within TS in the 1980s, is no longer valid. Language is behavior and, consequently, so is written and oral language production. Research on mental processes in translation and interpreting cannot ignore products or restrict their use to just evaluating quality or performance (see, e.g., Halverson 2010).

How do we establish an optimal correspondence between research topics and the methods applied to study them? Muñoz (2010b) suggests that TPR might be organized in three levels: (a) the set of mental states and operations that play a role when translating and interpreting, and the ways they are constructed and carried out, such as understanding, problem-solving and dichotic listening; (b) the variable set of sub-tasks and observable operations that often entail combining and managing the mental states and operations in the previous level, such as reading, revising, and self-monitoring; and (c) the roles, cognitive contributions, and relationships of all relevant agents who interact in the production of translations and interpretings. Chesterman (2013) proposes a three-fold distinction between (a) *cognitive translation acts* (mental processes); (b) *translation events,* where mental processes are sociologically embedded, and (c) *translation practices* (where translation events are embedded in history and culture). These are different suggestions; the first one maintains a cognitive approach across levels, whereas the second places current TPR studies within the larger landscape of TS. In any case, we need hands-on knowledge of what they entail, because methodological standards at one level or perspective might be totally inappropriate at another level. This is what Massey & Ehrensberger-Dow (2011) did in their project "Capturing Translation Processes." They collected data on (1) the situation surrounding the translation activity; (2) the practices the translators engaged

in; (3) the comments about translation processes; and (4) the translation products. Massey and Ehrensberger-Dow monitored staff translators at their usual workplaces, but they also tested them in controlled conditions in their lab. In this volume, Ehrensberger-Dow addresses the challenges of TPR research at the workplace.

9. Corollary

Let us contemplate this blurred snapshot for a minute. Advances in our knowledge on competence or expertise are yielding a clearer picture of what it takes to become an excellent translator or interpreter. Mental load has been tested in several tasks and situations, and from different perspectives. In particular, the relationship between mental load and professional tools, and between mental load and language and text/discourse features has been particularly informative. Concentrating on mental load has proved to be a good move, because it seems to impinge on both productivity and quality, and also on the welfare of translators and interpreters. Established data-collection procedures, such as introspective methods, have been thoroughly tested to determine their optimal application. New procedures have made it possible to study under-researched process components, such as reading and writing, and their interaction. Revision, sight translation and post-editing have also emerged as particularly interesting areas of study. In all of them, there seems to be a tendency to focus more on diverse expressions of mental control, such as monitoring and metacognition, than on assumed stable capacities, such as memory.

The field is slowly but steadily moving towards updated understandings of cognition that have challenged the focus on isolated, conscious rational thought, and have opened the door to the study of emotions, intuition and uncertainty, and their influence on the ways people translate and interpret. The translators and interpreters' experience and beliefs have been shown to have a bearing on the way they carry out their tasks, but not necessarily on their products. This has paved the way to study individual psychological traits and preferences, which compound into personal working styles. Much research is and will be carried out in labs, but now the full environment and conditions are also being observed, and research has also reached the working place. New settings and research topics call for an adjustment in research methods, and some multi-method strategies are being implemented that may soon shed light on the most appropriate ways of tackling different research goals. We may still not have the answers to many questions, but we are learning how to ask the right questions. These were the topics we addressed in TPRW3, and these are the topics addressed by the following articles.

Let us now zoom out a little bit and widen our scope. In the last eight years, contributions to cognitive and psycholinguistic approaches to translation and interpreting processes have doubled, and their quality has also risen in parallel. They are still a fuzzy set of only partially overlapping efforts, but that is just the normal state of affairs in any cutting-edge research domain: differences are what make research fields progress. Convergence is, however, already noteworthy and shows that not only TPR results, but also its ways and goals are relevant for fast-paced societies where translation and interpreting have become a must not only for the elites, but also for ordinary citizens in their everyday life. In my view, all of the above proves that, indeed, TPR matters, and that it matters more than ever before.

This snapshot also has some darker areas. The analysis of the publications shows that single researchers signed more than 60% of the contributions, and that a further 28% was written by only two. Many co-authored papers were written by the same people, intellectual partners who very often belong to the same institutions or research teams. This hints at a lack of exchange and cooperation that only lately seems to be losing ground.[7] We are not only borrowing from neighboring disciplines (cf. O'Brien 2013), but also—and heavily—from each other, as was to be expected. Nonetheless, research projects often mix many trends in ways than make them highly interesting, but also particularly difficult to frame or contrast. Many research efforts mentioned in a given section of this text might have featured in other sections as well. Research topics seem sometimes volatile, and not always thanks to advances in our knowledge.

A final word on publishing. Nearly half of the contributions in the sample related to interpreting were unsurprisingly published in *Interpreting.* The other half was scattered mainly between edited volumes, EST proceedings, and the rest of the journals. This may be partially explained by the growing interest in community interpreting, which had more publications than interpreting process research in all journals throughout this period, but their concentration in *Interpreting* also hints at a need to restructure a publication landscape dominated by generalist journals, where sometimes TPR contributions are not refereed by reliable specialists, and where they need to enter in an unfair competition with articles from very different approaches. The journal *Interpreting* has obviously provided a backbone to the emergent Interpreting Studies.

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7. For instance, in 2011 the international research network "Translation / Research / Empiricism / Cognition" (TREC) was created with 13 TPR groups from 10 countries. It was an initiative of PACTE Research Group.

Even so, Napier (2011: 127) remarks that many excellent research efforts in interpreting remain unpublished. One can only wonder how many valuable research efforts in TPR march directly from the press into the academic grey literature or simply sink into oblivion. In this period, many contributions by the 85 authors with more than one TPR-related publication have been published in "secondary" venues, and some contributions by very productive and cited TPR authors are to be found elsewhere too. The time seems ripe to consider whether it would be good to have a focused TPR research journal.

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BIONOTES / NOTAS BIOGRÁFICAS

Ricardo Muñoz Martín has been a freelance translator since 1988, mostly part-timing. After his training in languages and translation, he received his PhD in Hispanic Linguistics from UC Berkeley in 1993. He has trained translators at several universities ever since. Currently, he is Professor of Translation Studies at the University of Las Palmas de Gran Canaria, Spain. Since 2002, he coordinates the Research Group "Expertise and Environment in Translation" (PETRA, Spanish acronym), devoted to empirical research into translation processes. His main research interests include cognitive translatology and translator training. Muñoz has published articles in several journals, such as Babel, Meta, The Translator, Translation Spaces and Perspectives, and chapters in books by publishers such as John Benjamins, Mouton de Gruyter, Routledge and Samfundslitteratur.

Ricardo Muñoz Martín ha sido traductor autónomo desde 1988, casi siempre a tiempo parcial. Tras su formación en filología y traducción, obtuvo un doctorado en Lingüística Hispánica en la Universidad de Berkeley en 1993. Desde entonces ha formado a traductores en diversas universidades. En la actualidad, es Catedrático de Traducción en la Universidad de Las Palmas de Gran Canaria. Desde 2002 coordina el grupo de investigación «Pericia y Entorno de la Traducción» (PETRA), dedicado a la investigación empírica de los procesos de traducción. Entre sus principales intereses de investigación destacan la traductología cognitiva y la formación de traductores. Muñoz ha publicado artículos en varias revistas, como Babel, Meta, The Translator, Translation Spaces y Perspectives, y capítulos en libros publicados por editoriales como John Benjamins, Mouton de Gruyter, Routledge y Samfundslitteratur.