

# The Development of Translation Competence



The Development of Translation Competence:  
Theories and Methodologies  
from Psycholinguistics and Cognitive Science

Edited by

John W. Schwieter and Aline Ferreira

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SCHOLARS**

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P U B L I S H I N G

The Development of Translation Competence:  
Theories and Methodologies from Psycholinguistics and Cognitive Science  
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# **PART I**

## **INTRODUCTION**

## CHAPTER ONE

# SITUATING TRANSLATION EXPERTISE: A REVIEW WITH A SKETCH OF A CONSTRUCT<sup>1</sup>

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This introductory chapter outlines the prominent role of competence and expertise research in the development of Translation Studies and discusses the nature of a situated translation and interpreting expertise (STIE) within cognitive, empirical approaches to translation and interpreting. STIE is envisioned as a multidimensional research construct where behaviors such as chuchotage, fansubbing, conference interpreting, literary translation, localization and the like may be described in terms of different demands in subsets of a fuzzy set of skills. Defining a specified set of representative translation and interpreting tasks seems to be a precondition to predicate existence of STIE, let alone degrees thereof. A three-layer taxonomy is proposed, focusing on task models, component subtasks, and cognitive processes. Finally, a construct for STIE is sketched, with five overlapping and interacting dimensions, envisioned as scopes onto a single but complex mental experience. The five dimensions are knowledge, adaptive psychophysiological traits, regulatory skills, problem-solving skills, and the self-concept. The self-concept dimension is then used to illustrate how construct dimensions might be operationalized

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<sup>1</sup> I am indebted to Matthias Apfelthaler, Maureen Ehrensberger-Dow, Celia Martín de León, Hanna Risku, Gregory M. Shreve, Elisabet Tiselius, two anonymous reviewers, and the editors of this book for their thoughtful comments and their valuable suggestions to improve the quality of this text. The commenters do not necessarily agree with the contents of this paper and all remaining errors are only mine.

through several intermediary sub-constructs, in this case into the minimal sub-dimensions of self-awareness, situation awareness, and self-efficacy.

## 1. Introduction

In this text, an *expert* is somebody who displays “consistently superior performance on a specified set of representative tasks for the domain” (Ericsson and Charness 1994, 731) and *expertise* is understood as the bulk of cognitive resources and skills leading to that superior performance. These “fundamental but often uncritically examined” concepts are nowadays widely used in cognitive and psycholinguistic approaches to translation (Shreve 2006, 150). The overarching aim of this text is to contribute to disentangling part of the conceptual puzzle surrounding these concepts. In order to do so, Section 2 will attempt to situate readers by tracing the evolution of modern expertise research. Section 3 will focus on the nature of the concept of expertise. Section 4 will suggest a typology to organize research objects as a prerequisite to the empirical research into translators’ and interpreters’ expertise. Section 5 will then sketch and briefly discuss a construct for a general, situated notion of expertise within Cognitive Translatology.<sup>2</sup>

In Cognitive Translatology, translation is a subset of complex behaviors aiming to solve communicative needs, whose common thread is the use of at least two (spoken, written or signed) languages. Activities such as paraphrasing are very similar (Russo and Pippa 2004; Schmid 2005; Muñoz 2011; but see Tammola et al. 2000 and Christoffels and de Groot 2004), so this may be understood as an arbitrary assumption. There are, however, some powerful reasons to set such limits to our field: (a) as an applied science, Cognitive Translatology aims to respond to societal demands, and folk understandings of translation are usually within those limits; (b) communicative activities such as revising and paraphrasing are often constitutive components of translation behaviors; (c) some constitutive components may be altered in specific ways when combined into translation behaviors, as in the case of reading (Shreve et al. 1993;

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<sup>2</sup> Cognitive Translatology is a subdiscipline of Translation Studies characterized by its adherence to the scientific enterprise and by the use of the common grounds of several second-generation cognitive paradigms as a referential framework. As an applied scientific discipline, it seeks to improve translation quality, processes, and training (cf. Muñoz 2010a, 145–147, Muñoz 2010b, 173–179). Hence, expertise lies at the core of its endeavors.

Castro 2008; Jakobsen and Jensen 2008), listening comprehension (Ivanova 1999), or speaking and writing (Slobin 2003).

Although translation expertise and interpreting expertise are often implicitly assumed to be different constructs, no distinction is made between them here because (1) translating and interpreting skills are seen as concrete, adaptive developments of various levels of bilingual proficiency to specific task configurations; (2) they probably share some features, such as an optimized bilingual lexicon and—perhaps unlike “natural” code-switchers—strong inhibitory rules for competing linguistic forms from different languages; (3) people often engage in both translation and interpreting tasks, so it is very difficult to discern whether some phenomenon is solely due to their experience in either oral, written, or signed activities; and (4) research constructs must include all cases in the definition while excluding all others. In this case, it should include all actions seeking to satisfy communicative needs where at least one person is expected to convey a similar meaning in a different language. Hence, in this text *translation* is usually employed to mean both translation and interpreting, and *translation expertise* refers both to that of translators and interpreters. When *interpreting* is used, it will usually point to simultaneous interpreting unless otherwise specified, simply because cognitive approaches to research on community interpreting are still scarce. When focusing on written or oral/signed activities separately, then *expert translators* and *expert interpreters* are used.

## 2. The evolution of research on translation expertise

Modern expertise research started at the end of the 1950s with the dawn of the cognitive revolution. In the first decades, computer scientists applied the information-processing paradigm of cognition to build systems that would contribute to preserving, applying, and disseminating experts’ knowledge. The first systems in Artificial Intelligence basically viewed expertise as skilled memory, and problem-solving as efficient search within such skilled memory. Heuristic strategies, such as means-ends analysis, were assumed to be the base for knowledge compilation. Modern research into translators’ abilities started about that time, partially as an offshoot of efforts to build “mechanical translation” programs as expert systems. Thus, some notion of expertise can be said to have been ingrained in the empirical research of translation from the start.

The early heuristic “direct models” mentioned above turned out to be weak and to relate more to the behavior of novices than to that of experts (Kuchinke 1997). In Machine Translation, this approach produced little



more than rudimentary parsers with refined bilingual glossaries. Soon they were abandoned and new systems followed that were inspired by generative linguistics and by the mathematical model of communication—the “interlingua models”. How knowledge was organized and represented would become the subject of these *deep* models, based on the premise that knowledge could be represented in rules. Still, the assumption that knowing the rules of language and knowledge sufficed to become an expert remained untouched. However, in 1966, the ALPAC report found machine translation of the time to be slower, less accurate, and twice as expensive as human translation, and there followed what John Hutchins (1995) described as “the quiet decade”. This in turn contributed to the decline of (generative) linguistic approaches in translation research in the 1980s, and to broadening the scope of the field, under the new name of *Translation Studies* (Holmes [1972] 1988).

In the 1980s, empirically-oriented researchers within the infant Translation Studies started to look elsewhere for referential frameworks, precisely when expertise was gathering momentum in cognitive psychology. New memory models (e.g., Baddeley and Hitch 1974) had paved the way for a new wave in expertise research, centered on problem solving and speed. Many earlier ability researchers, such as Francis Galton and Lewis Terman, had been on the innatist side of the debate between nature and nurture. Now, however, psychometric tests on intelligence, memory and speed did not show any *general* advantage in experts, and expertise came to be seen as an extreme case of skill acquisition (Proctor and Dutta 1995), where cognitive advantages were restricted to each expert’s domain. Ericsson, Krampe and Tesch-Römer (1993) then forwarded their notion of expertise development through *deliberate practice*, i.e., basically as the result of (a) general mechanisms for learning and adjusting behavior to task demands, (b) the individuals’ commitment to improve their performance, and (c) well-designed training.<sup>3</sup> Expertise, in this view, is often taken to correlate directly with the time spent in such practice, with the magic 10-year rule as a threshold across several domains (Ericsson 2006).

In this second wave, expertise has often been considered the result of storing operator sequences that yield more successful problem solutions. Such operator sequences would become new, larger chunks of specialized production rules with detailed conditions and actions to apply them (Holyoak 1991:302). These new rules would become automated, and

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<sup>3</sup> Actually, Ericsson did not completely rule out the influence of some innate predispositions (cf. Ericsson and Charness 1994:744).

mental processing should thus be faster, as experimental research confirmed. Indeed, convergent empirical evidence yielded common cognitive, perceptual, and motor features in experts across many domains. Experts were taken to (1) know more, (2) use the information differently, (3) have better recall, (4) solve problems faster, (5) see problems at a deeper level, (6) analyze problems qualitatively, and (7) be more aware of their ability to make mistakes (Swanson and Holton 2001, 231). As to how expertise develops, it was and still is conceived of as a dynamic, domain-specific, internal process characterized by constant acquisition of knowledge, progressive mental reorganization of stored information, and growing problem-solving skills (Herling 2000, 12–13).

Translation Process Research (TPR) started at this point, more or less in the mid-1980s. Several research efforts focused on different aspects of translation competence—notably, on problem-solving—mainly with think-aloud elicitation techniques (Ericsson and Simon 1980). The originally linguistic notion of *competence* was preferred until the turn of the century. However, understandings of translation competence and its implications have been slowly drifting towards those of expertise within cognitive-psychological perspectives, and some authors nowadays use *competence* as a (near) synonym to *expertise* (e.g., Ehrensberger-Dow and Massey, this volume; Göpferich 2013; PACTE 2003). By the end of the first decade of this century, research in our field had already aligned views with standard expertise research. Shreve (2006) suggested that translators' expertise is an acquired skill where proceduralization, self-regulation, and metacognition play important roles, and quoted Ericsson (1996) to further suggest that there are “measurable changes in pattern learning and memory, problem recognition and representation, the organization and composition of knowledge structures and the ability to develop strong methods for problem resolution” (Shreve 2002, 151). Jääskeläinen (2010, 219–222) described translation experts as having automated certain linguistic operations, processing larger text segments, displaying stronger self-monitoring skills, and better exploiting their world and cultural knowledge. In interpreting, differences between experts and novices have been found to relate to chunking of information, reasoning, speed of processing, and individuals' knowledge base and its organization (Moser-Mercer et al. 2000, 108; see also Ericsson 2010, 246).

A new wave—or rather, several ripples—in the study of expertise is underway, mainly due to new understandings of cognition (e.g., situatedness) and to several theoretical paradoxes and empirical findings incompatible with second-wave models. For instance, some of the research summarized by Holyoak (1991, 304–309) shows that (a) novices may have

better memory than experts; (b) weak heuristic methods, such as means-ends analysis, may impair performance; (c) experts sometimes engage more in resource-hungry activities such as planning and problem-solving than novices do—for translators, see Tirkkonen-Condit (1989) and Sirén and Hakkarainen (2002, 78–79); (d) expert decision-making does not *always* lead to improved performance (see Jääskeläinen 2010, 219); and (e) adding basic domain information in texts may actually hinder the reading performance of experts—this is the *expertise reversal effect* (Sweller et al. 2003). Tirkkonen-Condit (2005, 405) summarized some interesting individual differences in translators: (1) longer times spent before starting to generate text do not always yield better results; (2) using no translation aids may improve quality; (3) spontaneous production is sometimes better than carefully crafted solutions; and (4) proceduralized routines may hinder creativity. A crucial finding that supports a unified approach to the basic characteristics of expert translators and interpreters is that expertise *does* transfer under certain conditions (Kimball and Holyoak 2000), that is, that expert skills may be successfully applied to non-identical tasks too. All these points are here taken as reasons to re-examine and situate translation expertise.

Recent research developments have often led to heterogeneous understandings of expertise. Very much like Pym (2003) noticed in the definitions of translation competence, there are almost as many definitions of “expert” as there are researchers who study them (Shanteau 1992, 255). Based on the domain specificity of expertise, new models often depart from the base conception, tailoring it to each researcher’s field. This is the ultimate goal here too, namely, to develop and motivate a concept of general translation expertise for Cognitive Translatology. Expertise has also been approached from sociological perspectives (e.g., Evetts, Mieg and Felt 2006; Germain and Tejeda 2012; for our field, see Sunnari and Hild 2010; Tiselius 2010). In the budding framework of Cognitive Translatology, anthropological and sociological perspectives on translation expertise are envisioned as complementary to “purely” cognitive approaches, rather than as alternative accounts. Let us now have a look to the nature of the *concept* of expertise.

### 3. Translation expertise as a research artifact

In inductive paradigms such as Cognitive Translatology, theory boils down to a coherent series of statements about the relationships between concrete variables (e.g., reading speed, typing speed) and also between them and abstract variables (e.g., translating speed). Abstract variables

cannot be directly observed. They are just hypothetical constructs used as shorthand for fuzzy sets of functionally related behaviors and mental processes. What is “hypothetical” in these theoretical concepts is their existence, not their definitions, because such constructs are only “heuristic devices for organizing observed relationships with no necessary presumption of real entities underlying them” (Messick 1981, 583). Explaining translation behaviors through translation expertise entails no claim as to its physical or even its psychological reality. It is an abstract model to fit data, not a representation of the workings of the mind. As Loevinger (1957, 83) crudely put it for psychology, “constructs [...] exist in the minds and magazines of psychologists”. This does not mean that research on translation expertise need not seek psychological and neural correlates to hypothesized mental activity. Quite on the contrary, Cognitive Translatology deems it necessary that any hypothetical construct be in agreement with what we know about mind and brain (see, for instance, Annoni, Lee-Jahnke and Sturm 2012; Diamond and Shreve 2010; Diamond, Shreve, Golden, and Durán-Narucki, this volume; García 2012; Moser-Mercer 2010; Tymozcko 2012).

Translation expertise is a convenient research construct because we can use it to explain some given observable translation behaviors. Again, a caveat seems in order. Translation expertise might not really exist, so it cannot be used to explain translation behavior as a whole:

Concepts are products of definition. They are merely descriptive and explain nothing. If someone says that a man has hallucinations, withdraws from society, lives in his own world, has extremely unusual associations, and reacts without emotion to imaginary catastrophes because he is schizophrenic, it is important to understand that the word *because* has been misused. The symptomatology defines (diagnoses) schizophrenia. The symptoms and the “cause” are identical. The “explanation” is circular and not an explanation at all.

(Kimble 1989, 495)

That is, we may use translation expertise to explain differences in the data between subjects in items such as text chunking or problem solving, but we cannot combine such potentially differential behaviors to use them as an explanation of translation expertise. Moreover, some kind of pre-existing translation theory is necessary to determine which data is more suitable to support or disprove it, and also to interpret data, so empirical observations are theory-dependent. The bottom line is that empirical research of translation expertise may tell us something about theoretical frameworks such as Cognitive Translatology, but not about translation phenomena per se.

Most constructs of expertise in other fields portray it as a combination of at least three dimensions: knowledge, experience, and problem solving (Herling 2000, 12–16). The dimension of experience has been particularly questioned on empirical grounds because it is often a weak predictor of performance (Ericsson 1996) and may lead to functional fixedness in problem solving (Schilling 2005, 133). Functional fixedness is related to notions such as *routine* experts (Hatano and Inagaki 1986), *experienced non-experts* (Bereiter and Scardamalia 1993, 11), and *arrested development* of expertise (Ericsson 1998). All these labels describe cases where individuals apply learned, otherwise successful strategies to new instances where they do not yield superior results. In translation tasks, where input is never exactly the same and idiosyncratic, ill-defined problems are the norm, only *adaptive* expertise—characterized by the ability to develop new strategies to cope with novel situations—can be deemed full translation expertise. A large experience may also induce more memory errors, by filling in empty slots in schemata with information not present in the stimulus (Roediger et al. 2001). Experience is also suspicious from a theoretical perspective, because it usually refers to the state of having gained or being influenced by (practical) knowledge or skills through direct observation or participation. It is, therefore, a feature of expertise development, rather than a defining dimension of expertise—which in this case would be knowledge and skills, not the way they are enhanced. One of the main objectives of studying expertise is to gain insights into how to develop it, but the what and the how of translation expertise should be kept carefully separated. In other words, experience is extremely important, but it is a developmental cause. It is the effects of such experience what should feature in expertise constructs.

Translation expertise is also generally conjectured to be a multidimensional construct. For example, Hoffman (1997) suggested that the constitutive dimensions of expertise in interpreters are developmental progression, the nature of expert memory organization, and the nature of expert reasoning. Regarding translators, Sirén and Hakkarainen (2002) discuss the applicability of “generic” expertise dimensions such as skills, speed, and self-monitoring skills. Beyond verbal, explanatory accounts of its nature and of the contrasts with neighboring research constructs such as writing (McCutchen 2011) and public speaking (e.g., Lie 2011), a multidimensional understanding of translation expertise may help us describe different behaviors—fansubbing, chuchotage, localization, language brokering, etc.—as subsets of dimensions where variables may reach different values and have different correlations and effects. In practical terms, this entails that (1) there will be a tension between generic

features of translation expertise and other features that are probably task-bound, so that translation expertise may often feel like a bunch of tightly knit constructs linked by family resemblances, rather than a unitary construct; (2) translation expertise will be composed of other constructs which in turn may also combine several lower constructs, down to concrete, testable hypotheses.

Finally, Ericsson (1996) stated that expertise may be a useful concept in any field that can define a coherent set of tasks and problems, and where performance can be measured objectively. Measurement is crucial because (a) translation expertise is assumed to point to instances of peak performance (Jakobsen 2005) within a graded continuum; (b) as an artifact for scientific research, expertise is only interesting if it can be operationalized and related to behavior; and (c) measurement may be instrumental to profile translation tasks. The possibility of measurement is thus a precondition to all candidate dimensions of translation expertise. Ericsson and Lehmann (1996, 277) insisted that expertise can be viewed as a “maximal adaptation to task constraints” and can only be predicated on a specified set of representative domain tasks. Hence, establishing such a coherent set of standardized translation tasks for research purposes may be seen as a precondition to study translation expertise, for it is the only way to make it possible to compare measurements of aspects of translation behavior.

## **4. In search of a comprehensive typology of empirical research objects**

This section will address some issues related to scope of the (general) object of study of Cognitive Translatology, and then suggest a three-layer typology of empirical research objects, corresponding to translation tasks, translation subtasks, and cognitive processes.

### **4.1. Delimiting translation behaviors**

Expertise constructs are constrained by the nature of the behaviors they describe. Their scope is not universal, but situated. Translation behaviors are socially defined, and the small print of expertise descriptions may be diverse in different communities. Most empirical research in our field seems unintentionally oblivious to the differences in both professional and non-professional tasks and work profiles outside a few Western countries. These differences, however, are important. For instance, Dragsted (2006) has shown how translation memories may exert an influence on the way

texts are processed when translating, and Ehrensberger-Dow and Massey (this volume) address several issues related to cognitive ergonomics in translation. This seems to call for a distinctive account of translation as human-computer interaction that only recently has been explicitly proposed (Risku 2007; Christensen 2011; Olohan 2011; O'Brien 2012). Computer-mediated translation behavior is perhaps the usual way professionals and non-professionals translate in developed countries but it is by no means the only, perhaps not even the most usual one. Hence, the approach to general translation expertise suggested here is intentionally blind to the divide between professional and non-professional behaviors, but there is no room here to develop this argument.<sup>4</sup> In any case, even within a community there are often several (folk) translation expert stereotypes. Popular professional labels such as literary translator, court interpreter, subtitler and the like are socially entrenched, and there seems to be a general agreement among researchers that specialized experts with those profiles may underperform when outside of their (narrow) domain, so their skills are not totally interchangeable. Within a unified, situated construct of translation expertise, multidimensional approaches may address this issue by linking expertise features (and values within such features) to concrete translation tasks.

## **4.2. A proposal for a multidimensional typology of research objects**

A research-based general typology of translation behaviors is still way ahead (cf. Jääskeläinen 2011, 24–26), but we need to agree on formulations of translation task models for research purposes (e.g., translating, sight-translating, liaison interpreting), on the ways to decompose these task models into subtasks (e.g., drafting, revising) and on the cognitive processes that play a role in task and subtask performance (e.g., attention, mental load). These minimal layers (graphic 1) should let researchers embed their research projects into the larger picture or matrix of empirical research on cognitive processes in translation, thereby contributing to make their efforts more compatible and comparable.

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<sup>4</sup> See discussions in Kiraly (2000:26–32), Sirén and Hakkarainen (2002), Englund Dimitrova (2005:10–18), Sunnari and Hild (2010), Jääskeläinen (2010) and Muñoz (2011).

### 4.2.1. Translation tasks

A theoretically and empirically grounded, three-layer research typology might start by adapting and enlarging Pöchhacker's (2004, 13–25) classification for interpreting tasks to cover translation tasks as well.<sup>5</sup> The first layer might relate to concrete translation task models that are agreed upon to demand specific configurations of skills within a general construct of translation expertise. Such models could be enriched beforehand with translators' "psycho-biographies as well as the social setting of the workplace and the contextual resources" to make it possible to fully understand their behaviors (Ehrensberger-Dow and Perrin 2013, 77).<sup>6</sup> Establishing translation-task models in ways more useful for our research calls for ethnographic methods (e.g., Hubscher-Davidson 2011; Koskinen 2006) and sociological approaches (e.g., Kuznik and Verd 2010; Monzó 2006). Several related research efforts have already proved interesting and useful (e.g., Ehrensberger-Dow and Perrin 2013; Risku 2004; Koskinen 2008). Two approaches with particular promise for Cognitive Translatology are Cognitive Ethnography (Edwin Hutchins 1995) and Actor-Network Theory (Latour 2005).

Cognitive Ethnography understands cognition as distributed through one or many human agents and objects, and it seeks to underpin how cognition adapts to carry out activities as they happen in real-world environments. A basic tenet of cognitive ethnography is that complex cognitive processes emerge from the organization of simpler cognitive processes due to cultural practices. Knowledge built from communities of practice is then applied to the micro-level analysis of specific episodes of activity (Williams 2006). Such an approach seems adequate to capture differences between related translation tasks in different communities. As for Actor-Network Theory (ANT), it stems from a different tradition and Risku and Windhager (2013) have used it in the interpretation of changes in translation management. ANT focuses on the relational ties within translators' environments to explore how different *actants*—humans and

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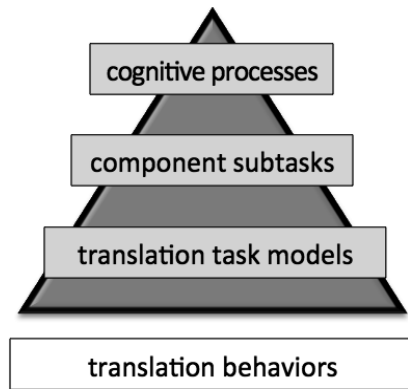
<sup>5</sup> Pöchhacker (2004) applied eight parameters to propose quite an exhaustive classification of interpreting behaviors, from conference interpreting to bilateral interpreting. His classification easily accommodates hybrid, emerging, and marginal phenomena such as simultaneous-consecutive interpreting, sight-interpreting, and tactile interpreting.

<sup>6</sup> Ehrensberger-Dow and Perrin (2013) seem to refer to actual research projects, rather than to modelling general translation tasks. Nevertheless, building these additional perspectives into translation-task models should make it easier to provide the full situated account they suggest.



also non-human artifacts—come together to act as a whole. ANT seems particularly adequate to account for particular task constellations and to describe team-translation behaviors as distributed cognition activities, especially within technological environments.

Either way, research within this first layer should lead to a set of interrelated and standardized translation-task models with detailed conditions and circumstances, to make it possible to explain how the characteristics of the task impact the cognitive demands placed upon subjects. Of course, human behavior is extremely complex and modeling it entails abstracting peculiarities, but a limited set of translation-task models for research may improve over time precisely thanks to putting them to test as to their correlation with real-world activities. In this line of work, Bayer-Höhenwarter (2011, 420–422) has discussed the (objective) task complexity construct (Haerem and Rau 2007; see also Wood 1986) in TPR, which describes the task both in terms of stimuli impacting individuals and of behavioral requirements.



Graphic 1. Three minimal layers in a typology of research objects within Cognitive Translatology

#### 4.2.2. Translation subtasks

This might be a second layer. At this level, translation-task models could decompose in ways relevant for Cognitive Translatology. Jakobsen's (2002a) division of translators' activities into orientation, drafting, and revision phases has been very useful to distinguish on-line

revision from final revision behaviors, but the orientation phase has so far proved nearly uninteresting.<sup>7</sup> Time and task sequencing are very important parameters in our research. However, given the acknowledged recursive and overlapping nature of translation processes, they should probably not be used as criteria to decomposing tasks. An optimal analysis of translation behaviors might synergically build on similar communicative constructs in neighboring disciplines, and divide translation-task models into subtasks such as reading comprehension (e.g., Koda 2005, 254–262); listening comprehension (e.g., Buck 2001, 94–115); information search (Kuhlthau 1985) and the like. In fact, some such subtasks or task components often become tasks on their own. Post-editing is one of them, and it has already attracted much interest (e.g., Koponen et al. 2012; and Lacruz, this volume; Lacruz, Shreve, and Angelone 2012; O’Brien 2005, 2006, 2007).

Some subtasks adopt similar but not identical configurations, as in the case of evaluating, correcting, revising, and editing translations (Muñoz 2007). The method of cognitive components—comparing tasks sharing all but one feature—has already proved useful for gaining insights into differences between monolingual writing vs. translating (Immonen 2006), shadowing vs. interpreting (Tommola et al. 2000), etc. Studying hybrids such as sight translation can also shed light on both task and subtask models (Dragsted and Gorm Hansen 2009; Lambert 2004; and Shreve, Lacruz and Angelone 2010, 2011). Cognitive Task Analysis (CTA, Schraagen, Chipman and Shute 2000) is probably a suitable method for this second layer. CTA may involve observation and interviews (e.g., Tiselius 2010), process tracing, and conceptual techniques (Cooke 1994). Process tracing through think-aloud techniques and prompted retrospection are by far the most popular strategies in TPR. These methods have often been misunderstood as letting researchers access actual mental processes, rather than partial, edited, and communication-oriented

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<sup>7</sup> Current data-collection techniques provide such a wealth of data that experimental texts or their analyses only rarely go beyond a couple of paragraphs. However, many subjects display qualitatively and quantitatively different behaviors through the first paragraphs or minutes of a translation task, when compared to their own behaviors in subsequent text or speech excerpts (cf. Englund Dimitrova 2005, 140–141). Hence, some TPR results might probably better explain subjects’ orientational activities *throughout* experimental texts than the more routinized behavior displayed later on. Setting minimum temporal or text-length limits for experimental tasks beyond the orientational phase—not necessarily for their analyses—might redress this issue.

constructions by the subjects (Muñoz 2012a, 246–247), but they are invaluable to develop subtask models on empirical grounds, and also to apprehend task awareness in research subjects (see 4.5.3).

#### **4.2.3. Cognitive processes**

Ericsson and Smith (1991b:12–13) suggested that the next step should be to map cognitive processes to expertise features. Not a very easy task in our case, for mental processing may be dissimilar in different translation tasks. The underlying processes that are part of the shared human cognitive architecture probably combine in quite different ways in, say, liaison interpreting and team translation. Thus, a third layer should address not only cognitive processes but also their interaction and peculiarities in different translation task and subtask models. Campbell and Wakim (2007) show how some features at this layer can be organized as a continuum in a multidimensional grid with the help of parameters such as the speed in attentional switching and in the decay of ST segment formal structure in memory. The interconnection between this layer and the previous layers is crucial. TPR has offered a wealth of insights by often focusing on cognitive processes in research efforts where sometimes translation tasks and subtasks are only sketchily outlined, such that operationalized parameters display important variations (Rodrigues 2002). That is the case of pause length, which may receive equal treatment in translating and in revising tasks, although pauses might be understood as indicators of partially different behaviors, goals, and processing circumstances.

Research projects also need to relate to their respective theoretical paradigms. For example, the distinction between internal and external sources of support for translating (Alves 1997) has yielded interesting insights and it is consistent with a relevance-theoretical approach, but it does not fit well in extended and situated paradigms for translation research, where the difference between inner and outer cognitive processing is blurred. Fortunately, in recent years there is a stronger tendency to converge into the study of parameters with different interpretations in competing frameworks, so that they provide a common ground to test such frameworks. Such is the case of mental load (Gile 2008; Lachaud 2010; Fougner-Rydning and Lachaud 2011; Lacruz, this volume; Lacruz, Shreve and Angelone 2012; O'Brien 2006, 2008; Seeber 2011, 2013; Sjørup 2011; Timarová, Dragsted and Gorm Hansen 2011), which may also contribute to bridging the traditional divide between translation research and interpreting research and also to incorporate

research from neighboring disciplines (Muñoz 2012b), or methods stemming from other disciplines.

#### 4.2.4. Process and product

In order to build a typology of translation tasks, subtasks, and the cognitive processes associated to them, we will need all the data sources we can make use of. Evaluating the quality of translators' and interpreters' products is already common practice in our empirical research, but the informative potential of the products largely exceeds their assessment in terms of quality. Alves et al. (2010) have shown how advances in the study of cognitive processes can be substantiated on sound empirical product data through corpora analyses.<sup>8</sup> Combined process/product analysis also sustains Alves and Vale's (2011) study of differences in drafting and revision, Göpferich's (2013) application of Dynamic Systems Theory to trace the development of translators' expertise, and Espunya's study of semantic shifts (this volume). This hints at product analysis being relevant in all layers of this typology. However, some research lines still shy away from using products as a source of data, perhaps due to the influence of Holmes' layout of the field of Translation Studies, the early tradition in TPR, and the scarcity of appropriate research tools.

In Cognitive Translatology, language use is viewed as situated behavior, so it needs to adopt a language-as-action perspective (Clark 1992) to account for aspects such as *audience design* (Bell 1984; see also Shreve 2009). Campbell's (2001) Choice Network Analysis and Dragsted's (2005) study on the influence of text difficulty on text segmentation show some of the insights to be gained by exploiting products as additional windows to cognition. This is simply an extension of the method of cognitive correlations, which in our field has often been unnecessarily restricted to contrast the overall performance of different populations in order to discriminate behavioral differences and ascribe them to presumed levels of expertise. To sum up, there are also theoretical reasons and empirical advantages beyond typological construction that call for an end of the traditional divide between process and product approaches.

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<sup>8</sup> There is an increasing tendency to organize and make process data from finished research projects available for further study, such as the corpus CORPRAT of the LETRA Lab (UFMG), the CRITT database of TPR data (Carl and Winther Balling, this volume), and the TransComp corpus of product and process data (Univ. Graz).

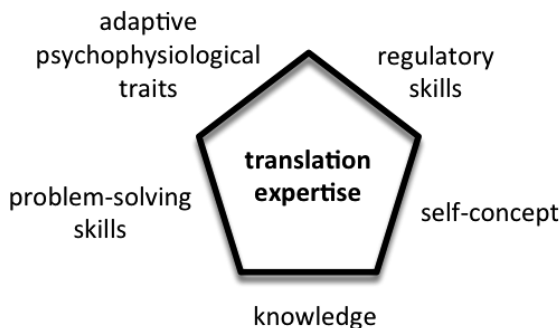
All in all, these successive layers of concretion seem necessary to ground the variables of any study involving translation expertise. It goes without saying that different researchers may legitimately understand these layers in different ways, but contradictory or puzzling results may often be explained by implicit or overlooked differences in our conceptions of task models, component subtasks, and the nature or workings of cognitive processes. Taken as a whole, constructing a research-based general typology of translation *explananda* seems an insurmountable obstacle that would admittedly turn any single research plan into a nightmare. Such an enterprise cannot be the result of isolated efforts, precisely because comparability and verifiability depend on agreements within the research community. Still, building such a conceptual apparatus is the only way to make findings and facts accessible to anyone, so it is just good science. Fortunately, the field is making slow but steady progress in this direction.<sup>9</sup> Let us now turn to the dimensions of translation expertise as an *explanans*.

## 5. Towards a situated construct of translation expertise

The construct proposed in what follows is inspired by the works of two prominent psychologists, namely Shanteau's (1992) Theory of Expert Competence—which suggests that more attention should be paid to task and domain characteristics—and Cowan's (1999) model of memory as 'embedded processes'. Within the realm of cognitive approaches to translation, this construct builds on Shreve's approach to translators' expertise, and on Risku's views on extended and distributed cognition as applied to translation. It is a minimal construct in that it contains the fewest components possible to account for data. For example, it does not include language skills as a separate dimension because they work everywhere in the model. Also, language command levels (a) vary quite a bit depending on the community and the situation, for either task- or training performance, (b) they are often seen as a pre-requisite for developing translation expertise, and (c) even the best experts keep improving their language skills throughout their professional careers. Thus, rather than explaining translation expertise, language skills seem to sustain it, and to interact with it.

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<sup>9</sup> For example, the international research network "Translation, Research, Empiricism and Cognition" (TREC) is working on standardizing translation research reports. Report standards implicitly ask for homogeneous research conditions.



Graphic 2. The five situated dimensions of translation expertise

The five dimensions I would like to suggest for a minimal, situated concept of general translation expertise are (1) knowledge, (2) adaptive psychophysiological traits, (3) problem-solving skills, (4) regulatory skills, and (5) the self-concept. They are labeled *dimensions* because they are conceived of as *scopes* into a complex behavior and they do not presume any “internal”, (fully) separate mental activity (Graphic 2). These five dimensions may be taken to apply to experts in other domains, but there may be some differences in the nature of expertise in different fields once tasks and domains are taken into account. For instance, chess experts deal with a closed set of explicit rules, and other experts have to adapt to closed behavioral conditions (e.g., sports in competition). Still others display skills that are totally learned from scratch (e.g., aviation control). As opposed to chess, in translation behavior the rules are often fuzzy and implicit. As opposed to sports in competition, translation task conditions vary quite a lot (countries, companies, demands). And, contrary to the case of aviation control, many skills in translators and interpreters are further developments of previously existing skills, such as bilingual command. I would like to suggest that these five dimensions are robust in the sense that there is a variable but increasing amount of indirect evidence supporting their likely adequacy and also their likely interaction within, and differential impact on, translation expertise.

## 5.1. Knowledge

For any construct to hold, researchers also need to gather evidence that competing explanations cannot account for, thereby ruling them out. This concerns the very notion of translation expertise but also its nomological

network, where often components are borrowed “as is” from other disciplines (cf. O’Brien 2013). Memory is a case in point. Improvements in task performance are often explained as the consequence of having an enlarged or improved working memory, and growing empirical evidence shows that this may well be the case (e.g., Christoffels, de Groot and Kroll 2006; Rothe-Neves 2003).<sup>10</sup> However, there are several memory constructs with different implications for our field (Timarová 2008) and all of them are present in our literature. For instance, Mizuno (2005) convincingly argues that Cowan’s (1999) model of memory is probably the best for our research interests, while Signorelli (2008) draws on an update of Baddeley and Hitch’s model, still the most popular one. A host of memory researchers have not yet been able to claim to have reached a fully valid description of the nature and workings of memory, for they all have positive and negative evidence to support their claims and mutual criticisms.

In view of the foregoing, constructs of translation expertise would benefit from attempting to preclude or circumvent problems inherited from other referential fields, such as competing psychological notions on memory. Although this construct draws from Cowan’s approach to memory, the actual view proposed here is to overcome what might become a roadblock by keeping it down to a minimum (i.e., knowledge). Human cognition is generally agreed upon to have a limited processing capacity that experts seem to be able to bypass, but there are also alternative approaches to standard explanations based on memory. For example, Glenberg (1997) turns most current memory understandings upside down by cogently arguing that the main function of memory is *not* storing information but supporting action, and Engle et al. (1999) suggest that working memory capacity actually reflects an executive attentional system. Coherent with extended and situated approaches, we might want to consider memory as a set of skills serving perception and action (MacLeod 1997).

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<sup>10</sup> Muñoz (2010c) even suggested applying general tests to screen experimental subjects, implying that such tests might be equally valid across different translation tasks and experimental designs (Tirkkonen-Condit 2012, 161). I obviously misexpressed what I meant, because I did not envision such tests as part of the variables to be considered in research projects. I just wanted to suggest that informants in descriptive studies could be screened *in advance* with such tests *only* to filter out informants way below average. Perhaps the suggestion of using these tests also to select subjects well above average for further analysis was a little too far-fetched (but see Macnamara et al. 2011; Mobaraki, Mashhady and Baqi 2012).

There is no need to stress the importance of knowledge for translating and its crucial role in any expertise construct. The knowledge dimension is here restricted to declarative or conscious knowledge—i.e., semantic, conceptual, episodic—and it is understood as synonymous with (*long-term*) *memory*. Mental representations are not seen as *fully* stored in complex structures and there is no such thing as the grandmother cell, i.e., a direct correspondence between single neurons and concepts (Gross 2002). Knowledge is not “collected in a language of symbols with discrete meanings, but rather emerges from the overall activation of the system” (Martín 2008, 17). In other words, knowledge “is not an object and memory is not a location [...] cognition is enacted or unfolded or constructed; without the action, there is no knowing, no cognition” (Wilson and Myers 2000, 59). This view also allows for distributed approaches to knowledge construction and management (e.g., Risku and Dickinson 2009).

Knowledge is not only about what things are known, but also about how they are arranged (Shreve 2002:161). Translation experts seem to access task-relevant knowledge faster and more reliably, and they do not seem to devote attentional resources to maintaining such knowledge active during task performance. Knowledge can be enlarged and it can become more and better interconnected, but it cannot be proceduralized (Paradis 2009, 6–28, 137–186). Improvements in the ways knowledge is used seem associated to the capacity of the brain to reorganize its neural architecture to adapt to environmental demands. Such adaptations may be explained by relevant practice and experience (Kelly and Garavan 2005; Poldrack 2010), based on the Hebbian principle that neurons that fire together, wire together.

Knowledge may be activated in different ways and degrees (cf. Binder and Rutvik 2011). People activate some of their knowledge in several ways in order to analyze and assign meaning to inputs, so activated knowledge is synonymous with *context* (de Mey 1982, 15). From this perspective, rather than subdividing it into fuzzy, overlapping categories like world knowledge, domain knowledge, language knowledge, etc., knowledge is just one single construct. It is envisioned as *knowledge-in-use*, so that task performance forms the basis to identify relevant aspects of knowledge (de Jong and Ferguson-Hessler 1996, 105). In this view, knowledge may be operationalized as to its quality—e.g., quantity, adequacy, etc.—for a concrete task and also in terms of efficacy/efficiency, in aspects such as bilingual lexical access (e.g., Schwieter and Ferreira, this volume) and enlarged and adapted neural networks (see, however, Poldrack 2010). From this perspective, perhaps



the closest notion to the way activated knowledge is envisioned in this construct is the combination of a *situation model* (Kintsch 1988, 168–169) and an *expectation structure* (Lörscher 1986; Kiraly 1995, 102–103).<sup>11</sup>

## 5.2. Adaptive psychophysiological traits

Skills are here understood as behavioral procedures that yield more efficient performance. Divided attention—a crucial skill for interpreters—is often seen as a special case of multitasking, and some neurological evidence hints that efficient multitasking results from a decreased reliance on attention (Dux et al. 2009). An important skill for many professional translators is improved hand coordination, because it is a requisite for proficient touch-typing (Salthouse 1991). When mastered, touch-typing is characterized by automatization and low attentional control. These adaptive psychophysiological skills result from repeated exposure to similar environmental stimuli that over time will begin to directly activate the appropriate response, such that related actions no longer demand conscious awareness. They become a habit (Trick et al. 2004, 388), a trait. This has been noted in our field too. Lee (1999, 266) states that interpreters are assumed “to have mastered the ability to *unconsciously* balance *automatized* attention distribution over several processing modules at once” (my italics). That is, automatized routines are unconscious, but they are goal-directed behaviors:

The idea that goals can direct behavior unconsciously is based on the notion that goals are part of knowledge networks that include representations of the goal itself, actions, procedures, and objects that may aid goal pursuit as well as situational or contextual features related to the goal [...] These knowledge networks enable people to act on goals without intentional control or without explicit expectancies. Thus, goal-directed behavior can start outside of conscious awareness because goal representations can be primed by, and interact with, behavioral and contextual information.

(Dijksterhuis and Aarts 2010, 470)

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<sup>11</sup> In Kintsch’s theory of text comprehension, individuals integrate their representation of the meaning of a whole text, or *text base*, with their stored knowledge, to create a situation model. For Lörscher, an expectation structure is the set of ideas about how an optimal translation should be, a sort of anticipated final state or blurred set of conditions to fulfil and goals to achieve in the task.

Clearly, an improved or enlarged working memory does not exhaust the adaptive psychophysiological traits that translation experts may develop, and these traits depend on the concrete tasks experts excel in. Besides, there may be some advantages in ascribing more importance to attentional processes in translation expertise. For example, attention is different from other cognitive processes in that it varies over time during task performance, thereby making it more amenable to study.<sup>12</sup> Attentional variation also fits better with the notion that translation expertise is not something that experts have, but rather the ways they behave (Sirén and Hakkarainen 2002, 75). Focusing on attention may also improve the internal consistency of a single translation expertise construct for oral, written, and signed tasks.

Unconscious attention—control out of awareness—derived from automatization is quite different from sustained attention or vigilance. Sustained attention is generally agreed upon to demand individuals to *consciously* maintain the focus of cognitive activity on a given stimulus or task. Sustained, conscious attention is effortful and also prone to performance decrements (Fisk and Schneider 1981; Warm, Parasuraman and Matthews 2008; for translation, see also Bayer-Hohenwarter 2009, 195–197). Finally, while automatized behaviors clearly distinguish experts from non-experts, decays in sustained attention seem to affect all individuals (Mackie 1984). In this construct, conscious attention is considered a property of two other dimensions, namely regulatory skills and, partially, problem-solving skills.

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<sup>12</sup> Some research results may be reframed in the light of this approach, such as Muñoz's (2010c) and Dragsted's (2005). Muñoz (2010c) studied the patterns of typing errors in translators as likely indicators of sudden task shifts, and linked them to overload in working memory, but attentional processes might become a better explanation for the correlations between typos and task shifts (e.g., Arrington and Yates 2009; Ariga and Lleras 2011). Dragsted's (2005) study on segmentation describes analytic and integrated ways of processing text chunks in a translation task and shows how these processing differences can be related to text difficulty and working memory overload. Nevertheless, Dragsted's findings can also be explained in terms of mental load impacting attentional processes (cf. Hung 2004). Dragsted's results are also consistent with Kellog's (2001) suggestion that writing processes (planning, production, revision) compete for attentional resources and also with Payne, Duggan and Neth's (2007) findings that people tend to interleave tasks at boundaries between subtasks, where mental load is transitorily lower (Bailey and Iqbal 2008).