Introduction

The 1950s were a crucial decade for the consolidation of the profession of conference interpreters and the establishment of several training courses for conference interpretation at university level (see Baigorri-Jalón, Fernández-Sánchez & Payás, Chapter 1, in this volume). Various factors contributed to this development: the rise of international organizations after the Second World War; the increasing demand for interpreters on both the private and public markets; the founding of AIIC (the International Association of Conference Interpreters) in 1953; the high status enjoyed by practitioners and the fascination exerted by this emerging profession.

The 1950s were also a crucial decade for psychology, when behaviourism was gradually being superseded by the emergent cognitive approach, the aim of which was the study of mental processes not directly observable, such as perception, attention, thought, language, memory and problem solving—diverging sharply, in this respect, from contemporary observation-based behaviourism research. A further shift in psychology was introduced by the development of the computer and the founding of artificial intelligence. The computer as an analogy for the brain, whereby mental processes are conceived as software running on a computer, gave psychologists a tool for analysing how the human mind handles information.

The first publications on conference interpreting, written by professional interpreters who were also interpreter trainers, made no explicit reference to psychological studies and discoveries to illustrate how interpreting is performed. Some years later though, what professional interpreters had indicated as important aspects of conference interpreting became the object of research conducted by experimental psychologists and psycholinguists. In the mid-1960s and 1970s, simultaneous interpretation was considered a perfect task to test language theories and hypotheses. Experimental psychologists and psycholinguists (Gerver 1976; Goldman-Eisler 1967; Oléron & Nanpon 1964; Treisman 1965) employed simultaneous interpretation as a research paradigm for investigating the processes of language comprehension and production, the differences between short-term and long-term memory, capacity management and cognitive overload. Some of these studies would later be criticized by interpreting researchers for
their lack of ecological validity because they often did not reproduce what was going on in a concrete interpreting situation.

There were, however, other experimental studies—in particular, those conducted by Gerver (see Gerver 1976)—investigating issues directly linked to interpretation challenges, such as the effects of different speeds of speech and of noise on simultaneous interpreters’ performance as well as the level of processing during interpretation. In conclusion, by the mid-1970s, there was a collection of experimental studies providing an initial picture of major cognitive challenges and limitations during simultaneous interpretation.

The first models of the simultaneous interpretation process (Gerver 1976; Moser 1978) reflect the advances and models of language processing based on the information theory in experimental psychology with box diagrams to represent the mental operations the information is subject to during communication: its components of input and output messages, the channel, encoding and decoding and memory stores to model the interpreting process (see Moser 1978).

However, the Interpretive Theory of the Paris School, by now the leading interpreting theory of the time, declined to acknowledge possible contributions of psycholinguistics and their experimental investigations to the theory of interpreting. Later, the studies of its exponents were criticized for being based on personal theorizing (Gile 1990: 34), i.e. theorizing without taking on board theories developed by others—yet, the publications of Seleskovich (1968, 1975) and Lederer (1981) make use of the cognitive terminology of the time in their model (for a discussion, see Ito 2017). Towards the end of the 1980s, the experimental-empirical approach regained momentum; the role played by mental processes—in particular, by memory, attention, cognitive resources and the overload of working memory during simultaneous and consecutive interpretation—were deemed fundamental to explain the interpreting process.

**Attention, working memory and capacity management in conference interpreting**

Both simultaneous and consecutive interpreting (see Bartłomiejczyk & Stachowiak-Szymczak, Chapter 2, in this volume) are complex oral cognitive tasks requiring efficient capacity management. Both include listening to, processing and converting into a target language a message expressed in the source language. Cognitive processes that are otherwise executed sequentially, overlap to a certain extent. In simultaneous interpreting, listening and processing continuously overlap during the production of the speech in the target language while the interpreter is also monitoring his/her own output. Consecutive interpreting is performed in two stages: the first comprises the listening, processing and memorizing of the original speech with the aid of a notation system, while the second is devoted to the production of the speech in the target language with the support of what has been noted. The listening and comprehending processes overlap with the note-taking while the production of the target speech is the result of the interaction between what has been noted and what has been memorized.

The term attention reflects different definitions; it may be characterized as a limited resource for information processing, while another concept of attention describes it as a selection of information to be processed with priority, i.e. a gatekeeper to determine which items will occupy the limited workspace within working memory (Oberauer 2019: 1).

Working memory indicates the ability to store and process information for a limited period of time, namely a few seconds. The concept evolved from that of short-term memory and shares similarities with it, but in addition, comprises a processing mechanism. Working
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Memory was first introduced by Atkinson and Shiffrin in their modal model of memory (1968); it was then proposed by Baddeley and Hitch in their multicomponent model (1974), undoubtedly one of the most prominent working memory models (for more on working memory, see Hodzik & Williams, Chapter 26, in this volume). Together with the embedded-processes model of working memory of Cowan (1999, 2005), it is also one of the most cited models in interpreting studies. A major difference between the two models regards the way information to be maintained in working memory is retained: either in temporary domain-specific stores (Baddeley & Hitch 1974) or it is simply activated in long-term memory (Cowan 2005). This is an indication of structural memory components in the former and functional components in the latter. The authors have, nevertheless, recognized similarities between the two models despite using very different theoretical metaphors: Cowan’s model is derived from an initial focus on attention and Baddeley and Hitch’s model was influenced by studies of short-term verbal memory.

According to Miller (1956), the working memory processing capacity is limited to seven elements (plus or minus two). Cowan has indicated a capacity limit of about four items in the focus of attention (Cowan 2000), but this limit can be overcome by grouping several chunks of information together. The Baddeley model had a time limit of two seconds for information to be retained in the phonological loop, but verbal memory traces can be refreshed by vocal or subvocal rehearsal (Baddeley 2010). Storage capacity and time limitations lead to situations where the available resources are not sufficient to complete a task or are managed in an inefficient way, resulting in capacity overload, which may lead to processing problems. The allocation of cognitive resources during simultaneous or consecutive interpreting is a case in point.

From the beginning, studies on simultaneous interpreting investigated the distribution of cognitive resources by interpreters and verified the hypothesis of automatic responses (Gerver 1976). Interest in the processes of comprehension and production paved the way for the study of simultaneous interpreting as a cognitive process. In particular, the division of attention, attention switching between reception and production as well as the time lag between the original speech pronounced by the speaker and the interpreted speech were objects of study because of the intricate mental operations whereby they were carried out and interest in how processing capacity was managed. Capacity management is to be understood in this contribution as the pre-emptive or online cognitive actions or procedures employed by interpreters with the aim of distributing (limited) attentional resources during their task to cope with the requirements and demands of the task in the communication setting they are working in.

The attentional and memory systems deployed for language processing have a limited pool of mental resources divided between processes or shifting from one process to the other. Hence, the simultaneity of the processes taking place in consecutive and simultaneous interpreting requires efficient capacity management to prevent or circumvent cognitive overload which would otherwise leave interpreters without the necessary mental resources for executing their task. In the literature on interpreting, cognitive load and cognitive effort have recurrently been the objects of studies (Gile 1988, 1995/2009; Seeber 2011; Seeber & Kerzel 2013). Cognitive load is the amount of cognitive or attentional resources required for completion of a task whereas cognitive effort is the sum of cognitive resources actually allocated to a task by the interpreter (Gieshoff 2018: 68–70; Gile & Lei 2020: 275). Cognitive load and cognitive effort during interpreting are not absolute values and may vary for the same assignment from interpreter to interpreter, depending on the individual knowledge structures and background knowledge, years of practice and level of expertise. Thorough preparation for an assignment is only one element, albeit important, for reducing cognitive effort, but is no substitute for longer
practice on a certain subject or the knowledge acquired individually about a certain topic: the cognitive effort produced by a professional differs from that of interpreters with limited experience of the task.

Moser-Mercer investigated the cognitive aspects of simultaneous interpreting. To highlight the skill acquisition process necessary to become a professional interpreter she analysed the differences between novices (students) and experts (professional interpreters) (1997, 2000/2001). Moser-Mercer identifies striking differences in the organization of declarative and procedural knowledge. Compared to beginners, experts are better able to render their interpretation relevant to the context of the speech “whereas novices’ semantic interpretations are often entirely unrelated to the context” (1997: 257). Moser suggests that experts have a wider array of schemata for different kinds of speeches into which they can integrate utterances and sentences and, when applying strategies, proceed from known to unknown information, using contextual and/or encyclopedic knowledge to fill in any gaps. Beginners tend to get stuck on what they do not know and, in the absence of equivalent elements, are unable to proceed. The planning of the interpreted speech by experts takes place on a global level, while that of students takes place on a micro-textual level. Expert interpreters are more fluent than novices (2000/2001: 89). Among the strategies implemented by professionals, Moser-Mercer attaches particular importance to automated strategies, without which simultaneous interpreting would not be possible. To facilitate access to and mobilization of these strategies, the author suggests that not only should declarative and procedural knowledge be developed, but that they should be reorganized and automated.

Knowledge reorganization, automation and capacity management are reflected in and may be studied via the application of interpreting strategies. The latter are internalized in successive steps through practice and experience and are adapted to the individual cognitive and personality traits of the interpreter.

**Strategies in conference interpreting**

‘Strategy’ is a concept that in psychology and psycholinguistics had been used in combination with information processing or the learning process: both lines of research had an impact on the study of conference interpreting and the terminology used was also adopted for the simultaneous interpreting process. The term strategy was chosen from the beginning by researchers (see Kade 1967: 12; Kirchhoff 1971: 43) to indicate possible solutions applied by interpreters to counteract the limits imposed by cognitive processing mechanisms and the communicative situation, and to convey the original speech in the target language when confronted with increased delivery speed, high information density, non-native accents or different language structures. As early as 1969, Chernov² (in Gerver 1976: 173) stressed that when speech rate increases or the interpreted speech risks becoming longer than the original speech, the experienced simultaneous interpreter employs strategies involving either lexical or syntactical compression. ‘Strategy’ has thus been employed to describe what happens during the simultaneous and consecutive interpreting processes under given circumstances, how the interpreter copes with certain variables that may result in processing capacity overload which in turn leads to impaired capacity management. Besides high delivery speed and information density—the main sources of high cognitive load during simultaneous interpreting—propositions with several subordinate clauses, parenthetical elements, but also culture-bound terms, idiomatic expressions, numerals, proper names or lists of elements, to name the most common, may be problem triggers requiring the adoption of a strategy or tactics (for a definition and the use of strategy compared to tactics, see below).
In 1971, Hella Kirchhoff emphasized the importance of a strategic approach to simultaneous interpreting in a paper where she analysed simultaneous interpreting as an object of the science of translation. In the following years, she made further contributions, in particular with her 1976 publication, where she examined simultaneous interpreting in relation to the interdependence of variables in the interpreting process, interpreting models and interpreting strategies, and the 1979 article dedicated to consecutive interpreting (Kirchhoff 1976; 1979). Kirchhoff describes simultaneous interpreting as a cognitively complex multiphase process requiring strategic solutions oriented towards the economy of cognitive resources. Interpreting strategies are classified as comprehension strategies—including anticipation, segmentation of the source speech, speech rhythm and décalage—and strategies for overcoming restrictions and limitations caused by the simultaneous interpreting situation, such as delayed processing of speech segments, open-planning strategies or the use of filler words to avoid long pauses. In her study, Kirchhoff stresses that strategies need to be continuously refined to ensure maximum efficiency and achieve automatic retrieval. The author defines the strategy used for storing information during consecutive interpreting as ‘a parallel storage strategy’ in which two interdependent storage modes are at work: the cognitive storage (memory) and the material storage (notes) (cf. Kirchhoff 1979: 121).

One of the first applications of a psycholinguistic processing model to conference interpreting is that of Jennifer Mackintosh in her 1985 study where she applied the Kintsch and van Dijk (1978) model of discourse comprehension and production to the interpretation process. The model specifies a set of operations for text comprehension and production whereby semantic structures are processed and organized at various levels, from micropropositions to macropropositions in the comprehension stage and the reverse during speech production. The process of comprehension is based on the application of the macrorules of deletion, generalization and construction, while, in production, the process operates through the rules of addition, particularization and specification to identify the micropropositions within the macroproposition (Mackintosh 1985: 39). The study provided evidence for the consecutive interpreting process and its various stages, less so for simultaneous interpreting, not because the model was unsuitable for the latter, but because the former is more easily observable through the interpreter’s notes. The macrorules indicated could possibly be interpreted as reduction and expansion strategies applied by the interpreter during consecutive interpreting.

Reduction strategies in the step from the source text to notes and of expansion strategies in the stage from the notes to the target text lie at the core of the study by Albl-Mikasa (2007, 2017), based on the analysis of five consecutive interpretations by students of different levels of proficiency (2017: 98–107). Her work draws on van Dijk and Kintsch’s seminal 1983 volume. The same applies to Kalina (1998) when discussing the theoretical foundation of strategies, because van Dijk and Kintsch integrate the processing point of view with the communicative dimension. They divide strategies into cognitive and language strategies. The latter include discourse strategies comprising cultural, social, interactional and pragmatic strategies. Whereupon the question arises as to whether it is appropriate to speak of strategies even though understanding and speaking are usually almost automatic processes. According to van Dijk and Kintsch, “it makes sense to speak of strategies of language use anyway, although those strategies in most cases will not be preprogrammed, intended, conscious or verbalizable by the language user” (1983: 71; see also Riccardi 2019).

The debate on the use of strategies vs tactics

Recently, the use of the term strategy has been criticized in the literature by Gile (2015) and Setton and Dawrant (2016). The authors prefer limiting the concept of strategies to
higher-level conscious decisions aimed at orienting the interpreting process in a certain direction. From their point of view, strategies evolve mainly offline although they may also be applied online. On the other hand, the term tactics refers to online cognitive skills, language skills included, or to a choice of one or more techniques aimed at improving quality and managing processing load or in the case of difficult conditions to keep the interpreting going. Gile (2015) favours a clear distinction between tactics and strategies. Strategies are seen by Gile as decisions adopted by the interpreter, offline choices with the possibility of “taking some time to think of the pros and cons of various options” (Gile 2015: 24). Examples thereof may be printing out preparatory documents or keeping them as files or preparing a specific glossary. By contrast, tactics are decisions taken during interpreting, when the interpreter, for example “has not understood a word just uttered by a speaker and needs to decide what to do about it on the spot” (Gile 2015: 24), replacing it with a hyponym, omitting it or asking the boothmate whether s/he has understood it. Tactics have immediate and short-term effects, while strategies are more general and target longer-term effects. Strategies can generally be taught as declarative knowledge: they are acquired faster than tactics and depend less on expertise than do tactics. The latter depend much more on cognitive skills, including language skills, and “are implemented under generally much higher cognitive pressure”. It follows inter alia that differences between advanced learners and beginners can be assumed to be greater with respect to tactics than with respect to strategies, and identifying experts is probably easier through scrutiny of their tactics than through the study of their strategies (Gile 2015: 24–25).

Setton and Dawrant (2016) criticize the very loose use made of ‘strategy’ to refer to almost any interpreting technique or tactic, and even to natural unconscious processes such as inference or anticipation (see Hodzik & Williams, Chapter 26, in this volume). They therefore distinguish between natural processes, techniques, tactics and strategies. Decoding, parsing, encoding and articulating are examples of natural communication processes that can and must be honed and coordinated for interpreting. Techniques are essential for “optimizing flexibility, efficiency and agility in managing this ‘multitasking’ between listening, understanding, (noting) and speaking at an externally-imposed pace”. They include what in Setton (1999) was referred to as strategies, like chunking-and-joining, waiting, stalling with neutral material, and ‘voiced’ anticipation. ‘Tactics’ is used to refer to choices of a technique or combination of techniques, aimed at improving quality, managing cognitive processing load. In difficult conditions they also include Gile’s ‘coping tactics’ to maintain a “meaningful and adequately accurate flow of speech”. Finally, the term ‘strategy’ should be reserved “for more conscious ‘macro’ choices, such as degrees of freedom or caution in translation, or positions deliberately adopted on the spectrum of optimization to serve the higher-level goal of communication and manage role and mediation norms or expectations” (Setton & Dawrant 2016: 72–73).

For the purpose of this chapter, the term strategy will be maintained to refer to all the interventions made by the interpreter in the production of the target speech, either to prevent possible problem triggers, cope with cognitive load or avoid process disruption. Coping tactics, solutions and procedures may sometimes also be used.

In the 1970s and 1980s, there were few studies investigating the application of strategies in conference interpreting. They analysed primarily the interpretation of professionals who, through their working experience, had reached a level of expertise enabling them to overcome most challenges in various interpreting conditions. With the passing of time, studies on strategies have grown in number and achieved a greater and more subtle understanding as revealed by the discussion of the terms ‘strategies’ and ‘tactics’. 

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Studies on strategies

Gile’s Effort models

The contribution of cognitive sciences to the study of conference interpreting can be traced in Gile’s modèles d’Efforts or models of resource allocation (1985, 1988, 1995/2009), initially developed for simultaneous interpreting but later modified to be applied also to consecutive interpreting, sight translation and simultaneous interpretation with text. With the ‘Effort models’ the author proposes an explanation of the errors, omissions or infelicities found in interpretation and not directly attributable to macroscopic difficulties of the original speech, or to difficulties of comprehension or production as such. Listening and analysis of the original speech, production of the interpreted speech and the operations of storage in and retrieval from memory are defined by Gile as non-automatic, functional cognitive efforts that require resource allocation. Additional resources are required for the coordination (the fourth ‘effort’ in the model) of these processes. The term ‘effort’ was chosen to highlight the effort made to direct attention to non-automatic cognitive tasks (Gile 1988). Gile based his model on the assumption that the cognitive capacity of interpreters at work is stretched almost to its limit (‘tightrope hypothesis’, 1999) and the cognitive effort required by simultaneous interpreting may prove to be greater than the mental resources available to the interpreter: in case of overload and when mental resources are exhausted, performance deteriorates. Mismanagement or overload of processing capacity is reflected in insufficient attentional resources for one or the other operation. To overcome the limits imposed by capacity limitation or to manage cognitive resources overload, Gile enumerates possible strategies and coping tactics applied by interpreters. He distinguishes between preparation strategies prior to interpretation and coping tactics implemented during interpretation to allocate the available resources in the best possible way and to overcome difficulties that may arise despite upstream preparation work. Coping tactics may either counterbalance the cognitive pressure inherent to the situation or mitigate its effects.

Coping tactics are divided into three groups: comprehension, preventive and reformulation tactics. Gile takes into account the overall interpreting situation when the interpreter is working simultaneously in a booth with a colleague; besides delay and reconstruction tactics in the first group, he illustrates tactics of waiting, abstraction, paraphrasing, simplification, literal translation, reversing the information of a list, modifying the décalage and inserting neutral sentences or segments. Other practical tactics are indicated, such as asking a colleague for help and consulting documents in the booth, taking notes, or referring to slides, tables and diagrams illustrated by the speaker.

Most of the tactics indicated for simultaneous interpreting (Gile 2009: 200–214) can also be used in consecutive interpreting, taking into account the differences between the two modes (see Bartłomiejczyk & Stachowiak-Szymczak, Chapter 2, in this volume). In consecutive interpreting the delaying tactic is used during note-taking (see Ahrens & Orlando, Chapter 3, in this volume). It consists in leaving a blank space that may or may not be filled in later. The segmentation tactic in consecutive is applied in the reformulation stage when logical links are missing and single information segments are delivered in isolation one after the other. Other tactics are part of note-taking skills to save time in the listening and comprehension stage, such as using abbreviations, symbols and other solutions (Gile 2009:14–15).

Gile’s resource allocation model highlights those cases where there may be an imbalance in resource distribution and indicates not only how strategically to prevent such cases by using solutions to reduce cognitive load, but also how to prepare for a suitable and rapid allocation
of resources once the problematic characteristics of a speech or communication situation are recognized. For students, the model provides an explanation of the difficulties to be faced in learning consecutive and simultaneous interpreting techniques when a different allocation of available cognitive resources is required.

Kalina’s strategies model

A significant contribution to the study of strategies in conference interpreting came from Sylvia Kalina, author of Strategische Prozesse beim Dolmetschen (1998). The volume is a milestone in the field and examines interpreting strategies from a cognitive-textual point of view, defining them as strategic processes or paths during which top-down and bottom-up processes interact to contribute to a solution.

Strategies are hypothetical and probabilistic; they are applied with the greatest possible economy and efficiency of cognitive resources under given communicative circumstances. For her investigation, Kalina employed authentic interpretations as well as experimental material. Based on the analysis of her corpus, she expanded and specified Kirchhoff’s approach by distinguishing between comprehension strategies and production strategies. The former include strategies of preparation prior to a meeting to help inferencing, anticipation and segmentation of the original speech. Production strategies include those determined by peculiarities of the original speech: syntactic transformations to avoid interference and transcoding, paraphrasing, chunking, strategies of approximation (several steps, each closer to the intended expression than the previous one), and use of linguistic open gambit forms (“which leave the largest possible number of options for continuation and correction”, Kohn & Kalina 1996: 130). Chunking is used to facilitate memorizing; in consecutive interpreting this strategy may be recognized in the notes, while in simultaneous interpreting it is reflected in the pauses and syntactic restructuring. Among the production strategies, those determined by peculiarities of the target language include: décalage (in consecutive the time lag between the speech and the noting of the same segment, in simultaneous the time lag between the speech and the interpreter’s output), expansion, compression (to enhance text coherence), as well as discourse presentation (pause distribution, intonation strategies and stylistic strategies, Kohn & Kalina 1996: 131). Décalage helps the interpreter to analyse information: in consecutive interpreting prior to notation, in simultaneous interpretation before producing the interpreted speech. Another category encompasses emergency strategies such as syntactic simplification, semantic compression and deletion. They are employed when processing capacity is exhausted or preparation strategies have proved insufficient for the task. The last group of overall strategies includes monitoring, strategies of relativization and repairs (Kohn & Kalina 1996: 130). Concerning the use of strategies, Kalina stresses that they are interdependent: one can induce the other, or they can influence and determine each other, thus generating a sequence of strategies that interpreters activate while interpreting. Finally, the author recognizes the importance of teaching interpreting strategies and gives concrete examples of systematic structured exercises to help students acquire the relevant strategic skills specific to interpreting.

Empirical studies

Interpreting strategies have become a very fertile research field. To begin with, the aim was to investigate how and to what extent professional interpreters cope with adverse interpreting conditions. During the 1970s, researchers concentrated on the comprehension stage of
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Simultaneous interpreting during which the process of anticipation was considered fundamental for successful interpretation (Chernov 1994; Lederer 1981; Wilss 1978). Research on strategies is characterized now by a variety of approaches, from analysing the effect of different speed rates (Barghout et al. 2015; Pio 2003), strategies in specific language combinations (Bevilacqua 2009; Donato 2003) or in extreme speech conditions (Meuleman & Van Besien 2009) to strategies applied in interpreting into the B language compared to the A language (Bartlomiejczyk 2006; Chang & Schallert 2007). There is also discussion of whether and how students are trained to use them in interpreting classes. Other studies have used the strategies applied by interpreters as a means to explore models of simultaneous interpretation and working memory overload (Mizuno 2005) or to test a Cognitive Load Model (Seeber 2011; Seeber & Kerzel 2013).

**Testing cognitive load models**

Mizuno proposed a model of simultaneous interpreting (2005) based on the embedded-processes model of working memory by Cowan (1999, 2000/2001) consisting of a central executive, long-term memory, active memory and the focus of attention. After describing the single components, Mizuno presents examples of working memory overload from a small corpus of simultaneous interpreting to explain the load-reduction strategies employed while interpreting from English into Japanese. Interpreting between structurally different languages is deemed very taxing for working memory capacity in interpreting circles—although up to now such correlation has remained unproven empirically—and there is reason to believe that it does exist: interpreters are required to reverse the word order in almost every clause. The strategies employed were conceived to avoid overloading of working memory and the focus of attention on counterbalancing structural differences. Mizuno puts forward the hypothesis that domain-specific skills for interpreters are translation strategies to help “reduce the processing and memory load rather than or in addition to the skills of allocating resources efficiently and switch attention properly” (Mizuno 2005: 750).

Cognitive load in simultaneous interpretation has been investigated by Seeber (2011), comparing theories, models and methods subsequently put to the test in a further study (Seeber & Kerzel 2013). The aim was to illustrate the hypothesized cognitive effort generated when interpreting simultaneously between structurally different languages taking specifically into account the German verb-final construction and its interpretation into a verb-initial language such as English and the strategies to be applied. The author presents a model based on Wickens’ Multiple Resource Model (1984) which assumes that tasks interfere with each other more evidently when they have structures in common, as in the case of language perception and production where working memory is involved both to store and process information. Gile’s Efforts Model is then compared to and contrasted with Seeber’s Cognitive Load Model. The strategies of waiting, stalling, chunking and anticipation were chosen to illustrate the conjectured theoretical local cognitive load (Seeber 2011: 196), which appears to vary according to the strategy applied. The findings of the 2011 study were then tested in the 2013 study by Seeber and Kerzel in which a set of experiments were carried out with ten professional interpreters to measure online cognitive load during simultaneous interpreting of German verb-initial and verb-final clauses into English. Pupillometry was used to measure cognitive effort. Results indicated that cognitive effort tends to be higher during the simultaneous interpretation of asymmetrical clauses, but the authors were unable to identify which of the strategies among waiting, stalling, chunking or anticipating was responsible for the increase of load (Seeber & Kerzel 2013). This is hardly surprising given the intrinsic difficulty in recognizing the impact of single strategies on the complex process of simultaneous interpreting.
Empirical studies within the expert-novice paradigm

The investigation of strategies is the object of numerous studies with didactic orientation, one strand can be labelled as research within the novice-expert paradigm. The aim of the studies is to compare the performance of professionals and students to detect differences in their interpretations, revealing what still needs to be honed in order for students to reach professional skills level and how strategy use develops with experience (Andres 2002; Ivanova 1999; Liu 2008; Liu et al. 2004; Riccardi 1996, 1998; Tiselius 2013).

Riccardi (1998, 2005) examined the interplay between language-specific strategies and general strategies. The analysis of a corpus comprising the simultaneous interpretations of the same German speech by student interpreters and professionals into Italian (Riccardi 1996, 1998) indicated several differences in their approach to simultaneous interpretation and the use of strategies. Special attention was devoted to examining to what extent the verb in final position was anticipated and the extent to which reformulation strategies were applied. As a result, the author recognized two further categories of strategies which were divided into explicit or knowledge-based strategies and implicit or skill-based strategies. Knowledge-based strategies require conscious elaboration processes that are costly in terms of attentional resources. Consequently, they induce early fatigue and require constant attention. The result is cognitive overload that hinders an efficient allocation of resources. Strategies based on acquired skills are automatic and a few clues are sufficient to activate them. They are used routinely for greeting formulas, thanking, reformulation of recurrent syntactic structures and segmentation of the original speech (Riccardi 1998). During simultaneous interpreting, students principally concentrated their attention on the lexical and superficial elements of the speech while professionals focused attention on its semantic and pragmatic level. Professionals had a broad repertoire of automated solutions and made better use of the linguistic and extra-linguistic clues provided by the text and the communicative situation (Riccardi 1996, 1998, also found by Ivanova 1999 and Tiselius 2013).

Strategies applied in consecutive interpreting by professionals and students were the object of Andres’ study (2002). The author compared the consecutive performances of the same Chirac speech of 14 students with that of 14 professional interpreters. The analysis and comparison of the video-recorded note-takings showed clear differences between the two groups in décalage and in the activation of relevant knowledge-specific information from long-term memory. In particular, it was recognized that to become an ‘expert’ the acquisition of the relevant strategies in note-taking is essential: professionals know which kind of notes are the most suitable and effective for which speech and communicative setting and which may be omitted to reproduce the original speech with all its nuances.

Directionality

A study by Bartłomiejczyk (2006) examined students’ performance without comparing it with that of professional interpreters and aimed at identifying and determining the frequency of various strategies depending on directionality when interpreting from English into Polish and from Polish into English. It is one of the first studies to address this topic. The subjects were 36 advanced interpreting students who interpreted in both directions and then did cued retrospective on the basis of dual-track recording of their interpretation. Through their retrospective comments, it was possible to recognize non-automated interpreting strategies in both language directions which were then grouped, forming 21 strategy classes. Strategies are defined by the author as methods that are ‘potentially conducive to solving particular problems encountered by interpreters or generally facilitating the interpreters’ task and preventing potential problems” (2006: 152). A detailed description of the strategies identified, combined with their respective strategic segments, offers a picture of how decisions were taken during the interpreting task by
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students. They tended to use more inferencing (trying to reconstruct fragments of the original message they had missed), parallel reformulation (having missed information the interpreter inserts something which is contextually plausible but was not in the original speech), and transcoding (word-for-word or almost word-for-word translation) when working in their A language, and more syntactic transformations, approximations and paraphrasing when working into their B language (Bartłomiejczyk 2006: 160–162).

Usefulness of strategy teaching

In interpreting training, strategies are increasingly viewed as skills to be taught from an early stage. The investigation of strategies can help recognize weak and strong elements in students’ interpreting at various points in the course of their training and can be a useful tool in highlighting what should be improved and what is already up to standard. Li (2013) investigated whether strategies are teachable and whether including specific training devoted to strategies leads to better strategic skills. The data analysis was based on the retrospective answers of 41 students immediately after performing consecutive interpretation from English into Chinese, analysis of the consecutive recording and on trainers’ answers to a questionnaire about strategy inclusion in class. His study confirmed that there was a positive correlation between the teaching of specific strategies and students’ strategy use. The author, therefore, suggests that strategies be a necessary component of interpreter training.

Teaching strategies is also the focus of the paper of Kader and Seubert (2015) who provide an overview of the various strategies listed in the specialist literature. Their comprehensive list of examples can be used in interpreting classes to equip students with the skills and tools they need for interpreting. Strategies may be taught first as declarative knowledge, identifying and illustrating them at the first level of training. Proceeding to the second and third level of the course, they should be gradually acquired as procedural knowledge through exercise and practice and gradually become more automatic. Kader and Seubert divide strategies into macro- and micro-strategies.

The macro-strategies applied for preparation and research work before a job are: planning; expectations; inferencing; continuous monitoring.

The micro-strategies listed are applicable to all language pairs and include: chunking; paraphrasing; flexible décalage; stalling; generalizing; simplification; approximation; transcoding; expansion; completion; condensing; prioritizing; anticipating/inferencing; output control; correction.

Every micro-strategy is explained in detail with examples as well as references to the interpreting mode and to the literature. Finally, the authors stress that strategies should be regarded as “an entity made up of individual strategies all working together” (2015: 142) and their interplay should be stressed to the students from the very beginning.

Outlook

Strategies have been the object of continuous investigation in interpreting studies and the notion has been applied to verify various aspects of the interpreting process with different objectives in mind. The consequence is a wealth of categories and approaches potentially confusing which need to be systematized. In view of the complexity of interpreting, specifically of simultaneous interpretation, and the recent criticism of a sometimes blurred use of the notion of strategy, a renewed systematic and critical analysis of the very concept of strategy is desirable to take into account progress made by the discipline of interpreting studies since the time when the term strategies was first employed.
Notes
1 In her paper, Ito illustrates the cognitive model of interpreting based on the Interpretive Theory of Translation.
2 Chernov was studying the effect of different input rates on interpreters working in simultaneous interpreting.
3 See also the abridged translation: Kirchhoff (2002), in Franz Pöchhacker & Miriam Shlesinger (eds), pp. 110–119.
4 Ilg (1978) discusses possible structural challenges in simultaneous interpretation from German into French and illustrates possible solutions such as ‘saucissonner’, ‘morceler’ and ‘télescopage’ to overcome structural differences between the two languages, whereby segmentation, chunking and telescoping became recognized as possible interpreting strategies well before cognitive psychology became a reference discipline.
5 The terms knowledge-based strategies and skill-based strategies were applied by the psychologist Reason (1990) to identify cognitive processes common to a wide variety of error types.
6 Declarative knowledge is the factual information about the world, it is descriptive and can be put into words. Procedural knowledge is the knowledge about how to perform a task—the know-how—and it is directly applied to that task and can be applied without conscious thinking. While knowledge about grammar rules is declarative, the spontaneous application of these rules is procedural (see Riccardi 2005: 756–757).

Further reading

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