

3. Results indicate inter alia the following:

- The highest coverage rate was 10 of the 16 problematic "terms." The second highest was 9, the third was 6. That is, *most of the sources sampled had a coverage rate of less than 50%.*
- While the highest coverage rate was found in a specialized bilingual dictionary (*Le Robert et Collins du management*, 1992), the second and third highest coverage rates were found in *specialized monolingual dictionaries in English.*
- The second highest coverage rate was found in a dictionary with only 3,000 entries, which was published in 1985, and the third highest coverage rate was found in a dictionary with about 6,000 entries, published in 1987.
- The highest number of "equivalents" in French given by a bilingual source which were suitable in the context was 8 (in *Le Robert et Collins du management*). Three other bilingual sources, one of which was a general (non-specialized) dictionary, gave 3 appropriate equivalents, one gave 1 appropriate equivalent, and one gave none.
- Even when appropriate "equivalents" were indicated in the dictionaries, they were often one of several in a list, without sufficient information to allow the translator to determine which was *the* appropriate one.
- While time was too short to conduct an extensive analysis of the results, the findings made above could have been generalized into at least the following three points:
 - Bilingual dictionaries do not necessarily have the highest coverage rate, nor give reliable and sufficiently precise information.
 - The size of a dictionary is not necessarily a good indicator of its coverage rate.
 - The age of a dictionary is not necessarily a good indicator of its coverage rate.

Clearly, the results of the experiment have no scientific value, because the situation was not controlled very strictly and only represents one case study. However, I believe that the work carried out in class by the students made the instructor's subsequent comments more convincing, hence the value of the experiment as a didactic tool, in spite of the fact that it did not produce all the results that would have been necessary to illustrate all the points made in chapter 6 regarding sources for Knowledge Acquisition. For a scientific investigation of sources, many replications of the experiment, with better control, would be necessary.

Gile D (1995), Basic concepts and models for Interpreters and Translator training, Amsterdam / Philadelphia, Benjamins.

CHAPTER 7

The Effort Models in interpretation

1. Introduction

One of the most striking and challenging phenomena in interpreting is its fundamental difficulty for the interpreter. This chapter presents a set of models that attempt to explain this difficulty in a way that should facilitate the selection and development of strategies and tactics toward better interpreting performance.

Performance problems occur not only in fast, informationally dense, or highly technical speeches, but also in clear, slow speech segments in which no particular obstacles can be detected. Moreover, errors and omissions are found not only in students' interpretation, but also in the work of seasoned professionals. As an illustration, in a case study by Gile (1989, chapter 4), over a segment of 70 seconds of speech, more than 10 incorrect and obviously clumsy target-language segments were found in a slow, non-technical target-language speech made by an experienced professional with an excellent reputation. I am making similar observations in an ongoing multi-center study involving a large number of professionals and students who are given the same recorded speech to interpret. For example, the following errors were noted in speeches produced by experienced interpreters:

"that wasn't my fault" was interpreted into "c'est ma faute" ("it is my fault")

"the Vietnamese government" was interpreted into "les gouvernements" ("the governments") by one interpreter, and into "le gouvernement chinois" ("the Chinese government") by another

"and you think they think you're foolish" was interpreted into "vous pensez qu'ils sont idiots" ("you think they are stupid")

It is highly unlikely that these mistakes are due to the subjects' insufficient understanding of English. Moreover, since each of them was made by only one of the 6 professional interpreters who had volunteered for the experiment, it is unlikely that the reason was the poor quality of the recording at these points in the speech (otherwise, there would probably have been a convergence of errors in these same segments). A third point is that the two interpreters who did two simultaneous interpretations of the speech, one after the other, made some errors the second time in segments which were interpreted correctly the first time. This is an intriguing point: Why should interpreters who have overcome a difficulty when first interpreting a speech not be able to overcome it when they interpret it a second time, with the advantage of having become familiar with it and had time to think about it? A possible explanation would be fatigue. However, the speech is less than 11 minutes long, and subjects were allowed to rest for a couple of minutes before starting to reinterpret it. In view of the fact that when interpreting in the field, the same subjects take turns of 30 minutes in the simultaneous interpreting booth, fatigue is also an unlikely explanation for the phenomenon.

Observations of errors made by professionals in speech segments containing no apparent difficulty are most intriguing, and trying to understand the reasons behind them seems very important. It seems particularly important to try to help students understand *why* interpretation is so difficult, lead them to accept this fact of life, and possibly provide them with some ideas or methods to alleviate the difficulties.

This is what I set out to do in the late 1970s in my reflections on the difficulties of simultaneous interpreting. The first step was the development of an *Effort Model* for simultaneous interpretation, which was first referred to in writing in a paper on the relative difficulty of interpretation as a function of the specific pairs of languages involved (Gile 1983b). Ever since, I have been developing the Models and extending the discussion, in particular with an *Effort Model* for consecutive (Gile 1990a). This chapter is an up-to-date discussion of the Models, which are central to my teaching of interpreting.

2. Processing capacity and interpretation Efforts

The development of the Models originated in two ideas:

- Interpretation requires some sort of mental "energy" that is only available in limited supply.
- Interpretation takes up almost all of this mental energy, and sometimes requires more than is available, at which times performance deteriorates.

The idea that there is some association between the deterioration of the interpreter's performance and some "overload" was not new. It had already been mentioned by Pinter (1969), as well as by several other authors, mainly with respect to short-term memory (Fukuui and Asano 1961, Kade and Cartellieri 1971, Lederer 1978, Moser 1978, Wilss 1978). Subsequent reading in cognitive psychology provided useful information revolving around the concepts of *attention* and *automatic* and *nonautomatic* operations, thus establishing a link between my intuitive ideas and some empirical research.

Toward the end of the 1940s, Claude Shannon, an engineer working on communication, formulated the idea that any channel serving to transmit information had a finite transmission capacity, beyond which information losses occurred (Shannon 1948). This idea, which had come out of studies on electric communication lines, was taken up by cognitive psychologists who adapted it to the case of the human mind (Broadbent 1958, Moray 1967, Kahneman 1973, Norman 1976). The idea is that some mental operations (*nonautomatic operations*) require *attention* or processing capacity and others (*automatic operations*) do not. Nonautomatic operations take processing capacity from a limited available supply. When the processing capacity available for a particular task is insufficient, performance deteriorates.

From this information, it becomes clear that if the operations of interpretation are nonautomatic, there is some basis for constructing an interpretation model around this idea of processing capacity requirements and processing capacity limitations.

According to cognitive psychology, nonautomatic operations are those which cannot be automated, such as detecting a brief stimulus, identifying a nonfamiliar stimulus or a familiar stimulus presented under *poor conditions*, storing information in memory for later use, preparing for a nonautomated response, controlling the accuracy of a movement, or manipulating symbols in

the cognitive systems. Automatic operations include decoding a familiar stimulus presented under favorable conditions, triggering an automated response, and operating a motor program without control (Richard 1980: 149-150). This very clear distinction is a simplification of reality, if only because it may sometimes be difficult to discriminate between long and short stimuli, or between familiar and unfamiliar stimuli. Nevertheless, it is shown in the next sections of this chapter that the operations making up interpretation as defined below are clearly on the nonautomatic side.

From my observation of simultaneous interpretation, I imagined it could probably be modeled as consisting of three main *components* or *Efforts*: a *listening and analysis component*, a *speech production component*, and a *short-term memory component*. There may be other significant operations associated with simultaneous interpretation that are not mentioned here, but they are probably marginal with respect to processing capacity requirements, and I have found the explanatory power of the three basic components listed above to be quite good.

2.1 *The Listening and Analysis or Comprehension Effort*

The *Listening and Analysis Effort* is defined here as consisting of all comprehension-oriented operations, from the analysis of the sound waves carrying the source-language speech which reach the interpreter's ears, through the identification of words, to the final decisions about the "meaning" of the utterance.

It is not yet clear how far the analysis of the meaning of the source-language speech must go before interpretation is possible. In my discussion of the interpretation and translation of specialized speeches and texts (see chapter 4), I suggest that such comprehension goes at least as far as understanding the underlying logic of each sentence, but no evidence is available to show that this level of comprehension is actually mandatory for all sentences. However, even by the most conservative standards, one can say that except for some names, which interpreters may simply try to imitate phonetically, interpretation requires at the very least the recognition of words in the source-language speech. This is enough to put the Listening and Analysis component in the nonautomatic category.

The reason is that there is no one-to-one relation between the sound reaching one's ears and any single phoneme, word, or group of words pro-

nounced by a speaker. As explained in most introductory texts on phonetics, there is great variability in the way such words are pronounced, not only from one individual to another, but also in the same speaker uttering the same speech segment twice. This is also why it is very difficult to recognize words on sonograms (graphic representations of sound). Even human experts familiar with phonetics and with the lexical and syntactic rules of a language never manage to read correctly more than 75% of the phonetic segments on a sonogram (Guibert 1979). It is therefore not surprising that machines, which do not have at their disposal as much lexical and syntactic information, nor a level of knowledge of the world comparable to a human's, are unable to recognize natural *chained* (or *continuous*) speech (as opposed to speech in which there are pauses between the words). In order for words to be recognized, acoustic features of the incoming sounds have to be analyzed and compared with patterns stored in the listener's long-term memory. Following a complicated process involving knowledge of the probabilistic structure of the language, the context, and the situation, the listener decides that particular sound sequences correspond to particular words (see for example Hörmann 1972, Clark and Clark 1977, Costermans 1980, Noizet 1980, Matthei and Roepers 1985, Greene 1986). Undoubtedly, speech recognition as it occurs in interpretation is a nonautomatic process.

In fact, a number of studies do show that comprehension during interpreting goes much beyond the mere recognition of words. Chernoy (1973) conducted an experiment in which he made students interpret sentences that seemed to be leading in a certain direction and then veered off to an unexpected ending. He found that sentences were usually interpreted according to the direction they were taking initially, not as they finally turned out. Apparently, subjects not only identified words, but also made inferences about their meaning and anticipated on-line. Several studies by Gerver (1976), Lambert (1988), and others focused on comparisons of recall and recognition under various conditions, and also led to results suggesting that interpreters do achieve a level of comprehension beyond the recognition of individual words.

It is not necessary to do sophisticated research in order to ascertain that interpreting comprehension goes beyond word recognition: field observation provides ample evidence for that in practically any interpreted speech segment of several sentences. A recent study by Dillinger (1989) showed that inferences made on incoming speech while interpreting are similar to inferences

made in everyday speech comprehension. As an illustration, below are French renditions by five professional interpreters of the same English speech segment. The material is taken from one of my ongoing experiments, involving in-laboratory interpreting of the same recordings of actual conference speeches.

Original English sentence (by speaker):

I was hoping to encourage the oil people to give a little bit back to the countries that they take the oil from

French interpretation:

Je voulais encourager les pétroliers à rendre un peu de leur butin aux pays où ils vont le prélever (Interpreter A)

Je pensais pouvoir encourager les compagnies pétrolières à restituer un peu des profits aux pays qu'ils exploitent (Interpreter B)

J'espérais que les compagnies pétrolières rendraient quelque chose à ceux dont ils prennent le pétrole (Interpreter C)

Je voulais encourager les pétroliers entre guillemets à rendre un petit peu de ce qu'ils ponctionnent aux pays qui ont du pétrole (Interpreter D)

... pour en quelque sorte sensibiliser les gens du secteur pétrolier afin qu'ils rendent un petit peu de ce qu'ils gagnent aux pays où ils prennent le pétrole (Interpreter E)

In this example, "oil people" was interpreted into "*pétroliers*", "*compagnies pétrolières*", "*gens qui font de la recherche pétrolière*" and "*gens du secteur pétrolier*"; as for "take oil", it is rendered by "*prélever*", "*exploitent*", "*ponctionnent*", and "*gagnent*", which shows the interpreters' understanding of both the economic meaning of the situation and the probable moral stance taken by the speaker, though neither are to be found in purely linguistic information in the original. Many similar examples of the "interpretive" nature of comprehension during conference interpretation have been given repeatedly by other authors, in particular by Seleskovitch and Lederer of ESIT. Such observations only confirm the difference between *human* interpreters and translators on the one hand, and machine translation programs based on linguistic analysis on the other. The latter's failure can be attributed to their present inability to relate linguistic signs to knowledge of the world, so as to disambiguate and solve other problems arising from the author's linguistic errors, mistakes in substance, and deviations from standard language and logic.

As a matter of fact, the comprehension effort is probably more intense for interpreters than it is for conference delegates (see also section 3 of chapter 8):

- While they are interpreting, interpreters have to concentrate on everything the speaker says, whereas delegates can select the information *they* are interested in.
- The interpreters' relevant extralinguistic knowledge, and sometimes the terminological part of their linguistic knowledge, are less comprehensive than the delegates'.

It follows not only that comprehension during interpretation is a nonautomatic process, but also that it is critical in terms of processing capacity management, as explained in a later section of this chapter.

2.2 The Production Effort

This is the name given to the output part of interpretation. In simultaneous interpretation, it is defined as the set of operations extending from the mental representation of the message to be delivered to speech planning and the performance of the speech plan. In consecutive interpretation, there are two kinds of production. During a first phase, the interpreter listens to the speech and produces notes; during the second phase, he or she produces the target-language speech. The analysis in this section deals with the latter. The case of note production is discussed in section 5, which introduces an Effort model for consecutive interpretation.

As in speech comprehension, the impression of effortlessness in speech production is deceptive. As stressed by Matthei and Roeper (1985: 114),

The fact that most people sometimes have great difficulty in comprehending it, and the fact that virtually all people make many false starts, add ums and ahs, and often speak ungrammatically, suggests that production may be making quite a number of very substantial demands on our linguistic systems.

According to Holmes (1988: 324), "Speakers' efforts to realize their intentions are seldom completely fluent and error-free." For Clark and Clark (1977: 226), "Speaking is problem solving." Such problems become particularly salient in hesitations associated with the search for lexical units and with syntactic decision-making (MacLay and Osgood 1959): it often takes time to find the

right word, and it often takes time to decide how to steer the sentence at a syntactic junction. Hesitations are the symptom that makes speakers and their listeners aware of speech production difficulties. Hesitations are also the main factor that determines speech rate (Goldman-Eisler 1958, Clark and Clark 1977, Costermans 1980).

Speech production problems account for a number of interesting phenomena. One of the most interesting observations is that speakers tend to "be tempted and constrained to having recourse to ready made verbal sentences, phrases and clichés" (Goldman-Eisler 1958: 67-68). As explained by Cherry (1978: 79), "We become prone to verbal habits. It is only too easy to use clichés, proverbs and slogans as a substitute for reasoned statements." In Goldman-Eisler's studies, "Fluent speech was shown to consist of habitual combinations of words such as were shared by the language community and such as had become more or less automatic" (p. 67), and meaning itself may be "guided through these channels and modified as a result" (p. 68). These observations suggest one reason why speech production under interpretation conditions may be difficult: instead of being free to speak their own mind, and therefore to bypass possible production difficulties by rearranging the sequence of information and ideas or by dropping or modifying some of these, interpreters have to follow the path chosen by the source-language speaker. In addition, "habitual combinations of words" generally differ from language to language, which makes the interpreter's speech production task more difficult than the speaker's, at least in this respect.

On the other hand, the very fact that lexical and syntactic choices are made by the speaker can in some cases help the interpreter, if he or she can make similar or parallel choices in the target language, or at least use them in some way when retrieving words from the mental lexicon and making his or her own syntactic choices. In fact this is often done, at times consciously, which seems to help interpreters speak faster than they can when they have only their natural fluency to rely on.

The other side of the coin is the fact that if an interpreter uses source-language words and structures to help construct his or her own target-language speech, the speech production process becomes more vulnerable:

- Following the source-language structure and lexical choices in one's target-language speech is risky: the interpreter may get stuck at a certain point because of syntactic and grammatical differences between the languages.

For example, in a training session in the classroom, one student tried to interpret into French the following English sentence by following its structure and the speaker's lexical choice:

This movement was shown by our team as consisting of three parts ...

The student started with: "*Ce mouvement a été montré par notre équipe ...*" at which point he could not construct a natural, grammatical segment to follow, as French does not allow the passive of the verb "montrer" (to show) to be followed by a structure similar to "as consisting of." A natural translation of the sentence into French would have put "team" in the beginning of the target version, in something like

Notre équipe a montré que ce mouvement se compose de trois parties ...

- Moreover, besides the risk of getting stuck, by following the target-language structure and lexicon, the interpreter may be deprived of part of his or her own linguistic resources as a speaker, which might be put to use if he or she were to produce a speech on the basis of meaning rather than on the basis of a linguistic structure borrowed from another speaker, in another language at that.
- Third, such *transcoding* is associated with great danger of linguistic interference between the two languages, be it gross interference resulting in grammatical errors, mispronunciations, *faux amis* (words that look similar in the two languages but which do not have the same meaning, connotation, or usage), or subtler interference that will make the interpreter's speech less native-like, less clear, or less pleasant to listen to.
- Fourth, by focusing on language, the interpreter is in greater danger of processing the incoming speech more superficially than if he or she produced the speech from the meaning. This may generate more errors, because the interpreter will do less hypothesis-testing (see chapter 5).

This is why the general rule to be followed whenever possible is to produce the target-language speech on the basis of the meaning, not the words, of the source-language speech.

The fact that interpreting constraints force interpreters to deviate from their habitual speech production patterns may account for the poor quality of language output in students' interpretation exercises. In an observational study I conducted on five native speakers of French at ESIT, in Paris, I measured the

number of deviations from acceptable linguistic standards (as indicated by native informants) per sequence of 100 words in three types of exercises: presentations by the students, exercises in consecutive, and exercises in simultaneous interpretation. The target language was French in all cases. I found that deviations were more numerous in consecutive than in presentations, and more numerous in simultaneous than in consecutive (Gile 1987).

It is worth noting that most of these deviations do not seem to be due to interference between source and target language, at least not in any direct, visible way. No systematic comparison was done with the output quality of professional interpreters, but scrutiny of consecutive and simultaneous interpretation transcripts obtained in other experiments seems to suggest that the overall linguistic deviation rate in professionals is much lower. It appears that the effects of interpretation constraints on production are stronger in simultaneous than in consecutive, probably because of differences between the two modes, both in processing capacity management and in time constraints (see section 5).

Another point, already mentioned for the Comprehension Effort in section 2.1, is that interpreters have to produce a speech in a field they are not necessarily familiar with. Neither are they always familiar with the particular language used in this field, with respect to both words, particularly technical terms, and style. Again, speech production in interpreting is clearly a non-automatic operation.

2.3 The Memory Effort

During interpretation, short-term memory operations (up to a few seconds) occur continuously. Some are due to the lag between the moment speech sounds are heard and the moment they are interpreted: phonetic segments may have to be added up in memory and analyzed until they allow identification of a word or phoneme. To take only one example, when spelling an unknown foreign name and saying "D as in Denmark," the phonetic elements carrying "D" may have to be held in memory until the word "Denmark" is recognized, which in turn makes it possible to recognize it as a *D* as opposed to a *T*. Other short-term memory operations are associated with the time it takes to produce speech, during which the idea or information to be worded is present in memory. Still others may be due to specific characteristics of a given speaker or speech: if the speech is unclear because of its logic, information density,

unusual linguistic structure, or speaker's accent, interpreters may wish to wait for a while before reformulating it (in simultaneous) or taking notes (in consecutive), so as to have more time and a larger context to deal with the comprehension and reformulation problems. There are also language-specific factors that require short-term memory operations. Inversions in determination sequences are one example, for instance in "System and application strategy" (from a Data Processing conference). The sequence was translated into French as "*stratégie en matière de systèmes et d'applications*." Clearly, either the sound or the meaning of "System" and "application" had to be stored in short-term memory until after the interpreter heard the English word "strategy" and had said "*stratégies en matière de*." Other language-specific factors in interpreting are discussed in more detail in section 4 of chapter 9.

Clearly, short-term memory operations fall under the category of non-automatic operations because they include the storage of information for later use (see Richard 1980, cited earlier). One might add that stored information changes both from one speech to another and during every speech as it unfolds, and that both stored information quantities and storage duration can vary from moment to moment, so that there is little chance for repetition of identical operations with sufficient frequency to allow automation of the processes.

3. An Effort Model of simultaneous interpretation

Using these definitions, simultaneous interpretation (SI) can be modeled as a process consisting of the three Efforts described above, namely the Listening and Analysis Effort *L*, the Short term memory Effort *M*, and the Speech production Effort *P*, plus a Coordination Effort *C*, which is required to coordinate the three other Efforts (Eysenck and Keane 1990):

$$(1) \quad SI = L + P + M + C$$

At each point in time, each Effort has specific processing capacity requirements that depend on the task(s) it is engaged in, namely the particular comprehension, short-term memory, or production operations being performed on speech segments. Due to the high variability of requirements depending on the incoming speech segments, processing capacity requirements of individual Efforts can vary rapidly over time, in seconds or fractions of seconds.

(3) $TR < TA$

TA total available processing capacity

(Total processing capacity requirements should not exceed the total available capacity.)

(4) $LR < LA$

LA capacity available for L

(5) $MR < MA$

MA capacity available for M

(6) $PR < PA$

PA capacity available for P

(7) $CR < CA$

CA capacity available for C

The last four inequalities state that capacity available for each Effort should be sufficient to complete the task the Effort is engaged in.

The difference between the two types of prerequisites defined by inequalities (3) to (7) is significant. The first condition deals with the total available capacity. When it is not met, a situation of *saturation* arises. For instance, a speech may be fast and dense, therefore requiring processing of more information per unit of time, and raising capacity requirements beyond what is available to the interpreter. Conditions (4)–(6) may not be met even when total requirements are below the critical threshold. For instance, the interpreter may try too hard to produce an elegant reformulation of segment A, and therefore not have enough capacity left to complete a Listening task on an incoming segment B. Had he or she been content with a simpler reformulation, enough capacity would have been left over for the L Effort. In other words, in such a case, the problem lies not in saturation, but in improper management of processing capacity, which results in an individual processing capacity deficit in one of the Efforts.

Since some students may be put off by a mathematical formulation of the conditions as shown above, I also use a drawing (Figure 1) to illustrate the ideas metaphorically: interpretation is likened to a party in which L, P, and M are invited guests. In order for them to be happy, two conditions must be met:

Generally speaking, at any point in time, each Effort deals with a different speech segment: in the simplest case, Production acts on speech segment A, while Memory acts on segment B which came after A, and Listening and Analysis acts on segment C which came after B. In fact, some overlapping and some inversions occur during interpretation, and at times anticipation results in the production of a target-language segment before the corresponding source-language segment has been heard. However, the general rule that Efforts deal with different segments is useful in that it helps devise strategies and assess tactics for coping with difficulties (see chapter 8).

Another point is that processing capacity requirements for each individual Effort are probably determined not only by their individual requirements, but also by their interaction. One reason is possible interference between the two languages in contact, the avoidance of which requires special attention. Indeed, some linguistic interference from source language to target language is often felt in the field, and interpreters are taught to be aware of the danger and fight it, for instance by deliberately avoiding words and sentence structures similar to those used in the source-language speech whenever possible.

4. Processing capacity-related problems

4.1 Operational requirements

At any point in time, one, two, or three of the Efforts are active simultaneously: there is now ample evidence that at least part of the time, interpreters do listen and speak at the same time (see a short review of research on the subject in Lambert 1992). The total requirements TR are therefore presented as a sum of the individual requirements (though not necessarily an arithmetic sum, as some resources may be shared):

$$(2) \quad TR = LR + MR + PR + C$$

LR capacity requirements for L

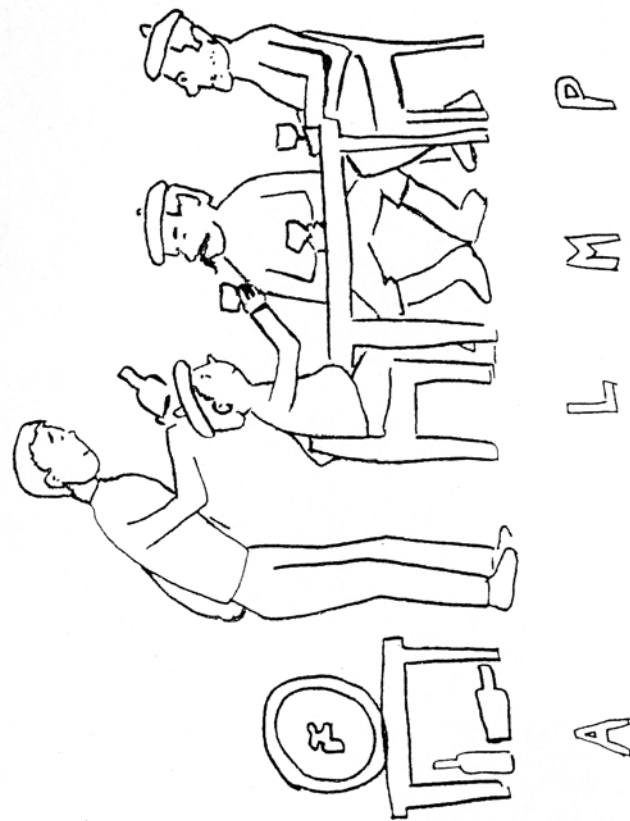
MR capacity requirements for M

PR capacity requirements for P

C capacity requirements for C

In order for interpretation to proceed smoothly, the following five conditions have to be met:

Figure 1. A visual metaphor for the Effort Model of simultaneous interpretation



not only must the total wine (or liquor) supply A cover their thirst, but the host must manage its distribution so as to be able to fill the glass of any guest as soon as it is empty.

4.2 Problem triggers

A major strength of the Model is its explanatory power with respect to interpretation difficulties. In particular, it helps explain recurrent problems which are well known to the interpreting community (and often mentioned in the literature), but which have not been analyzed in the past using a common conceptual framework.

4.2.1 Problems arising from an increase in processing capacity requirements

- a. *High density of the speech* increases processing capacity requirements, because more information must be processed per unit of time. This applies to both the Listening and Analysis Effort and the Production Effort, as the

interpreter's speech is paced by the speaker's. High speech density is probably the most frequent source of interpretation problems. High speech density is associated with:

- A *high rate of delivery* of the speech. It should be noted, however, that some speakers may speak very rapidly but provide little information, in which case speech density remains low.
- *High density of the information content* of the speech, even in rather slow speeches. In particular, *enumerations* are dense, as they consist of information elements put next to each other without grammatical or other low-density word groups in-between. Prepared speeches that are read by the speaker are generally devoid of the hesitations, filled or unfilled, which characterize ad-libbed speech, and are generally more densely formulated than spontaneous speech (see Halliday 1985 and Déjean Le Féal 1978).

- b. *External factors* such as the deterioration of the *quality of the sound* coming through the interpreter's earphones, a noisy channel, or other sources of interference also raise the Listening and Analysis Effort's processing capacity requirements (see Gerver 1974b). Similarly, *technical terms* may also require more processing capacity for understanding and/or for reformulation in the target language if they are not readily available in the interpreter's mind (Gile 1985b, see also chapter 8). *Strong accents* and *incorrect grammar* and *lexical usage* also increase the Listening and Analysis Effort's processing capacity requirements. So do *unusual linguistic style* and *reasoning style*.

- c. *Unknown names* composed of several words, or names whose target-language version is unknown to the interpreter, sharply increase the capacity requirements of the *Memory Effort*. For example, the English name "International Association of Conference Interpreters" translates in French into "Association internationale des interprètes de conférence." If the interpreter does not know the French name, in order to translate the English name, he or she has to scan it, decide that its second term should be translated first, then scan the name again, decide that its first term comes next, scan the name again and decide that "of" is translated into "de," scan the name a fourth and a fifth time and decide that the fourth term, and then the fifth term should be added to the French version. Such

names are indeed very difficult to interpret, as illustrated by an experiment described in Gile 1984b (see below).

- d. *Saturation* may occur through an increase in processing capacity requirements in the Short-term Memory Effort when the source language and target language are syntactically very different, and force the interpreter to store a large amount of information for some time before being able to reformulate it in the target language, as is often the case in interpretation between German and French or Japanese and English (see chapter 9).

4.2.2 Problems associated with signal vulnerability

Another type of problem trigger is speech segments which do not necessarily require much processing capacity, but are more vulnerable than others to a momentary processing capacity shortage because of their short duration and low redundancy. Such is the case of *numbers* and of short *names*, including *acronyms*. The briefest lapse of attention, and the information may be lost. This is the second type of problem generation pattern referred to in section 4.1, which results not from saturation, but from insufficient availability of processing capacity for one of the Efforts. In an experiment conducted with 15 professional interpreters who were asked to interpret a recorded speech containing 8 names, the reformulation rate was very low even for very simple names such as "Jim Joseph" (Gile 1984b).

4.3 Failure sequences

Problem triggers are potential sources of deterioration in quality, but they do not necessarily lead to actual problems. For instance, a long name may come up at the end of a sentence rather than in the middle, and be followed by a long pause. In such a case, Listening and Analysis Effort requirements disappear right after the name has been pronounced by the speaker, and the interpreter can devote full processing capacity to the Memory and Production components. Had the same name been followed right away by a new sentence, it would have caused more problems because the various Efforts would have had to be engaged in other tasks (see below).

Another point is that quality deterioration is not necessarily perceived as such by observers. Processing capacity problems may result in two types of adverse phenomena: deterioration of the *content* of the target-language speech

(errors, omissions, etc.), or deterioration of its *delivery* (linguistic output, voice, intonation, etc.). As explained in chapter 2, distortions of content are not always easy to detect. As for characteristics of delivery, unless there is a clear difference from one moment to the next, it may be very difficult to judge that an acceptable rendition of a particular speech segment could have been better had there not been a problem. Moreover, as explained below, it may be difficult to associate a particular quality deterioration phenomenon with the specific problem it originated in, because quality deterioration may occur at a distance and affect a segment which poses no particular problem in itself. It is therefore difficult to identify all deterioration sequences from the trigger to the consequences and vice versa. However, some of the processes are perceived clearly enough by the interpreters to be identified and described, and theoretical models provide reasonable explanations for phenomena observed in the field, and help devise tactics and strategies for improved interpretation.

The simplest type of failure sequence is exemplified by a momentary lapse of attention in the Listening and Analysis Effort which results in the auditory loss of an incoming segment such as a name or number, which the interpreter consequently fails to reproduce in the target-language speech. Alternatively, there is no lapse of attention, but an unexpectedly difficult segment comes up in the source-language speech, and because it is unexpected, the interpreter does not have enough capacity available for the Listening and Analysis Effort, and cannot complete the listening and comprehension task.

However, insufficient availability of processing capacity for the Listening and Analysis Effort may also be the consequence of a whole chain of events which may last several seconds:

For instance, as explained earlier, the interpreter may be devoting too much processing capacity to the Production Effort, trying to be particularly eloquent, and therefore ends up with insufficient processing capacity for the Listening and Analysis Effort. Alternatively, the interpreter may be devoting too much processing capacity to the Memory Effort, for instance in the translation of a long name such as "Association internationale des villes francophones de congrès" into English; this requires some reordering of the informational sequence ("International Association of Francophone Conference Cities" is one possible translation). He or she therefore has little capacity left for the incoming segment, and may miss it. It is interesting to note in this context that in her experiments on relay interpretation, Mackintosh (1983)

observed that when numbers (a well known problem trigger) were rendered correctly, neighboring segments were missed.

Following are two other possible scenarios:

- A long name comes up, and the interpreter chooses to interrupt or slow down the reformulation of a previous segment so as to concentrate on the name. He or she may then want to reproduce it as soon as possible so as to "unload" memory. By that time the previous segment may have been forgotten.
 - Bad pronunciation by a non-native speaker forces the interpreter to devote much processing capacity to the Listening and Analysis Effort, and therefore slows down production. This in turn overloads the Memory Effort and results in loss of information from memory. Alternatively, memory is not overloaded, but production becomes very difficult because the interpreter has to accelerate in order to catch up with the speaker, resulting in deterioration of output quality or decreased availability of processing capacity for the Listening and Analysis Effort and the loss of a later segment.
- Many other sequences are possible, resulting in the possible loss of segments that may not be difficult per se, but happen to be processed at the wrong moment, that is, at a time when there is not enough capacity available for the relevant Effort.

4.4 Anticipation

The usefulness of anticipation, often underscored by interpreters (see Moser 1978, Déjean Le Féal 1981, Cartellieri 1983), also becomes clear when analyzed with the Effort Model. Two types of anticipation are considered here: *linguistic anticipation* and *extralinguistic anticipation*.

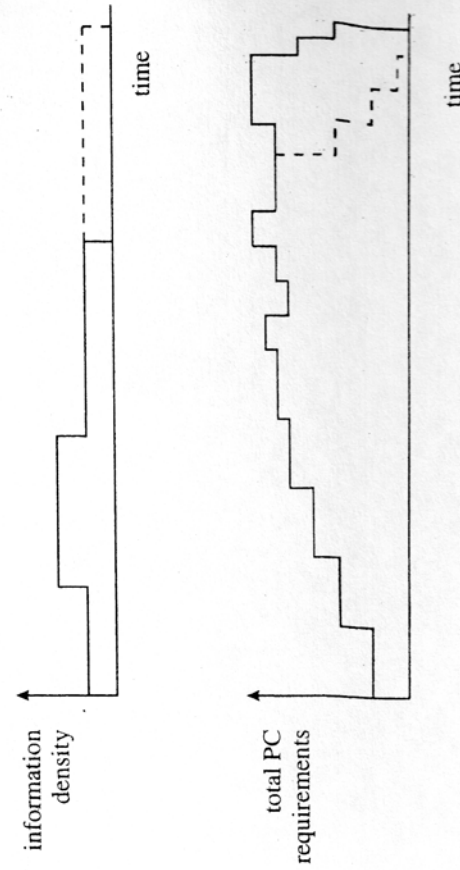
4.4.1 Linguistic anticipation

The probabilistic nature of speech comprehension is widely accepted. In every language, words follow each other not at random, but with highly differentiated probabilities: for instance, in English, the probability that an article will be followed by a noun or an adjective is high, but the probability that it will be followed by another article or a verb is low. Knowledge of such rules, albeit unconscious, helps reduce the uncertainty in transition from one speech seg-

ment to the next, and thus reduces processing capacity requirements in identifying incoming segments. This linguistic anticipation can be considered an integral part of the reception process, something that is in the very core of human language perception (Richaudeau 1973: 21). It appears, in particular in studies on reading, that subjects use transitional probabilities in identifying words (see Hörmann 1972: 97-101). The more numerous and precise such transitional probabilities are, and the better they are known to the interpreter, the less processing capacity is required for speech comprehension, all other things being equal. A high level of linguistic proficiency in individuals means not only that they know words and structures and can recognize them, but also that they have good knowledge of transitional probabilities and can use them in comprehension. Such high proficiency is difficult to assess in most everyday situations, in which all or nearly all available processing capacity can generally be allocated to the listening task. In simultaneous interpretation, however, two other Efforts compete with the Listening and Analysis Effort for processing capacity, and the mastery of transitional probabilities becomes critical.

The potential importance of anticipation can be seen in the particular case of Japanese. Japanese speeches offer many *predictable sentence endings*: from a certain point on, the informational content of the sentence is virtually

Figure 2: A theoretical comparison of total processing capacity requirements in the interpretation of sentences with (----) and without (—) predictable sentence endings



ended. A theoretical analysis of the impact of predictable sentence endings is presented in Gile 1992a. In a simple sentence having one informationally dense segment, if processing capacity requirements for each of the three Efforts are added up to approximate total processing capacity requirements, there can be two total requirement peaks during which the interpreter is most vulnerable to an incoming segment requiring much processing capacity. If the same sentence has a predictable ending, the second peak may disappear (Figure 2), which results in reduced vulnerability. I should stress, however, that at this point in time, this analysis is entirely theoretical; it has not been tested empirically yet, as such testing poses serious methodological problems.

4.4.2 Extralinguistic anticipation

Beyond linguistic anticipation made possible by good knowledge of the source language, good knowledge of the conference situation, of the subject, and of the speaker makes it possible to anticipate ideas that are expressed in speeches. Again, anticipation is defined here not as the exact and certain prediction of the speaker's words, but as *some* knowledge of the plausibility of the speaker's reacting or speaking in a particular way in a particular context or situation.

This is where conference preparation (see chapter 6) becomes important: by using documents and preparatory briefings in order to acquire knowledge about a conference, that is, about names, ideas, and terms likely to be used or referred to during the conference, interpreters increase their power of anticipation and therefore decrease their Listening and Analysis Effort capacity requirements. By doing so, they increase the capacity left for the two other Efforts, and are likely to reduce the frequency of processing capacity-related problems.

5. An Effort Model of consecutive interpretation

The initial Effort Model was developed for simultaneous interpretation. Using the same principle, a similar Model was later developed for consecutive interpretation.

Consecutive interpretation is performed in two phases, the *listening and note-taking phase*, and the *speech production phase*.

Phase one

Interpretation = L + N + M + C

- L Listening and Analysis
- N Note-taking
- M Short-term Memory operations
- C Coordination

In phase one, L is the same Listening and Analysis Effort as in the simultaneous mode, and M is similar to the Memory Effort in simultaneous interpreting. However, in consecutive, it is associated with the time between the moment information is heard and the moment it is *written down*, or between the moment it is heard and the moment the interpreter decides not to write it down, or again between the moment it is heard and the moment it disappears from memory; in simultaneous, it is associated with the time which elapses between the moment it is heard and the moment it is reformulated, deliberately omitted or lost. Another point is that the Production Effort during the first phase of consecutive interpreting is associated with the *production of notes*, not with the production of structured natural language. The implications of this difference are discussed below.

Phase two

Interpretation = Rem + Read + P

- Rem Remembering
- Read Note-reading
- P Production

In phase two, the Rem component refers to the efforts devoted to recalling the successive parts of the original speech, and is therefore different from the short-term M component. Phase two seems more complex than phase one, with its long-term memory operations (Rem) and note-reading (Read). However, if notes are good, they help perform Rem operations and may actually reduce Rem capacity requirements rather than increase them. In particular, interpreters occasionally mention the role visual memory plays in recalling the speech: indeed, when notes are taken according to a few simple layout rules (see Rozan 1956), the layout itself can be hypothesized to act as a visual stimulator of memory regarding the logical structure of the speech. Further-

more, while phase one is paced by the speaker, in phase two the interpreter is free to perform the three Efforts at his or her own pace. In this phase, unlike the first phase and unlike simultaneous interpretation, the interpreter does not have to share processing capacity between tasks while close to saturation; there are no problems arising from an accumulation of tasks under the pressure of time resulting in capacity requirement peaks. Neither does there seem to be a need to introduce the Coordination Effort in the second phase of the model. This is why, in terms of processing capacity, only phase one seems to pose a problem to competent practitioners. It follows that in the consecutive mode, *operational requirements* as defined for simultaneous interpretation through inequalities (3) to (7) are essentially meaningful in the first phase, not the second.

Similarly to the case of the simultaneous interpretation model, the following conditions must be met in order for consecutive interpretation to proceed smoothly:

- (1) $LR + NR + MR < TA$
- (2) $LR < LA$
- (3) $NR < NA$
- (4) $MR < MA$
- (5) $CR < CA$

When formula (1) is not true, saturation may occur. When formulas (2), (3), or (4) are not true, failure may result in spite of the possibility of the sum of available capacity being larger than total requirements.

Consecutive interpreting, processing capacity, and note-taking

One major difference between simultaneous and consecutive is that in consecutive, speech comprehension and speech production are separated, which means that, as explained above, the interpreter is spared both the high production requirements associated with structured speech, and some short-term memory load arising from syntactic differences between source language and target language (some increased requirements probably remain in note-taking).

It follows that during the second phase of consecutive interpretation, much more capacity and time are available for speech production than in simultaneous, which may explain why interpreters are more willing to work

into their B language (non-native active language) in consecutive, even when they refuse to work into B in simultaneous.

As for the first phase, which is paced by the speaker, it does not necessarily generate the same constraints as simultaneous, because note-taking allows much more freedom than speech production. Note-taking is not governed by rules of linguistic acceptability—lexical, syntactic, stylistic, or otherwise. As explained below, notes can be taken with much latitude. When processing capacity requirements for the Listening and Analysis Effort become high, some capacity can be freed by reducing the quantity of notes being taken. In simultaneous, slowing down speech production results in some lag, which has a cost in Memory Effort load and may have to be made up later at the expense of increased capacity requirements for Production. In consecutive, reducing the quantity of information that is written down in notes does not necessarily result in much increase in information to be stored and reformulated in the target language at a later stage. For example, below is a segment from a speech, as well as an approximate reproduction of one professional interpreter's notes:

Source-language speech

... because every child has the same needs, and the right to a basic education, the right to food, the right to shelter, and the right to basic health and every child needs a friend ...

Consecutive notes

all same
rights
ed.
shelter
health
need friend

As can be seen, words such as "because," "every child," "needs," and "basic," as well as function words, were not written down by the interpreter, who nevertheless interpreted faithfully the whole segment. This illustrates the latitude in note-taking mentioned above. Notes do not *reproduce* the speech; they are only written indications to help the interpreter remember it.

Essentially, during the first phase of consecutive interpretation, problem triggers are the same as in the simultaneous mode. The main difference between the two situations is associated with the nature of note-taking: note-

taking requires more *time* than speech production because of its partly mechanical nature (hand movements), and therefore leads to some lag, hence to higher Memory capacity requirements that may in turn reduce the capacity available for the Listening and Analysis Effort.

It can be argued that note-taking requires *less* time than speech production in simultaneous, because notes are taken only for information as carried by single words or short speech segments, whereas in speech production, full sentences have to be made. Furthermore, as shown above, only part of the information is taken down, while the rest is committed to memory. This is true enough. However, for whatever information is written down, the time factor becomes important, especially when the interpreter does not have a readily available symbol or abbreviation for the information.

It follows that in terms of processing capacity, note-taking is critical, which explains and justifies the large volume of literature it has generated, from Rozan (1956) to Matyssek (1989). On the empirical side, the critical nature of note-taking has been shown in an experiment (Gile 1991a) which demonstrated that students who have not been properly instructed in its principles and techniques tend to miss more names (names are a sensitive indicator; see Gile 1984b) when interpreting after taking notes than when they do not take notes (see section 10).

In the interpreting community, there are differing opinions as to the desirable quantity of notes, the language in which they should be taken, the use of symbols, etc. Note-taking is an area in which the concept of processing capacity can be useful but has seldom been used. The basic question is how to reduce processing capacity and time requirements of note-taking while maintaining the efficiency of notes as memory reinforcers. From this angle, symbols and abbreviations are logically good solutions provided they have been fully mastered by the interpreter (otherwise, retrieving them from one's memory for writing and decoding purposes may be capacity-consuming). The much-decried idea of learning a set of symbols rather than making them up on the spur of the moment may therefore have distinct advantages. Similarly, writing notes in the target language theoretically requires more processing capacity than writing them in the source language because of the capacity required for conversion. This may therefore be an unwise choice when the interpreter is working close to saturation level. This runs contrary to the advice given by some interpretation instructors, whose point is that taking notes in the target language is better because it makes for better listening and does away

with the need to translate during the reformulation phase, when notes are read.

Again, until empirical evidence is available, it is difficult to say which of the positions, equally valid in theory, is of more practical value, but instructors do seem to agree on the need to save both time and processing capacity in note-taking.

6. Efforts in sight translation

Sight translation is rather infrequent in interpreting. It consists of "reading" a source-language text aloud in the target language. It occurs when delegates receive a text and want to have it translated orally on the spot, or when a speech segment has been read from a text and has to be interpreted consecutively.

In sight translation, the Listening and Analysis Effort becomes a *Reading Effort*, and the Production Effort remains, but there does not seem to be a Memory Effort similar to the one in the simultaneous mode or the consecutive mode, since the information is available at any time on paper. Moreover, sight translation is not paced by the source-language speaker. In other words, two major interpretation constraints are not present in this type of translation.

On the other hand, in the Reading Effort, interpreters (or sight translators) are not helped by vocal indications such as the speaker's tone shifts, hesitations, or other pauses, and have to segment the text into "Translation Units" on their own. While reading, they cannot devote all their efforts to understanding the meaning of the text but must think of its translation as well, so that their interpretation is smooth enough. This may pose no difficulty when the two languages are syntactically similar and when the source language is written in a style which is easy to segment, *inter alia* when sentences are short and made up of independent clauses. However, when sentences are long, with relative or embedded clauses, it may be necessary for the sight-translator to read much more than the Translation Unit before reformulating it, which involves more time and more effort. This occurs when translating from languages such as German or Japanese into French, English, and other Western languages. The same difficulty also occurs in consecutive and simultaneous interpretation, but, as noted above, in sight translation there is no help for segmentation from a speaker's voice.

When the text is given to interpreters in advance, they can remove this particular difficulty by visually segmenting sentences before sight translation,

and by inserting handwritten slashes in the appropriate places. It is significant that many interpreters seem to perform this operation before they do anything else, including writing down target-language equivalents of source-language terms. Sight translators may also write numbers above words in a segment which will have to be reordered in the target language, as in:

2	4	3	1
Interamerican	Tropical	Tuna	Commission

To be translated into French as:

Commission (1) interaméricaine (2) du thon (3) tropical (4)

When prior preparation is possible, Effort load is reduced considerably. However, one more difficulty of sight translation is very significant in the initial training context: in interpretation, the sounds of the source-language speech disappear rapidly from the interpreter's memory, permitting the reconstruction of the speech from its *semantic* content rather than from the words and linguistic structures; in sight translation, words and linguistic structures are ever-present before the practitioner's eyes. This significantly increases the risk of interference between the two languages, which is why it does not seem advisable to introduce sight translation as a first-year exercise, except under highly controlled conditions, possibly as anti-interference drills.

7. Simultaneous interpretation with text

Simultaneous interpretation with text occurs frequently, when speakers read a text which has also been given to interpreters. This combination of simultaneous interpretation and sight translation has the following features:

On the positive side:

- The existence of vocal indications from the speaker, though these may not be as helpful as in ad-libbed speeches (see Déjean Le Féal 1978).
- The visual presence of all the information, which reduces memory problems and the deleterious effect of acoustic difficulties, as well as the probability of failures due to insufficient processing capacity in the Listening and Analysis Effort (see below, in particular regarding names and numbers).

On the negative side:

- The high density and peculiar linguistic constructions of written texts as opposed to oral discourse (see Halliday 1985).
- Risks of linguistic interference.
- The added difficulty of following both the vocal speech and the written text and the temptation to focus more on the text than on the speech. This is associated with two risks:
 - a. Since all the information is present in the text, interpreters often try to translate all of it even when delivery is very fast and they are being outdistanced. They may then lose the speaker completely, and therefore also lose important speech segments.
 - b. Speakers often deviate from the written text, by adding comments, changing segments, or skipping segments. When interpreters focus on the text, they may miss these changes.

It follows that simultaneous interpretation with text is a difficult exercise, but it does seem to make interpretation possible under acoustic and delivery conditions which would be prohibitory without the text.

8. The Effort Models and translation

Are interpreters more often close to processing capacity saturation in the simultaneous mode or in the consecutive mode? Which of the Efforts requires more capacity on average and under what specific conditions? What are the most frequent processing capacity-related errors in simultaneous and in consecutive interpretation? No answers are available to these questions yet because of the absence of quantitative studies of processing capacity in interpretation.

However, one hypothesis that can probably be taken as true even without such quantitative studies is that processing capacity requirements are much lower in written translation than in either mode of interpretation, precisely because in translation there are no competing Efforts, and all available capacity can be devoted alternately to the Reading and analysis component (the

counterpart of the Listening and Analysis Effort in interpretation) and to the writing component (which corresponds to the Production Effort in interpretation). Moreover, with respect to short sequences of Translation Units, under most usual working conditions, time constraints in translation can be considered virtually nonexistent when compared to the time constraints of interpretation. Translators can read the source-language text several times at leisure, which means that their Reading Effort requirements in terms of processing capacity per time unit are lower than requirements for the Listening and Analysis Effort in interpretation. Similarly, they can write their target-language text at leisure and improve it iteratively, which implies lower processing capacity requirements than in the speaker-paced Production component of simultaneous interpretation, or even in the Note-taking component of consecutive interpretation, which also requires fast decision-making.

This is an important but all too often forgotten point in the debate on the similarities and differences between interpretation and translation. Theoreticians tend to focus on linguistic differences between spoken and written language and point out that mastery of one does not imply mastery of the other. They also say that interpreters have to be faster than translators. These two conditions can be partially analyzed in terms of processing capacity, as shown above with respect to rapidity, and as explained in chapter 9 with respect to the question of oral vs. written mastery of a language.

But even when translators do have full mastery of spoken language, a lack of oral practice can make their processing capacity requirements for oral production and/or comprehension too high for simultaneous interpretation, in view of the simultaneity of the three competing Efforts. This could explain why translators who seemingly understand and speak the two languages "just as well" as interpreters, and who understand the basic principles and methods of interpretation and translation, are sometimes found to be totally incapable of doing simultaneous interpretation. Processing capacity considerations could also explain why such translators *can* interpret consecutively in fields they know well: because of their familiarity with the subject, they anticipate much of the content of speeches, and therefore require very little note-taking, which reduces processing capacity requirements.

Finally, besides processing capacity requirements per se, good *capacity management* (allocating and shifting processing capacity between the various Efforts) is important for interpretation. It apparently takes some training to achieve good *capacity management* (see Pinter 1969). This is probably another

important obstacle in the way of translators who try to interpret without specific training.

These considerations suggest that possibly what separates interpreters from translators, besides the points already made in section 4 of chapter 5, is not so much a set of different psychological requirements and professional philosophies as a lack of oral production and comprehension practice and of attention-management training in translators.

9. Processing capacity and interpretation students

At the present time, nothing is known about the initial status and possible changes over time of student interpreters' total available capacity. As stated by Carroll (1978: 266):

It is assumed that individuals vary not only in terms of their cognitive information, but also in the speed and facility with which they store, retrieve, and manipulate elements of information.

But the question remains whether it is possible to develop this capacity (and if so to what extent) through proper training or otherwise. The issue may be a crucial one to investigate, but to my knowledge no such study is in progress, and methodological obstacles may be formidable.

Interpretation training may not develop processing capacity per se, but it does act on both capacity management and the capacity requirements of the respective Efforts. In fact, most of the time it is difficult to say whether an improvement in performance results from improvements in one or the other, but there are some clear-cut cases: when students are told to construct simple sentences with simple words when interpreting into their B language, the aim is to reduce the capacity requirements of the Production Effort; when they are advised to cut German sentences into small segments in German-to-French simultaneous interpretation (Ilg 1978: 88) or to try to stick closely to a fast speaker rather than lag behind, they are given capacity-management strategies.

Very few capacity-management strategies are taught as such in interpretation schools. Most of the learning comes from practice, first with attention-division exercises such as *listening to a speech and counting backward* or shadowing, advocated by some instructors (see for example Moser 1978; Lambert 1989, 1992; Watanabe 1991), and then from actual interpretation exercises, in which students seem to acquire capacity management skills by

unconscious or semi-conscious trial-and-error procedures. Several teachers, in particular in the ESIT group, oppose shadowing on the grounds that it is allegedly inefficient and "dangerous" because it favors simple repetition rather than analysis (Thiéry 1989, Seleskovitch and Lederer 1989). At present, there is no experimental or other evidence supporting either of these views, but judging by the experience shared during a teacher training seminar held by the International Association of Conference Interpreters in Brussels in February 1991, many if not most teachers do use some shadowing exercises in the course of their interpreting classes, and many instructors consider them useful and important in preparing students for simultaneous, an opinion which is defended by Lambert (1992). In Japan, this is apparently the view of a large majority of interpretation teachers (see the first issue of *Kuôtari Tsiyakuironkenkyū*, reviewed in Gile 1992b).

10. Teaching suggestions

The concept of processing capacity and the two Effort Models presented above are theoretical, but I regard them as central to the general conceptual framework provided to students, as they seem to be efficient in helping them to understand many difficulties in interpretation and to analyze interpretation strategies and tactics advocated by teachers, including conference preparation, guidelines for work into one's B language, note-taking in consecutive interpreting, and linguistic skill enhancement (see chapter 9). Teaching these concepts is therefore strongly recommended.

The concept of processing capacity can be introduced toward the beginning of the syllabus, for instance after the basic concepts of quality and fidelity. The idea is to show students that listening for interpretation purposes requires more attention than listening in everyday life. One way of demonstrating the fact consists of making a short, informationally dense presentation, and then asking a student to repeat its content in the same language. Generally, the student will have missed part of the information. Other students are then asked what elements were omitted. Whenever one such element is mentioned by one student, the class is asked who did not hear it. It turns out that generally, some students will claim they did not hear particular words or ideas, at which point the instructor can point out that they did *hear* them, but did not *register* them because they were not listening with enough attention. This can be used as a

starting point to explain the basics of oral speech comprehension, including the fact that in most ordinary listening situations, listeners do not maintain a uniformly high level of concentration on the incoming discourse, hence the listening losses. The instructor can then move on to present the role of processing capacity in speech production, and explain the hesitations associated with the retrieval of words and with syntactic decision-making in speech production. This will be facilitated by the students' new awareness of their own speech production problems, which is generally observed when they start studying interpretation and must for the first time express faithfully and in a linguistically acceptable way ideas they have just heard. If at that time students have already started exercises in consecutive with note-taking, the teacher can explain the Effort Model of consecutive, possibly using the following experiment for raising awareness (already mentioned in section 5 of this chapter).

Students are divided into two groups for an exercise in consecutive interpreting. One group is instructed to take notes and the other to refrain from doing so, except as regards numbers, names, and technical terms, if necessary. A short presentation containing several names is made, and a student is asked to interpret. Whenever he reaches a name, students are asked to indicate whether they heard the name properly. At the end of the exercise, the number of names heard correctly among members of both groups are compared. It generally turns out that students who did not take notes heard the names better than the ones who did. The explanation, namely the idea that note-taking took away some of the processing capacity initially available for listening, can be a good starting point for the presentation of the whole model. The Models, as well as the concept of processing capacity, can then be recalled whenever difficulties are analyzed and strategies and tactics are presented.

MAIN IDEAS

1. Simultaneous interpretation can be viewed as a set of three Efforts, namely the Listening and Analysis Effort, the Production Effort, and the short-term Memory Effort, each of which takes up part of a limited supply of processing capacity.
2. Problems occur when the total processing capacity requirements exceed available processing capacity (*saturation*), and when the part of the total processing capacity which is available for a given Effort is not sufficient for the task this particular Effort is engaged in (*individual deficit*).
3. Problem triggers are of two kinds:
 - Those which *increase processing capacity requirements* (high speech density, signal disturbances, unusual speech signal, interpreting between syntactically different languages);
 - Short speech segments lacking redundancy, which are *vulnerable* (names, numbers, other short words).
4. Failure may occur at a distance, through sequences of processing capacity transfers ultimately resulting in saturation or deficit.
5. Consecutive interpretation consists of a listening phase, followed by a reformulation phase. In terms of processing capacity, only the former is critical.
6. In consecutive, note-taking is an important processing capacity-consuming component. Note-taking management is an important aspect of failure prevention.
7. In sight translation and simultaneous with text, the short-term memory component and vulnerable segments disappear, but texts have a higher density, and there is increased danger of interference. When interpreting simultaneously with text, it is important to give precedence to the speaker's voice rather than to the written text.
8. Processing capacity constraints account for a major difference between the skills required for interpretation and translation.

CHAPTER 8

Coping tactics in interpretation

1. Introduction

In spite of interpreters' preparation strategies, problems do arise in interpreting situations (see Gile 1989) because of processing capacity limitations (as explained in chapter 7), errors in processing capacity management, and gaps in the interpreters' Knowledge Base. Many of these problems can be said to be unavoidable, as shown by the fact that they are encountered regularly even by interpreters with a solid reputation and long professional experience. Interpretation has been referred to by some professionals as "crisis management," and in the light of interpreters' daily experience, these are apt words to describe an aspect of interpreting which is virtually unknown to the public at large.

Difficulties affect both comprehension and production, often through *failure sequences* as explained in chapter 7. When interpreters are aware of such problems, they tend to use a rather small set of tactics to limit their impact.

Coping tactics are a very fundamental practical skill in interpreting. Basically, they are taught within the framework of practical exercises. In most training programs, this is done by *trial and correction*, with trial on the student's part and corrections from the instructor. Such corrections are generally normative; instructors sometimes refer to the communication impact of the tactics in order to explain their preferences, but are not necessarily aware of other factors which influence them.

This chapter attempts to provide instructors with a list of basic coping tactics for a general view of the issue. It also presents a conceptual framework which spells out the advantages and drawbacks of each tactic, and discusses a few rules which may help explain what makes interpreters prefer one tactic over the other beyond their individual merits.