THE IDEAS SET forth by Seleskovitch were further studied and extended, both independently and in collaboration with her, by Marianne Lederer, herself a practicing interpreter and an interpreter trainer. As one of the first doctoral students in the research program on *Science et technique de l'interprétation et de la traduction* (*Traductologie*) at the Sorbonne Nouvelle School of Interpreters (ESIT), Lederer defended her doctoral thesis, *La traduction simultanée – fondements théoriques*, in the late 1970s. She was subsequently appointed full professor at Université Paris XII and, in 1985, at Université Paris III – Sorbonne Nouvelle, where she went on to become Director of ESIT (1990–9) and Head of the University Research Center for Translation Studies.

The paper reprinted here, first published in the Proceedings of the 1977 Venice Symposium (Lederer 1978b), presents Lederer's early investigations of simultaneous interpreting, preceding the more extensive empirical and theoretical analyses presented in the published version of her doctoral dissertation (Lederer 1981).

Lederer's later work focused on written translation, where similar aspects were found to be universally valid, whatever the situation and whatever the language pair. Among her many publications are *Études traductologiques – travaux réunis par M. Lederer* (1990) and *La traduction aujourd'hui – le modèle interprétatif* (1994), as well as several volumes on interpreting in collaboration with Seleskovitch.

Further reading: Lederer 1981, 1982, 1990, 1994; Seleskovitch and Lederer 1984, 1989.

Marianne Lederer

SIMULTANEOUS INTERPRETATION
Units of meaning and other features

IT IS CERTAINLY fit and no coincidence that this symposium devoted to interpretation should bring together psychologists, linguists and interpreters. Interpreting is a human performance in which cognitive activity is first and foremost; it therefore leads us into the field of psychology with no need to resort to special experiments; in this field the connection between thinking and speaking can be observed as it materializes with each segment of speech so that investigations into interpretation also pertain to psycholinguistics. Since it implies a comparison of speech acts in different languages it also obliges us to tread on linguistic ground. Thus interpreters can rejoice in having the opportunity of comparing their results with those obtained by psychologists, linguists and psycholinguists.

For a number of years, our research team at Paris University (Sorbonne Nouvelle) has been recording speeches and discussions at multilingual international conferences and comparing not only speeches and their interpretations but also speeches in different languages. We have collected a wealth of evidence which is as yet far from being entirely exploited; yet a number of conclusions seem now sufficiently ascertained for me to try and present a short extract of a speech and its simultaneous interpretation and to discuss some of the evidence obtained.

As a preface however, I should like to stress how important it is to consider what interpretation is supposed to achieve before embarking on a detailed study of the processes involved. Everything that is spoken in a booth in response to speakers' utterances is interpreting and representative of the state of the art; in a study that would propose to survey the present state of the profession, all types of interpretation would have to be taken into consideration. This, however, is not the purpose of our research team: we concentrate on the process of interpretation that establishes communication. We believe that in doing so, we determine not only what such interpretation is, but also what speech behaviour consists of. Seen from this angle

it becomes a truism to state that interpretation, to be taken as an object for investigation, has to establish communication.

A fundamental precept has therefore guided our selection of recordings at international conferences: we have always checked that discussions in the meeting room have developed unhampered by the variety of languages used. Delegates speaking different languages and listening to the interpretation of languages they do not know must be able to understand each other as if they were communicating directly through one and the same language: that is a basic prerequisite for interpretation to be considered worth studying as a process. The best way of judging the quality of interpretation is to listen to a discussion period where people put questions to each other. If all this is carried out in two or three languages, and people prove satisfied with the replies, it can be said that communication was established, that the interpretation was successful and that the process involved was representative.

We also have to bear in mind that the findings on any process under investigation can be distorted if extraneous factors confuse the basic issue. Interpreting is free speech and it should be investigated in connection with spontaneous speech, i.e. extemporaneous interventions and not prepared statements or papers being read out. When we speak, our thoughts are paramount in our minds and words follow suit without our paying attention to them. We think as we speak and so does the interpreter listening to us. When we read out a text however our thinking has already taken place and our thoughts, instead of controlling our words, are merely aroused by them, sometimes we even bypass thinking altogether. The interpreter's performance is not the same in both cases; when translating from texts being read out he has to overcome problems that are quite different from the process of understanding and stating that which was understood which he carries out normally.

A further fact is worth mentioning before embarking on a more detailed account of some of my findings: it is a recurrent fact that at the beginning of any meeting there is much more language transposition or transcoding than later on. This constantly recurring phenomenon can be explained: as long as too much of what is meant remains unknown to the interpreters (although perfectly known to all participants, and therefore unsaid by the speaker) their only recourse is to lag as little as possible behind the speaker's words so as to translate his language. By and by, as the meeting goes on, interpreters analyse the tiniest bits of information, probe more and more deeply into the intended meaning of speakers and, as this stored knowledge builds up, their interpretation departs from the linguistic meaning of the source language and consequently their rendering becomes more natural and their language more native.

The very short passage upon which I am going to comment – it took the speaker 36 seconds to utter it – has been extracted from a panel discussion which was part of a three-day meeting organized last March by the Sugar Industry on the general theme: "*Sugar, Diet and Health*". This panel discussion took place on the afternoon of the second day; interpreters had already heard and translated papers on sugar and obesity, sugar and diabetes, sucrose and brain chemistry and sucrose and sports. They were therefore quite familiar with the various topics speakers might touch on.

This passage in English and its interpretation into French was chosen from a

number of transcripts of recordings I made at that conference. It is intended to be an example of a few of the features that appear when studying simultaneous interpretation. It is of course not the sole basis for the conclusions I shall be presenting here, and not exhaustive as a substratum either. Much more can be said about simultaneous interpretation and its implications for language and memory than I could possibly say within this short time. [. . .] This paper is meant as a typifying example of results obtained so far. The passage is taken from a panel discussion on the role of sugar in the soft drink and food industry; Mr Brooks from Canada is speaking; here are the first sentences of his statement:

> I don't really want to get into the paper that I am presenting this afternoon, but it bears upon the matter that at present is being discussed. I think this is an extremely important point. Apart from certain necessary defensive work from sucrose manufacturers and sucrose users, there is a real need to identify where, within the normal society, sucrose and similar sugars are playing important positive roles. Dr Kingsbury's comments with regard to the sportsmen are pertinent. He is right also to identify the possibility of other needs at other times.

And here is the transcription of the recording showing the parallel development of original and translation:

APART FROM CERTAIN NECESSARY DEFENSIVE
Je crois que le problème est extrêmement

WORK FROM SUCROSE MANUF-
important. A part certains travaux

ACTURERS AND SUCROSE USERS
nécessairement défensifs

THERE IS A REAL NEED TO IDENTIFY
de la part des fabricants et des industries utilisatrices de saccha-

WHERE WITHIN THE NORMAL SOCIETY
rose, il faut préciser

SUCROSE AND SIMILAR SUGARS ARE
le

PLAYING IMPORTANT POSITIVE ROLES.
rôle positif et important du saccharose et autres sucres

DR. KINGSBURY'S COMMENTS
chez les bien-portants.

WITH REGARD TO THE SPORTSMEN
Ce que Monsieur Kings –

ARE PERTINENT. HE IS RIGHT ALSO
bury vient de nous dire à propos des sportifs est

TO IDENTIFY THE POSSIBILITY
extrêmement pertinent. Il a aussi

OF OTHER NEEDS AT OTHER TIMES
raison de dire qu'il y a

I DON'T THINK THE TOPIC IS A SIMPLE ONE
d'autres besoins à certains moments au plutôt chez d'autres

WHEN IT GETS DOWN TO IT I .....
personnes.

The reader will notice that at the beginning of the transcription, the interpreter is still rendering the previous sentence and that, whilst he is still translating the end of the passage, the speaker is pronouncing a new sentence. This is a reminder that the interpreter receives a continuous stream of information and that interpretation, although shown here on paper, should not be analysed as if it was written translation.

I have arbitrarily subdivided the 36 seconds extract into segments of three seconds each in my presentation in order to present the way the speaker's and interpreter's parallel speeches develop. I have very roughly superimposed the words simultaneously pronounced by them in an effort to reproduce (although very sketchily) what can be heard when listening simultaneously to tape recordings of the two languages.

The time lag between speaker and interpreter

When looking at the transcript it can be observed that there are times when interpretation follows fluently upon the speaker's output with a delay of between 3 to 6 seconds. There are other times however when the interpreter pauses and lets the speaker get very much ahead of him. And there are still other times, usually following a pause in the interpreter's rendering, when the flow of words coming out of his mouth increases to a very quick delivery. Why does this happen and how can it be explained? Let us look at the sentence: "*He is right also to identify the possibility of other needs at other times.*" Up to: "He is right also . . .", the interpretation is very fluid, developing smoothly and quickly.

"*Ce que Monsieur Kingsbury vient de nous dire à propos des sportifs est extrêmement pertinent. Il a aussi raison de . . .*" follows with no hesitation upon the previous sentence but then, upon hearing " . . . to identify the possibility . . . ", there is a pause of over one second, quite a remarkable interruption in such a quick delivery.

I suggest that this pause was necessary for the interpreter to get the amount of information required for his understanding of the speaker's meaning. *To identify the possibility* does not mean anything; more is needed to give this set of words some sense: the interpreter needed to hear "*of other needs at other times*". With lightning speed he was then able to connect these words with the information stored in his cognitive memory. He had translated Dr. Kingsbury's statement approximately ten minutes before translating the Canadian delegate. We have a proof of his remembering, for upon hearing "*Dr. Kingsbury's comments . . .*" he said: "Ce que Monsieur Kingsbury *vient de nous dire . . .*" His words there stem quite normally from sense, a combination of previous knowledge and immediate language understanding. But understanding "*to identify the possibility of other needs at other times*" requires more than the mere recollection of having heard the speech a short while ago.

If interpreting was mere language transposition, nothing could have prevented the interpreter from saying: ". . . *d'identifier la possibilité d'autres besoins à d'autres moments*". The English sentence: "He is right also to identify the possibility of other needs at other times" contains nothing but familiar words, arranged in a syntactic order which can easily be transposed into French. The fact that in his rendering the interpreter chose to say something else ("Il a aussi raison de dire qu'il y a d'autres besoins à certains *moments ou plutôt chez d'autres personnes*") points to a more complex process than a mere understanding of language. To start with, the interpreter does translate literally " . . . *of other needs at other times*" with "*d'autres besoins à d'autres moments*"; he apparently wants to catch up with the speaker but having understood what was meant, he immediately corrects himself by adding: ". . . *ou plutôt chez d'autres personnes*".

Understanding sense is adding a cognitive element to language meaning. What happened here is that the words "*other needs at other times*" merged with previously stored relevant knowledge, as evidenced by the addendum: ". . . *ou plutôt chez d'autres personnes*", that refers to information that has been in store for about ten minutes. In going through Dr. Kingsbury's statement, I found the following sentence:

> There are definitely times when there is a physiological need for sugar in the drinks, not only I think for athletes and sportsmen, but also in children, convalescents, people that aren't physically very active . . .

Of course the interpreter could not have remembered this sentence word for word, but his recollection of the substance was aroused by the mention of "*other needs at other times*", and the conjunction of the two made sense.

The choice of words

Understanding is not the only process of the human mind that can be studied in interpretation. The interpreter is not only a listener, he is also a speaker and while his words are determined by his understanding of the speaker's intended meaning, to some extent they are also based on the speaker's language.

In our example, the words "*sucrose and similar sugars*" are translated into French: "*du saccharose et autres sucres*". Here a word in French (*saccharose*) appears to have been

called up to match the English sucrose; the same can be said of *sugar* = sucre, or *important positive* = *positif et important*,etc.

Words that match in translation do so for a number of reasons that do not reflect identical psychological processes. In a previous publication (Lederer 1973), I identified three ways which seem to underlie word matching in translation. The first one I called "glissement phonétique" (phonetic shift): in the present case (E) *positive* = (F) *positif* or (E) *important* equating (F) *important*. A change in pronunciation brings a word from one phonological system over to another and the English word is turned into a French word. The "glissement phonétique" is in some cases fully justified, when controlled by sense as in the present case. At other times it is an important source of language contamination; thus (E) *material* becomes all too often (F) *matériel*, or (E) to *ignore, ignorer*, etc. In simultaneous interpreting, where both languages are constantly present at the same time in short-term memory, it is a great temptation to take a shortcut and be contented with the change in phonetics under the misguided impression that words phonetically similar are semantically identical; fighting this natural trend is one of the main problems in the translation of languages that resemble each other, such as English–French or Italian–French.

The second way words can be matched in translation is through a translation of primary meanings: the word that comes first to mind as an equivalent to the English word is the word that fits the translation; here we find *sugar* = *sucre*, *needs* = *besoins*, *manufacturers* = *fabricants*, *sportsmen* = *sportifs*, etc. The process involved here is very much what most people think interpreting amounts to; the only mental processes appear to be the recognition and transposition of language meaning. Figures are the typical instance of that process in interpretation and yet they are the arch foes of many of the best interpreters who fail to hear and translate correctly even two-digit figures, while having no problem in grasping the most intricate arguments. One finding of immediate interest in connection with figures is related to the interpreter's lagging behind the speaker: whenever figures are rendered correctly although they are embedded in a complex argument, the interpreter abruptly catches up with the speaker and pronounces the figure almost immediately after hearing it. It seems that figures have to be repeated while still within the span of short-term memory.

Primary meaning translation is a process that often proves successful but that just as often can fail. In the present case, *sucre*, for *sugar* is appropriate but in numerous cases primary meanings translated with no regard to sense are not immediately intelligible; so for instance (E) *challenge* is always rendered in French by *défi* or (E) *account for* by *rendre compte*, although *expliquer* is available and much more to the point in French.

Finally a third way of matching words is the deliberate calling up of a specific term to match a given word. Thus (F) *saccharose* for (E) *sucrose*. There the interpreter not only has to find the specific term that does not automatically associate itself with the English, as *sucre* did with *sugar*; he also has to consciously refrain from "glissement phonétique" (*sucrose* would sound so natural in French!). In other cases he would have to repel the primary meaning translation; for instance in the case of "*a fleet of engines*", "*parc de locomotives*" has to replace the automatic urge to say "*flotte*" or "*flotille*" before becoming automatically associated with "*fleet*" after having been said a few times. In the case of *saccharose*, it can be assumed that since this interpretation took place on the second day of the meeting, the calling up of the word did not require a conscious effort on the part of the interpreter, for whom the equivalent had probably by then become automatic reflex. But the phenomenon of having from time to time to summon consciously a word or an expression is too common in interpretation not to be mentioned here.

The verbal manifestations of sense in interpretation

In our English–French extract it is striking to note a constant intertwining of what might appear to be a word for word translation and of phrases that, although initiated by the words of the speaker, do not resemble them literally. A number of the words and phrases heard in English by the interpreter are transposed into French: "*A part certains travaux nécessairement défensifs de la part des fabricants*" is a literal translation of "*Apart from certain necessary defensive work from sucrose manufacturers*". This does not mean that the interpreter, when doing that literal translation, puts his intellect at rest. That he understood and not only repeated "*defensive work*" comes out clearly in the way he later translates "*within the normal society*" with "*bien-portants*".

Here a few words of explanation may be necessary: sugar manufacturers are not only doing promotion and marketing work in order to boost their sales, they also subsidize a number of laboratories doing research on the role of sugar in diabetes, coronary diseases, dental caries, etc. in the hope that results will ultimately show that sugar is not as bad for health as currently held by public opinion. The meeting brings together a number of scientists who have submitted papers on their findings in those various fields. The interpreter knows all this; he therefore cannot but understand what "*necessary defensive work*" means. The verbal manifestation of his understanding is found in the French rendering:

> *il faut préciser le rôle positif et important du saccharose et autres sucres chez les bien-portants.*

There is nothing in this French sentence that resembles phonetically or semantically the phrase "*within the normal society*". No better example could be found of the way in which something that is understood not only can be rendered in a form that is entirely alien to the original form but also kept in store for a period exceeding the short-term memory span, and rendered at a place that is adequate in French.

"*Defensive work*" meant research work on various diseases. "*Normal society*" where sugar is playing a positive role, means "*bien-portants*". The choice in French of words differing from the English words shows that the interpreter understood both this part of the sentence and the first part on defensive work. We find a similar example of language disparity in the same sentence, where "*sucrose users*" is rendered by "*industries utilisatrices de saccharose*". The speaker could not have meant the end users, the panel discussion is on the role of sugar in the soft drinks and food industry. This is obviously what the speaker meant by "*sucrose users*". The interpreter makes this even more obvious by stating it explicitly.

The difference between sense and linguistic meaning is clearly revealed in the two equivalents I have just shown : *users* = *industries utilisatrices, normal society* = *bien-portants*, or earlier, *comments* = *vient de dire*. This variance in the interpreter's

expression as compared to the basic meanings of words is the tangible evidence that can be seized upon to probe into nonverbal thinking. The point here is not how interpreters arrange their phrases syntactically so as to fit the requirements of their own mother tongue, but the fact that their wording reflects more than the knowledge of two languages and the ability to establish equivalents between the two. It reflects the thinking process that goes on during interpreting, something which obviously is not unique to interpreters or interpretation but applies to the understanding process in general.

Units of meaning

My investigations of recordings of interpretations led me to put forth the general concept of units of meaning. I suggest that such units are segments of sense appearing at irregular intervals in the mind of those who listen to speech with a deliberate desire to understand it. As long as there is nothing but words available, such as in our case: ". . . to *identify the possibility* . . ." recognition of language sounds is possible (at least in most cases, even though recognition of sounds often requires the assistance of sense), but no additional mental operations can be carried out. With the appearance of "*other needs*", the words present in short-term memory seem to pull together and merge with the recollection of knowledge acquired since the beginning of the meeting, all of a sudden making sense.

A colleague of mine who is preparing her Doctor's degree at our University, Miss Bertone, has drawn a parallel between the emergence of sense and Jacques Lacan's *point de capiton*. For Lacan, understanding is achieved with the last word of sentences, when words seem to pull together to give birth to an idea. He compares the process of understanding with the mattress maker's pulling up his thread every few stitches, making the *point de capiton* that divides up his fabric at regular intervals (Lacan 1966).

Chunks of sense appear in interpretation whenever the interpreter has a clear understanding of a speaker's intended meaning. They can be preceded by a slight pause or come after a few probing words that are literally translated. At other times they are rendered immediately, as "*ce que Monsieur Kingsbury vient de nous dire*" for "*Dr Kingsbury's comments*". Units of meaning are the synthesis of a number of words present in short-term memory associating with previous cognitive experiences or recollections; this merging into sense leaves a cognitive trace in the memory while the short-term memory is taking up and storing the ensuing words until a new synthesis occurs and a new cognitive unit adds up to those previously stored in the cognitive memory.

Word prediction and sense expectation

Units of meaning are not a grammatical segmentation of language into syntactic units. It often happens in ordinary life that we grasp the intended meaning of a speaker before he finishes his sentence. This also happens to interpreters. Anticipation can take different forms: either the interpreter actually says a word (the verb for

instance) before the speaker has uttered the corresponding word or, more commonly, he puts in a word at the correct place in his French sentence which, if compared in time, is uttered after the original, but so soon afterwards and at so correct a place in his own language that there is no doubt the interpreter summoned it before hearing the original.

When studying these anticipations a clear distinction should be drawn between anticipations based on sense expectation and anticipations based on language prediction. In the first case the interpreter who is piling up one unit of meaning after the other in his cognitive memory (they do not keep separate there, but they all contribute to his understanding of the speech as it unfolds) knows, rightly or wrongly, what the speaker is aiming at. In the other case he predicts the appearance of words that frequently occur together in speech. We have an example of this stochastic process in our passage here. The speaker, to wind up his sentence, says ". . . *where, within normal society, sucrose and similar sugars are playing important positive roles*".

The interpreter who had been speaking rather quickly while the speaker was uttering the beginning of that sentence remains silent while hearing: ". . . *society, sucrose and similar sugars are playing important* . . ."; the only word he pronounces is "*le*"! Then he gets the hint and resumes speaking: ". . . *rôle positif et important du saccharose et autres sucres chez les bien-portants*".

(F) "*rôle*" is pronounced practically at the same time as the English word "*important*". It is a fact that anyone would expect the word "roles" (or any other word with a similar semantic content) after hearing: "*There is a real need to identify where, within the normal society, sucrose and similar sugars are playing important* . . ."

Sense expectation is different.

I shall have to resort to interpretation from German into French where evidence of sense expectation is easier to collect, since the syntactic structures of German and French are wide apart and literal translation less frequent. The following example is an extract from an extensive study of simultaneous interpretation which is now nearly completed.

At a railways meeting the representative of an international financial body with headquarters in Switzerland said the following sentence

> *Die Schweizerischen Bundesbahnen haben uns angeboten diese Presseveranstaltung, die vom Vertreter des kommerziellen Dienstes* . . .

I stop here to show what the interpreter said in French in the meanwhile:

> "*Les CFF nous ont offert de nous aider à organiser* . . ."

The French word *organiser* coincides in time with the last German word quoted so far, *Dienstes*; so there is clear evidence that ". . *nous aider à organiser* . . ." is an anticipation. *Organiser* is language prediction : "*Die Schweizerischen Bundesbahnen haben uns angeboten diese Presseveranstaltung* . . ." calls for something semantically equivalent to *organiser*. We shall see that the German word was *durchzuführen*. But where does *nous aider* come from? "*Les CFF nous ont offert* . . ." is closely matching "*Die Schweizerischen Bundesbahnen haben uns angeboten* . . ." but why ". . . *de nous aider à organiser*", where only the word *organiser* could be expected in association with

Veranstaltung? The sense expectation *aider à* is vindicated by the end of the German sentence:

> *Die Schweizerischen Bundesbahnen haben uns angeboten diese Presseveranstaltung, die vom Vertreter des kommerziellen Dienstes in der Gruppe Guignard vorgeschlagen worden war, gemeinsam mit uns durchzuführen.*

So *aider à organiser* was anticipating ". . . *gemeinsam mit uns durchzuführen*".

Sense anticipation is easy to explain. In our case, the speaker has been giving details for several minutes about the way his company intended to organise a presentation to the press of various new types of passenger cars. So obviously when he starts saying: "*Die Schweizerischen Bundesbahnen haben uns angeboten diese Presseveranstaltung* . . .", this could not merely call for "*durchzuführen*", since his company was also involved. Once again we have here an example of the way cognitive memory constantly intervenes in communication.

In this short paper and with the few examples that could be drawn from 36 seconds of speech, I have tried to show some of the extraordinary complexity involved in speech understanding and oral translation. If interpreting was mere shadowing in another language, consisting of translating the individual meaning of each successive word in the speaker's output, or if it was just translation of language with only problems of syntactic restructuring and occasionally technical terms, it would be an interesting but limited field of investigation.

As it involves a complex series of cognitive activities, it offers I believe an avenue for an investigation of the thinking processes involved in understanding and speaking. This avenue might not have been opened up, and the thinking processes might have remained in their black boxes, had the comparison of interpretation and original speech yielded no different results from the comparison of languages as such.

Much that is revealed by interpretation is nothing other than normal speech mechanisms. I hope these few glimpses of how interpretation operates will contribute to their better understanding.

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Part 3

Modeling the Process