

Università degli Studi di Trieste
Dipartimento di scienze del linguaggio
dell'interpretazione e della traduzione

THE INTERPRETERS' NEWSLETTER

Number 11

2001



E. U. T.

The Interpreters' Newsletter

Dipartimento di scienze del linguaggio
dell'interpretazione e della traduzione
Università degli Studi di Trieste
Via F. Filzi, 14
34132 Trieste (Italy)

General Editors

Alessandra RICCARDI
Maurizio VIEZZI

With acknowledgments to

Alberto SEVERI (Lay-out)

© 2001 Dipartimento di scienze del linguaggio
dell'interpretazione e della traduzione
Università degli Studi di Trieste
Edizioni Università di Trieste - via F. Filzi 14
34132 Trieste - Tel. (39) 0406762345 - Fax (39) 0406762301

In copertina: *Primavera d'Estate*, foto di Alberto Severi

CONTENTS

Editorial <i>Alessandra Riccardi and Maurizio Viezzi</i>	v
Deconstructing SI: a contribution to the debate on component processes <i>Robin Setton</i>	1
On the option between form-based and meaning-based interpreting: the effect of source text difficulty on lexical target text form in simultaneous interpreting <i>Helle V. Dam</i>	27
Code-mixing and simultaneous interpretation training <i>Andrew Kay-fan Cheung</i>	57
Pauses in simultaneous interpretation: a contrastive analysis of professional interpreters' performances <i>Michela Cecot</i>	63
Numbers in simultaneous interpretation <i>Cristina Mazza</i>	87
"I failed because I got very nervous". Anxiety and performance in interpreter trainees: an empirical study <i>Amparo Jiménez Ivars and Daniel Pinazo Calatayud</i>	105
Research on interpreting by students at SSLiMIT, University of Bologna <i>Peter Mead</i>	119
Sign language: a newcomer to the interpreting forum <i>Cynthia Jane Kellett Bidoli</i>	131
Provision of interpretation services to other locations from permanent interpretation structures in New York, Geneva, Vienna and Nairobi <i>United Nations Report 1</i>	153

Remote interpretation <i>United Nations Report 2</i>	163
Book Reviews <i>Giuliana Garzone and Peter Mead</i>	181

EDITORIAL

This issue of our *Newsletter* comes out with some delay, but we are confident that our readers will not be disappointed by the papers and the themes it deals with. From process analysis to product analysis, from ST-induced to psychological problem triggers, from provocative proposals for the early stages of training to sign language interpreting, from students' research to remote interpreting at the United Nations, the range of topics covered in this issue testifies to the vitality of interpreting studies while at the same time calling for further investigation.

In the first paper, Robin Setton rejects the traditional view of interpreting as a composite of sub-tasks and suggests that interpreting is best described with reference to a coordinated use of existing faculties. He then advocates the opportunity to develop a discourse processing model based on cognitive pragmatics, in particular with a view to improving interpreter training.

Form-based vs. content-based interpreting strategies are discussed in Helle Dam's paper. After carefully analysing experimental data, Dam puts forward a tentative hypothesis whereby the more difficult the source text, the more interpreters tend to deviate from the form-based approach and move towards the meaning-based approach: a difficult text requires a greater comprehension effort which leads to an increased ear-voice-span and therefore to the production of a content-based rather than form-based target text. It would be interesting to test this hypothesis on the basis of data collected in experiments involving more, and more experienced, subjects.

A provocative proposal is put forward by Andrew Kay-fan Cheung who suggests that code-mixing can be used as an effort management strategy for students who are starting to learn SI. While at first sight probably difficult to accept, Cheung's method might well turn out to be useful – after all, simultaneous interpreting with occasional code-mixing is still simultaneous interpreting while shadowing or counting backwards are not.

The papers by Cecot and Mazza are based on their graduation theses. Michela Cecot deals with pauses and disfluencies in simultaneous interpreting and stresses the advisability of interpreters' becoming fully aware of the prosodic features of their deliveries. Cristina Mazza tackles the traditionally intractable problem of numbers in simultaneous interpreting and reaches the not-so-encouraging conclusion that the only strategy that seems to work is the tried and tested method of having the boothmate write down names and figures.

Jiménez and Pinazo examine the interrelation between anxiety, public speaking and consecutive interpreting in students during their final consecutive interpreting examination. They first analyse anxiety and public speaking from a

psychological point of view as two possible causes that may hinder consecutive performance in students. The results of their study show that low confidence in public speaking is related to high scores in state anxiety, but also that confidence in public speaking is not a specific measure of state anxiety. To explain these results the researchers look at possible coping strategies that students may have consciously or unconsciously applied to neutralize the effects of fear.

A detailed analysis of signed interpreting is provided by Jane Kellett's article. In the first part she gives an overview of studies on signed interpreting and presents practical examples taken from conferences. She then describes the complexity of interpreting services when both signed and spoken languages are involved.

Peter Mead illustrates recent graduation thesis on conference interpreting at the SSLiMIT of Forlì, University of Bologna. He examines the topics and the kind of research carried, providing interesting insights into their quality and weaknesses and indicating future orientation for students' research work.

The final contributions are two reports of the United Nations on remote interpretation. The Editors are grateful for the permission granted by the United Nations Publications Board to publish the two documents in their entirety and make them available to our readership. The reports concern two "full-scale" experiments entailing the use of all six official languages and the continuous use of remote interpretation throughout the duration of typical United Nations sessions. The first report includes a review of experience gathered in the field of remote interpreting and presents the experiment carried out during a meeting held in Geneva (from January 25 to February 5, 1999) with interpretation provided by a team of interpreters working from Vienna and the use of high-capacity digital telephone lines (ISDN links). The second experiment aimed at testing the suitability of satellite links for remote interpretation purposes and was carried out at UN Headquarters in New York from April 16 to April 27, 2001. To simplify the organization of the experiment and to reduce potential costs, interpreters worked remotely from booths other than those of the conference room where the meeting was taking place, but still located at the same conference centre.

Quite a number of topics, then, and no lack of enthusiasm. What emerges is the need for constant reflection upon relevant and necessary methodology. While we all seem to agree that interpreting studies have come of age, there is less widespread awareness regarding the timeliness of profound reflections on research methodology, using past experience as a basis for further developments.

Alessandra Riccardi and Maurizio Viezzi

DECONSTRUCTING SI: A CONTRIBUTION TO THE DEBATE ON COMPONENT PROCESSES

Robin Setton
ETI, Université de Genève

In interpreter training, and to evaluate quality, we need to know what is easy or difficult in different conditions and situations. This implies some underlying model of how basic cognitive faculties cooperate and are trained to do the task. (The presence in our brains of an evolved module for translation or simultaneous interpreting is unlikely). In this discussion paper I will (i) try to show that the analysis of simultaneous interpreting into composite sub-tasks is neither particularly productive nor unequivocally justified by the psycholinguistics or expertise literature; (ii) argue for a different kind of ‘componential’ analysis of interpreting, as a skill involving a coordinated and enhanced use of existing basic *faculties* rather than as a composite of subtasks; (iii) suggest briefly how this applies to teaching; and (iv) outline a tentative research orientation aimed at deducing discourse-related difficulty by focusing on the ease or otherwise of forming clear intermediate representations.

The most obvious extreme limiting factors on interpreting, like acoustics, input speed, recited monotonous delivery, and the interpreter’s preparedness, though well known to professionals, have not for the most part been formally demonstrated in replicable studies (with some exceptions, e.g. Gerver 1974 on noise), although their effects might show up accidentally as confounding factors if not taken into account in experimental design. Within these bounds, difficulty is often ascribed to overload in one or more of the processing modules which cognitive psychologists and linguistics claim to have differentiated, such as working memory, long-term memory, a syntactic processor, etc. Recently, however, it has become fashionable to treat interpreting as ‘multitasking’, or as a composite of sub-skills or sub-tasks, some of which might be ‘automatable’ with training (Lambert 1993, De Groot 2000 etc.).

Componential analysis is, of course, a common approach to modelling tasks in the information-processing paradigm. To mainstream psycholinguists, “it makes sense for us to start by investigating the clearly isolatable and testable aspects of SI. When some basic findings are firmly established in isolation, we can proceed to more complex situations in which the same aspects of behaviour are embedded in more realistic contexts...” (Frauenfelder and Schriefers 1997: 75). Gile, in modelling the interpreting task *a priori*, claims to make only one assumption about cognitive architecture: that three processes – comprehension, memory, and production – are distinct enough to be considered as *non-automatic* component efforts of the task; to these he adds coordination or

attention control (Gile 1985; 1999). De Groot (2000: 53) has sufficient confidence in the paradigm to apply it directly to training: she assumes that word recognition, word translation, or attention control, among others, can be treated as distinct sub-tasks in which trainees can acquire fluency or automaticity through specialised exercises.

However, doubts persist even among authors working within the cognitive psychology paradigm. Shlesinger questions whether SI is decomposable into recognisable sub-skills: “To study the cognitive processes of SI in isolation would appear to be, in a sense, a contradiction in terms [...] SI clearly involves meaningful, contextualised materials [...] thus, decomposition of the task is problematic...” (2000: 4-6). Such doubts increase when researchers think of SI in terms of meaning processing (‘translation’) rather than of inter-modular coordination and effort (‘simultaneity’).

SI: translation plus simultaneity?

The simplest possible analysis of simultaneous translation is suggested by its name. Even an account as ostensibly holistic as the Paris school’s (e.g. Seleskovitch and Lederer 1989) recognises two special abilities required in SI, as distinct from everyday dialogue: (1) the ability to listen while speaking, and (2) the ability to resist morphosyntactic interference from the source language¹. These two abilities are fundamentally different in terms of the systems they challenge and their potential for automation. Separating the two *voice streams* (i.e. hearing-while-speaking, or avoiding articulatory suppression), is learned once and for all early in training, through exercises like counting backwards while listening to a speech. In contrast, separating the two *language systems*, to avoid language interference, is a permanent challenge needing constant vigilance.

In terms of faculties mobilised, ‘simultaneity’ looks like a perceptual-motor skill which can be fully automated, like riding a bicycle, while ‘translation’ presumably includes a cognitive component requiring conscious attention. Save in exceptionally poor basic conditions (when negotiating uneven cobbles in the rain, or an inaudible speaker with unnatural choppy delivery) the cyclist does not worry about staying on his bicycle any more than the expert interpreter thinks

1 The Paris school does not propose any kind of componential analysis. Linguistic competence and general knowledge can be enhanced independently, but are considered just prerequisite tools for the job. Given these, comprehension and production are considered more or less automatic. The only permanent effort specific to SI is resistance to linguistic interference.

about hearing while speaking. In contrast, producing natural, native and elegant discourse in one language in the teeth of incoming discourse in another is a core function of good interpreting which, though it may be sharpened with warm-up exercises like sight translation, cannot be learned once and for all.

Still, decomposing SI simply into translation plus simultaneity is obviously inadequate: those who have performed both tasks would agree that one does not go about ‘translating’ in the same way in SI conditions. Separating ‘simultaneity’ from ‘translation’ would mean dissociating linguistic-conceptual from coordinating tasks, thus missing the cognitive-linguistic coordination (inference, pattern-matching, knowledge integration) which is probably the core of the interpreting task. A finer-grained account is obviously called for – ultimately, if possible, in terms of individual cognitive operations.

The component-skills approach in interpreting research and training

Those who isolate component subtasks do not feel the need to defend the componential approach as such, but take it as given with the information-processing paradigm. De Groot asserts *a priori* that both translation and SI are complex activities comprising many sub-skills that have been a separate object of study in cognitive psychology: perception, listening and speaking [...], reasoning and decision making, problem solving, memory and attention (cf. 2000: 54). The training strategy she proposes, based on automating sub-skills like word recognition, word retrieval, word-to-word translation, disabling articulatory suppression, or attention control, flows from this doctrine rather than from specific research (of which there is admittedly very little), and rests on two questionable assumptions:

- (1) that certain individual components of comprehension, production or translation, like word-recognition, lexical retrieval, word transcoding, can be automated ‘context-free’, and that the improvement thus achieved will transfer to the full or criterion task as performed in variable discourse and environmental contexts;
- (2) that the subtasks remain sufficiently independent in the performance of the full or criterion task (SI) for attention to be allocated to them separately. This assumption is so strong that subjects have been instructed in experiments to allocate attention to comprehension or production (de Groot suggests trainees can be directed to attend to ‘memory’), and conclusions drawn assuming that they have done precisely that (e.g. Lambert, Darò and Fabbro 1995; Darò, Lambert and Fabbro 1996).

De Groot cites evidence (Frederiksen and White 1989; Gopher 1992) for the superiority of training in component tasks, followed by integration, over simple ‘practice makes perfect’ training in the full or criterion task throughout. But are

the component tasks the right ones for SI? Exercises in word-recognition are proposed despite the admission that this process is different in SI, being ephemeral as well as more vulnerable to noise, not to mention heavily dependent on context (Marslen-Wilson and Welsh 1978). Word-to-word transcoding exercises should focus on words “notoriously difficult to translate” – but “trainees should also be made aware that the translation reflexes thus created may not always be quite appropriate, sometimes even totally inappropriate; that it would be wise always to save some of the mental resources to monitor and, if necessary, suppress a reflex” (ibid. 60). This is the mirror-image of the Paris recommendation to “strive always to reformulate, and with the exception of some technical terms, be wary of ‘equivalents’”, but does not seem obviously more efficient. More problematically, if lexical choice always needs some resources, how can it become automatic?

Apart from the difficulty of distinguishing automatic, ‘automatable’ and ‘controlled’ subtasks, it is hard to see how word-recognition or individual word translation could validly be isolated even provisionally (there is no discussion of later integration) from a situated speech communication task, where context is known to be crucial at every stage from phoneme recognition onwards and changes from one situation and discourse to the next. In a task involving a different speech each time, what might be the parts “amenable to automatization” which “should be automatized as rapidly as possible” (once and for all, presumably), and which the “components which will always be effortful whatever the level of expertise”? (ibid. 55). The postulate that there might be sub-tasks common to the processing of any and all discourse is not implausible, but any suggestion about what kind of cognitive or linguistic operations these might be needs to be argued with some reference to discourses, especially with a view to any real-life application.

Attention: divided, shared, distributed...

The allocation of attention to different component processes, or channels, is sometimes presented as a distinct effort (Gile, *passim*) or even as an isolatable sub-skill which can be learned on one task and transferred to others (Gopher 1992, cited in De Groot 2000). Taken together, the divided-attention and component-task paradigms reinforce the picture of a juggling performance involving an irreducible coordination effort between inherently distinct tasks.

The psycholinguistic evidence is open to different interpretations. Experimental research shows that some activities are easier to perform simultaneously successfully than others: simple perceptual and motor tasks, such as finger-tapping and picture recognition, may be quite easy to combine, unlike, say, reading for recall while doing mental arithmetic. But there is much more to

it than this, and to infer from this research that SI must be a difficult negotiation of several different tasks is to ignore two important variables – content and sensory modality – and one important difference between SI and some experimental tasks.

1. Channels and capacity

The notions of ‘task’ and ‘channel’ are fuzzy: shadowing, for instance, can be viewed as a combination of two sub-tasks (listening and speaking) in two different channels, or as a task competing with another task (e.g. reading) for a single channel. The very concept of ‘channels’, inherited from an early telecommunications-based model (Shannon and Weaver 1949), is inherently tendentious in suggesting constant uninterrupted attention. Studies like Allport *et al.* (1972, see below) have cast doubt on the ‘single channel hypothesis’ and suggest instead the possibility of parallel processing in multiple channels.

Let us assume for the sake of argument that SI involves four processes: (1) listening to speech, (2) conceptual/linguistic processing, (3) speaking and (4) self-monitoring. Even if these each occupied a distinct channel or capacity, smooth coordination between them does not seem problematic. Listening easily accommodates conceptual processing (we can think while listening), and more so with the redundancy of the input (Chernov 1979, 1992). The last three are routinely and effortlessly combined in everyday speaking, in which self-monitoring as a normal corollary must take only intermittent, sampling attention. Combining these four is therefore not as implausible as it appears when we model these processes as occupying distinct channels or capacities. It is even more conceivable that this can be done comfortably if they are all sharing the same representations.

2. Modality and content

Allport *et al.* (1972) showed that the ease or difficulty of combining operations depends both on the sensory *modalities* of the concurrent tasks (speech, perception or motor action) and their *content*: performance was better for associations of ‘dissimilar’ tasks’, like shadowing speech while taking in complex *unrelated* visual scenes, than for ‘similar tasks’ like attending simultaneously to two different verbal messages (the ‘cocktail-party problem’). Articulatory suppression, for example, is classically demonstrated when subjects are processing two *unrelated* speech streams. Dual-tasking experiments have shown different detrimental effects on the performance of tasks in similar or dissimilar modalities, and with similar and dissimilar content. When two inputs are presented with different tasks specified (e.g. accurate shadowing plus recall), or in *different modalities with no shared representations* (speech and digits), capacity is soon exceeded. But what about a goal-directed, cognitive-linguistic

task involving the *same* content in the *same* modality? Could it not be that listening while speaking becomes easier when the two streams can be processed to the level of common, shared representations – in other words, that attention can become unitary in a third, cognitive channel integrating the products of two lower-level speech decoding processes? Gile (1995: 92; 1999) drawing on Kahneman among others, presents SI as a cognitive management tightrope in which attention is precariously allocated between the three efforts. But Kahneman himself concedes that “at high task load, attention becomes almost unitary” (1973: 193, cited in Gerver 1976).

3. Goal-directed synergies in complex vs. concurrent tasks

Interpreting may involve several inputs (speech, text, slides, body movements) but only one output, and is therefore not ‘multitasking’ in the sense of the dichotic tasking paradigm in experimental psychology, which involves coordinating two tasks each with its own input and output. More importantly, since such truly multiple tasks have *different goals*, the component-task paradigm fails to capture goal-directed synergies between components in a ‘complex’ but single task.

Outside the laboratory our behaviour is not neatly separated into sub-tasks each with a goal defined by someone else (remember this picture, repeat this sentence, tap that lever in time). As free agents we can focus on a chosen mix of different inputs, including our own thoughts, in a trade-off between our interest and the effort required to process them. As interested receivers we may freely divide or share our attention between listening, thinking and taking notes. But if the goal requires attending to multiple inputs, we will exploit whatever local and contingent conditions reduce the ‘multiplicity’. If several people are angrily accusing me of something, I can at first attend only to whatever common representation emerges, such as ‘anger directed at me’, assembled from acoustic and visual features common to the inputs, and will be unable to process the multiple linguistic streams for their propositional content. In the case of interpreting, common representations from the speaker’s speech and my own can be assembled and focused on as a single stream of content at the level of propositions concepts and attitudes, ignoring (at a conscious level) dimensions like morphophonosyntax, which form distinct systems in each stream.

In short, assuming a complex task to be a composite of sub-tasks, or a negotiation between distinct efforts or channels, overstates the task’s complexity, missing the synergies and shortcuts made possible by local contexts. In SI, once a pattern of *significant features* is recognised in each voice stream, multiple ‘channels’ can plausibly be superimposed with sufficient attention to the semantically relevant peaks (not words or pauses) in each. To enhance this ability, training can focus on developing a sensitivity to patterns of relative

significance in texts and discourses, first by active listening, then progressing to exercises such as on-line paraphrase.

Automatic, internalised, controlled...

Three degrees of 'automaticity' are usually recognised – automatic, automatable and controlled/strategic – and a complex task can be expected to comprise elements of all three. With increasing expertise, many actions and responses which were once new and deliberate will gradually become unthinking routine (Searle (1983) describes the process elegantly for skiing). The limits to such progressive automation are presumably set in part by the organism's basic capabilities, and in part by variations in the environment. Proficient cyclists and skiers, having internalised several layers of skilled moves, still meet (and for sport seek out) different and challenging terrains requiring focused attention and the use of local, contingent strategies.

The degree of possible automation of a task therefore depends on the amount of variation in the terrain or task environment. Interpreting and translation are done on a different discourse each time – a parametric variation surely greater than variations in skiing terrain and perhaps even of board positions in chess. Certainly interpreters try to collect and refine as many more-or-less-reliable all-weather word and phrase equivalents as possible. Lexical interference can be combatted by paying special attention to false cognates (*faux amis*), but the potential for automation is much more limited at the syntactic and pragmatic levels, since if identical words or phrases may recur, identical utterances or discourses hardly ever do. In a task involving processing of situated, real discourse, a very large component must therefore remain irreducibly variable and resistant to automation.

Expertise research – what kind of a task is interpreting?

It seems reasonable to assume that experienced interpreters perform better than novices without expending proportionately more effort; in other words, that they have developed some strategies which are both effective and partly internalised, perhaps based on recognition of recurrent patterns and/or generalisable procedures of some kind. If breaking down interpreting (or translation) into context-independent subtasks seems unsatisfactory, in what terms can we try to capture expertise?

Pioneered and guided since the eighties by Karl-Anders Ericsson and Herbert Simon, expertise research has investigated superior performance in a range of tasks in sports (e.g. wrestling, figure-skating, tennis), science (mental

arithmetic, solving physics problems, mental arithmetic), games (chess, Space Fortress, Tower of Hanoi) and the arts (musical performance, reading, writing) (Ericsson and Simon 1980, 1987, 1996). Whereas psycholinguistic research explicitly aims to establish universal (non-domain-specific) limits to basic information-processing abilities, expertise studies have found that these are in fact bypassed or exceeded in expert performance. These researchers are also coming to realise that generalisations to capture the essence of expertise over a wide variety of tasks have to be framed at a level of considerable abstraction, ultimately in terms of intermediate representations.

The central methodology used in expertise research has been introspection through such devices as think-aloud protocols (TAPs), interviews and questionnaires. The godfathers of the paradigm recommend that each task being studied should first be analysed and modelled *a priori* as a sequence of cognitive operations, or in some cases, 'heeded thoughts'. Although introspective techniques are now being applied to written translation with some sophistication, it remains hard to pin down variables more precise than translators' personality traits, although some researchers have claimed to identify specific operations (Tirkkonen-Condit 2000).

It is difficult to find complete tasks which compare directly to translation or interpreting. Identifying common sub-goals like 'accuracy' or 'elegance' with tasks like Space Fortress or figure-skating does not seem particularly productive. Generalisations need to be sought at a more abstract, systems level. Tasks can be compared in terms of the tools used (car, tennis racket, chess pieces, skis), or variations in the task environment, whether physical (terrain, weather), cognitive (place, people, accessible semantic memories) or affective (competitors, mood, episodic memories). As we have seen, if discourse is the terrain of interpretation, there can probably only be limited automation.

Another parameter is the degree of goal determinacy. Translation scholars have expressed doubts about applying research on tasks with a clearly defined final goal or end-state, like mathematical problems and certain games (Space Fortress, Tower of Hanoi) to an 'open-ended' task like translation (Tirkkonen-Condit and Jääskeläinen 2000). But tasks like essay writing and judicial decision-making have also been studied. An interesting by-product of such studies was that, while mathematical models successfully predicted outcomes, think-aloud protocols showed that the experts' procedures for arriving at these outcomes were quite different, and were based more on *gestalt*-like recognition of patterns in episodic memory than on a sequence of binary decisions based on declarative knowledge of problem-solving steps or rules (Ericsson 1996: xxxix-xli).

Acquired or trained skills can also be classified in terms of the main systems they mobilise, as primarily 'perceptual-motor' (sports), 'perceptual-cognitive'

(chess) or ‘perceptual-linguistic’ (word-recognition). T&I tasks, where the perceptual and motor systems have a proportionally auxiliary role, would have to be classified as ‘linguistic’ or ‘cognitive-linguistic’ (but not just ‘cognitive’, to distinguish them from mental arithmetic or scientific problem-solving).

Ericsson and colleagues have tentatively identified two universal characteristics of expertise: experts form, maintain and utilize larger and more structured representations; and they learn to bypass and surpass normal cognitive limitations (such as a working memory capacity of 7 ± 2 units) (Charness *et al.* 1996; Ericsson 1996: lii). In other words, baseline measures of speed and capacity in terms of units like words or digits are not applicable to expert cognitive performers, who work with large chunks and structures (cf. models of understanding and reasoning proposed in cognitive semantics: Fauconnier 1985; Garnham 1987; Gernsbacher 1990). In a cognitive-linguistic task, this means that while experts must necessarily be proficient in peripheral operations like decoding and encoding language, the critical element of expertise is located at the cognitive core rather than the linguistic periphery.

Expertise researchers are now aiming for a finer-grained analysis of tasks by increasing the temporal density of observations (Ericsson and Simon 1996). This should lead to analysis in terms of individual cognitive processes, and ultimately, according to the IP rationale, of representations. Ericsson recognised in a recent paper that

expert performance in interpreting is mediated not by fully automatic translation processes but by mental representations and mechanisms providing them with tools to gain *more rather than less control* over their performance [...] *The improved ease of performing the task – typically seen as evidence for automation – can be explained by acquired and refined [message-preserving] representations.* By refining the representations experts will be able to attend and focus on only those aspects of the presented message that are relevant to the translation [...] (Ericsson, forthcoming; my emphasis).

Interpreting models and data: a gap still unbridged

With the rejection of Behaviourism, cognitive science has adopted as a central postulate that non-reflex behaviour, such as meaningful speaking, is mediated by representations. This has posed the challenge of describing the interaction between linguistic and higher cognitive processes. The Chomskyan generative analysis was a huge advance in our understanding of language, but its application to modelling real-time speech processing has been problematic. The perceived need to integrate functional, communicative features of speech has resulted in a fragmentation of theory and a period of relative stagnation. Pending

a synthesis, interpreting theory has drawn on some of the fragments (e.g. Dillinger 1989, Setton 1999, and those working with the Hallidayan framework), but most authors have fallen back on modular cognitive psychology. As a result, there is a gap between most models and the linguistic data.

To take a well-known example, Gile's (1985, 1997) postulated efforts of comprehension, production, memory and coordination (attention allocation) reflect standard psycholinguistic modules. But the model is not easy to relate to a corpus. This is partly because (in the model's terms) overloads can lead to knock-on effects downstream in the performance. But a more basic problem is that hypothesised load factors, or 'problem triggers', are not sufficiently specified to correlate effort (were it to be measured) with discourse or environmental events. It is not clear how capacity is measured and what constitutes a load.

In attempting to specify a model like Gile's, the obvious source to consult for probable problem triggers is the speech processing literature, which suggests factors like phonetic or grammatical anomalies (e.g. foreign accents), short words vulnerable to noise, syntactic complexity (e.g. centre-embedded sentences), lexical density, and in production, lexical retrieval in the appropriate style and register (Gile 1995: 106-108). In other words, problem triggers and load factors have not been identified at the semantic and discourse levels, except in vague general terms like 'tortuous logic'. This leaves a large theoretical gap in the correlation between input properties and processing challenges at the intermediate stage of inference and conceptualisation, where mainstream psycholinguistics has little guidance to offer.

This intermediate stage has always been the knottiest part of modelling interpreting. The ideas put forward include:

- (a) a holistic, neurosensory process of knowledge integration and reconceptualisation and spontaneous generation of TL (Seleskovitch 1975), which remains rather underspecified;
- (b) a semantic-conceptual network consisting of nodes with multilingual connections (Moser 1978), which probably underestimates contextual variation;
- (c) a 'translation' module (Darò and Fabbro 1994), which is evolutionarily implausible;
- (d) 'memory' as the third, intermediate effort, without specifying the linguistic and conceptual operations within it (Gile 1995, 1997).

These models all gloss over the core cognitive and integrative processes by hiding them in self-explanatory networks or modules labelled 'memory' or 'translation'.

One less black box: memory as a property of representations

Memory is intuitively assumed to be a critical function in successful interpreting. Models of interpreting have generally imported the traditional distinction between a limited-capacity working memory (WM) assumed to be dealing with pieces of input or output in quasi-linguistic form, and knowledge retrieved from longer-term memories of various types (semantic, episodic, procedural, etc.). Once the role of background knowledge became clear, the problem arose of modelling the integration of this knowledge into working memory to generate a basis for output.

The characterisation of WM capacity in terms of digits or words has lingered for a long time, under the influence of Miller's '7±2 items' (Miller 1956) and of AI, and is implicit in much of the sentence processing literature, but it is now increasingly recognised (with *gestalt*-based cognitive semantics, mental models theory and similar trends) that in sophisticated cognitive activities, WM 'capacity' depends on the efficiency with which it can manage complex representations (see Setton 1999). At the same time, recent work is blurring the boundary between working and long-term memory (LTM), with the suggestion that experts use 'long-term working memory' (Ericsson and Kintsch 1995), or that in a task like interpreting, relevant knowledge is filtered in a 'working substrate' of LTM before being fed back into WM to be processed with the immediate discourse input (Shreve and Diamond 1997), or indeed, that WM capacity must be assessed in terms of 'underlying conceptual interpretations' rather than text chunks (McWhinney 1997).

Meanwhile, more fundamental work on the evolution of cognition, reviewed below, has drawn attention to the different types of representation needed for higher-order cognitive processes. By specifying required properties of representations like durability, traceability and so on, we can treat 'memory' as a distributed general property of cognition, instead of a store- or workspace-like fixed-capacity effort-consuming module. In assessing effort or difficulty, for example, the focus would shift to representation, and in a cognitive-linguistic task, representations formed primarily from linguistic input. Are some representations more difficult to form, manipulate and maintain than others? To answer this question we need a model of human (i.e. evolved) cognition, as opposed to an all-purpose, ideal or designed computational system.

Another side of cognitive science

The information-processing paradigm has blurred the difference between evolved (human) and designed (mechanical) cognitive devices. To ensure that we are working from a plausible model of human cognition we must turn away

from cognitive psychology (component skills) and artificial intelligence (where information-processing models must be machine-compatible) and look instead to human evolutionary anthropology and neurology. These disciplines offer a rather different perspective on the most likely modules of the embodied mind/brain. Since they are not traditional sources of T&I theory, an expository digression is called for.

In designing an information-processing system from scratch, we are free to specify both hardware and software, so the most efficient solution is to design maximally general-purpose hardware capable of executing a wide range of programmes as rapidly as possible. An evolved cognitive apparatus is unlikely to have the same architecture. It is more likely, given the population needed to generate sufficient diversity, and the number of generations necessary for successive incremental adaptations, that our present behaviour and abilities are defined by specialised (domain-specific) basic faculties selected for the survival advantage they conferred in the hunter-gatherer environments we inhabited for over 95% of our history. According to this view, in addition to the sophisticated pattern-recognition faculties needed for all successful animals, like habitat selection and edible food discernment, we evolved two key abilities which enabled us to occupy the so-called ‘cognitive niche’ in evolution: (1) metarepresentation, or the ability to conceive of unreal and abstract things and attribute beliefs and intentions to other sentients and sapients; and (2) language: the ability to convey and receive messages to and from other linguistically-endowed sapients in a structured way, allowing cooperation, social organisation, sophisticated collective planning, mental manipulation, etc. and hence eventually the development of our present highly complex inner and outer environment (Tooby and Cosmides 1992; Cosmides and Tooby, 2000; Sperber 1994, 2000; Origi and Sperber 2000; Pinker 1994).

Metarepresentation and language together separate us from animals and machines. Communication is impossible without some elementary metarepresentation, if only of another’s intention to communicate. A few other species, among primates and possibly cetaceans, are thought to have some such ability. But apparently only humans have the higher-order metarepresentational abilities necessary for complex inferential communication aided by language, involving the distinct representation of one’s own and others’ opinions and of hypotheses with different credibility values. Humans display such ‘metapsychological’ abilities from late infancy; the full metarepresentational ability seems to emerge fully from the fourth year, becoming integrated with language use from early adolescence to allow increasingly sophisticated linguistic communication through adolescence to adulthood.

Conceiving and communicating abstractions and hypotheses requires metarepresentation, as does the ‘negotiation’ of meaning communicated by

others. Sperber (1994) identifies three stages in communicative sophistication, linked to the levels of metarepresentation deployed. In *Naive Optimism*, the hearer assumes the speaker is both communicatively competent and benevolent, so no metarepresentation of his thoughts or communicative intention (as possibly deviating from the decoded surface meaning of his utterance) is necessary. In *Cautious Optimism*, the speaker's competence is not necessarily assumed, so that the hearer may also envisage what the Speaker *might have meant* to convey – for instance, in a slip like 'I've been feeding the penguins in Trafalgar Square' (Wilson 2000). In the third strategy, *Sophisticated Understanding*, the hearer assumes neither the competence nor the benevolence of the speaker (he might be lying), and may use second-order metarepresenting to infer what she *might have thought he would think* was relevant.

Interpreter trainers may find the account of *Naive Optimism* familiar. For some strange reason, students of translation and interpretation often seem to approach their texts and speakers at this level – expecting them to encode information perfectly and truthfully – whereas *Cautious Optimism* is needed at the very least, and they obviously practice *Sophisticated Understanding* in everyday life.

Metarepresentation and *irrealis* in interpreting

In current thinking, metarepresentation as a higher cognitive function allows for two related kinds of mental feat, which are reflected in language:

- (a) the representation of abstract and hypothetical events, entities or states of affairs. *Irrealis*, as this dimension is known, finds linguistic expression in negation, epistemic or deontic modality, conditionals and interrogatives, encoded in different languages in various devices like subjunctive mood, modal verbs and adjectives, particles, or verb tenses.
- (b) the representation of other people's beliefs and intentions. This 'attributive' metarepresentation can be seen as a special case of the general ability to represent states of affairs tagged with some epistemic restriction about their reality or desirability.

Metarepresentation and language are therefore, as one would expect, thoroughly intertwined. In addition to the lexical and syntactic equipment to formulate simple first-order statements and descriptions of states of affairs, all human languages comprise devices to communicate degrees of reality, possibility, probability, and desirability or to attribute statements or descriptions to another source. Not surprisingly, attributive uses and indirect quotation share many of the syntactic and lexical devices, including particles, conditionals and modals, which are used to mark hypothetical or abstract *irrealis* (Wilson 2000).

Irony, which involves sophisticated metarepresentation, also employs these devices and others, like intonation.

Returning to our pursuit of sources of difficulty, we can assume that inferential comprehension requiring higher-order metarepresentations – for instance, when Speakers are incompetent, vague, indirect, highly abstract, ironic or sarcastic – requires more effort than passages where the first relevant interpretation is available with only minimal enrichment and resolution of the basic proposition after linguistic decoding. There is in fact both empirical evidence and persuasive theoretical argument for seeking factors of effort in this inferential phase.

Anne Marie Bülow-Møller (1999) found that, regardless of the syntactic straightforwardness of the text, interpreters made significantly more errors on passages involving the expression of possible, hypothetical, conditional or implicitly negated events and facts (*irrealis*). On an argumentative, rhetorical speech, professionals stumbled on *irrealis* features, frequently failing to attach the right modality (e.g. ‘is’ vs. ‘ought’) with the right facticity (e.g. fact vs. hypothesis) and the right scope (e.g. they negated more or less of the proposition than the original).

On close inspection, most of Bülow-Møller’s examples, especially those she calls ‘inherent negatives’ (explicit negatives pose no real problems) require higher-order metarepresentation. In one instance, the speaker is describing the intentions of the British Conservative Party in proposing legislation (the interpreter must form a third-order metarepresentation), and the beliefs and desires ascribed by the Conservatives to the British public (fourth-order metarepresentation):²

‘Apparently it didn’t occur to him [*Michael Howard, the British Home Secretary*] that what the public wants is more criminals arrested, not laws that may make it easier to convict people whether they are criminals or not.’

The translation [...] *apparently it didn’t occur to him that more criminals were arrested* [...] loses one level of metarepresentation (from 4th to 3rd order). The record number of errors occurred on *finally they were to be allowed to bug...* which was generally rendered as *finally they were allowed to bug*. In

2 Formally we must recognise, with Gutt (1991/2000), that the entire utterance of a translator or interpreter is an unmarked direct quotation, expressing a detailed macro-metarepresentation of the Speaker’s beliefs and intentions, thus distinguishing translational discourse as an interpretive (as distinct from descriptive) use of language. However, we need to go into more detail to identify local representational and linguistic challenges of the task.

some cases, either negation, or epistemic modality (*should, might, could*), or one order of attribution, as above, were simply lost. In other cases, the slippages take the form of a displacement of the scope of the *irrealis* or metarepresentation, a pattern which had been noted by Setton (1999).

These findings suggest that any measure of difficulty will need to consider factors to do with conceptual (meta)representation, like *irrealis* and attributive uses, in combination with factors affecting the more nuts-and-bolts levels of language processing, such as syntactic-semantic mapping.

Since *irrealis* is expressed through syntax, which is also doing other work and embodies other types of complexities which need to be processed with a view to reformulation in another language, the difficulty due to *irrealis* must be evaluated in combination with other discourse variables (as well as task-specific constraints). The following syntactic-semantic properties – i.e. concerning the form, concentration and sequence in which meaning is encoded and presented in the speech stream – have been identified as probably significant for processing difficulty:

- Pure *syntactic complexity* (centre-embedded sentences).
- *Semantic or propositional density*, measured as e.g. the number of propositions per clause (Le Ny 1978; Dillinger 1989; Tommola forthcoming).
- *Syntactic-semantic mapping, information structure, case-role relations*. Utterances may be difficult to process when they depart from canonical orders, or correspondences between Subject and Agent, Object and Patient, Indirect Object and Beneficiary, etc., as for example in passive constructions, or utterances beginning with an unmarked indirect object (Givón 1984/1990; see also Dillinger 1989).
- *Logical order*. Beyond the sentence, the order of presentation of premises – ‘figural effects’ – is a significant factor in the speed of logical processing (Cornish and Watson 1970; Johnson-Laird and Bara 1984; Givón 1990).
- *Pragmatic guidance*: word-order, stress, prosody and other devices which mark contrasts and emphasis or otherwise help the hearer to make the desired inferences (Blakemore 1987; Wilson and Sperber 1993; Setton 1999). Conversely, their absence probably makes aural reception more difficult (Déjean le Féal 1982).

Bülow-Møller (1999) discusses the possible combined effects of *irrealis* with some of these variables, as well as task-specific factors like forced compression or simplification under production constraints. Unravelling these interactions between logical-semantic structure, cognitive-pragmatic factors and task constraints will certainly be complex, but may open up a whole new paradigm in interpreting research.

Unpacking comprehension

To recapitulate, we are on firmer theoretical ground if we model any task as a team effort of known or evolutionarily plausible basic faculties towards a task-specific (and situation-specific) goal, rather than as a composite of other tasks which – particularly if not automatic – would each recruit these faculties differently to serve different goals. A rough configuration of basic faculties as they might be recruited in a cognitive linguistic task like interpreting is offered in Figure 1: perception and articulation, language (grammar and lexicon), and the higher cognitive functions, traditionally including categorisation, pattern-matching, reasoning, imagination and planning, all thought to be centred in the frontal lobes³, here subsumed in two key faculties: deduction-inference, involving the construction of intermediate representations; and metarepresentation, with recursive embedding (tagging, scoping) of intermediate representations.

Note that the ‘cognitive’ box is superimposed on the ‘language’ rectangle. Translation proceeds neither in a special module nor via two competing routes (word for word vs. reconceptualising); in the professional translator, SL words and phrases evoke *both* concepts *and* SL words and phrases, and the latter are selected under more or less cognitive control.

Nor is there a box for ‘memory’: the phenomena traditionally going under that name are realised by the faculties of (meta)representation, in which representations are tagged, labelled and scoped for different degrees of reality, durability and reconstructibility: episodic, semantic and implicit memories can be treated as representations with different kinds of temporal, attributive or epistemic tags attached by the emotional, sensory and cognitive experiences associated with them.

This scheme provides a basis for a tentative distinction between basic cognitive constraints and resources, on the one hand, and task-specific strategies on the other (cf. Shlesinger 2000: 6-8). The potential difficulties discussed above – complex *irrealis*, uncomfortable logical sequences or language-*gestalt* correspondences, lack of natural prosody and so on – can be considered as challenges to basic, evolved cognitive abilities: perception, representation, pattern recognition, empathy etc. (cf. Chernov 1979, 1992 on evolutionarily preferred patterns of information flow and redundancy). Task-specific strategies, in contrast, are acquired skills to compensate for or bypass these basic cognitive

3 And apparently inseparable from the emotions (Damasio 1994) – but that is another story.

limitations, by learning to perceive, metarepresent, and formulate appropriately and flexibly on the changing task terrain.

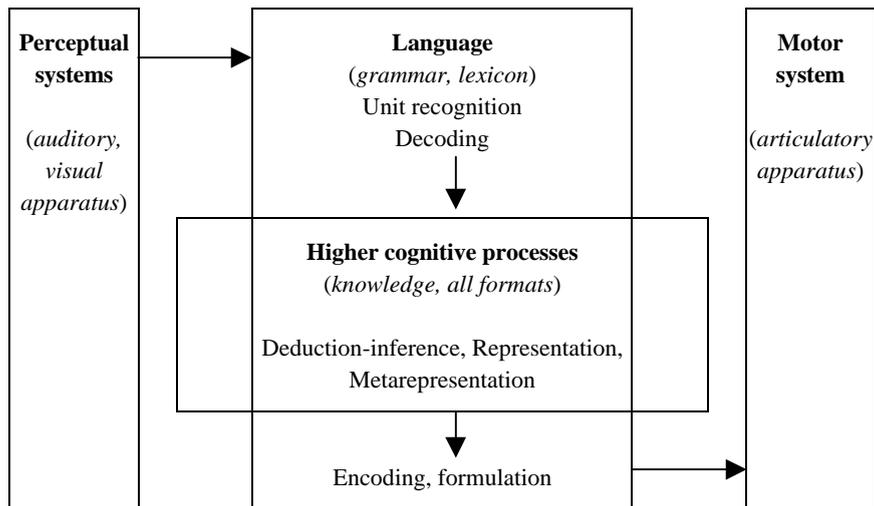


Figure 1: Faculties and sub-processes in interpreting
(*pre-requisite inputs and systems are shown in italics*)

To relate interpreting data to mental operations, we need to unpack the linguistic, inferential and integrative processes in comprehension. Taking our model of utterance processing from relevance-theoretic pragmatics (Sperber and Wilson 1986/1995; Blakemore 1987; Wilson and Sperber 1993), comprehension appears, independently of subjective factors like the interpreter's mood, as a cascade of processes, products and contingencies as shown in Figure 2. Using the inputs on the left, perceptual, semantic, pragmatic and formulating processes yield increasingly complete products – word meanings, propositions, explicatures, implicatures, speech – subject to the factors on the right. The inputs and potential obstacles are both cumulative, as shown by the plus signs in the table, e.g. satisfactory pragmatic processing depends on correctly interpreting prosody, given the inputs at the semantic level (basic word meanings, context); and awkward discourse structure, as in a recited written text, will add to the difficulty of interpreting a non-native speaker.

Now real discourse does not deliver the building blocks of full comprehension in this order – for example, clues to attitude may become

available before the proposition they affect⁴ – and this is where the interpreter’s acquired skills and strategies come in. In consecutive, we learn to use later clues to clarify earlier ambiguities; in simultaneous, to enunciate incrementally: waiting, stalling or approximating then compensating or completing as more comes in.

Input	Process	Product	Effort also depends on
sensory input; language knowledge	perception and decoding	word strings	acoustics; speaker’s use of language
(+) context: situation, background, earlier discourse ...	semantics – reference assignment – disambiguation – conceptual enrichment	propositions (explicatures) ⁵	(+) discourse structure (order in which information is presented, referential cohesion)
(+) clues from discourse connectors, prosody, marked word-order, facial expression, posture	pragmatics 1 <i>vouloir-dire</i>	intentional utterances (‘higher- order explicatures’) with attitude, illocution, evidential and epistemic values	(+) speaker’s rhetorical skills, pragmatic guidance ⁶
metarepresentation of shared meaning (S and A through I*)	pragmatics 2 what-is-understood	implicatures	(+) appreciation of speaker-audience relationship
active linguistic abilities	formulation	TL speech	norms

Figure 2: Cumulative comprehension in SI

* S=Speaker, I=Interpreter, A=Addressee

4 Compare this relevance-theoretic account of the on-line adjustment of inferences: “Interpretive hypotheses are made rapidly, on-line, and in parallel. The mechanism that mediates the inferences from logical form to communicated propositions is one of ‘mutual parallel adjustment’ of explicatures and implicatures [...] the reasoning need not progress step by step from premises to conclusions. [...] The process may involve several backwards and forwards adjustments of content before an equilibrium is achieved which meets the system’s current ‘expectation’ of relevance” (Carston, forthcoming).

5 Sperber and Wilson (1986/1995).

6 This dimension cannot be properly assessed from a mere transcript.

Expertise thus results from a combination of an enhanced basic cognitive ability (comprehension) and acquired techniques of incremental formulation. It is the ability to make an ostensibly difficult process easier, and the product better, by (a) tapping higher, inferential inputs to understanding and (b) using enhanced linguistic skills, such as syntactic agility and a rich vocabulary, to express this richer understanding smoothly under the imposed conditions.

Space allows for only one example, from a political speech, to show how the ease and quality of SI production depends on the level of input tapped (words, context, clues to speaker's intentionality...) and the appropriate choice of output. The higher the level of information available at a given point, the better the production options available.

Donner de nouveaux moyens au développement de la coopération, j'ai commencé de le faire en engageant dès la formation du Gouvernement la réforme des instruments de coopération. (*Lionel Jospin, December 2001*)

1. *Donner de nouveaux moyens au développement de la coopération*

The product yielded by the primary process of perception and decoding is a string of words assembled as a proposition lacking tense, subject and modality.

Option 1: Strategy: decide this is not enough to work with, and wait.

Option 2: Strategy: stick to information provided by the words and syntax, produce a proposition which is safely neutral as to tense, subject and modality:

Devoting fresh resources to expanding cooperation...

Option 3: Strategy: use the clues to attitude and intentionality in the words, which convey a positive connotation of desirability:

We need to devote fresh resources to expanding cooperation...

Option 4: Strategy: use previous discourse and general knowledge to metarepresent, allowing confident packaging. Jospin is listing his achievements, possibly after flagging them earlier in the speech. The clause can thus be analysed as a topicaliser, or topic refresher:

As for devoting fresh resources to expanding cooperation...

2. At the next phrase, *j'ai commencé de le faire...* the following continuations are possible

Option 1: *I have begun devoting fresh resources...* (emphasis, topicalisation lost)

Option 2: *...is something I have begun to do...* (acceptable, but laborious; this construction is forced by having made the first proposition a Subject instead of a syntactically independent Topic 'As for...')

Option 3: *...and I have begun this work...* (acceptable, but over-translation - *we need to*).

Option 4: *...I have begun to do so...*

Option 4b: Wait (tense ambiguity of **j'ai commencé...**) ...and so on.

Option 4, based on the highest level of understanding, with metarepresentation, allows for the best continuation; but the next phrase contains an ambiguity – *I began* or *I have begun* ... – suggesting, in this case, the waiting strategy (4b).

The oft-quoted 'strategies' observed in professionals can be seen as techniques for incrementally enunciating a TL version as far as possible or safe, using clues as they emerge from inference, other knowledge, and so on, and 'falling on your feet', thanks to the linguistic skill which I have elsewhere called syntacrobatics (Setton 1994). As shown in another corpus, this often entails temporary deviations and dilutions, which experts usually manage to rectify discreetly (Setton 1999). Both strategy and understanding are necessary: as seen in option 2, playing safe without drawing on higher levels of understanding is not optimal.

On this basis the interpreting task can be seen as a combination of the following sub-skills and competences:

- comprehension of SL at all levels (including pragmatic clues)
- context acquisition, off and on line: preparation, awareness, alertness
- metarepresentation, or in everyday terms, empathy and acting
- syntactic agility and a rich vocabulary in TL.

Given a proper grounding in syntax, semantics and pragmatics, combined with his or her own experience as a practitioner, an interpreter trainer should be able to attribute students' failures in any discourse, task constraint and language pair to linguistic, representational or strategic problems, in terms specifically related to the passage concerned.

Research on discourse difficulties as an input to training

In our view, overall interpreting quality can only be satisfactorily gauged by combining peer and user evaluations. However, with a view to an eventual application in training, there is room for a research programme aimed at clarifying text-specific sources of difficulty by controlling other variables. The following variables were identified as factors in performance:

- (1) *external factors* like acoustics and visibility, which affect perception and reduce contextual clues;
- (2) the *interpreter's linguistic competence*, for the linguistic decoding and encoding phases of comprehension and production: recognition and retrieval (passive and active lexicon), syntactic and general verbal agility, etc.;
- (3) the ease with which coherent representations can be formed from the discourse under ideal environmental conditions, which depends on
 - (a) *properties of the discourse* like semantic density, information structure, metarepresentational demands, and pragmatic guidance from the Speaker in the form of prosody, cohesive pointers, and so on; and
 - (b) the *interpreter's background knowledge*.

Experimental conditions can be designed to eliminate or minimise (1), and control or neutralise (2) as far as possible (without entirely losing sight of it) by selecting highly proficient experts. Variable (3b) might be controlled by using texts on unfamiliar subjects, checking equal ignorance on the part of subjects through preliminary interviews, and providing them with the same limited preparatory background material. Studies could then focus on independent variables chosen within (3a), either attempting to control the chosen features by constructing texts, or more 'ecologically', testing theoretical predictions by scoring passages of authentic discourses for anticipated difficulties.

Conclusion

Given the problems theoretical linguistics has had in coming to grips with real discourse, it is not surprising that interpreting researchers have hesitated to explore this avenue. But a corpus-based discourse processing model based in cognitive pragmatics appears to provide a better fit to the problems encountered in the classroom than a theoretical division into sub-tasks. In principle, such a model could be empirically refined by identifying particular combinations which pose problems – for example, embedded syntax plus metarepresentation, or logical deduction with passives, or any of these with or without prosodic and

pragmatic clues. Perhaps it could be developed into a tool for scoring discourses and predicting loci of difficulty.

In terms of teaching, maximising understanding and verbal agility still seem to be more direct routes to expertise than enhancing attention or memory independently of their objects. Above-average working memory and concentration are prerequisites for aspiring interpreters. But these abilities serve understanding and formulation, not the reverse. It is not memory and attention which are specific to interpreting expertise, but enhanced understanding and speaking. If there is any pedagogical advantage in decomposing processes, we should be focusing on these rather than on the universal processes which subserve them.

References

- Allport A., Antonis B. and Reynolds P. (1972): "On the division of attention: a disproof of the single-channel hypothesis", *Quarterly Journal of Experimental Psychology* 24, pp. 225-235.
- Blakemore D. (1987): *Semantic Constraints on Relevance*, Oxford, Blackwell.
- Bülow-Møller A.M. (1999): "Existential problems. On the processing of irrealis in simultaneous interpreting", *Interpreting* 4 (2), pp. 145-168.
- Carston R. (forthcoming): "Relevance theory and the saying/implicating distinction", in *Handbook of Pragmatics*. Ed. by L. Horn and G. Ward, Oxford, Blackwells.
- Charness N. *et al.* (1996): "The role of practice and coaching in entrepreneurial skill domains: an international comparison of life-span chess skill acquisition", in *The Road to Excellence: Acquisition of Expert Performance in the Arts and Sciences, Sports and Games*. Ed. by K.-A. Ericsson, Mahwah, N.J., Lawrence Erlbaum, pp. 51-80.
- Chernov G. (1979): "Semantic aspects of psycholinguistic research in simultaneous interpretation", *Language and Speech* 22 (3), pp. 277-295.
- Chernov G. (1992): "Conference interpreting in the USSR: history, theory, new frontiers", *Meta* 37 (1), pp. 149-168.
- Cornish E.R. and Watson P.C. (1970): "The recall of affirmative and negative sentences in an incidental learning task", *Quarterly Journal of Experimental Psychology* 22, pp. 109-14.
- Cosmides L. and Tooby J. (2000): "Consider the Source: The Evolution of Adaptations for Decoupling and Metarepresentation", in *Metarepresentations: A Multidisciplinary Perspective*. Ed. by D. Sperber, Oxford, Oxford University Press, pp. 53-116.
- Damasio A. (1994): *Descartes' Error*, New York, Putnam Books.

- Darò V. and Fabbro F. (1994): "Verbal memory during simultaneous interpretation: effects of phonological interference", *Applied Linguistics* 15(4), pp. 365-381.
- Darò V., Lambert S. and Fabbro F. (1996): "Conscious monitoring of attention during simultaneous interpretation", *Interpreting* 1(1), pp. 101-124.
- De Groot A. (2000): "A complex-skill approach to translation and interpreting", in *Tapping and Mapping the Processes of Translating and Interpreting*. Ed. by S. Tirkonnen-Conduit and R. Jääskeläinen, Amsterdam-Philadelphia, John Benjamins, pp. 53-70.
- Déjean Le Féal K. (1982): "Why impromptu speech is easy to understand", in *Impromptu Speech: a Symposium*. Ed. by N. E. Enkvist, Åbo, Åbo Akademi Foundation, pp. 221-239.
- Dillinger M. (1989): *Component processes of simultaneous interpreting*, Unpublished doctoral dissertation, Department of Educational Psychology, McGill University, Montreal.
- Ericsson K.-A. (1996): "The acquisition of expert performance: an introduction to some of the issues", in *The Road to Excellence: Acquisition of Expert Performance in the Arts and Sciences, Sports and Games*. Ed. by K.A. Ericsson, Mahwah, N.J., Lawrence Erlbaum, pp. 1-50.
- Ericsson K.-A. (forthcoming): "Expertise in Interpreting: Insights from Adopting an Expert-Performance Perspective". Paper delivered at Ascona II Conference on 'Complex cognitive processes: Simultaneous interpreting as a research paradigm', July 1-6, 2000, Monte Verità, Ascona/Lugano (Ticino, Switzerland).
- Ericsson K.-A. and Kintsch W. (1995): "Long-term working memory", *Psychological Review* 102 (2), pp. 211-245.
- Ericsson K.-A. and Simon H. (1980): "Verbal reports as data", *Psychological Review* 87, pp. 215-51.
- Ericsson K.-A. and Simon H. (1987): "Verbal Reports on Thinking", in *Introspection and Second Language Research*. Ed. by K. Faerch and G. Kasper (eds.), Clevedon and Philadelphia, Multilingual Matters, pp. 24-53.
- Ericsson K.-A. and Simon H. (1996): *Protocol Analysis: verbal reports as data*, Cambridge, Mass, MIT Press.
- Fauconnier G. (1985): *Mental Spaces*, Cambridge, Mass, MIT, Bradford Books.
- Frauenfelder U.H. and Schriefers H. (1997): "A psycholinguistic perspective on simultaneous interpretation", *Interpreting* 2 (1/2), pp. 55-90.

- Frederiksen J. and White B. (1989): "An approach to training based on principled task decomposition", *Acta Psychologica* 71, pp. 89-146.
- Garnham A. (1987): *Mental Models as Representations of Discourse and Text*, Chichester, Ellis Horwood.
- Gernsbacher M.A. (1990): *Language comprehension as structure-building*, Hillsdale, N.J., Erlbaum.
- Gerver D. (1974): "The effects of noise on the performance of simultaneous interpreters: accuracy of performance", *Acta Psychologica*, 38, pp. 159-167.
- Gerver D. (1976): "Empirical studies of simultaneous interpretation: a review and a model", in *Translation*. Ed. by R.W. Brislin, New York, Gardner Press, pp. 165-207.
- Gile D. (1985): "Le modèle d'efforts et l'équilibre en interprétation simultanée", *Meta* 30 (1), pp. 44-48.
- Gile D. (1995): *Regards sur la recherche en interprétation de conférence*, Lille, Presses Universitaires de Lille.
- Gile D. (1997): "Conference interpreting as a cognitive management problem" in *Cognitive Processes in Translation and Interpretation*. Ed. by J.H. Danks, G.M. Shreve, S.B. Fountain and M.K. McBeath, Thousand Oaks-London-New Delhi, Sage Publications, pp. 196-214.
- Gile D. (1999): "Testing the Effort Models' tightrope hypothesis in simultaneous interpreting – A contribution", *Hermes, Journal of Linguistics* 23, pp. 153-172.
- Givón T. (1984/1990): *Syntax: a functional-typological introduction*, Amsterdam-Philadelphia, John Benjamins.
- Gopher D. (1992): "The skill of attention control: acquisition and execution of attention strategies", in *Synergies in Experimental Psychology, Artificial Intelligence, and Cognitive Neuroscience [Attention and Performance 9]*. Ed. by D.E. Meyer and S. Kornblum, Cambridge, Mass, MIT Press, pp. 299-322.
- Gutt E.-A. (1991/2000): *Translation and Relevance: Cognition and Context*, Oxford, Blackwell.
- Johnson-Laird P.N. and Bara B.G. (1984): "Syllogistic inference", *Cognition* 16, pp. 1-61.
- Kahneman D. (1973): *Attention and effort*, Englewood Cliffs, N.J., Prentice Hall.
- Lambert S. (1993): "The effect of ear of information reception on the proficiency of simultaneous interpretation", *Meta* 38 (2), pp. 198-211.

- Lambert S., Darò V. and Fabbro F. (1995): "Focalized attention on input vs. output during simultaneous interpretation: possibly a waste of effort", *Meta* 40 (1), pp. 38-46.
- Le Ny J.-F. (1978): "Psychosemantics and simultaneous interpretation", in *Language Interpretation and Communication*. Ed. by D. Gerver and W.H. Sinaiko, New York, Plenum Press, pp. 289-298.
- Marslen-Wilson W. and Welsh A. (1978): "Processing interactions during word recognition in continuous speech", *Cognitive Psychology* 10, pp. 29-63.
- McWhinney B. (1997): "Simultaneous interpretation and the competition model", in *Cognitive processes in translation and interpreting*. Ed. by J.H. Danks, G.M. Shreve, S.B. Fountain and M.K. McBeath, Thousand Oaks, Sage, pp. 215-232.
- Miller G. (1956): "The magical number seven, plus or minus two: some limits on our capacity for processing information", *Psychological Review* 63(2), pp. 81-97.
- Moser B. (1978): "Simultaneous interpretation: a hypothetical model and its practical application", in *Language Interpretation and Communication*. Ed. by D. Gerver and W.H. Sinaiko, New York, Plenum Press, pp. 353-368.
- Origgi G. and Sperber D. (2000): "Evolution, communication, and the proper function of language", in *Evolution and the Human Mind: Language, Modularity and Social Cognition*. Ed. by P. Carruthers and A. Chamberlain, Cambridge, CUP.
- Pinker S. (1994): *The Language Instinct*, London, Penguin Books.
- Searle J. (1983): *Intentionality*, Cambridge, CUP.
- Seleskovitch D. (1975): *Langage, langues et mémoire. Étude de la prise de notes en interprétation consécutive*, Paris, Minard Lettres Modernes.
- Seleskovitch D. and Lederer M. (1989): *Pédagogie raisonnée de l'interprétation*, Paris, Didier Erudition.
- Setton R. (1994): "Experiments in the application of discourse studies to interpreter training", in *Teaching Translating and Interpreting 2: Insights, Aims, Visions*. Ed. by C. Dollerup and A. Lindegaard, Amsterdam-Philadelphia, John Benjamins, pp. 183-198.
- Setton R. (1999): *A cognitive-pragmatic analysis of simultaneous interpretation*. Amsterdam-Philadelphia, John Benjamins.
- Shannon C. and Weaver W. (1949): *The Mathematical Theory of Communication*, Urbana, Univ. of Illinois Press.
- Shlesinger M. (2000): "Interpreting as a cognitive process", in *Tapping and Mapping the Processes of Translating and Interpreting*. Ed. by S.

- Tirkkonen-Condit and R. Jääskeläinen, Amsterdam-Philadelphia, John Benjamins, pp. 3-16.
- Shreve G.M. and Diamond B. (1997): "Cognitive processing in translation and interpreting: Critical Issues", in *Cognitive Processes in Translation and Interpretation*. Ed. by J.H. Danks, G.M. Shreve, S.B. Fountain and M.K. McBeath, Thousand Oaks-London-New Delhi, Sage Publications, pp. 233-251.
- Sperber D. (1994): "Understanding verbal understanding", in *What is Intelligence?* Ed. by J. Khalfa, Cambridge, Cambridge University Press, pp. 179-198.
- Sperber D. (2000): "Metarepresentations in an evolutionary perspective", in *Metarepresentations: A Multidisciplinary Perspective*. Ed. by D. Sperber, Oxford, Oxford University Press, pp. 117-137.
- Sperber D. and Wilson D. (1986/1995): *Relevance: Communication and Cognition*, Oxford, Blackwell.
- Tirkkonen-Condit S. (2000): "Uncertainty in translation processes", in *Tapping and Mapping the Processes of Translating and Interpreting*. Ed. by S. Tirkkonen-Condit and R. Jääskeläinen, Amsterdam-Philadelphia, John Benjamins, pp. 123-142.
- Tirkkonen-Condit S. and Jääskeläinen R. (eds.) (2000): *Tapping and Mapping the Processes of Translating and Interpreting*, Amsterdam-Philadelphia, John Benjamins.
- Tommola J. (forthcoming): "Estimating the transfer of semantic information in interpreting", Paper delivered at 1st International Conference On Quality In Conference Interpreting, Almuñécar, 19th-21st April, 2001.
- Tooby J. and Cosmides L. (1992): "Cognitive adaptations for social exchange", in *The adapted mind: evolutionary psychology and the generation of culture*. Ed. by J. Barkow, L. Cosmides and J. Tooby, New York, OUP.
- Wilson D. (2000): *Metarepresentation in linguistic communication*, in *Metarepresentations: A Multidisciplinary Perspective*. Ed. by D. Sperber, Oxford, Oxford University Press, pp. 411-448.
- Wilson D. and Sperber D. (1993): "Linguistic form and relevance", *Lingua* 90 [Special Issue on Relevance Theory, Vol. 2, D. Wilson and N. Smith (eds.)], pp. 1-24.

**ON THE OPTION BETWEEN FORM-BASED AND MEANING-BASED
INTERPRETING: THE EFFECT OF SOURCE TEXT DIFFICULTY ON
LEXICAL TARGET TEXT FORM IN SIMULTANEOUS
INTERPRETING¹**

Helle V. Dam
Aarhus School of Business

1. Introduction

The hypothesis that will be addressed in this paper is rooted in the highly generalized idea that it is possible to distinguish between two paradigmatic procedures or strategies of interpreting: one is generally referred to as **form-based** (or word-based, structural, horizontal, sign-oriented, etc.) interpreting, and the other is labelled **meaning-based** (or conceptual, vertical, sense-oriented, etc.) interpreting (Seleskovitch 1975; Gran and Fabbro 1988; Gran 1989; Fabbro, Gran, Basso and Bava 1990; Fabbro, Gran and Gran 1991; Darò and Fabbro 1994; Paradis 1994; Isham 1994 and 1995; Gran and Bellini 1996; De Groot 1997 and 2000; Frauenfelder and Schriefers 1997; Gernsbacher and Shlesinger 1997; Lonsdale 1997; Massaro and Shlesinger 1997; Dam 1998). Form-based interpreting is generally described as a more or less direct transmission of source text structures to corresponding structures in the target language, i.e. as a procedure in which the interpreter follows the surface form of the source text as much as possible when constructing the target text. In meaning-based interpreting, by contrast, the interpreter detaches him/herself from source text form and produces the target text only on the basis of a conceptual – i.e. a non-verbal or amorphous – representation of the meaning of the source text. Because of this assumed non-verbal stage, the process involved in meaning-based interpreting is also often referred to as the process of *deverbalization*, whereas the procedure involved in form-based interpreting is frequently labelled *transcoding*.

As may be derived from this description, form-based and meaning-based interpreting are generally taken to be different both in terms of the underlying cognitive processes and in terms of the final product, i.e. the target text. Thus, it has been suggested that form-based interpreting involves source text processing only at a more superficial level, whereas meaning-based interpreting involves

¹ This is a revised version of an article published in the proceedings of the ASLA Symposium on Translation and Interpreting held in Stockholm in November 1998 (Englund Dimitrova (ed.) 2000).

processing at a deeper semantic level (e.g. Darò and Fabbro 1994: 368; Gran and Bellini 1996: 104; Gernsbacher and Shlesinger 1997: 123; Lonsdale 1997: 96). In terms of the interpreting product, the form-based approach is thought to lead to a target text that is formally similar to the source text, whereas the meaning-based strategy would result in a target text with a lexical and morphosyntactic form that is essentially different from that of the source text (e.g. Fabbro *et al.* 1990: 75).

It is generally assumed that both techniques are available to trained interpreters, who may alternate between them according to internal or external circumstances (e.g. Gran 1989; Fabbro *et al.* 1990; Fabbro *et al.* 1991; Lonsdale 1997; Frauenfelder and Schriefers 1997; Massaro and Shlesinger 1997), be it consciously or unconsciously (Isham 1994). Although very little is known about the nature of the circumstances that would affect the choice of strategy, one assumption appears to be rather generalized: it is repeatedly stated in the literature that meaning-based interpreting is the strategy generally preferred by interpreters, whereas form-based interpreting is reserved for specific situations – typically situations which may be characterized as problematic for the interpreter (Gran 1989; Fabbro *et al.* 1990; Isham 1994 and 1995; Gran and Bellini 1996; De Groot 1997; Lonsdale 1997; Massaro and Shlesinger 1997). In other words, meaning-based interpreting is normally thought of as the standard strategy, whereas form-based interpreting is held to be an exceptional approach to which interpreters resort primarily in order to overcome difficulties. Interpreters' choice of either strategy is therefore essentially associated with the notion of *difficulty*. As examples of interpreter-internal factors that are likely to produce a situation experienced as difficult, and therefore inductive of form-based interpreting, some researchers mention stress and fatigue (cf. Gran 1989: 98; Fabbro *et al.* 1990: 75; Fabbro *et al.* 1991: 4; Darò and Fabbro 1994: 368). Interpreter-external difficulties, on the other hand, are normally associated with the characteristics of the source text or the way it is presented. Frequently stated examples of such source-text-related difficulties that are likely to make interpreters resort to form-based interpreting are numbers, names, technical terms, enumerations or a high rate of delivery (Gran 1989: 98; Fabbro *et al.* 1990: 75; Isham 1994: 206 and 1995: 139; Gran and Bellini 1996: 105; Lonsdale 1997: 96; Massaro and Shlesinger 1997: 39) – all of which are also often characterized as sources of interpreting difficulties in the general literature on interpreting (e.g. Seleskovitch 1975; Gile 1995: 172-174).

Even if these assumptions concerning the distribution of form-based and meaning-based interpreting are shared by many interpreters and interpreting scholars, no empirical evidence has been obtained to support them so far. In fact, in a previous study in which I examined the general distribution of form-based and meaning-based interpreting on a small-scale corpus of consecutive

interpretations, I found that, contrary to the current assumption, evidence of form-based interpreting was more dominant than evidence of meaning-based interpreting (Dam 1998).

The central question of the study I shall report on in this paper is not so much whether form-based interpreting is more, or less, frequent than meaning-based interpreting overall. Rather, the question here is whether it is true that the level of difficulty of the source text has an effect on simultaneous interpreters' choice of approach to the task, difficult texts being associated mainly with form-based interpreting and, inferentially, non-difficult texts being linked primarily with meaning-based interpreting. In other words, the present study sets out to test the prevailing **hypothesis** that *the more difficult the source text, the more the interpreter tends to deviate from the meaning-based approach and to interpret on the basis of source text form.*

In order to test this hypothesis, I shall essentially apply the methodology proposed in my previous study on form-based and meaning-based interpreting (Dam 1998), in which I drew upon the assumed product-manifestation of the two paradigmatic interpreting procedures. Thus, the basic method of the study will consist in comparative analyses of source and target texts, and, as the key concepts of the model of analysis, *lexical similarity* and *lexical dissimilarity* will be used as tools to identify form-based and meaning-based interpreting, respectively. The model of analysis and its underlying principles are described in section 3. In addition, for the above hypothesis to become operational, the elusive concept of 'difficulty' needs to be operationalized. Section 2, which contains a description of the data of the study, includes an attempt to do so.

2. Data

The study is based on an experimental set of data comprising extracts from two Spanish speeches (the source texts) and the corresponding extracts from five simultaneous interpretations into Danish of each of the two speeches (the target texts).

2.1 Source texts

The source texts were originally presented in the context of two simulated conferences organized as part of the interpreter training programme at the Aarhus School of Business. As regards instructions, the speakers – two native speakers of Spanish – had been asked to give speeches that were in line with the general themes of the conferences ('refugees and immigrants' and 'unemployment', respectively) and to base their presentations on notes rather

than using full manuscripts. They had received no further instructions as to the selection of specific topics, perspectives, etc. The speakers and their presentations were video-recorded during the conferences, and the video-recordings were subsequently used as source text data for the present study.

I selected the two source texts for this study because of their apparently very different levels of difficulty. One of them – hereafter referred to as **Source Text 1** – was assessed as the less difficult text, and the other – hereafter referred to as **Source Text 2** – as the more difficult text.

A question that needs to be addressed at this point is how to determine a text's level of difficulty – an evidently subjective notion that depends largely on individual experience, knowledge, etc. (see also Lamberger-Felber 2001). While the level of difficulty of a text therefore cannot be determined in objective terms, an initially purely subjective assessment may be backed by intersubjective consensus. In this case, there were several factors to indicate the existence of such a consensus to back my intuitive identification of Source Text 1 as less difficult than Source Text 2.

Firstly, on several occasions prior to the study, the two texts had been presented to different groups of interpreting students during class, and their immediate reaction was invariably the same: they all found Source Text 1 very straightforward and easy to interpret, whereas they complained about how difficult Source Text 2 was. This was, then, a first indication of a shared opinion in the assessment of Source Text 1 as less difficult to interpret than Source Text 2.

Secondly, analyses of the relevant extracts (cf. section 2.3) of the source texts revealed that a series of the characteristics that are normally identified as sources of interpreting difficulties – essentially by general agreement among interpreters – were present to a much greater extent in Source Text 2 than in Source Text 1. Table 1 below shows the most important differences between the two texts in terms of sources of difficulties:

	Source Text 1	Source Text 2
Specialized terms	0	several
Numbers	2	34
Average sentence/clause length		
- Words per sentence	13.32	20.02
- Words per clause	7.06	10.81
Average rate of speech		
- Words per minute	119	125
- Syllables per minute	232	262

Table 1: Differences with possible implications for the respective levels of difficulty of Source Text 1 and Source Text 2.

As shown in Table 1, one difference between Source Text 1 and Source Text 2 concerns the use of **specialized terms** – a feature often referred to as a problem trigger in interpreting (e.g. Gile 1995: 173; see also Gile 1985 for some empirical support). None of the texts were truly technical, but whereas the speaker of Source Text 1 primarily used high-frequency words from every-day vocabulary, Source Text 2 also contained a series of fairly specialized terms of low frequency. Obviously, speakers' terminological choices are not random, but depend i.a. on their choice of topic and, perhaps more importantly, of perspective. The topic of Source Text 1 was the situation of immigrants in Mexico as seen from the point of view of an ordinary citizen of Mexico – a choice that favoured the use of non-specialized language. The topic of Source Text 2 was unemployment in Spain, and emphasis was put on the reasons for this phenomenon as analysed from a macroeconomic perspective; this choice of perspective, together with the fact that the speaker of Source Text 2 was an economist, explains the usage of a series of specialized terms and concepts from the domain of Economics.

Another important difference, that is probably also determined by the speakers' choice of topic and perspective, concerns the use of **numbers** – another well-known source of difficulties in interpreting (e.g. Gile 1995: 176; for some empirical documentation, see Alessandrini 1990). As shown in the Table, Source Text 1 contained only 2 numbers, whereas Source Text 2 included as many as 34 – or one number for every 1.6 sentence in the analysed extract. In addition, the two numbers in Source Text 1 consisted of one digit only, whereas only 4 of the 34 numbers in Source Text 2 were one-digit numbers; the remaining 30 were composed of between two and eight digits and were therefore more complex.

A third significant difference between Source Text 1 and Source Text 2 derives from **sentence** and/or **clause length**, the sentences and clauses of the latter text being considerably longer than those of the former. While the length of the sentences and/or clauses of a text may not be of importance in itself, it is an indication of phenomena that may indeed affect the level of difficulty. Thus, sentence length is an indicator of information density, insofar as it reflects the amount of information given in one sentence. High information density is often described in the literature as a major source of interpreting problems (e.g. Gile 1995: 173). Seen from a different angle, sentence length is an indicator of syntactic complexity, because long sentences suggest the presence of many modifiers at phrase, clause and/or sentence level(s), i.e. a high degree of syntactic subordination.

A fourth difference between the two source texts is the **rate of delivery**, Source Text 2 being presented at a slightly higher rate than Source Text 1. Together with high information density, a high rate of delivery has been

characterized as one of “the most frequent sources of interpretation problems” (Gile 1995: 173). Although none of the source texts were delivered at extreme speed, there was a measurable difference between them, which may have been sufficient to be experienced as significant by interpreters. In fact, in an experimental study, Gerver (1969 and 1976) found that the input rate at which simultaneous interpreters perform at their best is between 95 and 120 words per minute – a rate that was exceeded only by the speaker of Source Text 2, as shown in Table 1.

The above differences between the two source texts are tangible, and objective, enough. It is even safe to say that these differences make it likely that Source Text 1 will be experienced by many interpreters as less difficult to interpret than Source Text 2, though interpreters’ actual perception of difficulty will always remain individual and subjective. Consequently, as a way of ascertaining that the assumed difference in levels of difficulty was, in fact, experienced as such by the interpreters who served as subjects in the present study, I asked them, after they had interpreted the two texts (cf. section 2.2), whether they felt that there was a difference. Their response was unanimous: all the subjects answered that there was indeed a difference. When asked about the distribution of the levels of difficulty, they all responded that Source Text 1 was the less difficult text and Source Text 2 the more difficult one. In fact, they all characterized Source Text 1 as “easy” and Source Text 2 as “difficult” – in absolute terms. This was, then, a further indication of an intersubjective consensus on the identification of Source Text 1 as less difficult than Source Text 2 – and vice versa.

In accordance with the prevailing hypothesis, as formulated in section 1, we may therefore expect more evidence of the form-based strategy in the interpretations of Source Text 2 than in those of Source Text 1 in the present study. This expectation will be matched with the actual results of the study in section 4.

2.2 Target texts

The video-recordings of the two Spanish source texts were presented to a group of five subjects, each of whom performed a simultaneous interpretation into Danish of each source text. Thus, a total of ten target texts were obtained.

All five subjects had recently finished their interpreting training at the Aarhus School of Business and had passed their exams with one of the highest

marks². Thus, the subjects had undergone formal interpreting training and had shown good interpreting potential, but none of them had actual conference experience. They all had Danish as their mother tongue and Spanish as their first foreign language.

Prior to the task, the subjects had been informed of the general themes of the simulated conferences and the titles of the source texts. They knew that their interpretations were to be used as data in an investigation on interpreting, but they were not informed of the specific purpose of the study. Apart from having been told to interpret in the simultaneous mode, the subjects had received no instructions on how to interpret; they were simply asked to interpret “as they thought best”.

During the task, the subjects sat in classroom interpreting booths equipped with head-phones, microphones, monitors and tape-recorders. Before the actual task began, the subjects were given a short live speech, which they interpreted as a warming-up. Then they interpreted the video-recording of Source Text 1 and, after a five-minute break, that of Source Text 2. The duration of the warming-up speech was approximately 5 minutes; Source Text 1 lasted approximately 10 minutes, and Source Text 2 approximately 15 minutes. The interpretations were recorded on the tape-recorders in the booths.

2.3 Preparation of data for analysis

For the purpose of the analyses, the recordings of the two source texts and the ten target texts were transcribed essentially in accordance with orthographic standards. Apart from voiced hesitations, everything was recorded in the transcripts, including self-corrections, repetitions and other manifestations of oral language production.

The transcribed texts were then divided into smaller units, hereafter referred to as **segments**. As a rule, a segment consists of a series of words grouped around a finite verb. In most cases, a segment therefore corresponds to a clause. As the interpreters tended to include more verbs in their texts than were originally present in the source texts, it was sometimes necessary, in the data preparation stage, to compound two or more target text segments into one in order to ensure comparability between source and target text segments. The segments, then, constituted the units of analysis in the comparative analyses of source and target texts.

² They had obtained either 10 or 11 on a scale of 13, which does not contain 12 and with 13 being awarded only very exceptionally for outstanding performances.

When segmented, Source Text 1 had become divided into a total of 173 segments and Source Text 2 into 184. For the analyses, I selected 100 consecutive segments from each source text, starting with a segment uttered approximately 3 minutes into each speech, and the corresponding target text segments. The duration of the analysed extract of Source Text 1 was approximately 6 minutes, and that of the extract of Source Text 2 approximately 9 minutes. The discrepancy between the number of segments and duration may seem strange at a first glance, but it is simply a reflection of the fact that the segments of Source Text 2 were generally longer than those of Source Text 1, which again reflects the higher degree of syntactic complexity and information density of the former text (cf. section 2.1).

3. Analyses

In this section, I shall describe how the data of the study were analysed. After a description of the general principles of analysis (section 3.1), I shall present the model of analysis itself (section 3.2).

3.1 General principles of analysis

As explained, the study is based on the comparative analyses of the source and target text data described in section 2. What is interesting in a product-based, or text-comparative, study on form-based and meaning-based interpreting is how these two approaches to interpreting manifest themselves in the target text as compared with the source text. As briefly mentioned in section 1, we can expect the direct passage from source to target text involved in form-based interpreting to lead to a target text that displays a high degree of formal *similarity* in relation to its source text, whereas we can expect the deverbalization process hypothesized for meaning-based interpreting to lead to a target text with very few traces of the linguistic form of the source text, i.e. a target text that exhibits a high degree of *dissimilarity* to the source text in terms of form (cf. Dam 1998). What should interest us here is therefore formal similarities and formal dissimilarities between source and target texts.

While such similarities and dissimilarities of form may be both phonological, morphological, syntactic and lexical in nature, the only aspect of form that will be studied here is the lexical one. This choice was made in order to limit the number of parameters to be analysed, which would otherwise have been overwhelmingly high. In support of the choice of the lexical aspect, rather than the others, I may mention the fact that there are so many phonological, morphological and syntactic differences between the source language, i.e.

Spanish, and the target language, i.e. Danish, that it would be extremely cumbersome – if not impossible – to attempt to isolate the language-induced differences of this type in the source and target texts from the interpreting-induced ones, which are those of interest here. Lexical comparisons are certainly not without problems, but the obstacles are fewer, I believe (for a discussion, see Dam 1998; see also sections 3.1.1 and 3.2 below).

As a basic premise, then, **lexical similarity** between source and target texts is taken to reflect form-based interpreting, whereas **lexical dissimilarity** is held to reflect meaning-based interpreting in this study. Consequently, these two concepts represent the main categories of analysis, or the so-called theoretical categories of the study, on the basis of which the model of analysis is constructed, as also described in section 3.2 below.

In order to determine whether the relation between the lexical elements of a target text and those of its source text is one of similarity or dissimilarity, we need a device which may serve as a bridge between the two texts, since they are, by definition, expressed in two different languages and therefore not directly comparable. In order to identify the formal-lexical relation between a target text and its source text across the language gap, a not very formalized version of the concept of **formal equivalence** will be used here (cf. Dam 1998). In this context, a relation of formal equivalence is considered to exist between source and target texts, when a particular lexical target text element can be identified as the closest possible contextual equivalent, or an inflectional or derivational form thereof, of a particular lexical source text element; in that case, the relation between the two elements in question is considered to be one of lexical similarity. If, on the other hand, it is not possible to identify a given target text element as the closest possible contextual equivalent, i.e. as the formal equivalent, of a given source text element, the relation between that target text element and the source text is determined as one of lexical dissimilarity. In other words, lexical similarity is identified as a function of formal equivalence, and lexical dissimilarity as a function of lack of formal equivalence in the present analyses.

The binary structure inherent in the distinction between lexical similarity and lexical dissimilarity is evidently a theoretical construct. Empirically, there may of course be different degrees of similarity and, particularly, of dissimilarity between a target text and its source text, even if the object of analysis has been narrowed down to lexis only. The binary structure of the theoretical categories of the study is, however, justified by the binary structure of the empirical phenomena under study, i.e. form-based and meaning-based interpreting. Still, the theoretical and empirical range of each of the categories needs to be at least roughly explained and tentatively illustrated, and will be so in section 3.1.1 and 3.1.2 below.

3.1.1 Theoretical categories

As explained, the so-called theoretical categories of the study comprise lexical similarity and lexical dissimilarity.

3.1.1.1 The category of lexical similarity

As we have seen, the category of lexical similarity is considerably more narrowly defined than that of lexical dissimilarity, since it is defined as a function of formal equivalence – and that only. In other words, the category of lexical similarity is positively defined – as opposed to the negatively defined category of lexical dissimilarity. However, it is not, and cannot be, a one-option-only category. This is due to the fact that some source text words have two or more target language words as very close equivalents, and it may be practically impossible to determine which one has the highest degree of equivalence, even when they appear in a particular context. In such cases, each of the very close equivalents would qualify as ‘the closest possible one’, and therefore as the formal equivalent, in the present analysis.

In the following example, which is extracted from the data, the italicized elements illustrate a possible variation within the category of lexical similarity:

Example 1³

- ST-1 (25): otro punto importante es la *posición* social y económica
[another important point is the social and financial
position]
- TT-1 (19): et andet vigtigt punkt er den sociale og økonomiske
position
[another important point is the social and financial
position]
- TT-5 (14): en anden vigtig ting er den sociale og økonomiske *stilling*
[another important thing is the social and financial
position]

3 In the examples, the source text extracts are preceded by the abbreviation ‘ST’ and the target text extracts by the abbreviation ‘TT’. The abbreviations are followed by the number of the source or target text from which the example is extracted (ST-1 or ST-2; TT-1, TT-2, TT-3, TT-4 or TT-5). In a subsequent parenthesis, the number of the exemplified segment, as it appears in the data, is stated. Following each extract, a literal translation into English is provided in square brackets.

In this example, the lexical source text element ‘posición’ is represented as two different lexical elements in the Danish target texts: ‘position’ (TT-1) and ‘stilling’ (TT-5). While the two target text words are therefore mutually different, they were found to have approximately the same degree of equivalence in relation to the source text word in the present context. In fact, the only real difference between the two target text words is etymological: while ‘position’ is of Latin derivation, ‘stilling’ is of Germanic origin. As such, this example illustrates a pattern of lexical equivalence typical of the Spanish-Danish language pair: a number of Spanish words have two Danish equivalents – one of Latin and one of Germanic origin – which are freely interchangeable in many contexts. Target language equivalents of this type were therefore both analysed as the formal equivalents of the source text word, i.e. as manifestations of lexical similarity, in the present analysis. An observation that supports the indiscriminate analysis of the two target text words as the formal equivalents of the source text word in the above example is the fact that, if the two target text segments were to be translated back into the source language, the two target text words in question – ‘position’ and ‘stilling’ – would probably both be translated into the original source text word, i.e. ‘posición’.⁴

3.1.1.2 The category of lexical dissimilarity

The category of lexical dissimilarity covers an even wider range of target text elements than the category of lexical similarity. This is a consequence of the negative definition of this category, to which target text elements were ascribed exclusively as a function of their *lack* of formal equivalence with particular source text elements. Target text elements allocated to the category of lexical dissimilarity may therefore relate to the source text in an infinite number of ways: they may be apparently direct – although not formally equivalent – substitutions of specific and clearly identifiable lexical source text elements, or they may represent complete changes of larger stretches of text, just to mention the two extremes on the continuum of possible manifestations of dissimilarity. For reasons of space, it is not possible to illustrate and explain all the possible types and ranges of dissimilarity here, though the italicized elements in example 2 below are fairly representative examples of target text elements that were categorized as manifestations of lexical dissimilarity:

4 Incidentally, more or less the same pattern of lexical equivalence seems to exist between English and Danish, which is also reflected in my identical translation of the two Danish target text words in example 1 (‘position’ in TT-1 and ‘stilling’ in TT-5) into English (‘position’ for both).

Example 2)

ST-2 (46): *medio millón* de españoles han vuelto a casa
 [half a million Spaniards have returned home]

TT-3 (38) *mange* Spaniere kom tilbage til Spanien
 [many Spaniards returned to Spain]

In this example, the relation of substitution between the target text elements analysed as lexically dissimilar and specific source text elements seems fairly clear-cut. Thus, it would be possible to characterize the target text element ‘mange’ [many] as a substitution of the source text expression ‘medio millón’ [half a million], and ‘til Spanien’ [to Spain] as a substitution of ‘a casa’ [home]. However, the substituting target text words are evidently not the formal equivalents of the apparently substituted source text words, and they were therefore analysed as manifestations of lexical dissimilarity. Incidentally, we may note that the two substitutions work in opposite semantic directions, insofar as the first one (‘mange’ for ‘medio millón’) involves a loss of specificity, whereas the other (‘til Spanien’ for ‘a casa’) adds specificity in relation to the source text word. But what is important to note about these substitutions is that they represent *interpretations* (in the hermeneutic sense of the term)⁵ of the source text elements. Thus, it is quite clear that some kind of contextual and/or background knowledge is required to understand ‘half a million’ as ‘many’, and ‘home’ as ‘Spain’. This *interpretative* nature is a common characteristic of all the target text elements that were allocated to the category of lexical dissimilarity in the data, independently of their nature, structure, range, etc. And it is exactly this characteristic that makes it reasonable to link the category of lexical dissimilarity with meaning-based interpreting: it is obviously not possible for interpreters to make *interpretations* like the ones in example 2 above, unless they resort to the underlying meaning of the source text; conversely, the target text elements in question clearly have not been produced by a simple transfer of source text words to their formal target text equivalents, which would be the essence of form-based interpreting.

5 Using the term ‘interpretation’ in its hermeneutic sense is clearly unfortunate in the present context, where the topic is ‘interpreting’ - understood as oral translation. However, I know no other appropriate term, and have therefore chosen to use it anyway. But in order to avoid confusion, the term ‘interpretation’ – and its derivations – will be stated in italics here when it is used in its hermeneutic sense.

3.1.2 Empirical categories

The examples shown above may produce the impression that there is always some sort of relation of substitution between target and source text elements – be this relation of a formal or (only) a semantic nature, be it clear or blurred. This is not the case. Apart from target text material that does appear to substitute linguistic elements in the source text, it is possible to identify target text elements that constitute actual additions seen in relation to the source text. On the other hand, some source text elements have been omitted in the target texts. In other words, the target texts contain examples of (1) material that does have a relation of substitution with respect to the source text material, which I shall refer to here as **core-material**, examples of (2) **omissions**, and examples of (3) **additions**. These are then the empirical categories, as opposed to the theoretical categories of lexical similarity and lexical dissimilarity.

So far, I have explained how the so-called core-material was categorized as manifestations of either lexical similarity or lexical dissimilarity. In the following, I shall describe how omissions and additions were analysed.

3.1.2.1 Omissions

Omissions were disregarded in the analysis, i.e. they were not recorded at all. In order to understand this choice, it is necessary to consider the purpose of the analyses, on the one hand, and the nature of the data and the evidence they can provide, on the other. The fundamental purpose of the analyses is to describe what interpreters do – rather than what source text speakers do. Therefore, even if the analyses are essentially comparative, the focus of interest naturally lies with the interpreters' output rather than with that of the speakers. But, as data, target texts have the limitation of providing no evidence of what interpreters have done with source text material that has not been transmitted to the target texts. In other words, the data used here provide no evidence of how, or if, the omitted source text material was processed: the interpreters may have processed it and chosen to leave it out, they may have processed it but not have had time to reproduce it, or they may not have processed (heard) it at all. The point is that we cannot know from the type of data used here. Omissions may therefore be regarded as 0-evidence in the present context. This point probably becomes clearer if we consider the status of omissions in relation to the key concepts of the study, i.e. lexical similarity and lexical dissimilarity: clearly, omissions cannot be considered as manifestations of either lexical similarity or lexical dissimilarity. For these reasons, omissions were not taken into account in the present analyses.

3.1.2.2 Additions

As opposed to omissions, additions do provide evidence of how interpreters process the source text and were therefore treated differently in the analyses.

Additions may take different forms and have different functions, but as a general characteristic, they evidently add information to the text – information that is not (explicitly) given in the source text. Rather, additions normally represent the interpreter’s *interpretation* of one or several source text elements, which have also been transmitted to the target text. This characteristic of additions is apparent in example 3 below, where the added element is italicized:

Example 3)

ST-2 (44): que también explican el desempleo en España
[which also explain the unemployment in Spain]

TT-5 (33): som også kan forklare *problemet* med hensyn til
arbejdsløsheden
[which may also explain the *problem* of unemployment]

In this example, the interpreter has made an addition by characterizing ‘unemployment’ as a ‘problem’, though it was not characterized as such in the corresponding source text segment. This added characterization may therefore be seen as a result of the interpreter’s *interpretation* either of the concept of unemployment as such or of the way s/he felt it had been presented in the source text at a more general level. On the other hand, we may safely say that the addition has not been produced on the basis of explicit linguistic information in the source text segment. This *interpretative* nature of additions makes them conceptually very close to the core-material that was categorized as manifestations of lexical dissimilarity in the present analyses. Consequently, additions were categorized in the same way, i.e. as manifestations of lexical dissimilarity.

3.2 Model of analysis

So far, I have mainly been concerned with the analysis of *individual* target text elements in relation to the categories of lexical similarity and lexical dissimilarity. However, the model of analysis is designed to categorize larger entities of text, namely the *segments*, which, as explained in section 2.3, are the units of analysis here.

Since the purpose of the model of analysis is to describe and quantify the distribution of lexical similarity and lexical dissimilarity at the level of segments,

the model contains a series of categories which reflect different distributional patterns of lexical similarity and lexical dissimilarity in the target text segments as compared to the source text segments.

In principle, the relation between a target text segment and a source text segment, or the source text as such, may be characterized either exclusively by lexical similarity, exclusively by lexical dissimilarity, or by a mixture of the two; in the latter case, it may be characterized mainly by lexical similarity, mainly by lexical dissimilarity, or by an even distribution of the two. Accordingly, the model of analysis contains the following five categories of target text segments: (1) Similar segments, (2) Dissimilar segments, (3) Similar(dissimilar) segments, (4) Dissimilar(similar) segments, and (5) Similar/Dissimilar segments⁶. In subsections 3.2.1-3.2.5, the five categories will be described and illustrated with examples from the data.

3.2.1 Similar segments (S-segments)

Similar segments, hereafter referred to as S-segments, are target text segments which are exclusively characterized by lexical similarity in relation to a particular source text segment.

A more formal definition would run as follows: an S-segment “is a target text segment in which all the lexical elements can be identified as the formal equivalents, or inflectional or derivational forms of such equivalents, of particular lexical elements in the source text segment on the basis of which the target text segment appears to have been constructed” (Dam 1998: 55-56).

This means that, even if an S-segment may reflect morphological and syntactic changes in relation to the corresponding source text segment, it typically represents a literal translation of the source text segment – one in which each target text word apparently substitutes a particular source text word as directly as possible, i.e. by means of its closest possible equivalent in the context. The example below, which shows two target text segments that were categorized as S-segments and their corresponding source text segments, is typical of this category:

6 In the paper in which I first proposed this model (Dam 1998), these categories were referred to as ‘Parallel segments’, ‘Substituting segments’, ‘Parallel(substituting) segments’, ‘Substituting(parallel) segments’, and ‘Parallel/Substituting segments’ respectively. The definitions remain the same, but the names were changed because I found those used here more appropriate to indicate the nature of the empirical phenomena that the categories are designed to describe.

Example 4)

- ST-1 (29): México es un país del tercer mundo
 (30): *y necesita este tipo de gente*
 [Mexico is a third world country/and needs this kind of people]
- TT-3 (23): Mexico er et tredieverdensland
 (24): *og behøver den slags mennesker*
 [Mexico is a third world country/and needs this kind of people]

In this example, all the lexical target text elements can be identified as the formal equivalents of particular lexical source text elements: ‘Mexico’ as ‘México’, ‘er’ as ‘es’ [is], ‘tredie(-)’ as ‘tercer’ [third], ‘verden(s-)’ as ‘mundo’ [world], ‘land’ as ‘país’ [country], ‘og’ as ‘y’ [and], ‘behøver’ as ‘necesita’ [needs], ‘slags’ as ‘tipo’ [kind], and ‘mennesker’ as ‘gente’ [people]. At the lexical level, the formal similarity between source and target text segments is therefore indisputable. Nevertheless, the example does reflect certain structural changes between source and target text segments, including for example changes in noun structure and word order (e.g. ‘país¹ del tercer² mundo³’ -> ‘tredie²verdens³land¹’), and in grammatical number (‘gente’ [singular] -> ‘mennesker’ [plural]) – changes which we may note are exclusively language-induced, as opposed to interpreting-induced. As explained, such morpho-syntactic changes were not registered in these exclusively lexis-based analyses.

3.2.2 Dissimilar segments (D-segments)

Dissimilar segments, also referred to as D-segments, are exactly the opposite of the S-segments, since they are exclusively characterized by lexical dissimilarity in relation to the source text.

Formally they would be defined as follows: a D-segment “is a target text segment in which no lexical element can be identified as the formal equivalent, or an inflectional or derivational form of such an equivalent, of any lexical element either in the source text segment on the basis of which the target text segment appears to have been constructed or – if no source text segment can be identified as the basis of the target text segment – in any other source text segment” (Dam 1998: 57-58).

It follows from this definition that, empirically, D-segments may consist of either core-material or additions in relation to the source text (cf. section 3.1.2). D-segments of the first type would then be complete reformulations of specific source text segments. This is the case for the target text segment which, along

with the apparently corresponding source text segment, appears in italics in example 5 below:

Example 5)

- ST-2 (6-8): - siguiendo con las causas específicas del estado español quisiera mencionar también el -- la no existencia de una política económica adecuada debido a la transición
- *cuando murió Franco en mil novecientos setenta y cinco*
- la situación política era muy difícil
[continuing with the specific reasons of the Spanish State I would also like to mention the -- the non-existence of an adequate economic policy due to the transition/*when Franco died in nineteen hundred and seventy five*/the political situation was very difficult]
- TT-3 (6-7): - jeg ville også gerne nævne den manglende existens på en økonomisk politik ved overgangen til demokrati
- *dengang*
- var den øk. -- var den politiske situation meget svær
[I would also like to mention the lack of existence of an economic policy in the transition to Democracy/*at that time*/the ec. -- the political situation was very difficult]

Here the source text speaker uses the expression ‘cuando murió Franco en mil novecientos setenta y cinco’ [when Franco died in nineteen hundred and seventy five] to refer back to, and elaborate on, the expression ‘la transición’ [the transition (to Democracy)], mentioned in the first source text segment of the extract, whereas the interpreter refers back by means of the much shorter expression ‘dengang’ [at that time] – an expression which is entirely different from that of the apparently corresponding source text segment in terms of form.

In example 6 below, the italicized target text segment is a D-segment of the second type, i.e. one that may be analysed as an addition in relation to the source text, insofar as no particular source text segment can be identified as the basis of the D-segment:

Example 6)

- ST-1 (52): en México si no trabajas
(53): no comes
(54): o de alguna manera tienes que buscar la forma de -- de

ganar dinero
 [in Mexico if you do not work/you do not eat/or
 somehow you
 have to find a way of -- of making money]

- TT-5 (31): i Mexico hvis du ikke har arbejde
 (32): skal du finde en eller anden måde at -- at skaffe penge på
 (33): *for du får ingen penge fra staten*
 [in Mexico if you do not have a job/you have to find
 some
 way of – of getting money/*because you receive no money
 from the State*]

As is clear from the examples above, the common denominator of D-segments is their *interpretative* nature, independently of the type of empirical material ascribed to the category: be it actual core-material which has been changed completely as in example 5, or be it additions as in example 6.

3.2.3 Similar(dissimilar) segments (S(d)-segments)

Similar(dissimilar) segments, hereafter referred to as S(d)-segments, belong to the mixed categories of the model of analysis. S(d)-segments, then, are target text segments which are characterized mainly by lexical similarity, but also by some degree of lexical dissimilarity in relation to a source text segment.

Formally, the category can be defined as follows: an S(d)-segment “is a target text segment in which most of the lexical elements can be identified as the formal equivalents, or inflectional or derivational forms of such equivalents, of particular lexical elements in the source text segment on the basis of which the target text segment appears to have been constructed, whereas no such identification can be made for the rest of the lexical elements of the target text segment” (Dam 1998: 59).

Since the only constraint attached to the categorization of a target text segment as an S(d)-segment is that *most* of its lexical elements can be identified as the formal equivalents of particular elements in the corresponding source text segment, the distribution of similarity and dissimilarity in S(d)-segments may actually vary to some degree. However, the typical pattern is a very limited degree of lexical dissimilarity, and example 7 below is therefore highly representative of the category of S(d)-segments. In the example, all but one – namely the italicized – lexical target text element can be identified as the formal equivalents of particular lexical elements in the corresponding source text segment:

Example 7)

ST-1 (27): que llegaron durante la segunda guerra mundial
[who came during the Second World War]

TT-4 (18): som – som kom *på grund af* den anden verdenskrig
[who – who came *because of* the Second World War]

3.2.4 Dissimilar(similar) segments (D(s)-segments)

The second mixed category of target text segments is that of Dissimilar(similar) segments, which I shall refer to as D(s)-segments in the following. This category reflects exactly the opposite pattern of that of the S(d)-segments. Thus, D(s)-segments are target text segments which are mainly characterized by lexical dissimilarity, but also by some degree of lexical similarity in relation to a source text segment.

Formally defined, a D(s)-segment “is a target text segment in which most of the lexical elements cannot be identified as the formal equivalents, or inflectional or derivational forms of such equivalents, of particular lexical elements in the source text segment on the basis of which the target text segment appears to have been constructed, whereas such an identification can be made for the rest of the lexical items of the target text segment” (Dam 1998: 60-61).

As was the case with the S(d)-segments, the distribution of lexical similarity and lexical dissimilarity may vary to some degree between the individual target text segments categorized as D(s)-segments, since target text segments are allocated to this category if only less than half of their lexical elements can be analysed as the formal equivalents of particular source text elements. As examples of the category of D(s)-segments, consider target text segments (66) and (67) in the following example, in which the lexically similar target text elements and their source text counterparts are italicized; note that target text segment (65) and source text segment (82) are only included to provide a context:

Example 8)

ST-1 (82): es muy fácil encontrar en México
(83): que los amigos del hijo o de la hija pasan a formar parte de la *familia*
(84): si ellos mismos *no tiene* una
[it is very easy to find in Mexico/that the friends of the son or the daughter come to form part of the *family*/if they do *not have* one themselves]

- TT-1 (65): det er – man kan meget let finde i Mexico
 (66): at en *familie* omfatter andre mennesker
 (67): der *ikke har* egen familie
 [it is -- you can very easily find in Mexico/that a *family*
 includes other people/who do *not have* a family of their
 own]

Target text segment (66) of this example was categorized as a D(s)-segment in relation to source text segment (83), since they are comparable in terms of content but they only have the lexical element ‘family’ (: ‘familie’ vs. ‘familia’) in common. Target text segment (67) was categorized as a D(s)-segment in relation to the semantically corresponding source text segment (84), because they only have the elements ‘not’ (: ‘ikke’ vs. ‘no’) and ‘have’ (: ‘har’ vs. ‘tiene’) in common. The remaining lexical elements of the two target text segments cannot be identified as the formal equivalents of the lexical elements of the two corresponding source text segments.

3.2.5 Similar/Dissimilar segments (S/D-segments)

The third mixed category of target text segments is that of Similar/Dissimilar segments, which are characterized by an approximately even distribution of lexical similarity and lexical dissimilarity in relation to a source text segment. The abbreviation for Similar/Dissimilar segments is S/D-segments.

The formal definition of this category runs as follows: an S/D-segment “is a target text segment in which approximately half of the lexical elements can be identified as the formal equivalents, or inflectional or derivational forms of such equivalents, of particular lexical elements in the source text segment on the basis of which it appears to have been constructed, whereas no such identification can be made for approximately the other half of the lexical elements of the target text segment” (Dam 1998: 61).

The even distribution of lexical similarity and lexical dissimilarity characteristic of S/D-segments is reflected in example 9 below:

Example 9)

- ST-2 (67): en los años sesenta muchos the los tripulantes eran
 españoles
 [in the sixties many of the crew members were Spanish]
- TT-3 (56): *en stor del af besætningen var tidligere spaniere*
 [a large part of the crew members were previously
 Spanish]

In this example, three of the lexical target text elements can be identified as the formal equivalents of specific source text elements – namely ‘besætningen’ as ‘tripulantes’ [crew members], ‘var’ as ‘eran’ [were], and ‘spaniere’ as ‘españoles’ [Spanish]; on the other hand, three of the target text elements have no formal equivalents in the corresponding source text segment – namely ‘stor’ [large], ‘del’ [part], and ‘tidligere’ [previously].

3.2.6 Summary

The five categories of target text segments described above represent different distributional patterns of lexical similarity and lexical dissimilarity in relation to the source text segments on the basis of which they appear to have been constructed, or in relation to the source text as such. Ordered on a scale with a descending degree of similarity and, conversely, an increasing degree of dissimilarity, the categories are the following:

- S-segments
- S(d)-segments
- S/D-segments
- D(s)-segments
- D-segments

If we relate these categories to the empirical phenomena under investigation, i.e. form-based and meaning-based interpreting, the categories placed at the top of the above scale may be regarded primarily as evidence of form-based interpreting, whereas those placed at the bottom of the scale can essentially be seen as evidence of meaning-based interpreting. Therefore, if it is true that the meaning-based approach to interpreting is more associated with non-difficult source texts, and the form-based technique is more associated with difficult texts, we may expect the categories at the bottom of the scale to be more dominant in the interpretations of Source Text 1 than in those of Source Text 2, and vice versa. In the following section we shall see how the categories were actually distributed over the interpreted versions of the two texts.

4. Results and discussion

All the target text segments of the corpus were categorized in relation to each source text according to the model described above, whereby the results summarized in the tables below were obtained.

Table 2 shows the results of the analyses of the interpretations of Source Text 1, i.e. the less difficult text, whereas the results obtained for Source Text 2, i.e. the more difficult text, are shown in Table 3. In the tables, the figures

without brackets indicate the absolute number of occurrences of target text segments as distributed over the different categories, whereas the figures appearing in brackets indicate the approximate percentages. The categories are ordered so as to represent a decreasing degree of lexical similarity and, conversely, an increasing degree of dissimilarity (cf. the scale of section 3.2.6):

	TT-1	TT-2	TT-3	TT-4	TT-5	TOTAL
S-segm.	50 (58%)	17 (22%)	55 (58%)	36 (43%)	40 (52%)	198 (47%)
S(d)-segm.	22 (26%)	32 (42%)	26 (27%)	36 (43%)	25 (32%)	141 (34%)
S/D-segm.	7 (8%)	8 (11%)	7 (7%)	9 (11%)	5 (6%)	36 (9%)
D(s)-segm.	5 (6%)	13 (17%)	2 (2%)	2 (2%)	5 (6%)	27 (6%)
D-segm.	2 (2%)	6 (8%)	5 (5%)	1 (1%)	2 (3%)	16 (4%)
TOTAL	86	76	95	84	77	418

Table 2: Distribution of target text segment categories in the interpretations of Source Text 1 (the less difficult text)

	TT-1	TT-2	TT-3	TT-4	TT-5	TOTAL
S-segm.	25 (27%)	11 (15%)	23 (25%)	17 (19%)	26 (30%)	102 (24%)
S(d)-segm.	39 (42%)	28 (39%)	43 (47%)	42 (48%)	47 (53%)	199 (46%)
S/D-segm.	15 (16%)	13 (18%)	13 (14%)	16 (18%)	6 (7%)	63 (15%)
D(s)-segm.	8 (9%)	12 (17%)	7 (8%)	7 (8%)	8 (9%)	42 (10%)
D-segm.	5 (5%)	7 (10%)	5 (5%)	6 (7%)	1 (1%)	24 (6%)
TOTAL	92	71	91	88	88	430

Table 3: Distribution of target text segment categories in the interpretations of Source Text 2 (the more difficult text)

For comparison, Table 4 below shows the differences between the overall results of the analyses of the interpretations of Source Text 1 (cf. Table 2), on the one hand, and Source Text 2 (cf. Table 3), on the other. The results for each source text are indicated in percentages and the differences in percentage points:

	Interpretation of Source Text 1	Interpretations of Source Text 2	Differences
S-segments	47%	24%	-23
S(d)-segments	34%	46%	+12
S/D-segments	9%	15%	+6
D(s)-segments	6%	10%	+4
D-segments	4%	6%	+2

Table 4: Differences between the results obtained for Source Text 1 overall and those obtained for Source Text 2 overall

If we look at Tables 2 and 3, or the first two columns of Table 4 in isolation, it becomes apparent that one tendency is particularly salient: the large majority of the target text segments, in relation to both source texts, have been allocated to the categories at the top of the scale. As explained, the top-categories are those that reflect the highest degree of similarity in relation to the source texts and may therefore primarily be considered evidence of form-based interpreting. This observation is therefore clearly in contradiction with the general assumption that meaning-based interpreting is the standard technique, whereas form-based interpreting is used only exceptionally (cf. section 1). On the other hand, it is also an observation that corroborates the results of my previous study on the general distribution of form-based and meaning-based interpreting (Dam 1998, cf. section 1), although it should be stressed that my previous study was on consecutive interpreting whereas the present one is on simultaneous, which means that the two studies and their results are not directly comparable.

Although the general tendency of the interpreters to concentrate their output on the categories at the top of the scale is reflected in the results for both source texts, the last column of Table 4 shows that there is also one very clear difference between the results obtained for Source Text 1 and those obtained for Source Text 2: the category that represents pure similarity, i.e. the S-segments, is far more dominant in the interpretations of Source Text 1 than in those of Source Text 2. Thus, almost half of the target text segments in the interpretations of Source Text 1 have been allocated to the category of S-segments (47%), whereas for Source Text 2 this is only the case for approximately half as many (24%). On the other hand, the D-type-segments clearly have more weight in the interpretations of Source Text 2 than in the renditions of Source Text 1. Thus, both the S(d)-segments, the S/D-segments, the D(s)-segments and the D-segments are more frequent overall in the interpretations of Source Text 2 than in those of Source Text 1.

Approximately the same pattern can be observed in the interpreters' individual performances, as can be derived from Tables 2 and 3 above. Thus, all five interpreters represent more target text segments as S-segments in their renditions of Source Text 1 than in their renditions of Source Text 2 (in TT-1 the representation of S-segments for Source Text 1 as compared to Source Text 2 is 58% vs. 27%; in TT-2 it is 22% vs. 15%; in TT-3 it is 58% vs. 25%; in TT-4 it is 43% vs. 19%; in TT-5 it is 52% vs. 30%). On the other hand, all the subjects represent more target text segments as D-type-segments – i.e. as S(d)-, S/D-, D(s)- or D-segments – in their interpretations of Source Text 2 than in those of Source Text 1 (cf. Tables 2 and 3).

It is therefore clear that lexical similarity is a more salient feature in the interpretations of Source Text 1 than in the renditions of Source Text 2. Conversely, lexical dissimilarity is more dominant in the interpretations of

Source Text 2 than in those of Source Text 1. Consequently, insofar as lexical similarity and lexical dissimilarity can be considered general evidence of form-based and meaning-based interpreting, respectively, the results of the present analyses indicate that the form-based strategy is more associated with less difficult source texts, whereas the meaning-based technique is more linked with more difficult texts. This finding is clearly in contradiction with the prevailing hypothesis, which, as stated in section 1, predicts exactly the opposite pattern. Thus, even if there seems to be a relation between the level of difficulty of the source text and interpreters' choice between the form-based and the meaning-based strategies, as is generally assumed, this relation may in fact be exactly the opposite of what is often held to be the case.

While this finding is potentially interesting, it needs to be pointed out that the evidence obtained here has a series of weaknesses. For one thing, the experiment on the basis of which data were obtained was not carefully controlled so as to maintain all parameters, except for the one studied, unaltered across the two tasks. Thus, factors other than that defined as the parameter under study here, namely the level of source text difficulty, may in principle have influenced the results. Furthermore, the lack of in-conference experience of the subjects and the small size of the corpus weaken the representativeness of data and results.

However, the evidence obtained here should be strong enough to serve as a basis for the (re-)formulation of hypotheses. On the basis of the results of the present study, and in opposition with the prevailing hypothesis, I shall therefore formulate the following **alternative hypothesis**: *the more difficult the source text, the more interpreters tend to deviate from its surface form in their target text production*. Using standard terminology, this hypothesis could alternatively be formulated as follows: the more difficult the source text, the more interpreters tend to deviate from the form-based approach and move towards the meaning-based approach.

In order to provide a tentative explanation for this hypothesis, and for the results obtained here, we may resort to some of the existing research on the interpreting process. Particularly, the Effort Model of simultaneous interpreting, proposed and developed by Daniel Gile (e.g. Gile 1988, 1995 and 1997), seems to provide a useful starting point. Basically, this model describes simultaneous interpreting as a process consisting of three different, but highly interlinked, components: (1) a listening or comprehension component, (2) a production component, and (3) a short-term memory component. These components are referred to as **efforts** to stress the fact that they are non-automatic operations and that each of them requires a certain amount of processing capacity, which is available only in limited supply. The processing capacity requirements for each effort are described as highly variable, since they depend on the task the interpreter is engaged in at a particular point in time. And because of the

interlinked nature of the three efforts, variations in the requirements for one effort may have implications for any of the other efforts.

Using this framework, we may assume that the different *production* patterns observed in the interpretations of Source Text 1 and Source Text 2 are a result of different *comprehension* requirements which, again, have had implications for the short-term *memory* component.

Thus, the following scenario seems plausible: the more difficult the source text, the higher the requirements for the listening or comprehension effort. When comprehension requirements are high, the interpreter is likely to pay particular attention to this effort. One way of doing this would be to postpone target text production for as long as possible in order to have more time and a larger context to deal with comprehension problems. In other words, we may assume that a focus on the listening/comprehension effort leads to an increase in the time lag, or **ear-voice-span** (Goldman-Eisler 1972), that is the time that elapses from the moment a source text element is heard until the moment it is reproduced in the target language. In fact, Gile also mentions this possibility within the framework of the Effort Model. Thus, as one possible “coping tactic” aimed at increasing comprehension potential, Gile suggests, among many other tactics, “delaying the response” (Gile 1995: 192-194). We may also note that there is some empirical evidence to support the idea that interpreters tend to increase the ear-voice-span when the source text is difficult. In one experimental study, Gerver (1969) found that interpreters’ ear-voice-span increased with an increase in the input rate. In another experimental study, Adamowicz (1989) found that interpreting prepared and well-structured texts involved a shorter ear-voice-span than working with unprepared and structurally more scrambled texts.

It would therefore be reasonable to assume that interpreters tend to increase the ear-voice-span when the source text is difficult. This is again likely to have implications for the memory component, since an increased ear-voice-span involves an increase in the amount of source text information stored in memory for subsequent target text production.

An accumulation of source text information in memory, on its part, is likely to have implications for the production component. This is due to the fact that verbal memory, i.e. memory for verbatim surface forms, has a very limited duration. As explained by Isham (1994), based on Jarvella (1971), information about form, i.e. the particular words used and their syntactic relations, is normally only available in memory for the most recent sentence in a text. For previous sentences, by contrast, only the “gist”, or meaning, is generally retained in memory. And there are in fact quite a number of studies that show that verbal memory is even poorer in simultaneous interpreting than in ordinary listening or other cognitive tasks that do not involve concurrent listening and speaking (Gerver 1974; Lambert 1989; Isham 1995 and 1995; Darò and Fabbro 1994). Be

that as it may, if difficult source texts make interpreters increase the ear-voice-span, we may assume that this leads to an increase in the amount of source text information stored in memory, which may be accumulated up to a point where the limits of verbal memory are exceeded (cf. also Massaro and Shlesinger 1997: 27). Therefore, when target text production eventually starts, information about the surface form of the source text may have disappeared, partially or completely, from the interpreters' memory. At that point, the interpreters would therefore be less able to base their target text on source text *form*, even if they wished to do so, but would have to rely primarily on source text *meaning*. In other words, interpreters may tend to reformulate, rather than to reproduce, the source text when they work with a relatively long time lag. By contrast, actual reproduction of source text form in the target text, or form-based interpreting, is probably only possible when the interpreter works with a relatively short ear-voice-span (cf. also Frauenfelder and Schriefers 1997: 81). And it stands to reason that a short ear-voice-span can mainly be used for source texts that are characterized by short and straightforward sentences or clauses – i.e. source texts which may be described as fairly easy⁷.

The above scenario may, then, explain how different production patterns, such as those observed in the interpretations of the two source texts in this study, may be a function of different memory requirements, which may again be reflections of different requirements for listening and comprehension.

No attempt has been made here to measure the ear-voice-span or in other ways to examine the underlying interpreting process more directly than can be done by means of product observations. The above scenario therefore serves exclusively as a tentative explanation for a hypothesis which is in itself only tentative. However, the hypothesis is both intuitively appealing and backed by at least some empirical evidence.

7 Whether interpreters actually *prefer* to work with a short ear-voice-span is a different discussion altogether. However, we cannot exclude the possibility that interpreters tend to work with the shortest possible time lag as part of a general strategy to adhere to the so-called **minimax principle**, according to which interpreters prefer to use the least demanding strategy whenever possible (e.g. Massaro and Shlesinger 1997: 36; Gernsbacher and Shlesinger 1997: 130). As part of such a general strategy, a short ear-voice-span could be aimed at avoiding an overload of memory, which would increase the risk of forgetting part of the source text (de Groot 1997: 50).

References

- Adamowicz A. (1989): "The role of anticipation in discourse: text processing in simultaneous interpreting", *Polish Psychological Bulletin* 20, pp. 153-160.
- Alessandrini M.S. (1990): "Translating numbers in consecutive interpretation: an experimental study", *The Interpreters' Newsletter* 3, pp. 77-80.
- Dam H.V. (1998): "Lexical similarity vs. lexical dissimilarity in consecutive interpreting: a product-oriented study on form-based vs. meaning-based interpreting", *The Translator* 4/1, pp. 49-68.
- Darò V. and Fabbro F. (1994): "Verbal memory during simultaneous interpretation: effects of phonological interference", *Applied Linguistics* 15/4, pp. 365-381.
- De Groot A.M.B. (1997): "The cognitive study of translation and interpretation", in *Cognitive Processes in Translation and Interpreting*. Ed. by J.H. Danks, G.M. Shreve, S.B. Fountain and M.K. McBeath, Thousand Oaks-London-New Delhi, Sage Publications, pp. 25-56.
- De Groot A.M.B. (2000): "A complex-skill approach to translation and interpreting", in *Tapping and Mapping: The processes of translation and interpreting*. Ed. by S. Tirkkonen-Condit and R. Jääskeläinen, Amsterdam-Philadelphia, John Benjamins, pp. 53-68.
- Englund Dimitrova B. (2000) (ed.): *Översättning och Tolkning. Rapport från ASLA:s höstsymposium i Stockholm, 5-6 november 1998*, Uppsala, Ekonomikum.
- Fabbro F., Gran L., Basso G. and Bava A. (1990): "Cerebral lateralization in simultaneous interpretation", *Brain and Language* 39, pp. 69-89.
- Fabbro F., Gran B. and Gran L. (1991): "Hemispheric specialization for semantic and syntactic components of language in simultaneous interpreters", *Brain and Language* 41, pp. 1-42.
- Frauenfelder U.H. and Schriefers H. (1997): "A psycholinguistic perspective on simultaneous interpretation", *Interpreting* 2 (1-2), pp. 55-89.
- Gernsbacher M.A. and Shlesinger M. (1997): "The proposed role of suppression in simultaneous interpretation", *Interpreting* 2 (1-2), pp. 119-140.
- Gerver D. (1969): "The effects of source language presentation rate on the performance of simultaneous conference interpreters", in *Proceedings of the 2nd Louisville Conference on rate and/or frequency controlled speech*. Ed. by E. Foulke, University of Louisville, pp. 162-184.

- Gerver D. (1974): "Simultaneous listening and speaking and retention of prose", *Quarterly Journal of Experimental Psychology* 26, pp. 337-341.
- Gerver D. (1976): "Empirical studies of simultaneous interpretation: a review and a model", in *Translation – Applications and Research*. Ed. by R.W. Brislin, New York, Gardner Press, pp. 165-207.
- Gile D. (1985): "Les termes techniques en interprétation simultanée", *Meta* 30/3, pp. 199-210.
- Gile D. (1988): "Le partage de l'attention et le Modèle d'Efforts en interprétation simultanée", *The Interpreters' Newsletter* 1, pp. 27-33.
- Gile D. (1995): *Basic Concepts and Models for Interpreter and Translator Training*, Amsterdam/Philadelphia, John Benjamins.
- Gile D. (1997): "Conference interpreting as a cognitive management problem", in *Cognitive Processes in Translation and Interpreting*. Ed. by J.H. Danks, G.M. Shreve, S.B. Fountain and M.K. McBeath, Thousand Oaks-London-New Delhi, Sage Publications, pp. 196-214.
- Goldman-Eisler F. (1972): "Segmentation of input in simultaneous translation", *Journal of Psycholinguistic Research* 2/1, pp. 127-140.
- Gran L. (1989): "Interdisciplinary research on cerebral asymmetries: Significance and prospects for the teaching of interpretation", in *The Theoretical and Practical Aspects of Teaching Conference Interpretation*. Ed. by L. Gran and J. Dodds, Udine, Campanotto Editore, pp. 93-100.
- Gran L. and Bellini B. (1996): "Short-term memory and simultaneous interpretation: an experimental study on verbatim recall", *The Interpreters' Newsletter* 7, pp. 103-112.
- Gran L. and Fabbro F. (1988): "The role of neuroscience in the teaching of interpretation", *The Interpreters' Newsletter* 1, pp. 23-41.
- Isham W.P. (1994): "Memory for sentence form after simultaneous interpretation: Evidence both for and against deverbilization", in *Bridging the Gap. Empirical research in simultaneous interpretation*. Ed. by S. Lambert and B. Moser-Mercer, Amsterdam-Philadelphia, John Benjamins, pp. 191-211.
- Isham W.P. (1995): "On the relevance of signed languages to research in interpretation", *Target* 7/1, pp. 135-149.
- Jarvella R.J. (1971): "Syntactic processing of connected speech", *Journal of Verbal Learning and Verbal Behaviour* 10, pp. 409-416.
- Lamberger-Felber H. (2001): "Text-oriented research into interpreting: examples from a case-study", *Hermes* 26, pp. 39-64.

- Lambert S. (1989): "Recall and recognition among conference interpreters", in *The Theoretical and Practical Aspects of Teaching Conference Interpretation*. Ed. by L. Gran and J. Dodds, Udine, Campanotto Editore, pp. 83-91.
- Lonsdale D. (1997) "Modeling cognition in SI: methodological issues", *Interpreting* 2 (1-2), pp. 91-117.
- Massaro D.W. and Shlesinger M. (1997): "Information processing and a computational approach to the study of simultaneous interpretation", *Interpreting* 2 (1-2), pp. 13-53.
- Paradis M. (1994): "Toward a neurolinguistic theory of simultaneous translation: the framework", *International Journal of Psycholinguistics* 10 (3), pp. 319-335.
- Seleskovitch D. (1975) *Langage, langues et mémoire. Étude de la prise de notes en interprétation consécutive*, Paris, Minard.

CODE-MIXING AND SIMULTANEOUS INTERPRETATION TRAINING

Andrew Kay-fan Cheung
Hong Kong Polytechnic University

Research background

According to the 1996 government census, 89% of Hong Kong residents claim Cantonese as their first language. However, the form of Cantonese that is used in Hong Kong has been labeled as the most Westernized Chinese dialect (Zhuang 1996).

This study considers the influence of English code-mixing on Cantonese in the simultaneous interpretation (SI) of student interpreters. The impact of English on the Cantonese lexicon has been widely discussed from historical, commercial, political and pedagogical perspectives. Yet the issue of code-mixing in SI with a focus on Cantonese has been virtually ignored in the literature. The two major reasons for this are that most interpreters in Hong Kong are not engaged in conference interpreting research (CIR) and that the Cantonese dialect is only used extensively in Hong Kong and is therefore of less concern to CIR communities in China, Taiwan or the West.

Code-mixing between Cantonese and English is pervasive among Hong Kong university students (Li 1996). Although English is the medium of instruction in most local secondary schools, teachers tend to use a mixture of English and Cantonese in classes as they find it more effective (Bauer and Benedict 1997). Students therefore become familiar with this form of code-mixing and use it from the early stages of their secondary education (Tung 1997). Moreover, knowledge is introduced to university students in English, which is the designated medium of instruction at all tertiary institutions in Hong Kong. However, as Cantonese is the major linguistic vehicle for communication among students, they tend to develop code-mixing habits (Pennington *et al.* 1992).

The Gravitational Model of linguistic availability, the Effort Model and SI training in Hong Kong

The Gravitational Model of linguistic availability breaks down an individual's command of a language into variable and invariable aspects. The invariable aspect is comprised of "language elements the availability of which is assumed to be constant or to vary very slowly, including most basic rules of grammar and

a small number of the most frequently used words in the language. The variable part includes at least dozens of rules and many thousands of words and idioms” (Gile 1995).

When applying the Gravitational Model to the SI process, conference interpreters naturally use vocabularies that are easily accessible. This can lead to the polarization of lexical systems, whereby interpreters use their basic vocabularies plus technical terms in their renditions (Gile 1995).

When confronted with an English-into-Chinese SI task, Hong Kong student interpreters with minimal SI training stumble over terms and expressions that are familiar to them in their English forms. As mentioned earlier, university students have a tendency to code-mix English words when conversing in Cantonese. This is more obvious when words that they frequently use in English are part of the source text.

Research methodology

The objective of this study is to test the following hypothesis: code-mixing can be used as an effort-reduction strategy to increase accuracy, fluency and completeness of SI delivery.

An experiment tested this hypothesis on a sample of twelve Cantonese-speaking third-year students who took “Introduction to Interpreting” in the second semester of their first year and “Sight Translation and Consecutive Interpreting” in their second year. All of the participants were female.

The experiment took place in the fourth week of the semester. The participants had already performed English-into-Cantonese SI tasks in the researcher’s class. All twelve participants were volunteers and each gave consent that their performance could be used in academic research.

The twelve participants were randomly divided into two groups and were briefed on the general idea of the speech to be interpreted before the experiment took place. During the experiment, Group A – the control group – interpreted the speech into Cantonese. Group B – the experimental group – did likewise, but was allowed to use words and phrases in the source language.

The methodology incorporated an SI task of interpreting a 421-word video-taped English speech into Cantonese. Participants were seated individually in soundproof SI training booths and could choose to watch the video presentation on the large screen in the language laboratory or on the TV screen inside the booth.

The speaker was a native English-speaking Caucasian male, with a standard North American accent and a normal speaking speed. The speech was a university president’s welcome address to first-year students that did not contain

any special terminology. Instead, it used English words and phrases that are often used by university students in Hong Kong.

The experiment took place in an SI training laboratory with six training booths. Group A took part in the experiment first. An audio signal was given to participants before the video was played. The researcher used a centrally-controlled SI training system to record the participants' interpretations on cassette tapes. When Group A finished the task, Group B took part in the experiment. All cassette tapes were collected for grading immediately after the two groups had completed the tasks.

The tapes were arranged randomly and number coding ensured that the participants remained anonymous when two professional conference interpreters with Cantonese A and English B in their language combinations graded the tapes. A very simple grading sheet allowed a rating of Good or Bad for each participant, with Good bearing a numerical value of 1 and Bad bearing numerical value of 0.

Criteria	A1	A2	A3	A4	A5	A6
Completeness						
Accuracy						
Fluency						
Grade	Good/Bad	Good/Bad	Good/Bad	Good/Bad	Good/Bad	Good/Bad

Table 1 – Grading Sheet

The two raters were summoned to a pre-assessment discussion, at which the researcher played English-into-Cantonese SI exercise recordings of students other than those who participated in the experiment. The purpose of this exposure and the ensuing discussion was to familiarise the raters with the assessment process and to generate common assessment criteria.

The raters and the researcher discussed each example in terms of why it was a good or bad interpretation. After listening to more than twenty tapes, the consensus was that the criteria for assessment would be the completeness of the delivery, the accuracy of the meaning in the target language and the fluency of the rendition.

The acceptability of code-mixing was limited to words that Cantonese speakers normally say in English. However, there was some difficulty in distinguishing the English words that are commonly used by Cantonese speakers when conversing in Cantonese, and the raters were allowed to use their own judgments in such matters.

Results

A general hypothesis of whether simultaneous interpreters use code-mixing source-language words as an effort-reduction strategy to increase the accuracy, completeness and fluency of delivery guided the experiment. The overall score of Group A was worse than that of Group B.

Participant	Code-mix	Rater 1	Rater 2	Hesitation	Pauses	Unfinished sentences	Meaning errors
A1	0	Bad	Good	>5	>10	0	Yes
A2	0	Bad	Bad	>5	>10	>5	Yes
A3	0	Bad	Bad	>5	>10	>5	Yes
A4	0	Bad	Good	>5	>10	>5	Yes
A5	0	Good	Bad	>5	>10	>5	Yes
A6	0	Good	Good	>5	<10	0	Yes

Table 2 – Group A results

Participant	Code-mix	Rater 1	Rater 2	Hesitation	Pauses	Unfinished sentences	Meaning errors
B1	<5	Good	Good	<5	<10	0	No
B2	<5	Good	Bad	<5	<10	0	No
B3	<5	Good	Good	<5	<10	0	No
B4	<5	Good	Good	>5	<10	<5	No
B5	<5	Good	Good	<5	<10	0	No
B6	>5	Bad	Bad	>5	<10	<5	Yes

Table 3 – Group B results

As shown in Table 2, Group A received five Good grades when all participants did not code-mix English in the delivery. However, only one participant in Group A was awarded a Good grade by both raters. Two participants received a Bad grade from both raters, and three participants received one Good and one Bad grade.

The Group A participant who received a Good grade from both raters left no sentences unfinished in her delivery and paused relatively few times. However, all Group A participants erred in meaning during their performances.

Table 3 shows that the raters awarded 13 Good grades to Group B. One participant received a Bad grade from both raters and one received one Bad and one Good grade. Four participants were awarded a Good grade from both raters. All of the participants code-mixed the source language when performing the SI task.

In addition to not erring in meaning during their SI performances, all of the participants in Group B who received a Good grade from both raters left

relatively fewer sentences unfinished and hesitated less frequently than the control group participants.

Participant B6, who received a Bad grade from both raters, left more than five sentences unfinished and erred in meaning to the same degree. However, this participant used fewer source-language words when performing the SI task. Participant B4, who received a Good grade from both raters, also left more than five sentences unfinished but did not err in meaning during the task.

Discussion

The experiment supported the general hypothesis of this study. The participants from the experimental group, in which code-mixing was allowed, had relatively better SI performances than the participants from the control group. The two raters awarded more good grades to the experimental group than to the control group. These results indicate that when performing an SI task, code-mixing can be used as an effort management strategy to increase the accuracy, completeness and fluency of delivery.

SI is a very complex process, and code-mixing can allow interpreters the space to utter what they have heard rather than having to process the meaning of the message. When processing effort is reduced, extra effort can be devoted to listening or to delivery. Consequently, those participants who code-mixed the source language in the delivery performed better than those who did not.

However, what actually happened when the participants decided to code-mix the source language in the delivery? Did they turn their attention to listening or to uttering? How much effort was shifted among the different SI tasks? Moreover, will audiences accept a code-mixed SI delivery? Inter-disciplinary research can be a means to solve these and many other questions that current research cannot yet provide answers to.

The code-mixing of source languages in professional SI delivery might not be entirely desirable as it could well hinder audience comprehension, and might even seem like parroting. However, those participants who code-mixed in the experiment performed better in the SI task than those who did not. The implication of this finding is that code-mixing can be used as an effort management strategy for students who are starting to learn SI. New students should be instructed to code-mix source language words in their delivery to manage their distribution effort until they have learned sufficient SI skills.

References

- Bauer R.S. and Benedict P.K. (1997): *Modern Cantonese Phonology*, Berlin, Mouton de Gruyter.
- Gile D. (1995): *Basic Concepts and Models for Interpreter and Translator Training*, Amsterdam-Philadelphia, John Benjamins.
- Li D.C.S. (1996): *Issues in Bilingualism and Biculturalism: A Hong Kong Case Study*, New York, Peter Lang.
- Pennington M., Balla J., Detaramani C., Poon A. and Tam F. (1992): *Towards a Model of Language Choice among Hong Kong Tertiary Students: A Preliminary Analysis*, Hong Kong, City Polytechnic of Hong Kong.
- Tung P.C.S. (1997): "Why changing the medium of instruction in Hong Kong could be difficult", *Journal of Multilingual and Multi-cultural Development* 11, pp. 523-534.
- Zhuang Zeyi (1996): "Xian-gang-hua: Zhui-yang-hau de Fang-yan" [Hong Kong language: the most westernized dialect], *Zhong-guo Yu-yan Tong-xun* [Chinese Language Communication] 37, pp. 41-45.

**PAUSES IN SIMULTANEOUS INTERPRETATION:
A CONTRASTIVE ANALYSIS
OF PROFESSIONAL INTERPRETERS' PERFORMANCES**

Michela Cecot
Freelance Conference Interpreter

1. Introduction

The aim of the present study is to describe the performances of 11 professional interpreters, who were asked to interpret two texts from English into Italian. The texts were read by a native English speaker, at two different speech rates, in order to compare pause occurrence in the source and target texts. Differences in terms of pause duration and pause function were recorded and categorised according to the current literature on pauses in psycholinguistics and rhetoric.

The results obtained from the analysis of target texts were then compared to each interpreter's subjective perception of their own delivery. Significant inconsistencies between the objective data and the subjective perception of performances were highlighted, which suggests that there is a need to enhance interpreters' awareness of their own delivery.

2. The simultaneous interpreter: a public speaker

The relevance of non-verbal communication for simultaneous interpretation is highlighted in the current literature. Indeed the focus is not only on content but also on form.

Gile (1995: 152), for instance, states that the concept of *fidelité informationnelle* refers both to content and form. This means that interpretation consists of translating a source text into a target text, maintaining not only the content but also the stylistic and rhetorical element which characterises it (Riccardi 1999: 48). Straniero (1999: 109) draws attention to the fact that the absence of spontaneous prosodic features hinders the smooth comprehension of the text. Politi (1999: 200) emphasises the role of intonation and pauses, which are considered a sort of 'oral punctuation conveying further information, counteracting the oral nature of the discourse and catching the attention of the listener'. Viezzi (1996: 96) defines the elusive concept of quality in interpretation, introducing four parameters, namely equivalence, accuracy, appropriateness and usability. The last parameter concerns the non-linguistic aspects of oral production, related to target text delivery. Prosody, pauses, voice quality, hesitations, all have a significant role in communication. A monotonous

interpreter jeopardises the usability of the target text. The interpreter, as a public speaker, has to use pauses correctly and to adopt a proper speech rhythm. Viaggio (1992) provides an exhaustive description of simultaneous interpretation, focusing attention on what he calls the ‘textual activity component’, namely form. The interpreter is asked to be ‘duly conversant with the use of oral speech, first and foremost intonation and pause management’, to save time and to convey ‘modal information suprasegmentally’ (Viaggio, 1992: 311).

3. The importance of non-verbal communication for simultaneous interpretation

The *reality of speech* (Poyatos, 1997: 249) consists of ‘what we say’, namely verbal communication, ‘how we say it’, paralinguistics, and ‘how we move what we say’, namely kinesics. All aspects involved in the *reality of speech* are relevant for interpreters since they interpret messages conveyed through words, paralinguistic elements and gestures. Non-verbal components are sometimes useful to understand the real meaning of the message, beyond the surface of words. Non-verbal aspects of communication have been subdivided into *vocal* and *non-vocal* non-verbal aspects¹, the first being related to paralinguistics and prosody, the latter to kinesics and prossemics.

Prosody is the use of vocal non-verbal aspects for communication purposes and it consists of features (*pitch, loudness, duration and pauses*) and components (*tempo, intonation, stress and rhythm*). The ability of the interpreter to manage properly these different prosodic elements, usefully serves as a ‘*safety net* when he gets in difficulty’ (Weber 1989: 164). Interpreters use prosody to deliver their texts more smoothly (Straniero 1999: 110). Alexieva (1990: 5, in Straniero 1999: 110) noted that ‘a clever use of one’s voice qualities - in addition to a felicitous choice of prosody, may also contribute to the transmission of the speaker’s message to the audience and thus ensure a successful realisation of the communicative act’.

4. The relevance of pause occurrence

The present study is focused on the role and function of pauses, which are one of the four prosodic features whose co-occurrence gives rise to the four prosodic components. The link between the various features and components is evident, and pauses are associated with other prosodic elements. For instance, speech rate

¹ More precise and detailed information on the functions of verbal and non-verbal communication may be found in Cecot (2000).

depends on pause frequency and duration, and intonation contours are emphasised by pause occurrence.

Hargrove and McGarr (1994: 109) stated that pauses 'are physically represented as a period in time in which no acoustic signal occurs for at least 200-270 msec'. Pauses are referred to as *silence*, *hesitation* and *uncture*. Indeed, pauses are silent intervals of variable duration located between linguistic units that can be compared to suprasegmental elements (Simone 1990). Simone (1990: 126) distinguishes between two types of pauses. The first, *individual* pauses, are occasional silent moments due to the communicative intention of the speaker or to external events, and the second, *functional* pauses, are placed at grammatical *unctures*, namely outside the boundaries of words and clauses. But there is also a third type of pause not functional to communication, namely *hesitation pauses*, which occur at non-grammatical *unctures*. *Hesitation pauses* may be subdivided into *filled* and *unfilled* pauses. The first are disturbing elements for the listener, such as vowel lengthening and the use of the fillers 'ah', 'ehm', 'eh', etc. (Canepari 1985). Spontaneous speech is characterised by the occurrence of *non-fluencies*, such as false starts, interruptions and incomplete sentences, which are mainly due to the nature of linguistic production. These features may co-occur during the performances of interpreters. For instance difficulties in the syntactic or lexical planning of the discourse coincide with the occurrence of *hesitation pauses*.

Pichler (1995) underlines that *grammatical pauses*, namely pauses at grammatical *unctures*, differ from *hesitation pauses* in terms of distribution and duration. Hesitation pauses do not follow any distribution rules, since they are spontaneous and due to on-line planning, lexical difficulties, etc. Hence a regular distribution of pauses may only be recorded in read texts (1995: 56), in which there is no need for on-line planning. This means that there is no regular distribution of pauses in the target texts produced by interpreters. As far as duration is concerned, grammatical pauses follow a hierarchy. Pauses at the end of major constituents are longer than pauses within constituents.

The duration and distribution of pauses depend on the individual physiology of the speaker (*breathing pauses*), on the production task (reading or spontaneous speech - *lexical or syntactic planning pauses*) and on the communicative intentions of the speaker (*rhetorical pauses*).

Hargrove and McGarr (1994) focused attention on the communicative function of pauses. Speakers segment their discourse through grammatical pauses, enabling the listener to understand the syntactic organisation of the discourse. Moreover, pauses emphasise the new and most important information in a sentence and, last but not least, provide time to plan the discourse. Hence pauses are useful for all the actors involved in the communicative act.

5. Pauses in psycholinguistic and rhetorical studies

The first studies on pauses were published in the 1960s, but it was only in the 1980s that the role of pauses was thoroughly investigated. In the 1960s pauses were seen as signals of uncertainty and hesitation, as interruptions in oral production (Petrilli 1985). It was in the early 1980s that a new approach to pauses emphasised the relation between pause occurrence and emphatic devices, the association between pause occurrence and pragmatics (Pribram 1980) and the functional aspects of pauses (Brown and Yule 1983). In 1980 Grosjean stated that

there may be 40 or 50 different variables that can create a silence in speech. A silence may mark the end of a sentence, you can use it to breathe, you can use it to hesitate: there may be 10 or 15 different things happening during silence (1980, in Avesani and Vayra 1992: 389).

In 1985 Petrilli suggested that ‘silences’ have a communicative value. The relation between pauses and pragmatics was emphasised in the 1990s by Giannelli (1992), who draw attention to the fact that pauses and other prosodic devices, such as intonation, emphasise new information in the sentence. These pauses have been referred to as ‘wise pauses’. Other authors underlined the relation between prosody and discourse organisation (Avesani and Vayra 1992), emphasising the link between intonation and pauses. Avesani and Vayra (1992) presented Grosjean’s categorisation of pauses into pauses at the end of syntactical boundaries, breathing pauses and hesitation pauses. According to Studdert-Kennedy (1983) the latter mirror automatic cognitive and physiological processes and have nothing to do with the communicative intentions of the speaker. Yet the public speaker is trained to make breathing pauses and pauses at the end of syntactical boundaries coincide with grammatical junctures and with relevant information in the discourse.

This means that psycholinguists focus on the physiological and cognitive processes which are at the basis of pause production, whereas rhetoric and public speaking focus on the communicative aspects linked to pauses.

5.1 A psycholinguistic approach

As stated above, psycholinguistics analyses the cognitive and physiological aspects linked to pause occurrence, namely *speech understanding* and *speech production*, in the following ways:

- By analysing situations when communication fails, namely when there are disfluencies, in order to understand processes that take place under normal conditions;

- By conducting experiments with normal subjects;
- By setting up software programs.

The present study is based on these modalities. Source and target texts have been analysed in terms of the occurrence of disfluencies, in order to understand the processes that occasioned them. The source text involved a reading task, while the target texts entailed all the tasks involved in simultaneous interpreting performed by normal subjects. The recording and measurement of pauses was carried out through a software program.

As far as the contribution of psycholinguistics to pause occurrence in interpreter's texts is concerned, the studies of Goldman-Eisler (1968) are particularly useful. The author notes that in the early 1960s researchers began to focus on the relation between human beings and time and discovered that mankind struggles to avoid time pressure. In conversation, for instance, time is shared among participants and in simultaneous interpretation time pressure is particularly important.

On the basis of these assumptions Goldman-Eisler (1951) studied the relation between periods of inactivity and periods of activity in speaking, which means the relation between pauses and linguistic production. Goldman-Eisler (1951) noted that pauses follow a certain scheme and that they determine speech rate, which is a personal characteristic of the speaker. Silent periods mirror central activity, since activity periods are peripheral phenomena. 'A passage of speech extending into time consists of two sorts of time: time of vocal action and time of silence' (Goldman-Eisler 1968: 11). This means that spontaneous speech is characterised by discontinuity due to hesitations and breathing. Goldman-Eisler analysed the occurrence of hesitations in interviews and in simultaneous interpreted texts. Hesitation pauses signal content, syntactic and lexical planning. Even in the case of interpreters, syntactic and lexical planning may lead to hesitations and Goldman-Eisler noted in particular that hesitations in interpretation increase when interpreters change the source text (ST) structure.

Goldman-Eisler's findings are limited by lack of reference to the languages used, which would have been particularly relevant when comparing syntactic structures in ST and TT.

Goldman-Eisler emphasised the relation between on-line planning and hesitations and stated that 'the creative act of generating speech interferes with the proficiency of rhetorical performance' (1968: 95). Hence the author recognised the existence of pauses which are rhetorical in function and which are useful for effective communication.

5.2 A rhetorical approach

Recent public speaking studies, based on the ancient *ars bene dicendi*, emphasise the role of silence, which challenges rhetoric (Mortara Garavelli 1998). Delivery is not the most complex aspect of public speaking, but it acquires great importance since it attracts the attention of the listener who will be positively impressed by an effective public speaker. Voice control, namely loudness, intonation, diction, speech rate and, obviously, pauses are tools at the disposal of public speakers. Pauses highlight transition points in the discourse, emphasise significant concepts, give time for thinking – in short they are persuasion instruments. Beebe and Beebe (1991) demonstrate that 93% of the emotional impact conveyed by a message depends on non-verbal communication, 38% on prosodic elements and 55% on facial expression. Hence the need for interpreters to develop public speaking skills.

6. Pause categorisation

An in-depth description of the history of pause categorisation will be provided to reaffirm the relevance of pause occurrence in oral discourse, and to convey a clear image of the whole variety of pauses that a speaker may use.

Maclay and Osgood (1959) were the first to propose a categorisation of pauses. They distinguished between *filled* and *unfilled* pauses. The former included: *repetition*, *false starts* and *vowel lengthening*. Many other authors based their own studies on this categorisation.

(a) One of the most recent and accurate proposals is the categorisation put forward by Magno Caldognetto, De Zordi and Corrà (1982). They stressed the fact that pauses are necessary for comprehension and production of spontaneous speech; pauses are useful signals to understand the processes underpinning production, namely *macro* and *micro on-line planning* of the discourse. The former refers to semantic and syntactic organisation of the utterances, the latter refers to lexical choices. Both require a sort of ‘production moment’ (*tempo reale di elaborazione*, Magno Caldognetto *et al.* 1982: 13) provided by pauses. The authors analysed the relation between discourse planning and speech production and mentioned Goldman-Eisler’s theory of a temporal cycle in which two phases, ‘hesitation phase’ and ‘fluent phase’, alternate. In the case of phase overlapping there is an increase in pause frequency. The speaker may have not planned the whole discourse before beginning to speak and pauses, interruptions and repetitions signal the need to plan the discourse.

The authors focused attention on the role of pauses for the ‘theoretical concept of ideal production’ (Magno Caldognetto *et al.* 1982: 14), which

foresees the occurrence of pauses between sentences, utterances and clauses, namely at grammatical junctures. These ‘pauses for the speaker’ (Magno Caldognetto *et al.* 1982: 15) enable them to breathe. Spontaneous speech is characterised by the presence of these pauses, but also by the use of *non-fluencies*, namely fluency interruptions, which are categorised as follows:

1. *unfilled pauses or initial delay* which, for the interpreter, correspond to the décalage with the source text;
2. *Unfilled pauses within the utterance or juncture pauses*, such as pauses occurring at grammatical junctures, which are useful for the speaker and the listener at the same time. The former makes breathing pauses coincide with grammatical junctures to let the latter understand the syntactic organisation of the discourse;
3. *Unfilled pauses within clauses in the utterance*, namely pauses occurring at non-grammatical junctures, due to cognitive or socio-linguistic factors, or to speaker disorders.
4. *Filled pauses, hesitations*, such as *ehh, mhm, mah, beh, bah* (used by Italian speakers), glottal clicks, audible breathings;
5. *Parenthetical sentences, corrections*;
6. *Utterance interruptions*:
 - a) *repeats*, i.e. a word or a phrase is repeated, usually after a pause
 - b) *restructurings*, a sentence is interrupted and rearranged after a pause, with a change in strategy but not in the meaning of the utterance
 - c) *incomplete sentences or false starts*, a sentence is interrupted and remains incomplete since the following one is characterised by a change in meaning.

McNeill (1979) defines *filled pauses, utterance interruptions* and *parenthetical sentences* as *disfluencies*, which are to be found in spontaneous speech. Starweather (1980) stated that speaking fluently does not mean speaking without pauses, it means speaking with a number of pauses and hesitations, which do not exceed the norm.

- (b) Duez (1982: 13-14) focused attention on an aspect related to pause function which had not been analysed by Magno Caldognetto *et al.* (1982), that is the stylistic function of pauses in political and casual interviews and in political speeches. The author recorded the presence of:
 - a) *silent pause*, ‘any interval of the oscillographic trace where the amplitude is indistinguishable from that of the background noise’
 - b) *filled pause*, i.e. the occurrence of hesitation interjections
 - c) *false start*, ‘any sequence of segments that is intended to start the next utterance but is interrupted and replaced by another that will get completed’

- d) *repeat*, ‘any unintended repetition of a sequence of phonetic segments that is subsequently produced in its complete intended form’
- e) *lengthened syllable*.
- (c) Hieke (1981) introduced a new approach to hesitation phenomena. They are considered as strategies to gain time or to correct already produced utterances, which means that hesitations are signals of the speaker’s willingness to control production quality. They are subdivided into *stalls* (*silent pause, filled pauses, prospective repeats and syllabic prolongation*) and *repairs* (*false starts, bridging and retrospective repeats*), both linked to the concept of *error avoidance*.
- (d) The following is a new categorisation of pauses which draws on all these studies:

Non-fluencies		
Unfilled or silent pauses		Disfluencies
Communicative pauses	Non-communicative pauses	Filled pauses, glottal clicks, audible breaths, vowel and consonant lengthening
Initial <i>décalage</i>	Hesitation pauses (non-grammatical pauses)	Parenthetical sentences
Segmentation pauses		Utterance interruptions: a. repeat b. restructuring c. false start
Rhetorical pauses (grammatical and non-grammatical pauses)		

Table 1

Non-fluencies, i.e. fluency interruptions, are divided into *unfilled or silent pauses* and *disfluencies*. Silent pauses have been subdivided into *communicative* and *non-communicative* pauses, to highlight the communicative function that pauses may have. For instance, the *initial décalage* is useful for the interpreter but at the same time it may be considered as a rhetorical device to capture the attention of the listener at the beginning of the speech. *Segmentation* pauses occur at grammatical junctures. They are used as breathing pauses by the speaker and they allow the listener to understand the syntactic structure of the discourse. The hierarchical distribution of pauses and their length help the listener to understand the relations among the components of the discourse. For instance, pauses within sentences are shorter than pauses at the end of the sentence. *Rhetorical* pauses may occur at grammatical or non-grammatical junctures, for instance within a clause or even between an article and the noun.

These rhetorical devices cannot be considered as disfluencies, since they have a precise communicative role, they emphasise the word they precede. Rhetorical pauses have not been mentioned by Magno Caldognetto *et al.* (1982) in their categorisation. The lack of controlled studies on the stylistic-rhetorical function of pauses limits the possibility for a thorough discussion of pause occurrence in different text typologies. The present study is aimed at describing pause occurrence in read formal source texts, compared to target texts produced by professional interpreters, which have the characteristics of both spontaneous and formal speech.

More formal speech is characterised by the occurrence of communicative rhetorical pauses, whereas spontaneous speech is characterised by the presence of *disfluencies*, namely fluency interruptions, which do not have a communicative role. They are due to both *micro* and *macro* on-line *planning* of the discourse.

7. Experimental Study

The new categorisation of pauses presented above (Table 1) was used in the following experimental study to find out which type of non-fluencies characterise the interpreter's output.

7.1 Aim of the study

The aim of the study is to provide a description of professional interpreters' performances in order to bridge the gap between theory and practice which has been denounced by many authors (e.g. Gile 1995, Stenzl 1989). The study is divided into two parts. The first consists of an analysis of the two source texts (STs) read at two different speech rates. The various non-fluencies have been divided into the different categories of table 1 and subsequently counted and measured. The second part consists of the recording and measurement of non-fluencies occurring in the target texts (TTs). Non-fluency occurrence in STs and TTs has been compared to detect any correspondence between the two, to understand why interpreters hesitate or pause.

7.2 Materials and methods

7.2.1 Subjects

The subjects are 11 professional interpreters, working either for the European Institutions or in the private market. To obtain a homogeneous sample, 10 out of 11 interpreters are currently teaching at the School for Interpreters and

Translators in Trieste and just one is a professional working outside the School, and thus function as a point of comparison. Yet, these interpreters have different backgrounds in terms of career and working environment; for some of them English is their B language, for others their C language. All this may have an impact on their approach to interpreting.

All of them are Italian native speakers and they were asked to interpret from English into Italian.

The lack of descriptions of professional interpreters' performances (Stenzl 1989) led to the choice of professional interpreters as opposed to students. Moreover, would-be interpreters have not yet gained the necessary experience on the ground to enable them to produce a quality performance and to develop the strategies to cope with difficulties. They would tend to resort to hesitation pauses more frequently than professionals.

As far as the communication context is concerned, all subjects were asked to interpret the texts in laboratory, that is to say in an artificial setting. In a real setting it would not have been possible to collect a statistically significant number of the same interpreted text.

The subjects were divided as follows: 6 women and 5 men. As Bühler (1985: 49) noted, the approach to non-verbal communication depends on experience and gender. Professionals with vast experience are more aware of the role of non-verbal communication. Moreover, significant differences between male and female approaches to prosody have emerged.

7.2.2 Texts

The professional interpreters were asked to translate two texts from English into Italian. The source texts were read by a native speaker, to avoid difficulties deriving from prosodic deviations linked to the pronunciation of non-native speakers. The speaker, who has developed great abilities as a public speaker, was videotaped to allow the interpreters to see him.

The speaker read the texts for the first time, hence the occurrence of disfluencies has been recorded.

The first speech was made by Ms Joyce Quinn at the Franco-British meeting in Paris, 14 January 2000; the second speech was delivered by Mr Keith Vaz at the Cambridge Union, 10 March 2000. Both texts touch upon themes such as the enlargement of the EU, unemployment, the Euro and Agenda 2000. They belong to the same genre, they are political speeches.

A week before the experiment took place, all subjects had been informed about the topic, namely international politics and Great Britain's stance on European issues. Just before the experiment, the professionals were told the precise topic of the texts, the name of the speakers and the date and place of

these speeches. The subjects were not told that the first texts would be read at a faster speech rate than the second, in order not to give any clues about the aim of the study.

7.2.3 Recordings

The performances were recorded with a Tascam recorder.

7.2.4 Transcription of texts

The transcription of texts caused difficulties because of the absence of codified and established transcription norms. Unfilled pauses and disfluencies have been signalled as follows:

(...) = pauses (Benveniste and Jean Jean 1987)

[:] = vowel and consonant lengthening

underlined = repeats, false starts, restructuring

Vowel and consonant lengthening has been signalled only to have an idea of the occurrence of this sort of disfluency compared to the others.

After careful listening, the collected material was analysed by a software program, *Creative Wave Studio 4.06*, which allowed visualization on screen and the measurement of silent pauses.

Unfilled pauses characterised by a duration of less than 250msec were not taken into account, according to the threshold proposed by Goldman-Eisler (1968).

7.2.5 Questionnaire

After interpreting both texts the eleven interpreters were asked to answer a series of questions on pause function in ST and TT. Most interpreters added comments on their personal perception of pause occurrence in ST and TT.

7.2.6 Analysis criteria

Target texts were analysed in terms of non-fluency occurrence. Disfluencies and unfilled pauses were counted and measured. Attention was focused on the following disfluencies and pauses:

Disfluencies (according to the definition provided by Magno Caldognetto *et al.* (1982):

- filled pauses, *ehm, eeh, mmh, ah*;

- repeats;
- restructuring;
- false starts;
- vowel and consonant lengthening, which are signals of difficulties linked to on-line planning and hence do not appear in the read STs;

unfilled pauses:

- ‘segmentation’ pauses, namely grammatical pauses which have a communicative function. They are useful for the speaker and the listener at the same time. A clear segmentation of the concepts allows swift recognition and comprehension. Moreover segmentation avoids the risk of overloading the audience’s attention;
- *rhetorical* pauses, occurring at grammatical or non-grammatical junctures, but having a communicative function, since they emphasise new or important information in the clause;
- *hesitation* pauses, namely non-grammatical pauses that do not have a communicative function.

Sometimes it was hard to decide to which category certain pauses belong. Repeated listening of the texts proved to be useful and particular attention was given to intonation. Contrastive analysis of pause occurrence in STs and TTs allowed the recognition of pause function.

7.2.6.1 Speech rate

There is a close link between pause occurrence and speech rate. An increase in speech rate implies a decrease in pause occurrence and pause length. The aim of the study is to analyse pause occurrence in simultaneous interpreting when there is a change in speech rate.

The average speech rate in ST was obtained by counting the syllables uttered by the speaker in 3 samples consisting of one minute each. In the first text the average is 263.3 syllables/min, in the second 204 syllables/min.

7.2.6.2 Methodological difficulties

The initial and final *décalage* in TTs has not been taken into account, since the first words of some TTs were not recorded because of technical problems.

Hesitation pauses have only been analysed from a quantitative point of view, since it is hard to define the reason for hesitating. Indeed, Salevsky (in Gile *et al.* 1997: 116) states that “it is problematic to establish a connection between the

world of ideas and the world of experience, that is to find the reason, in a concrete setting, for a particular hesitation pause”.

8. Results of the questionnaire

A questionnaire was given to all interpreters at the end of the experiment session. The aim was to compare objective data deriving from the analysis of TTs with the subjective perception of the interpreters.

When asked to assess the role of different kind of pauses in TTs, 5 out of 11 interpreters believed that hesitation pauses have a significant role to play, especially from a quantitative point of view. Some interpreters referred to this particular experiment, others referred to their experience in general. All subjects agreed that the speech rate in the first ST was higher than in the second, which meant that there was an increase in hesitation pauses. Three out of 11 interpreters said that pauses due to on-line planning have a very significant role. Ten out of 11 interpreters noted that breathing pauses are physiological aspects linked to oral production. Yet some of them state that breathing pauses cannot be controlled.

Six subjects out of 11 perceived rhetorical pauses as the least important ones. Yet when asked to assess the role of these pauses, the majority of the subjects recognised their importance in TTs. Interpreters say that they do not use rhetorical pauses very often, especially when the speech rate is too high. They noted that when the speech is delivered at an average speech rate the interpreter is involved in the text and hence the author's text becomes the interpreter's text. Moreover if the speaker is a skilled public speaker, the wise use of prosody allows the interpreter to do the same.

Professionals were further asked to explain where and why they paused. Nine out of 11 interpreters remembered at least some of the pauses in their TTs. The majority of the subjects say that they did not perceive any pauses in the first ST, since the speech rate was too high. They felt they had produced hesitation pauses only. 81.8% of the interpreters are aware of the use of hesitation pauses, which are easier to remember since they are related to the difficulties they encountered. Moreover they state that the use of pauses is more or less a mechanical, automatic process. They were not aware of the type of pauses they used, which suggests that the majority of the professionals involved had never thought about pause occurrence in their delivery.

Then the interpreters were asked if pauses in the TTs were speaker-induced pauses. Five interpreters out of 11 noted that pauses in the TTs mirrored the speaker's choice in the STs. Four interpreters agreed when asked, but argued that sometimes this was not the case.

The majority of the subjects stated that the use of pauses in TTs is aimed at conveying a message which is equivalent to the original.

Even though the subjects admit that sometimes excessively long pauses may hinder comprehension, since they have to wait longer to understand the message, the vast majority think that pauses in STs help comprehension. Hence they reaffirm the usefulness of pauses for both comprehension and delivery.

9. Results and discussion

The analysis of the two source texts provided a reference model for the analysis of target texts. In the first text there were 109 pauses, of which 80 were segmentation pauses and 29 rhetorical pauses. In the second text there were 142 pauses, of which 97 were segmentation pauses and 45 rhetorical pauses. In both texts there are no hesitation pauses, since they are read. Reading does not require on-line planning of the discourse.

Segmentation pauses are extremely important since they highlight the boundaries between information units.

As far as disfluencies are concerned, there are only 5 corrections in the first text and 4 in the second. This was related to the fact that the reader was reading the text for the first time. According to Goldman-Eisler (1968) fluency in reading can be improved re-reading the text several times.

The results obtained analysing the TTs were compared to ST results.

In 5 out of 11 TT1s the number of unfilled pauses (segmentation pauses and rhetorical pauses), which have a counterpart in ST1 was less than half the total number of pauses in TT1. In 5 out of 11 TTs the number of pauses with a counterpart in the ST1 is more than half the total number. Pauses that have a counterpart in ST1 maintain the same function, which means that often the syntactic structure remains unchanged.

As far as the second text is concerned, in 7 out of 11 TT2s the number of unfilled pauses which have a counterpart in ST2 was less than half the total number and in 3 out of 11 TT2s it is more than half the total number.

According to these results the trend is for interpreters to follow the speaker's pattern in terms of unfilled pause occurrence (segmentation and rhetorical pauses).

Hesitation pauses in TT1s and TT2s do not have a counterpart in STs. Moreover, the comparison between TT1s and TT2s shows a significant decrease in hesitation pause occurrence in TT2s. That is to say that a decrease occurs when the speech rate is higher in the STs.

As far as disfluencies are concerned, they outnumber unfilled pauses in both texts. In the second TTs there is an average increase in the number of filled pauses, corrections and vowel and consonant lengthening.

9.1 Comparison between male and female interpreter performances

In the second TT both women and men used a larger number of pauses. Women used more filled pauses and men used more unfilled pauses. Moreover, as far as pause duration is concerned, pauses in men's texts lasted longer. This means that men tended to speak more slowly than women, using pauses more frequently.

	Average occurrence of silent pauses		Average occurrence of disfluencies	
	TT1	TT2	TT1	TT2
Men	75.3	111	104.8	166.5
Women	70.2	92	124	176.4

Table 2

10. Comparison between questionnaire and text analysis results.

A very significant part of the present study is focused on the comparison between data deriving from the analysis of TTs and the personal opinions of the 11 interpreters.

Firstly, in the questionnaire the subjects were not asked to assess the role of non-fluencies in the TTs, since these aspects of oral communication have been analysed simply for the sake of a clear categorisation of pauses. Indeed, the isolation of these elements allows us to focus on pauses and their function.

Disfluencies may occur in simultaneous interpreted texts, since they are linked to difficulties related to on-line planning of the discourse, to time pressure. The time lag necessary for interpreters to organise and plan their discourse may derive from the use of disfluencies, which may be considered as time gaining devices or even as interpreting strategies. Yet the excessive use of disfluencies may disturb the listener. Moreover the use of certain kinds of disfluencies depends on the way people talk. Some people do use vowel lengthening, filled pauses, and repetition as part of their own way of speaking. Women tend to use disfluencies more than men do. Women tend to increase their speech rate, which means that pause frequency and duration are lower and disfluency occurrence higher.

These disfluencies are significant from a quantitative point of view, since in the first TTs there are on average 73 unfilled pauses and 113.5 disfluencies and in the second TTs 102.3 unfilled pauses and 171 disfluencies. Disfluencies outnumbered unfilled pauses.

Secondly, it is important to stress that the personal categorisation of pauses proposed in Table 1 is the result of the comparison between the analysis of the interpreted texts and the assessment of the professionals' personal opinions. For

instance, the category '*breathing pauses*' was considered as a physiological feature of oral production by the majority of the subjects. Most interpreters stated that it is hardly possible to gain control over these pauses, which are mechanical. But according to the literature on public speaking it is clear that skilled public speakers make these pauses coincide with grammatical junctures. Indeed some interpreters make their non-audible breathing pauses coincide with grammatical junctures without even realising it. Many female interpreters produced audible breathing pauses, which are usually considered as disfluencies, but when they coincide with syntactic boundaries they can be classified as *segmentation* pauses. Interpreters should be able to develop the necessary public speaking skills to control their breathing pauses, avoiding audible breathing and making silent breathing coincide with syntactic boundaries to aid comprehension.

As far as *hesitation* pauses are concerned, the definition in the personal categorisation did correspond with the idea expressed by the subjects. In the questionnaire a distinction was made between *hesitation* pauses and pauses due to *on-line planning* (*pause di pianificazione*), but all subjects agreed that pauses due to syntactic and lexical on-line planning are to be considered as hesitation pauses, since interpreters interrupt the smooth flow of speech to plan their discourse. Moreover it is almost impossible to decide which pauses are due to lexical or syntactic on-line planning and which are due to difficulty in comprehending the message.

In the questionnaire the interpreters were asked to assess the role of *communicative* and *rhetorical* pauses. 45.5% of the subjects believe that there is a clear difference between the two, whereas according to 54.5% of them the two concepts overlap. According to these suggestions by the interpreters and in the light of available literature a new approach was adopted. The adjective *communicative* has been used to define both *segmentation* and *rhetorical* pauses.

Going back to hesitation pauses, 45.5% of the subjects consider hesitation pauses as highly significant from a quantitative point of view and refer mainly to the experiment session. Moreover, 27.2% of the subjects consider pauses due to on-line planning very significant. Since it has been agreed that they are both hesitation pauses, this means that 72.6% of the interpreters consider hesitation pauses as a very significant feature in interpreted texts. 81.8% of the professionals believe that there is a larger number of hesitation pauses in the first TTs, because of the very high speech rate in the ST. Yet the reverse is true. There are more hesitation pauses in the second TTs. Only one professional was aware of this and said that this was due to the larger amount of time at the speaker's disposal for thinking and planning in the second ST.

Moreover all subjects say that hesitation pauses are the most significant ones in the interpreting process because they believe that they outnumber all the other types of pauses. In fact the most frequently used pauses are *segmentation* pauses.

Rhetorical pauses are another very interesting point. In the questionnaire 54.5% state that rhetorical pauses did not have a very significant role to play in these texts, since they neglect the use of these pauses in their texts. The majority of the subjects consider only very long pauses as rhetorical pauses, but in this context even very short pauses have been considered as rhetorical if their function was to emphasise certain words or concepts. Interpreters were not aware of their use of rhetorical pauses. When asked to express their personal opinion about rhetorical pauses in general, all interpreters agreed that they are extremely important as emphatic devices.

As far as interpreters' awareness of the use of pauses is concerned, it is important to note that the majority of the subjects do not remember having used segmentation or rhetorical pauses, they only remember the occurrence of hesitation pauses since they are related to difficulties. This means that sometimes interpreters pause where the speaker is pausing without even realising it. Indeed almost half of the pauses in TTs have a counterpart in STs but the interpreters were not aware of this, even though 81.8% noted that pauses in the TT mirror the speaker's choices in the ST.

100% of the subjects emphasise the importance of pauses both for comprehension and for production. A judicious use of pauses may be a useful strategy to enhance the *usability* of the interpreter's text.

As far as interpreting strategies are concerned, interpreters are required to find a certain number of strategies to cope with time pressure. As already mentioned, the use of disfluencies can sometimes be considered as a strategy. Vowel or consonant lengthening is a time gaining device, repetitions may be used to add further details to what has already been said, and so on. More frequently interpreters stop at grammatical junctures to breathe and to signal the end of a unit of meaning but then the pause becomes longer and the initial segmentation-breathing pause becomes a hesitation pause due to on-line planning. This means that sometimes it is hard to define pauses in one single category, since different functions inevitably overlap.

11. Conclusion

The aim of the study was to prove the importance of pauses in simultaneous interpreting. In order to do this it was essential to define what simultaneous interpreting is all about and to stress the role of the oral component. On the basis of these definitions the relevance of prosody for simultaneous interpreting emerged clearly. Among all the prosodic elements pauses have an important role

to play in oral production. Pauses have been described from the point of view of psycholinguistics and rhetoric. As far as rhetoric is concerned it has been shown that interpreters are required to develop public speaking skills to obtain quality performance. A careful use of voice and silence may enhance the *usability* of the interpreter's text. All interpreters involved in the experiment session emphasise the significance of the rhetorical component in simultaneous interpreting. Yet their texts are characterised by a statistically significant number of disfluencies, which may disturb the listener. Moreover, the most frequently used pauses are segmentation pauses, followed by hesitation pauses. The majority of the interpreters were not aware of the use of pauses in the TTs. It is for this reason that this study could be significant. The description of professionals' performances in this respect may enhance the interpreters' awareness of their own delivery. This means that interpreters may be helped to perceive their own weaknesses and to improve. Moreover, detailed descriptions may be used as a didactic tool for would-be interpreters.

Appendix

The following are excerpts of ST 1 and of TT 1 transcriptions. No punctuation or orthographic rules were applied. The following symbols have been used to identify *non-fluencies*:

- (...) = pauses measured in milliseconds;
- [:] = vowel and consonant lengthening;
- underlined = repeats, false starts, restructuring;

Source Text 1 (ST 1)

The UK is no longer out of touch with her partners (362) and standing alone against the tide of further integration (709) the Prime Minister said in Paris in March last year (361) 'Britain's future lies in being a full partner in Europe' (864) we want Britain to be influential and respected in Europe(709) and I believe that we now are: (903) we are forging new alliances new links across the European Union (555) in the last two months alone we have made an historic agreement with France on the future of European Defence (632) launched a Joint Initiative with Spain on promoting employment and labour market flexibility (645) reached agreement with Sweden on promoting social inclusion and gender equality (413) made a Joint Statement with Germany on EU taxation (1238) we have instigated a Step Change in our relations with all our EU partners (503) and with the applicants from Central and Eastern Europe (709) this Step Change has already brought political and economic benefits (361) both to the UK and to

Europe as a whole (439) and will bring more (1135) but that does not mean that we are blind to the challenges that Europe is facing today (619) make no mistake about it, further reform is required, (554) if Europe is to be successful in the 21st century (374) as it has been in the 20th (941) [...]

Target Text 1, subject 1:

Abbiamo ridefinito: l'approccio: e: il Regno Unito all'Unione Europea (1400) non: si tratta più di un: (485) isolamento ma piuttosto n: no scorsò: è stato che il futuro della Gran Bretagna (488) eh rientra nell'Euro:pa intendiamo che: (276) la Gran Bretagna sia (257) abbia influenza e eh (589) sia oggetto di rispetto in Europa (444) stiamo: stringendo nuove alleanze: nuovi collegamenti nell'Unione Europea (534) e: (505) negli ultimi due me:si (614) abbiamo raggiunto un accordo storico della Fra con la Francia per la difesa europea abbiamo lanciato: mmh un'iniziativa con la Spagna pe:r (305) la flessibilità del mercato del lavoro: e abbiamo raggiunto accordi con: la Svezia: (466) eh (594) per l'inclusione sociale: inoltre (417) abbiamo raggiunto accordi anche: dal punto di vista fiscale con la Germania (1784) ci sono stati grandi cambiamenti n: nelle relazioni con tutti i partner: dell'eum dell' Unione Europea scusate (618) e (919) questi cambiamenti hanno portato sicuramente dei vantaggi economici e politici si:a per la Gran Bretagna che per: l'Europa in generale (519) ma ciò non significa (782) eh che non vediamo le sfide future (1844) sono necessarie ulteriori riforme: (430) per raggiungere: il successo nel: XXI secolo come (330) è stato raggiunto nel XX secolo (550) [...]

Target Text 1, subject 2:

Abbiamo ridefinito: gli approccio: l'approccio britannico all'Europa (733) e la: il Regno: eh (577) Unito si è allontanato un po' dalle politiche (272) eh comunitarie (372) e eh mmh vogliamo che la eh Gran Bretagna sia eh rispettata in Europa (893) noi: eh siamo: stiamo stringendo nuovi legami attraverso l'Unione Europea (397) e: in questi ultimi mesi abbiamo stretto mmh mmh (297) rapporti con la: eh Francia (447) per eh sviluppare eh ulteriori possibilità abbiamo raggiunto degli accordi con la Svezia (5959) per quanto riguarda la parità fra i sessi e anche con la Germania per problemi fiscali (446) abbiamo: iniziato a cambiare i nostri rapporti con tutti i partner europei e dell'Europa orientale e occidentale (446) e abbiamo già avuto i primi vantaggi politici economici (322) per la Gran Bretagna e per l'Europa in generale questo non significa che: (347) eh noi mmh siamo sordi alle nuove sfide (348) ci vogliono

nuove riforme se l'Europa vorrà avere successo nel nuovo secolo come nello scorso secolo [...]

Target Text 1, subject 3

Il Regno Unito non è più eh (1080) senza contatti con i propri partner è: in favore dell'integrazione (270) il ministro ha detto nel marzo dell'anno scorso che: il futuro dell'Unione (262) è nell'essere: un pieno partner dell'Europa (285) noi vogliamo avere influenza essere rispettati in Europa e crediamo di esserlo ora (416) noi stiamo creando nuove alleanze nuovi legami attraverso l'Unione Europea e negli ultimi due mesi soltanto (339) abbiamo: concluso un accordo storico con la Francia (254) sul futuro della difesa europea iniziato l'iniziativa congiunta con la Spagna (269) nel: promuovere l'occupazione e la flessibilità del mercato dell'occupazione (494) concluso un accordo con la Svezia sul: (948) miglioramento: della: situazione sociale concluso un accordo con la Germania per eh la nuova fiscalità (350) abbiamo migliorato i nostri rapporti con tutti i partner europei (262) e anche con i candidati dell'Europa centrale (979) questo cambiamento: ha già portato benefici economici e politici all'Europa e al Regno Unito e certamente lo farà ancora (625) però questo non significa che siamo: ciechi di fronte alle sfide dell'Europa di oggi (2151) non eh eh (1141) dimentichiamo che sono necessarie altre riforme ci sono nel ci c'è bisogno di nuovi sforzi per il XXI secolo come è stato necessario per il XX (370) [...]

References

- Avesani C. e Vayra M. (1992): "Discorso, segmenti di discorso e un'ipotesi sull'intonazione", in *Storia e Teoria dell'Interpunzione*. Ed. by E. Cresti, N. Maraschio, L. Toschi. Atti del convegno internazionale di studi (Firenze 19-21 maggio, 1988), Roma, Bulzoni Editore, pp. 355-396.
- Beebe S.A. and Beebe S.J. (1991): *Public Speaking. An Audience-centered Approach*, Englewood Cliffs (NY), Prentice Hall.
- Benveniste C.B. et Jean Jean C. (1987): *Le Français Parlé. Transcription et Edition*, Paris, Didier Erudition.
- Brown G. and Yule G. (1983): *Discourse Analysis*, Cambridge, Cambridge University Press.
- Bühler H. (1985): "Conference Interpreting - A multichannel communication phenomenon", *Meta* 30 (1), pp. 49-54.
- Canepari L. (1985): *L'intonazione*, Napoli, Liguori Editore.

- Cecot M. (2000): *Pause in interpretazione simultanea: analisi contrastiva di prestazioni di interpreti professionisti*, unpublished dissertation, Trieste, SSLMIT, Università degli Studi di Trieste.
- Duez D. (1982): "Silent and non-silent pauses in three speech styles" in *Language and Speech*, vol. 25, part 1, pp. 11-28.
- Gee J.P. and Grosjean F. (1983): "Performance structures: a psycholinguistic and linguistic appraisal", in *Cognitive Psychology* 15, pp. 411-458.
- Giannelli L. (1992): "Sul valore comunicativo delle pause 'vuote' nella narrazione e nel proverbio, nella prospettiva funzionale della frase", in *Storia e Teoria dell'Interpunzione*. Ed. by E. Cresti, N. Maraschio, L. Toschi. Atti del Convegno internazionale di studi (Firenze, 19-21 maggio 1988), Roma, Bulzoni Editore, pp. 311-354.
- Gile D. (1983): "Aspects méthodologiques de l'évaluation de la qualité du travail en interprétation simultanée", *Meta*, 28 (3), pp. 236-243.
- Gile D. (1995): *Regards sur la recherche en interprétation de conférence*, Lille, Presses Universitaires de Lille.
- Gile D. et al. (1997): "Methodology", in *Conference Interpreting: Current Trends in Research*. Ed. by Y. Gambier, D. Gile and C. Taylor, Amsterdam-Philadelphia, John Benjamins, pp. 109-122.
- Goldman-Eisler F. (1951): "The measurement of time sequences in conversational behaviour", *Br. J. Psychol. Gen. Sec.* 42, pp. 355-362.
- Goldman-Eisler F. (1968): *Psycholinguistics: Experiments in Spontaneous Speech*, London, Academic Press.
- Grosjean F. (1980): "Linguistic structures and performance structures: Studies in pause distribution", in *Temporal Variables in Current Speech. Studies in Honour of Fireda Goldman-Eisler*. Ed. by H. Dechert and M. Raupach, The Hague, Mouton, pp. 91-106.
- Hargrove P.M. and McGarr N.S. (1994): *Prosody Management of Communication Disorders*, San Diego, California, Singular Publishing Group Inc.
- Hieke A.E. (1981): "A content-processing view of hesitation phenomena" in *Language and Speech*, vol. 24, part 2, pp. 147-160.
- Maclay H. and Osgood C. E. (1959), "Hesitation phenomena in spontaneous English", *Word* 15, pp. 19-44.
- Magno Caldognetto E., De Zordi E., Corrà D. (1982): "Il ruolo delle pause nella produzione della parola, in *Quaderni del Centro di Studio per le Ricerche di Fonetica*, 1, pp. 212-237.
- McNeill D. (1979): *The Conceptual Basis of Language*, Hillsdale, LEA.
- Mortara Garavelli B. (1998): *Manuale di retorica*, Milano, Bompiani.

- Petrilli R. (1985): "Valore delle pause nella comunicazione verbale orale", in *Sintassi e Morfologia della Lingua Italiana d'uso*. Ed. by A. Franchi De Bellis and L. Savoia, Roma, Bulzoni, pp. 429-436.
- Pichler D. (1995): *Analisi vocale durante prove di interpretazione simultanea: un confronto tra due situazioni stressogene*, unpublished dissertation, Trieste, SSLMIT, Università degli Studi di Trieste.
- Politi M. (1999): "Interpretazione simultanea tra due lingue romanze", in *Interpretazione Simultanea e Consecutiva, Problemi Teorici e Metodologie Didattiche*. Ed. by C. Falbo, M. Russo and F.S. Straniero, Milano, Hoepli, pp. 189-201.
- Poyatos F. (1997): *Non-verbal Communication and Translation*. Ed by F. Poyatos, Amsterdam-Philadelphia, John Benjamins Publishing Company, pp. 249-282.
- Pribram K. (1980): "The place of pragmatics in the syntactic and semantic organization of language", in *Temporal Variables in Current Speech. Studies in honour of Frieda Goldman-Eisler*. Ed. by H. Dechert and M. Raupach, The Hague, Mouton, pp. 13-19.
- Riccardi A. (1999): "Attuali metodi di valutazione dell'interpretazione presso la SSLMIT", in *Quality Forum 1997 Esperienze, Problemi, Prospettive*. Atti della giornata di studi sulla qualità in interpretazione, Trieste, 14 novembre, 1997. Ed. by M. Viezzi. Trieste, SSLMIT, 1999, pp.33-52.
- Simone R. (1990): *Fondamenti di Linguistica*, Bari, Editori Laterza.
- Starkweather C.W. (1980): "Speech fluency and its development in normal children", in *Speech and Language: Advances in Basic Research and Practice*. Ed. by N.J. Lass. Vol. IV, Academic Press, pp. 143-200.
- Stenzl C. (1989): "From theory to practice and from practice to theory", in *The Theoretical and Practical Aspects of Teaching Conference Interpretation*. Ed. by L. Gran and J. Dodds, Udine, Campanotto, pp. 23-26.
- Straniero Sergio F. (1999): "Verso una sociolinguistica interazionale dell'interpretazione", in *Interpretazione simultanea e Consecutiva, Problemi Teorici e Metodologie Didattiche*. Ed. by C. Falbo, M. Russo and F.S. Straniero, Milano, Hoepli, pp. 103-139.
- Studdert-Kennedy M. (1983): "Review to 'Temporal variables in speech'", in *Haskins Laboratories Status Report on Speech Research*. Ed. by H.W. Dechert and M. Raupach, SR-74/75 (1983), pp. 201-207.
- Viaggio S. (1992): "Translators and interpreters. professionals or shoemakers?", in *Teaching Translation and Interpreting: Training, Talent and Experience*. Proceedings of the First Language International

- Conference, Elsinore, Denmark, 31 May-2 June, 1991. Ed by C. Dollerup and A. Loddegaard. Amsterdam-Philadelphia, John Benjamins, pp. 307-312.
- Viezzi M. (1996): *Aspetti della Qualità in Interpretazione*, Trieste, Scuola superiore di Lingue Moderne per Interpreti e Traduttori, Università di Trieste.
- Weber W.K. (1989): "Improved ways of teaching consecutive interpretation", in *The Theoretical and Practical Aspects of Teaching Conference Interpretation*. Ed. by L. Gran and J. Dodds. Udine, Campanotto Editore, pp. 161-166.

NUMBERS IN SIMULTANEOUS INTERPRETATION

Cristina Mazza
Freelance Conference Interpreter

1. Introduction
- 1.1 Numbers

In everyday practice, conference interpreters report a certain difficulty dealing with numbers. On first analysis, it might seem surprising that numbers cause so many problems. Indeed, since their main characteristic is univocity of meaning (Alessandrini 1990), their interpretation should be relatively easy.

In most modern languages, numbers are represented in writing both by their *number name*, for example “five” in English, and by *numerals*, that is special symbols for representing numbers visually, for example “5” (Hurford 1987). While the Arabic code of numerals is almost universal, number names are specific to each language, and are used to reproduce numbers both orally and in writing. Since numerals must represent a potentially infinite set of quantities, the system developed makes it possible to create virtually all numbers from a small set of basic words and fixed syntactic rules, each providing a single piece of information on the number. The main constituents are called *base digits* (0..9 in the decimal system), which are used to create another two lexical classes: *teens* (eleven, twelve,...nineteen) and *tens* (twenty,...ninety). A fourth set of items, called multipliers (e.g. hundred), is used to mark the magnitude of the base digits.

Although this system allows the representation of all numbers, it sometimes requires a long string of items to reproduce a large quantity. For example, English uses two words to say “35”, “thirty five”, while “35,035” needs as many as six terms, “thirty five thousand and thirty five”. The difficulty experienced by interpreters could therefore be a memory problem, due to the need to remember many words for expression of a single concept.

- 1.2 Memory, numbers and simultaneous interpretation

Memory is a complex cognitive activity, whose functions are the *encoding* (comprehension), *storage*, and *retrieval* of input information. These tasks are carried out by two different kinds of memory, *short-term memory* (STM) and *long-term memory* (LTM). Information which must be stored for a short time (1.5-2 seconds) is processed in the STM, while information stored for a long time (from minutes to years) is managed by the LTM (Atkinson 1999). One of

the main functions of STM is to hold and manipulate information while it is used for some cognitive activities (storing, but also reasoning, calculating, etc.). In this case, it is said that STM acts as a Working Memory (Baddeley 1990).

The working memory (WM) is simply the *temporary storage of information that is being processed* (Baddeley 1987: 34). The many experiments conducted over the last decades (Miller 1956; Craik and Lockhart 1972; Baddeley 1987; Harrington 1992) have highlighted that the WM also has an important role in linguistically related complex cognitive tasks, and in the planning and organization of tasks.

However, WM also has several limits. The most striking characteristic is perhaps its very limited capacity in terms of the number of items it can store at the same time (the *memory span*). In his milestone article, *The Magical Number 7*, Miller maintains that on average WM capacity¹ spans sequences of only 7 ± 2 non-related chunks (1958: 91). Linking elements together can be a useful strategy for reducing the number of chunks to be retained by WM (Bower and Springston 1970, mentioned in Atkinson 1999). While chunking is possible with digits, it is less probable than with letters (it is not necessary to form a meaningful word to create a chunk of letters, a syllable being sufficient).

WM capacity varies according to the complexity of the items (letters, words, sentences, texts) and the task to be carried out. Management of extended texts can be facilitated by reducing storage demands - for example, words and syntactic structures can be forgotten, to retain only the general meaning of the sentence (Carpenter *et al.* 1994). However, Seleskovitch (1975: 13/15) considers that:

ce phénomène général de dissociation du sens et des structures sonores dans la mémoire ne s'applique pas au chiffre, [dont] la signification unique implique une (...) concordance entre leur structure sonore et leur signification.

If structural complexity increases the burden on WM, *anticipation* can help cope with processing demands. Anticipation is the establishment of the range of all possibilities that might follow a linguistic item, according to language use (Baddeley 1990, 1993). For example, English usage generally expects an article to be followed by a noun or an adjective, while the occurrence of a verb after it is impossible. With numbers, none of the other elements in a sentence anticipates them. Obviously, expressions like “the rate dropped by” or “the

1 Miller originally put forward the “ 7 ± 2 ” idea for STM. However, in the present article the reference will be to WM, because in simultaneous interpretation STM is used to carry out cognitive activities (see above).

number of X was” make it clear that a quantitative item of information will follow, but they do not help make inferences about its exact value.

The intrinsic difficulty in remembering numbers is accentuated during simultaneous interpretation (SI), which is a complex cognitive activity. In SI the interpreter listens to the incoming message and translates it, to all intents and purposes, immediately. In practice, there is usually a certain delay (*décalage*) between the source text and the interpreter's output (Setton 1999), necessary to understand a meaningful chunk in the source language, process it, and shift language to produce it.

The role of memory in SI is essential. LTM provides essential lexical, syntactic and semantic information to understand the input and produce the output, while WM is needed to keep the input activated while it is being processed and translated, and to monitor the output

The limitations of WM are even more apparent in SI than in normal text comprehension. Indeed, while mnemonic traces are very short-lived in normal listening conditions (Luria 1976), in interpreting they must arguably be stored for a longer time for continuous checking against the target speech (Kalina 1992). This requires continuous rehearsal, known as *subvocal repetition* (Baddeley 1987). However, the presence of many concurrent tasks in SI is likely to cause interference with this operation: Baddeley (1990: 79) has indeed shown that *articulatory suppression*, i.e. concurrent repetition of items, interferes with subvocal repetition.

Against this background, numerals, especially large ones, could increase demands on the interpreter's WM and disrupt the normal encoding, storing and retrieval of the other elements in the text.

1.3 Gile's Effort Model of Simultaneous Interpretation

The Effort Models are based on the idea that the mind has a limited capacity, and that the difficulties in interpretation stem from time constraints and the need to divide attention between several concurrent operations (Gile 1995: 91). In the Effort Models, SI is seen as requiring a balance in the allocation of processing capacity, according to the requirements of each task performed at a given moment.

The Effort Model of SI is based on three non-automatic interpreting Efforts²:

- Listening and Analysis Effort: all the mental operations between perception of discourse by auditory mechanisms and the moment at which the

2 See Gile (1999: 154), and also Setton (1999: 35) for a review.

interpreter either assigns, or decides not to assign, a meaning to the segment s/he has heard;

- Production Effort: all the mental operations between the moment at which the interpreter decides to convey an item of meaning and the moment at which s/he reformulates it in the target speech (TS);
- Working Memory Effort³: all the memory operations from the time a speech segment is heard to the time it is reformulated in the TS or disappears from memory.

The management of capacity allocation (Coordination Effort) between the three Efforts causes further energy consumption. At each moment during SI, the individual Efforts deal with different fragments of the original speech (Gile 1995: 99). The sum of the capacity required by all single Efforts at a specific moment represents the total capacity required, which cannot exceed the total capacity available. If one of the three Efforts suddenly needs more resources to deal with a particularly difficult segment, a part of the attentional capacity is diverted from the other two. However, if all the Efforts are operating close to their allotted capacity, this shift of resources can cause errors in one or more tasks.

Gile has also developed the *Tightrope Hypothesis* (Gile 1999: 157), stating that most of the time interpreters work near saturation level. Therefore, even a limited increase in the attentional requirements could lead to failure. This hypothesis might account for the high frequency of errors and omissions: if interpreters worked well below saturation level, failures should occur only in the presence of very difficult chunks.

Numbers are mentioned several times in his works (e.g., 1984a, 1995, 1999), arguing that they are a problem trigger in SI because of their *low redundancy*. This increases the Listening and WM Effort: it is essential not to miss or forget them, because they cannot be inferred from any other element in the text (Gile 1995: 108).

Numbers are also characterized by *low predictability* (Braun and Clarici 1996). This again increases the Listening and WM Efforts, because no anticipation is possible. The quantity expressed can only be understood the moment it is uttered by the speaker.

In addition, numbers also have a *high informative content* (Alessandrini 1990). Dense speech sections increase processing capacity demands for all Efforts, because the interpreter must process, retain and translate more information per unit of time.

3 Gile originally uses the term STM (see note 2).

According to the Effort Models, numbers are therefore extremely energy-consuming. Each of the three Efforts in SI requires additional resources to deal with them, which is likely to saturate the system or leave insufficient capacity for concurrent Efforts. This could explain the frequency of mistakes with numbers in SI, especially large numbers which are expressed as a string of shorter components.

- Management of numbers in SI

Are there some means, or strategies, by which the interpreter can overcome this difficulty? Obviously, written material (handouts, slides) and the boothmate, who can write down figures and names, are helpful, not only for numbers (Gile 1984b: 84). However, help from these sources is not always available.

One possible solution is reduction of *décalage*. This allows shorter retention in STM, but faster processing and restitution of the input. There is thus more strain on the Listening (Comprehension) and Production Efforts. xxxx

To deal with particularly complex segments, Kalina (1992: 254) suggests that *approximation* could be a useful strategy. She sees it as a means to provide partial information until the interpreter finds a more accurate translation. However, this is probably counterproductive for numbers, because strategies to gain time increase the WM Effort.

Since the main problem with numbers seems to be insufficient WM, a possible strategy could be to write the numbers down while interpreting. Note-taking is widely used in consecutive interpretation, to help LTM during the production stage. Although note-taking can represent a further Effort competing for its share of attentional capacity, it might also prove useful as a means of relieving excessive pressure on WM in SI – particularly for items like numbers and proper names. In addition, the possibility of using a “supra-linguistic code”, the Arabic code, facilitates detachment from the source language. These are obviously theoretical assumptions, which need empirical confirmation.

A few studies, for instance by Crevatin (1991) and Braun and Clarici (1996), have focused on management of numerals in SI, and the usefulness of notes. Results show low overall accuracy for numerals, omissions being the most common mistake. In both these studies, notes proved useful for numbers during “passive” interpretation (i.e. into the A-language). However, detailed and systematic comparison of these experiments is difficult, because the methods used varied considerably. In addition, the languages studied were different (Italian-English in one case, and Italian-German in the other).

2. The experiment

2.1 Aims of the study

This study was set up specifically to investigate the following points:

- 1) whether numbers cause problems during simultaneous interpretation (and, if possible, why);
- 2) whether numbers affect the interpretation of nearby numbers and of the surrounding text;
- 3) which types of numbers cause most problems;
- 4) whether note-taking can be helpful when interpreting numbers.

Numbers are expected to prove troublesome for subjects in the experiment – especially large numbers, which are likely to require more WM Effort. However, taking notes during SI of numbers might be a good strategy to solve this problem (see above). Whether note-taking is useful for SI of numbers is actually the main focus of the study.

2.2 Materials: interpretation and questionnaire

The experiment was carried out on 15 students of interpretation, aged between 24 and 28 years of age, who had attended interpretation courses for at least 3 years at the Faculty for Interpreters and Translators in Forlì (SSLMIT⁴). All subjects were late bilinguals, Italian being their A-language and English their B-language, and knew at least one other foreign language. Although no test was administered, all subjects were known to be right-handed at least as regards their handwriting. Of the 15 students tested, 12 were female and 3 were male.

The experiment consisted in three simultaneous interpretations from English into Italian, one of a general speech, and two of balanced experimental speeches containing numbers. Note-taking was allowed for the first experimental text only. The English source speeches dealt with recent trends in birth rates and other topics related to motherhood in the United States. All texts were read by an English mother-tongue lecturer at the SSLMIT, and recorded on a cassette recorder with an external microphone. The general text (T0) had the double purpose of ensuring that the subjects were able to produce an acceptable interpretation of a text without numbers, and of providing subjects with relevant information and vocabulary.

The two experimental texts (T1, with note-taking allowed, and T2, without note-taking) were balanced: they contained an introductory part with no

4 Scuola Superiore di Lingue Moderne per Interpreti e Traduttori, University of Bologna.

numbers, lasting about 2 minutes, in which all the specific terms were presented. The second part contained 67 and 60 numbers of different types respectively. “Resting” paragraphs interrupted the flow of numbers now and then, allowing evaluation of whether subjects performed better in these parts without numbers.

Numerals were divided into 5 categories, which were expected to create different problems for subjects. This classification was not used in any other experiment on interpretation of numbers, but was especially created for the present study: A) whole numbers $\geq 1,000$ (with 4 or more digits); B) whole numbers $< 1,000$ (with less than 4 digits); C) decimals; D) ranges; E) dates.

Some numbers were repeated, for instance the date 1998 in both T1 and T2. This could provide information as to whether a number causes the interpreter fewer problems when it is not used for the first time. Other figures formed a *cluster*, that is a passage with a high density of numbers. Here too, the analysis could reveal whether these clusters increase the difficulty of interpretation.

Before starting the experiment, it was made clear that during the interpretation of T1 and T2 a series of numbers would occur, and that note-taking was allowed for T1 only. Subjects were then given a preliminary briefing, which included possible translations for some terms, so that these items could be handled with minimum effort during the trial.

Notes taken during the interpretation of T1 had to be handed in at the end of the session. The only participants who took no notes were subjects no. 1, who is blind, and no. 9. Notes of subject no. 15 are missing. For the interpretation of T2, subjects were not allowed to take notes, but could refer to those taken during the briefing for items other than numbers.

All subjects interpreted the texts in the same sequence, that is T0, T1, and T2, which is their “natural” order. The experiment was carried out at the SSLMIT, using booths and recorders in the interpretation classrooms. All subjects except nos. 1 and 14 interpreted the three texts on different days.

An identical questionnaire was administered to all subjects after the interpretation of T1 and T2, with 10 questions divided into three distinct “blocks” concerning different aspects of the analysis: *Difficulty of text*, *Influence of numbers on performance* and *Importance of notes*.

The purpose of the questionnaire was:

- 1) to confirm that subjects considered the texts fairly easy except for numbers;
- 2) to provide a basis for matching subjects’ perception of certain points (their performance in T1 and T2, the influence of numbers, the usefulness of note-taking) against their actual performance. Expectations were that subjects would evaluate both texts as generally easy, and numbers as very difficult; that they would perceive numbers not only as inherently difficult, but also as problem triggers in interpretation of the context; that performance would be

rated worse for T2 than for T1; and that note-taking would be considered important when interpreting numbers.

2.3 Evaluation procedures

The categorization of mistakes is based on that of Braun and Clarici (1996). For the present study, it was decided to simplify the classification and group together similar errors. Six types of mistakes were established:

- 1) *omissions*: the numeral is left out altogether, or replaced by a generic expression such as *molte*, *pochi* (many, few), etc.;
- 2) *approximations*: translations respect the right order of magnitude, but are rounded up or down. Usually, the subject is aware that the original number is different, and accompanies his/her interpretation with a lexical element (e.g. 3,941,553 being translated as *circa 3.900.000*, “about 3,900,000”);
- 3) *lexical mistakes*: the order of magnitude of the stimulus is maintained, but the elements composing the numeral are in the wrong order, they have been either misplaced or inverted (e.g. 346 being translated as 436; 1989 as 1998);
- 4) *syntactic mistakes*: even if it contains the right figures in their correct sequential order, the number is of a wrong order of magnitude, or the nature of the number has been changed, modifying the overall information (e.g. 110,000 becomes 1010; 51.1/1000 becomes 51.1%, 423% becomes “423 units”);
- 5) *phonological mistakes*: the error can be related to a phonemically wrong perception of similar sounding figures in English (e.g. 17, “seventeen”, perceived as 70, “seventy”);
- 6) *other mistakes*: this category includes all possible mistakes not belonging to any of the previous types. Causes of such errors are often not apparent, and cannot be readily grouped into categories. These mistakes are therefore kept apart and form a rather miscellaneous group. However, analysis of all mistakes in this category also considers their position in the original text, to identify a possible “echo” effect due to the proximity of another number.

In the analysis, all numbers were circled with a different color according to whether they were translated correctly or wrongly and, if so, according to the error concerned. Since one aim of the study was to consider how numbers affect the interpretation of the text as a whole, errors in the surrounding text were identified by differentiating the system of highlighting.

The error analysis conducted on interpretations of T1 and T2 focused mainly on:

- the total amount of wrong numbers;
- which category of numbers (A, B, C, D, E) caused more problems;
- the total amount of different mistakes;

- which was/were the most common mistake/s;
- whether a specific type of number was likely to produce a specific kind of mistake.

To ensure comparability of error rates in T1 and T2, as well as between the various categories of numbers, results were calculated as percentages.

The hypothesis that notes can be useful during SI of numbers was tested statistically, by comparing the results in T1 and T2, note-taking being the distinguishing feature of the two texts. The test used was the Paired Sample T-Test (C.I. = 95%).

Subjects' notes for T1 were examined, to ascertain: (i) what proportion of numbers in the text were noted; (ii) whether subjects who took more notes performed better than the others. The statistical correlation between quantity of notes and quality of performance was examined, matching scores for correctly and incorrectly interpreted numbers in the TS against the frequency of noted numbers.

The analysis of notes also considered which types of numbers were written down. Errors in note-taking were considered for each kind of number.

3. Results

3.1 Performance

In terms of content, all subjects in the sample interpreted the text without numbers (T0) satisfactorily.

Within each of the experimental texts (T1 and T2), fidelity to the source speech was compared in two paragraphs with numbers and two without. To ensure that the amount of information in paragraphs with and without numbers was comparable, they were broken down into items of meaning⁵. Numbers and their immediate context were scored as separate items of meaning, since in many cases subjects omitted the numeral but conveyed the idea of the trend correctly (increase, decrease, etc).

On average, subjects correctly reproduced 81.8% of items in parts without numbers, but only 53.9% of those in parts with numbers, suggesting that interpretation of parts with numbers was more difficult and less accurate. While performances varied (e.g., in fluency, capacity to successfully convey the message, style, etc.), inter-subject differences did not affect the overall trend. In

5 The expression *item of meaning* refers to all items of form judged necessary to understand a sentence or utterance. A sentence of T1, with items of meaning underlined, is given here as an example: *Babies born to single mothers were 1,293,567 in 1998, that is 32.8% of all births, while in 1997, the percentage was 32.4%.*

other words, the interpretation was consistently worse in parts with numbers than in those without.

3.1.1 General performance for numbers

The degree of accuracy for numbers varied considerably in both T1 and T2. The error score in T1 ranged from 50 mistakes out of 67 (74.6% of all numerals) to 14 (20.9%). The mean score, 30.2 (45.1%), highlights that on average nearly half the numerals were interpreted wrongly. Conversely, only 8 people translated correctly more than 50% of numbers, and only 3 exceeded 70%. Similar remarks can be made for T2: the error score ranged from 46 mistakes out of 60 (76.7%) to 11 (18.3%). The mean, 29.9 (49.9%) underlines that on average half the numerals were wrongly interpreted, 70% accuracy being reached by only three subjects.

The statistical analysis shows that overall performance is better in T1 than in T2 ($t = 2.882$; $df = 14$; $p = 0.012$). This means that note-taking, the independent variable, probably influenced performance in SI of numbers.

3.1.2 Categories of numbers

Data for both T1 and T2 indicate that numbers are often wrongly interpreted. However, the probability of error varies according to the type of number and its position in the text. Table 1 shows the error score for each category in T1 and T2, and the results of the statistical test carried out to highlight whether the difference in performance is significant (this condition is verified when $p < 0.05$).

	T1	T2	Paired Sample T-Test		
			T	df	P
A) Large whole numbers	67%	82%	- 2.287	14	0.038
Small whole numbers	37%	49%	- 2.682	14	0.018
C) Decimals	56%	63%	- 2.433	14	0.029
Ranges	47%	57%	- 2.674	14	0.018
Dates	41%	35%	<i>Difference is not significant</i>		

Table 1 – Error score for each category of number in T1 and T2

Results suggest particular difficulty in interpreting whole numbers with 4 digits or more (A) and decimals (C), while whole numbers with less than 4 digits (B) and dates (E) are more easily interpreted. Ranges (D) also prove

troublesome, especially in T2. However, performance in ranges varies slightly according to the components of the range (e.g. dates, decimals, whole numbers).

The difference in performance between T1 and T2 is significant for all categories except dates. However, category A actually includes the number *1,000*, twice in T1 and once in T2. This is a “borderline” item, in that it comprises four digits but is in fact a simple sequence of a digit (one) and a multiplier (thousand). If it is excluded from the calculation, the error score is the same in both texts (91.7%, for the four “typical” large numbers in both T1 and T2). Despite the statistically significant difference for this category, results thus suggest that fidelity for “normal” large numbers is not affected by note-taking.

3.1.3 Types of mistake

The analysis of the different types of mistakes highlights that the percentage of omissions is the same in both texts, while approximations, lexical mistakes, phonological mistakes and other mistakes are more frequent in T2. Only the proportion of syntactic mistakes is higher in T1.

Table 2 shows the proportion of the various types of mistake in the two texts, and the results of the statistical test.

	Breakdown of mistakes in T1	Breakdown of mistakes in T2	Paired Sample T-Test		
			T	df	P
Omissions	30.1%	30.2%	<i>Difference is not significant</i>		
Approximations	6.7%	20%	3.877	14	0.002
Lexical mistakes	4.1%	4.9%	<i>Difference is not significant</i>		
Syntactic mistakes	4.6%	2.6%	<i>Difference is not significant</i>		
Phonetic mistakes	1.1%	4.8%	3.609	14	0.003
Other mistakes	13.5%	13.5%	<i>Difference is not significant</i>		

Table 2 – Breakdown of mistakes in T1 and T2

Omissions are by far the most common mistake. Unlike the other mistakes, omissions mostly involve the surrounding text, that is a reference (e.g. *increase by*, *drop to*, etc.) or a whole chunk of information. It is also likely that subjects sometimes use it as a strategy to catch up when they are lagging behind.

Approximations are the second most common class of errors (see Table 2). The most significant proportion of approximations is by far that for type-A numbers ($\geq 1,000$), in 30% of cases in T1 and almost 60% in T2. This supports the idea that numbers saturate WM, since it shows that the more complex the

number, the less able the subjects are to reproduce it correctly. This mistake probably depends in part on a conscious decision to minimize any risk of compounding the error. The interpreter is aware that s/he is missing some specific information, but since s/he cannot store all of it, s/he chooses to simplify the number.

Decimals are the other category for which approximations are relatively frequent (17% of decimals in T1, 20% in T2). This is consistent with the finding that large numbers and decimals are the most troublesome categories (see 4.1). Not only do they tend to be omitted when in clusters, but they are often wrongly interpreted.

Statistical results indicate that approximations are significantly more numerous in T2 (see Table 2). This might suggest that when notes were not allowed, WM could not rely on any help to retain the whole number and the subject was forced to give a rounded version of it.

Lexical mistakes and syntactic mistakes account for low percentages of the error scores. Only type A-numbers show a relatively high incidence of these. This supports the idea that difficult numbers to store cause more problems. The difficulty does not lie in the structure of the numeral, which is linear (from the highest to the lowest order of magnitude), but in limited WM capacity – not all the information needed to accurately reconstruct the number can be stored.

Phonological mistakes are not very significant in the present study. The significant difference between T1 and T2 for phonological mistakes (see Table 2) might depend on the fact that T2 contains more numbers which could be phonetically confused with others (e.g. 14/40, 17/70, etc.).

In the category “other mistakes”, about one third of occurrences might be possibly caused by an “echo effect” (see *Evaluation procedures* above), in both T1 and T2.

3.1.4 Context

About 27% of all numbers in T1 and T2 are not in context or have a wrong reference.

For most correct numbers, the context and the reference are correctly interpreted. However, there is still a certain proportion of wrongly contextualized correct numbers (5.2% in T1 and 3% in T2), which further reduce accuracy in interpretation of numerals.

A high proportion of wrong numbers is also wrongly contextualized. This result is mainly due to omissions, which are the only category for which there are more mistakes involving the context than those involving the number alone. In T1, there is an approximately 2:1 ratio between omissions involving the whole context and those involving the number alone. In T2, the ratio is 3:1. The

high proportion of omissions involving the context might be due to problems in the processing of information near the number, caused by WM shortage – particularly when notes are not used.

If omissions are not calculated, the proportion of wrong numbers in the wrong context is similar to that of correct numbers in the wrong context (from 1% to 2%). This low percentage suggests that usually subjects are able to assess whether their interpretation will be successful. Thus, when they include the context, it is in most cases correct. When they are aware that they did not understand enough to convey the right message, they omit the whole segment. On the other hand, when subjects transpose the overall meaning of a segment with an approximation of the numerical item, the context is usually correct.

In conclusion, these data suggest that numbers are not only a source of difficulty to the interpreter, but also a problem trigger for interpretation of the speech segment in which they occur.

3.1.5 Notes

Notes in T1 cover, on average, 39.4% of numbers. Right notes helping to produce right numbers make up 66% of items noted, that is 25.9% of numbers. Mistakes in the notes, leading to mistakes in production, are common (26.6% of items noted), accounting for 10.5% of the total numbers in the text. Significantly, correct notes failing to prompt the correct number in the target text account for 6.2% of notes and 2.5% of numbers. There is also a minimal incidence of items which are wrongly noted but then correctly interpreted.

When the quality of performance is compared with the quantity of notes, both correct and wrong numbers in the TS show significant correlations (about 0,650 in all cases): (i) with the total amount of numbers noted; (ii) with the amount of correctly noted numbers. The correlation is positive for correct numbers in the TS, negative for incorrect items, giving further support to the view that note-taking improves handling of numbers in SI.

It seems that subjects take more notes for “difficult” numbers. Decimals are the most frequently noted category, followed by large numbers (A) and ranges. However, not even half of the notes for these categories are correct. Small numbers (B) and dates (E), the “easiest” groups, are the categories in which least notes are taken. However, notes are probably also useful for these “easy” numbers in clusters, because they can be rapidly written down to leave room for the next number.

3.2 Perception

The questionnaires for T1 and T2 are identical. Since most of the results were similar in both cases, they were analyzed together.

– BLOCK 1: *Difficulty of the text*

Subjects judged the texts easier than average, while the numbers were considered quite difficult. This strengthens the initial assumption that most errors in the interpretations would be caused by numbers.

Another interesting result regards the difference between two specific variables, “overall speed” and “speed of parts with numbers”. Subjects indicated that the speed of parts with numbers was higher than the overall speed, which suggests that speed was thought to be one of the reasons why numbers were difficult to translate. Actually, the speed was kept constant for the whole text, or even decreased in parts with a high density of numbers, because the reader tried to articulate them as clearly as possible to reduce problems of comprehension. This result stresses the difference between perception and reality. Subjects probably thought they were lagging behind because of a sudden increase in the speed of reading, while the real source of difficulty is more likely to have been the numbers⁶.

– BLOCK 2: *Influence of numbers on performance*

Answers to block 2 highlight the general tendency to see numbers as problem triggers. Subjects rated their performance in parts with numbers rather negatively, indicating that both comprehension and production of numbers and surrounding elements were poor. However, they did not seem to know why numbers caused so many problems.

– BLOCK 3: *Importance of notes*

While only 60% of subjects indicated that they usually take notes during SI, as many as 86.7% stated that they take notes for numbers. This clearly underlines the perceived importance of notes when there are numbers in the text.

4. Discussion

4.1 Error analysis

The analysis of general performance highlights that subjects’ accuracy in speech segments with numbers is lower than in those without numbers. This suggests that numbers are indeed problem triggers during SI.

⁶ “Subjective” speed is one of the subjects of Déjean Le Féal’s doctoral dissertation (1978).

The degree of accuracy for numbers is rather low (about 50% on average). Given that the specific structure of numbers is thought to increase the already high processing demands of SI (additional WM capacity to store them), the expectation was that they would also affect interpretation of the context. This was confirmed by the analysis of information items around the number, about 27% of numbers having a wrong reference or lacking the source speech context.

However, performance varies according to the type of number. Numbers with four or more digits (type A) show the highest error score (about 91%)⁷, followed by decimals (59.5%), ranges (51.7%), small whole numbers (43.3%) and dates (38.1%)⁸. The most common mistakes are omissions, which involve about 30% of all numbers in both texts. This is consistent with the results of other studies on numbers in SI (Crevatin 1991; Braun and Clarici 1996).

Clusters increase the difficulty of numbers⁹, even for items like small numbers which do not usually trigger mistakes. Subjects seem to rely more on note-taking when they have to deal with a dense passage, since nearly all the most frequently noted numbers in T1 are in clusters. This suggests that when the difficulty increases, the need for notes is greater. Results therefore support the hypothesis that notes may be a useful strategy in relieving the burden that numbers place on the WM.

Performance for numbers does not seem to improve when they occur more than once in the speech. Subjects sometimes even repeat the same numbers in their notes. Repeated numbers are thus treated like all the other numbers, probably because they are discarded from WM as soon as they are translated and have to be assimilated again when they recur.

Results of the error analysis are in line with the Effort Model (Gile 1995). Numbers are likely to require considerable effort to be assimilated and stored, and often exceed the attentional capacity threshold, causing errors during SI.

4.2 Comparative analysis

The overall performance is worse in T2, suggesting an effect of the independent variable – i.e. note-taking. The relative frequency of approximations for longer numbers (large whole numbers, ranges and decimals), for which notes could be expected to prove most useful, is consistent with this observation. However,

7 This percentage refers to “normal” large numbers, without “borderline” cases (i.e. 1,000).

8 Percentages represent the error score for each category as a mean between performance in T1 and T2.

9 See also Pearl (1999: 20).

results for type-A numbers (> 1,000) actually show that notes are not very useful with this category (in most cases they are wrong), probably because large whole numbers are often too dense even to be successfully noted. In other words, any advantage in terms of reduced demand on WM is offset by the extra processing capacity required for note-taking. On the contrary, decimals and ranges contain too many components to be remembered correctly all the time, but few enough to be quickly written down; notes are often correct for these two categories.

An interesting remark concerns subjects who usually take notes. In both texts, but especially in T2, they have a higher mean error score than subjects who do not usually take notes. An explanation could be that the exclusion of note-taking has a more marked effect on subjects who usually rely on them. These subjects' lower accuracy in T2 might also be due to their conviction that, since they cannot take notes, they will surely perform badly. On the contrary, those who are used to interpreting without notes will find themselves more at ease in the conditions created for T2.

Another difference concerns the degree of accuracy for subjects who said that they were not affected by numbers during interpretation. These subjects have a lower error score than others in both T1 and T2, suggesting that they are reasonably able to evaluate their performance. Despite this, their performance in parts with numbers is actually worse than in parts without.

In conclusion, the study suggests that the error score for numbers increases when note-taking is not allowed. However, this seems to be true only of decimals, ranges and (to a lesser extent) small whole numbers (see Table 2). The error score increases most in terms of approximations, probably because these categories of number overload WM during interpretation of T2 and are therefore only partially reproduced.

4.3 Final remarks

When the present experiment was set up, it was attempted to limit possible flaws and create a situation as close as possible to real life, despite the need to run the study in a classroom and record shorter interpretations than would be common in actual practice.

Admittedly, the texts were constructed with the specific aim of studying numbers, the speeches were recorded, and the environment was artificial (the classroom). However, this was in part due to the logistic impossibility of having all subjects interpret a single "live" speech at the same time. Lack of sufficient booths meant that this would have been possible only by repeating the speech several times, with the risk of changing such features as speed of delivery, intonation and pronunciation of numbers.

The sample was kept small to eliminate as far as possible any variables which could have influenced the outcome of the experiment. It is composed of students, which means that results are not representative of professional interpreters. However, only English first language students with at least three years of practice were chosen, to ensure that all had a certain minimum level of experience.

The analysis considered the variable “note-taking” only in passive interpretation (i.e. into the A-language). It would therefore be interesting to study direction of interpretation as a variable in future research, or to repeat this study with active interpretation (i.e. into the B-language). Moreover, languages other than Italian and English could give different results, in relation to features such as word length (Ellis 1992) or syntax. This underlines the interest of carrying out similar experiments with other languages, to compare the results obtained, and focus more on the effect of word length in SI of numbers.

In conclusion, no valid comprehensive strategy has been identified to deal with these extremely difficult linguistic items called numbers. The only strategy that seems to work is the tried and tested method of having the boothmate write down names and figures. If the interpreter is alone, s/he can use omissions and approximations when numbers are too large or dense for notes to be useful. Note-taking is not enough to definitively solve the problem of numbers, arguably among the main features which make SI a “finite and fallible function” (Pearl 1999: 3).

References

- Alessandrini M.S. (1990): “Translating numbers in consecutive interpretation: an experimental study”, *The Interpreters' Newsletter* 3, pp. 77-80.
- Atkinson R. (1999): “Memoria”, in *Introduzione alla Psicologia*. Ed. by R. Atkinson *et al.*, Piccin, Padova, pp. 265-305.
- Baddeley A. (1987): *Working memory*, New York, University Press.
- Baddeley A. (1990): *Human memory: Theory and Practice*, Hove, Lawrence Erlbaum Associates.
- Baddeley A. (1993): *La memoria. Come funziona e come usarla*, Bari, Laterza.
- Braun S. and Clarici A. (1996): “Inaccuracy for numerals in simultaneous interpretation: neurolinguistic and neuropsychological perspectives”, *The Interpreters' Newsletter* 7, pp. 85-102.
- Carpenter P.A., Miyake A. and Just M.A. (1994): “Working memory constraints in comprehension: evidences from individual differences, aphasia, and aging”, in *Handbook of Psycholinguistics*. Ed. by M.A. Gernsbacher, New York, Academic Press, pp. 1075-1122.

- Craik F.I.M. and Lockhart R.S. (1972): "Levels of processing: a framework for memory research", *Journal of Verbal Learning and Verbal Behavior* 11, pp. 671-679.
- Crevatin, A. (1991): "La traduzione dei numeri in interpretazione simultanea: un contributo sperimentale", unpublished dissertation, SSLMIT, Trieste.
- Ellis N. (1992): "Linguistic relativity revisited: the bilingual word-length effect in working memory during counting, remembering numbers, and mental calculation", in *Cognitive Processing in Bilinguals*. Ed. by R.J. Harris, Amsterdam, Elsevier Science Publishers, pp. 137-155.
- Gile D. (1984a): "Des difficultés de la transmission informationnelle en interprétation simultanée", *Babel* 28, pp. 18-25.
- Gile D. (1984b): "Les noms propres en interprétation simultanée", *Multilingua* 3/2, pp. 79-85.
- Gile D. (1995): *Regards sur la recherche en interprétation de conférence*, Lille, Presses Universitaires de Lille.
- Gile D. (1999): "Testing the Effort Models' tightrope hypothesis in simultaneous interpreting: a contribution", *Hermes* 23, pp. 153-172.
- Harrington M. (1992): "Working memory capacity as a constraint on L2 development", in *Cognitive Processing in Bilinguals*. Ed. by R.J. Harris, Amsterdam, Elsevier Science Publishers, pp. 123-135.
- Hurford J.R. (1987): *Language and Number: The Emergence of a Cognitive System*, Oxford, Basil Blackwell.
- Kalina S. (1992): "Discourse processing and interpreting strategies – an approach to the teaching of interpreting", in *Teaching Translation and Interpreting. Training, Talent and Experience*. Ed. by C. Dollerup and A. Lindegaard, Amsterdam-Philadelphia, John Benjamins, pp. 251-257.
- Luria A.R. (1976) *The neuropsychology of memory*, Washington, V.H. Winston & Sons.
- Miller G.A. (1956): "The magical number seven, plus or minus two: some limits in our capacity for processing information", *The Psychological Review* 63, pp. 81-97.
- Pearl S. (1999): "The other three eighths and the four 'F's", *The Interpreters' Newsletter* 9, pp. 3-28.
- Seleskovitch D. (1975): *Langage, langues et mémoire*, Paris, Minard Lettres Modernes.
- Setton R. (1999): *Simultaneous interpretation. A cognitive-pragmatic analysis*. Amsterdam-Philadelphia, John Benjamins.

“I FAILED BECAUSE I GOT VERY NERVOUS”.
ANXIETY AND PERFORMANCE IN INTERPRETER TRAINEES:
AN EMPIRICAL STUDY

Amparo Jiménez Ivars and Daniel Pinazo Calatayud
Universitat Jaume I, Castellón

Fear of public speaking and anxiety

It goes without saying that conference interpreting is a very stressful activity not least because it involves the performance of a series of complex cognitive and psychomotor operations in public or at least for the public. During the process of interpreting training the high levels of stress experienced by students when having to speak (interpret) in public can become one of the major obstacles in the early stages. Stress becomes evident through symptoms of anxiety currently defined by psychologists as a normal innate emotional alarm response to the *anticipation* of danger or threat. Anxiety emerges very soon during the early training stages even when students “only” have to make monolingual presentations in front of their peers and teacher in language A or B. Those levels of anxiety do not decrease easily when monolingual presentations become real consecutive interpretations involving complex cognitive processes of language and cultural transfer. The climax is reached the day of the final consecutive interpreting examination where an attempt is made to simulate a real life situation at the University of Castellón. There are students who cannot stand the stress and abandon the exam moments before sitting it. Sometimes they even show physical symptoms (tears, difficulty in breathing, sickness, etc.). Many interpretation teachers feel they have to turn into *ad hoc* psychotherapists during office hours, trying to allay students’ terrors of interpreting even after ordinary class sessions.

The capacity to control stress has traditionally been considered one of the requisites for interpreting (Cooper, Davies and Tung 1982; Moser-Mercer 1985; Longley 1989; Klonowicz 1994; Gile 1995; Moser-Mercer, Künzli and Korac 1998) and a predictor for interpreting competence (Alexieva 1997). Although the number of empirical studies about the influence of stress in interpreting performance is scarce, there is a wide consensus that stress is intrinsic to interpreting – both in the consecutive and simultaneous mode – even though its impact is not clearly defined (Brisau, Godijns and Meuleman 1994). Interpreting research on stress has revolved around the professional realm, focusing mainly on the physiological responses to stress during interpreting and on performance: cardiovascular activity (Klonowicz 1994), causes of stress (Cooper *et al.* 1982), and the relation between stress and quality in prolonged interpreting turns

through chemical and physiological analysis (Moser-Mercer *et al.* 1998). Little empirical research has been carried out on interpreting students (Riccardi *et al.* 1998). The capacity to control stress in interpreting is sometimes taken into account in interpreting entrance exams (Moser-Mercer 1985). On those occasions the capacity to cope with a situation of continuous stress during a relatively long time is considered more important than actual performance *per se*, provided candidates show a minimum number of skills. Apparently, some candidates had to admit that they could not cope and abandoned the test (Moser-Mercer 1985). It can be inferred, especially from students' comments, that the anxiety they feel when they have first to speak and later to interpret in public may arise basically from fear of public speaking (among other causes). Let us analyse from a psychological point of view the possible origins of the two conditions that can hinder performance – fear of public speaking and anxiety.

Public speaking is generally considered to be a stressful social situation (Montorio, Guerrero and Izal 1991) that may have negative consequences leading to poor professional or academic outcomes (Greer 1965; Gutiérrez-Calvo and García-González 1999). Most studies on the fear of public speaking tend to consider it a major source of anxiety (Bados 1990; Cano-Vindel and Miguel-Tobal 1999; Gutiérrez-Calvo and García-González 1999; Montorio, Fernández, Lázaro and López 1996). Fremouw and Breitenstein (1990) describe this fear as a non-adaptive response to environmental events, resulting in inefficient behaviour. The following are outlines of some of the causes for this non-adaptive response.

Standing in judgement of others

When an individual speaks in public he or she is exposed to other people's judgement of his or her personal image. Situations in which one feels judged by others may induce negative emotions that can affect the individual's behaviour. Fear of acting in an inappropriate way, of being negatively evaluated and therefore of being rejected interferes with the capacity to perform a task (Peri and Torres 1999). When the public speaking situation is felt as threatening, it is associated with the need to achieve high performance levels as well as with a lack of self-reliance to meet demands (Gutiérrez-Calvo and García-González 1999). Consequences of the fear of public speaking are crucial for certain activities such as consecutive interpreting which heavily depends, among other things, on public speaking skills. This is an emotion interpreting trainees must overcome because otherwise it could hinder their professional performance. Research on public speaking fear considers that the resulting anxiety is responsible for the non-adaptive behaviour that emerges in a public speaking situation when it is seen as a threat (Cano-Vindel 1985). However, the

connection between fear of public speaking and poor performance in a professional activity involving public speaking has not been demonstrated.

Lack of self-confidence, insecurity

Anxiety associated with public speaking derives from feelings of insecurity or fear related to the result of the task (performance). It is an emotional reaction typical of situations of judgement arising from evaluation situations (Gutiérrez-Calvo and Miguel-Tobal 1998). These premises are in line with evidence found in empirical research pointing to a negative relation between anxiety and (non-specific) academic performance; that is, the greater the anxiety the poorer the performance (Seipp 1991). Furthermore, research has established that anxiety felt just in delivering a speech in public is an emotion linked to lack of competence in public speaking (Behnke and Sawyer 1999; Westenberg 1999). Interpreting students are a specific group for which public speaking skills and control of anxiety constitutes a main component of the interpreting operation. Lack of both aptitudes may affect performance both at the academic and professional levels.

Feelings of threat

A public speaking situation may give rise to anxiety feelings if it is interpreted as threatening and consequently is experienced with fear. This threat can objectively result in academic or professional failure and loss of social prestige or self-esteem (Gutiérrez-Calvo and García-González 1999). Public speaking situations themselves are not simply associated with anxiety. According to the model of cognitive assessment, anxiety results from a subject's interpretation of the level of threat a situation poses and the available resources to face it, that is personal capacity to deal with the threat is seen as very inadequate (Lazarus and Folkman 1986). Anxiety will be contingent on the situation if the individual considers it to be threatening; however, the subject can also interpret the situation as a challenge or as irrelevant (Cano-Vindel and Miguel-Tobal 1999; Lazarus and Folkman 1986). When the situation is considered threatening, anxiety may appear. When the subject feels the situation as a challenge or irrelevant, anxiety is not the emotion that will emerge as a result of the situational assessment. Results obtained by Cano-Vindel and Miguel-Tobal (1999) confirm the close correlation between the consideration of a situation as threatening and anxiety.

The specific goal of this paper is to study a) the existing relation between fear of speaking in public and state anxiety in translation and interpreting

students; b) the existing relation between fear of speaking in public and consecutive interpreting performance in translation and interpreting students and c) the existing relation between state anxiety and public consecutive interpreting performance in translation and interpreting students.

Method

A correlational research model has been implemented in order to discover the relationship between the above mentioned factors. In this type of study events do not happen at the experimenters' discretion. A series of variables have been selected to study the phenomenon. We have opted for this type of research because it is closer to real life situations rather than laboratory experiments, which constitutes a technical advantage over experiments in that it offers a possibility to study phenomena in natural settings. Its disadvantage is that it offers only limited possibilities to control and manipulate variables. Data are collected in a real setting with a real task in order to determine patterns of functional variation. The possibility to demonstrate the relation between two or more variables is the essence of correlational studies, although causal relations cannot be established.

Hypotheses

Hypothesis 1: there is a relation between fear of public speaking and anxiety; that is, the greater the fear of speaking in public the greater the anxiety.

Hypothesis 2: there is a negative relation between fear of public speaking and performance in interpreting; that is, the greater the fear of speaking in public the poorer the consecutive interpreting performance.

Hypothesis 3: there is a negative relation between anxiety and performance in interpreting; that is, the greater the anxiety the poorer the consecutive interpreting performance.

Variables and testing instruments

Independent variable: confidence in public speaking

In order to measure this variable an abridged version of the "Confidence in public speaking" questionnaire by Méndez *et al.* (1999) based on Bados (1991) was used. The questionnaire presents a $\alpha=0.906$ reliability. Méndez *et al.* (1999) have reviewed the existing instruments based on self-reports to measure fear of public speaking. Most testing instruments rely on the strong correlation between this construct and anxiety. The instrument proposed by Méndez *et al.* (1999) has

been validated with a Spanish sample. According to the items, lack of confidence in public speaking is synonymous with fear of the situation. The individual expresses this fear in the questionnaire with responses denoting anxiety (e.g. "I am scared and tense most of the time I am speaking in front of a group of people") The abridged version of the questionnaire "Confidence in public speaking" is made up of 12 items that can be filled out in less than 5 minutes (See Appendix). The content of the questionnaire in the negative end portrays the difficulties an individual has in responding to a situation he or she faces with fear – fear expressed with cognitive signs of anxiety when having to face an audience. It assesses both the fear felt by the subject ("I am afraid to be in front of the audience") and/or the opposite emotion with respect to the degree of personal self-confidence ("I face with self-confidence the prospect of speaking in public"). In order to obtain a final score a study of internal consistency has been carried out. Cronbach alpha shows that all 12 items have a high internal consistency ($\alpha=0.91$). Single item scores were added and subsequently divided by 12 to achieve a single score reflecting public speaking self-confidence. The scores range between 1 (fully agree) and 6 (fully disagree). High scores show that the subject is afraid to speak in public, and low scores show that the subject is confident in public speaking situations. According to research, it should be expected that low scores in the questionnaire (the lower the self-confidence in public speaking, the higher the fear to speak in public) would be associated with high scores in state anxiety, that is situational anxiety. If fear of public speaking generates anxiety when the situation is interpreted as threatening, a relation between the scores of questionnaires and interpreting performance would be expected. This relation, however, should be mediated by anxiety contingent upon the situation. Since anxiety is thought to be the emotion linking fear of public speaking with low academic/professional performance there should be a negative relation between anxiety and performance in interpreting.

Mediating variable: anxiety

Anxiety was measured using the STAI questionnaire (Spielberger, Gorsuch and Lushene 1988) This test was designed in 1970 and has been widely used worldwide since. It is appropriate for ages 14-64 and grades 9-16, it is composed of 40 items and takes approximately 20 minutes. It has been translated into more than 40 languages and is written at the 6th-grade reading level. It includes normative tables for working adults, high-school students, college students, and military recruits. The 40-question test booklet allows clients to respond on a 4-point Likert self-administered scale. The State Anxiety scale evaluates temporary conditions of apprehension, tension, nervousness and worry, which increase in response to physical danger and psychological stress. It does not

measure general traits of anxiety and is limited to a particular situation. It may be used with emotionally disturbed individuals as well as the general population.

Dependent variable: interpreting performance

The exam grade was taken as a measure for interpreting performance. Scores ranged between 1 (lowest level) and 10 (highest) according to the usual parameters of quality used by the sample's interpreting teachers. The experimenters did not participate in the assessment of interpretations. It may be argued that performance should not be identified with "academic grading", especially when that grading is only one person's responsibility and prone to subjective bias. But it must be taken into account that the main motivation to carry out this study was the usual excuses put forward by interpreting students at the University of Castellón, identifying failure with fear and anxiety. So, it was decided not to question the teacher's grading method; the teacher, on the other hand, acted completely freely, without access to the results of the questionnaires.

Sample

The sample was made up of 197 subjects, 158 women and 39 men; all of them were final-year Translation and Interpretation students at the University Jaume I (Castellón, Spain) with an average age of 23.4; they had all had a similar training in interpreting, 8 credits in consecutive interpreting and 8 credits in simultaneous interpreting, making 160 hours of interpreting training. Only few of them aim to become professional interpreters but they all have to do 16 credits in interpreting in order to obtain a Translation and Interpretation degree. They are required to give an acceptable interpretation of short general subject speeches without the usual difficulties a real interpretation may pose (speaker's accent or rate of delivery, complexity of figures, names, terminology etc.) although some figures and names are usually included and most speeches are authentic with a few modifications. Sometimes a more specific topic is chosen (e.g. genomics, Creutzfeld-Jacob disease...) but texts are always addressed to the general public and not to experts. Data were collected in three academic years in order to obtain a relatively large sample (in 1999, 2000 and 2001). The teachers and teaching method remained unvaried throughout; Spanish was the mother tongue for the whole of the sample, 23 per cent of them considered themselves to be bilingual, sharing Spanish and Catalan as mother tongue.

Procedure

The task consisted of interpreting a 6 to 8-minute speech on current affairs read out by one of the interpreting teachers. This task was also the final consecutive interpreting exam. The original speech was delivered in three segments of 2-3 minutes, after each of which there was a pause for the

interpretation. Five possible current affairs topics had been announced to all of them weeks before the testing as possible speech subjects. The experimenters asked students to fill out the two questionnaires when they were just about to enter the testing room one by one. They voluntarily started to answer the items 20 minutes before entering the interpretation room. The interpretation was performed in front of the teachers and students of lower grades who acted as the public. Once they had finished, they sat down and joined the public and were not allowed to go out until the end of the session. This situation bears a resemblance to a real interpreting setting, and although in this case neither the speaker nor the public are authentic, it can be considered a simulation of real settings. In each session, every student did the same speech.

Of course, one may argue that possible fear of public speaking adds to the natural anxiety in exams where the subject feels evaluated. Fear of evaluation is one of the most important components of the fear of public speaking. The exam situation makes the threatening potential of evaluation more explicit. The subjects are not only being evaluated but they know it. All this can reinforce fear of a negative assessment. But we must not forget that in the interpreting profession – just as in any other professional activity involving public exposure – every single performance entails a new evaluation on the part of the public or employer, so a poor performance may represent an important setback with unforeseeable consequences. Once a subject is exposed to public scrutiny the public demands quality – although they may not be able to define exactly what that quality is. There are no second chances, the first time is the last time, with little or no option to repeat anything. In this sense, an interpretation exam has a lot in common with professional interpreting situations; especially the pressure to make a good delivery, that is to perform a complex job in no time and in front of an audience, adding to that that failure in both cases may entail negative consequences. In fact, for evaluation purposes performance in ordinary practice sessions is hardly taken into account by the teachers because a student unable to do a good job in a stressful situation is not considered prepared for the profession.

Results

The mean shows that the sample has a moderate fear of public speaking ($M=3.62$; $d.t.=0.96$).

Anxiety reports also show levels of medium-high state anxiety ($M=6.93$; $d.t.=1.55$). Decatypes have been used to assess anxiety levels following the STAI manual instructions.

The performance mean was $M=5.93$; $d.t.=1.87$.

The Méndez-Carrillo, Inglés-Saura and Hidalgo-Montesinos (1999) questionnaire's internal validity is based on the interpretation of the public

speaking situation as a self-confidence/fear continuum. The authors recommend the assessment of the convergent validity of the abridged version. However, they do not clearly suggest the constructs with which the measure of the questionnaire should converge. Confidence in public speaking could be a similar construct to the one measured by the state anxiety questionnaire. A significant correlation between the two measures could demonstrate a close link between both constructs, in which case it would validate the questionnaire.

The results show that there is a significant correlation between both variables (Table 1). However, the level of correlation is moderate, insufficient to conclude that lack of confidence in public speaking is an alternative measure for anxiety.

Fear of public speaking is supposed to have a negative effect on the interpreting trainee performance if anxiety mediates between these two variables. According to the first condition a variable has to meet to be considered a mediator between other variables (Baron and Kenny 1986), the independent variable (fear of public speaking) must be able significantly to explain part of the variance of the mediating variable (state anxiety) between public speaking and performance. The correlational analysis suggests that fear of public speaking and state anxiety are significantly related (see Table 1). The regression analysis shows that fear of public speaking significantly explains 11.5% of the state anxiety scores (see Table 2), statistically meeting the first necessary condition for anxiety to mediate between fear of public speaking and performance.

	Confidence in public speaking	State anxiety	Performance
Confidence in public speaking		.340**	- 0.86
State anxiety			- 0.73

Table 1. Correlations between variables (N=197)

** Significant correlation at level 0.01 (bilateral).

	beta Coefficient	R	R ²	F	Sig. F
Public speaking	.340**	.340	.115	25.413	.000

Table 2: Regression analysis "Confidence in public speaking" on state anxiety

** Significant correlation at level 0.01 (bilateral).

Nevertheless, the second mediating condition is not met. This condition demands a significant relation between the independent and the dependent variable (performance) (Baron and Kenny 1986), and results to this effect are negative (see Table 1). Self-confidence in public speaking is not related to performance in interpretation students. On the other hand, anxiety does not show any significant relation with performance either. The results show that there is a significant relation between fear of public speaking and anxiety. However, the anxiety variable does not mediate between fear of public speaking and interpreting students' performances.

Discussion and conclusions

The results show that the measure of confidence in public speaking is significantly related to anxiety showing that low confidence in public speaking is related to high scores in state anxiety. Hypothesis 1 (the higher the fear of public speaking, the higher the anxiety) is thus confirmed. This result agrees with the cognitive assessment model that contemplates anxiety as a response to a public speaking situation when interpreted as a threat (Lazarus and Folkman, 1986). There is a wide range of theoretical/empirical evidence suggesting a positive relation between fear of public speaking and anxiety (Bados 1990; Cano-Vindel and Miguel Tobal 1999; Gutiérrez-Calvo and García-González 1999; Montorio *et al.* 1996). However, this relation, although statistically significant, is insufficient for our purposes since it only explains 11.5 per cent of the variance. Considering the questionnaire content validity (Méndez-Carrillo *et al.* 1999), the results obtained in this study indicate that confidence in public speaking is not a specific measure of state anxiety. The anxiety measured in this study could, to a certain extent, be reflecting the test situation in which the task took place. The subjects' answers may have reflected not only a public speaking situation but also the fact that it was an exam. In this case, fear of evaluation adds to the fear of the objective consequences of the evaluation. Part of the anxiety variance may have reflected this circumstance. However, it must not be forgotten that the exam is a simulation of a real consecutive interpreting setting. The academic grade would be related to a public/client assessment (although professional assessment is not as straightforward as a grade and responds to industrial relations norms). Fear of getting a negative grading is partly fear of being considered incompetent, although this feeling may be mitigated by the fact that the university regulations provide students with several opportunities to sit the exam. In a real life situation a repetition of the interpretation would not be acceptable. This fact leads us to think that the students' perception of facing an exam should not represent a different source of anxiety from what they would

feel at a professional level. Students may have consciously or unconsciously applied several coping strategies to neutralize the effects of fear.

1. Wish to overcome a challenge and show competence. The desire to show professional competence could exceed examination fear, and there is also the fact that they have several chances to pass the exam. Students could have also considered the situation as a challenge to prove their professional competence to themselves and the evaluating person; this means that they would show a lack of anxiety regardless of the fact that fear of public speaking could be present as part of the situation. This possible explanation would also suggest that feelings of threat posed by the situation and feelings of challenge to show professional competence could both be present simultaneously in public interpreting situations. The “Confidence in public speaking questionnaire” does not seem to be able to measure both types of feelings when they are interrelated in a situation.

2. Interpreting resources. The public speaking questionnaire may reflect that confidence or fear but it does not seem able to determine if the subjects feel they have enough resources to cope with the situation. Fear of public speaking may not exceed personal resources to face a situation resembling a professional environment. The situation does not only have to be perceived as threatening but also the subject must feel that he or she has not enough resources to cope with it (Cano-Vindel and Miguel-Tobal 1999). It may be possible that part of the unexplained variance relating to anxiety before public speaking may be due to the fact that the sample first interpreted the situation as a challenge and secondly felt they had enough resources to cope positively with the situation, thus avoiding a response of acute anxiety to the fear of public speaking.

According to the results, anxiety is not negatively related to interpreting performance, so hypothesis 2 is not confirmed. This result does not agree with most studies, which conclude that there is a negative relation between anxiety and academic performance (Seipp 1991). The relatively high level of anxiety shown by the sample could be a sign of what psychologists call positive anxiety, the one needed to face stressful situations. Nevertheless, in our case, anxiety has not proved to have any influence in any direction. Again, coping strategies may be the explanation for this lack of influence.

3. Self-efficacy. Defined as “the belief in one’s capability to execute required actions and produce outcomes for a defined task” (Wood and Atkins 2000: 431) as well as personal resources for consecutive interpreting (global comprehension of original speech, analysis and synthesis capacity, degree of familiarization with the topic, note-taking technique, etc.) it could modulate the effect of anxiety on interpreting performance. That is to say, the belief in one’s capability and the real amount of personal resources available could produce variations in performance regardless of the anxiety felt.

4. Maturity and responsibility. Seipp's (1991) studies also report that the negative relation between anxiety and performance decreases with the level of studies and it is lower if the testing is performed just before the task. Subjects in our study are final-year university students and the testing took place just before they took their final interpreting examination. It is possible that anxiety does not influence performance in mature and well-prepared students carrying out a task that implies professional responsibility. From Seipp's results and ours it can be inferred perhaps that performance is related to responsibility, and responsibility would mediate anxiety. These results coincide with a prior similar exploratory study that analysed the relation between anxiety and performance tested in sight translation (Jiménez and Pinazo in press), which is also considered a stressful activity when the text has not been prepared beforehand (Lambert 1991).

Fear of public speaking is not related to interpreting performance. Hypothesis 3 is not confirmed. A possible explanation is that once the individual realizes that he or she is obliged to perform the task, fear of public speaking is put into the background and personal resources for interpreting prevail. Public speaking becomes only a part of the different resources needed for consecutive interpreting and the individual activates other coping strategies to perform the task. This would imply that fear of public speaking alone does not necessarily determine professional competence in interpreting.

The results, however, open up new perspectives about the relative importance of anxiety and fear of public speaking in interpreting trainees' performance. Performance difficulties in students' consecutive interpretation exams need to be explained and contrasted with more possible causes. These conclusions may not necessarily make students feel relieved or less anxious about the interpreting task. Fear and anxiety are uncomfortable and unpleasant feelings, to say the least; students should be encouraged to pay more attention to their coping strategies (interpreting resources, feelings of self-efficacy, sense of challenge, will to show competence, responsibility and maturity) and less to their feelings of fear and anxiety in order to try to overcome those unpleasant feelings and increase self-confidence, if only for reasons related to personal well-being. To this end, future interpreting research should perhaps aim at studying the relation between the effects of fear of public speaking and anxiety with resilience.

For the time being, the interpreting teachers at the University of Castellón know what to tell students when they invariably say: "I failed the exam because I got very nervous".

References

- Alexieva B. (1997): "A typology of interpreter-mediated events", *The Translator* 3 (2), pp. 153-174.
- Bados A. (1990): "Afrontamiento y prevención del estrés: intervención sobre las dificultades para hablar en público", in *Psicología y salud: control de estrés y trastornos asociados*. Ed. by J.M. Buceta and A.M. Bueno, Madrid, Dykinson, pp. 63-84.
- Bados A. (1991): *Cómo hablar in público*, Madrid, Pirámide.
- Baron R.M. and Kenny D.A. (1986): "The Moderator-Mediator Variable Distinction in Social Psychological Research", *Journal of Personality and Social Psychology* 51(6), pp. 1173-1182.
- Behnke R.R. and Sawyer C.R. (1999): "Milestones of anticipatory public speaking anxiety", *Communication Education* 48(2), pp. 165-172.
- Brisau A., Godijns R. and Meuleman C. (1994): "Towards a psycholinguistic profile of the interpreter", *Meta* 39 (1), pp. 87-94.
- Cano-Vindel A. (1985): *Estudio experimental sobre medidas de autoinforme: influencia de las situaciones en la evaluación cognitiva de respuestas de ansiedad*, Madrid, Universidad Complutense de Madrid (Memoria de Licenciatura).
- Cano-Vindel A. and Miguel-Tobal J.J. (1999): "Valoración, afrontamiento y ansiedad", *Ansiedad y Estrés* 5 (2-3), pp. 129-143.
- Cooper C.L., David R. and Tung R.L. (1982): "Interpreting stress: sources of job stress among conference interpreters", *Multilingua*, 1 (2), pp. 97-107.
- Fremouw W.J. and Breitenstein J.L. (1990): "Speech anxiety", in *Handbook of social and evaluation anxiety*. Ed. by H. Leitenberg, New York, Plenum Press.
- Gile D. (1995): *Basic concepts and models for interpreter and translator training*, Amsterdam-Philadelphia, John Benjamins.
- Greer J.M. (1965): "The development of a scale to measure fear", *Behaviour Research and Therapy* 3, pp. 45-53.
- Gutiérrez-Calvo M. and García-González M.D. (1999): "Procesos cognitivos y ansiedad en situaciones de evaluación", *Ansiedad y Estrés* 5 (2-3), pp. 229-245.
- Gutiérrez-Calvo M. and Miguel-Tobal J.J. (1998): "The anxiety response: concordance among components", *Motivation and Emotion* 22, pp. 211-230.
- Jiménez A. and Pinazo D. (in press): "Aptitudes necesarias en la formación de intérpretes. Un estudio exploratorio", *Quaderns. Revista de Traducció* 8.

- Klonowicz T. (1994): "Putting one's heart into simultaneous interpretation", in *Bridging the gap. Empirical research in simultaneous interpretation*. Ed. by S. Lambert and B. Moser-Mercer, Amsterdam-Philadelphia, John Benjamins, pp. 213-214.
- Lambert S. (1991): "Aptitude testing for simultaneous interpretation at the University of Ottawa", *Meta* 36 (4), pp. 586-594.
- Lazarus R.S. and Folkman S. (1986): *Estrés y Procesos Cognitivos*, Barcelona, Ediciones Martínez Roca.
- Longley P. (1989): "The use of aptitude testing in the selection of students for conference interpretation training", in *The Theoretical and Practical Aspects of Teaching Conference Interpretation*. Ed. by L. Gran and J. Dodds, Udine, Campanotto, pp. 105-108.
- Méndez-Carrillo F.J., Inglés-Saura C.J. and Hidalgo-Montesinos M.D. (1999): "Propiedades psicométricas del cuestionario de confianza para hablar en público: estudio con una muestra de alumnos de enseñanzas medias", *Psicothema* 11 (1), pp. 65-74.
- Montorio I., Guerrero M.A. and Izal M. (1991): *Estudio sobre las dificultades para hablar en público de estudiantes universitarios*, Trabajo policopiado, Madrid, Universidad Autónoma de Madrid, Facultad de Psicología.
- Montorio I., Fernández M., Lázaro S. and López A. (1996): "Dificultad para hablar en público en el ámbito universitario: eficacia de un programa para su control", *Ansiedad y Estrés* 2, pp. 227-244.
- Moser-Mercer B. (1985): "Screening potential interpreters", *Meta* 30 (1), pp. 97-100.
- Moser-Mercer B., Künzli A. and Korac M. (1998): "Prolonged turns in interpreting: effects on quality, physiological and psychological stress", *Interpreting* 3 (1), pp. 47-64.
- Peri J.M. and Torres X. (1999): "Modelos cognitivos y trastornos de ansiedad", *Ansiedad y Estrés* 5 (2-3), pp. 285-298.
- Riccardi A., Marinuzzi G. and Zecchini S. (1998): "Interpretation and Stress", *The Interpreters' Newsletter* n. 8, pp. 93-106.
- Seipp B. (1991): "Anxiety and academic performance: a meta-analysis of findings", *Anxiety Research* 4, pp. 27-41.
- Spielberger C.D., Gorsuch R.L. and Lushene R.E. (1988): *Cuestionario de Ansiedad Estado-Rasgo. Adaptación Española*, Sección de Estudio de Tests, TEA.
- Westenberg H.G.M. (1999): "Facing the challenge of social anxiety disorder", *European Neuropsychopharmacology* 9 (3), pp. 93-99.
- Wood R.E. and Atkins P. (2000): "Self-efficacy and strategy on complex tasks" *Applied psychology: An international review* 49 (3), pp. 430-446.

APPENDIX

“CONFIDENCE IN PUBLIC SPEAKING”

Factorial structure

(Méndez-Carrillo, F.J.; Inglés-Saura, C.J.; Hidalgo-Montesinos, M.D., 1999)

ITEM	QUESTION	FACTOR I
11	<i>I face with confidence the prospect of speaking before an audience</i>	0.78
9	<i>I'm not afraid of being before an audience</i>	0.74
22	<i>My mind is fresh when I am before an audience</i>	0.73
10	<i>Although I'm nervous just before standing up, soon I forget my fear and enjoy the experience</i>	0.72
16	<i>I feel relaxed and at ease while I'm speaking</i>	0.72
29	<i>I feel terrified just at the thought of public speaking</i>	0.70
26	<i>I'm afraid and tense all the time I'm speaking in front of a group of people</i>	0.68
25	<i>My pose is forced and unnatural</i>	0.67
8	<i>When I speak in front of an audience, my thoughts get confused and mingled</i>	0.66
15	<i>Although I speak fluently with my friends, I cannot find the right words when I am at the rostrum</i>	0.66
18	<i>As much as I can I try to avoid public speaking</i>	0.66
12	<i>I think I am completely under control when I speak in public</i>	0.65

RESEARCH ON INTERPRETING BY STUDENTS AT SSLIMIT, UNIVERSITY OF BOLOGNA (ITALY)

Peter Mead
SSLIMIT, Forlì, University of Bologna

1. Background
- 1.1 The importance of theses in interpreting research

Pöchhacker's (1995) bibliography of writings and research on interpreting from 1989 to 1994, covering a total of 627 bibliographic items, attributes more than 10% of overall output to unpublished theses and dissertations.¹ While the contribution of doctoral and post-doctoral dissertations is quantitatively small (less than 2% of total production), theses submitted for a Master's qualification (or, in some cases, a first degree) account for 60 items (almost 10%). This figure, a considerable increase on the six Master's theses completed during the previous three and a half decades (Pöchhacker 1995: 20, 25), is probably lower than the actual total. The reason is that universities do not always disseminate information on theses (Gile 2000: 314), making it difficult to carry out an exhaustive survey.

Gile (2000: 318) highlights the growth in the combined output of the five countries contributing most theses from the 70s (17 theses) to the 90s (175 theses). A clear trend in the countries concerned is the growing proportion of theses reporting empirical studies – 65 out of 175 theses (37%) during the 90s, as opposed to 2 out of 17 (12%) in the 70s (Gile 2000: 318).

Authors of degree theses rarely have any further involvement in interpreting research after graduation (Pöchhacker 1995: 21), and hardly any have so far gone on to complete a doctorate (Gile 2000: 302). However, the “one-off” nature of most theses does not reflect on their *quality*, which is in some cases very high (Gile 1995: 22). Gran and Viezzi's (1995: 115) account of research into interpreting at the University of Trieste emphasises that theses are not only an important learning experience for undergraduates, but also contribute to development of institutional research.

1 Consistent with the terminology used by Pöchhacker (1995) and Gile (2000), the term “dissertation” is applied here to work for a doctorate or post-doctoral qualification, while a “thesis” is considered to have been submitted at graduation or Master's level.

1.2 Interpreter training and related research at the University of Bologna

Available figures show the highest national total of graduation theses during the 90s to have been 35, in Italy (Gile 2000). This figure actually represents the combined output of just two universities – Trieste and Bologna.

Against this background, the following brief account focuses on the contribution of graduation theses to interpreting research at the University of Bologna. No reference is made to publications by academic staff, which are beyond the scope of this survey.

Before the University of Bologna opened its School of Interpreting and Translation at Forlì in 1990, the only Italian university to award degrees in these disciplines was Trieste. About 800 students currently attend the School at Forlì (the intake being about 170 per year), and over 40 staff have tenure (including a number of interpreting specialists). Professional interpreters and translators also make a vital contribution, both as teachers and as examiners. In 1999, Forlì became part of the Conférence Internationale d'Instituts Universitaires de Traduction et Interprétation (CIUTI).

Following the recent reform of the Italian university system, both Forlì and Trieste are in the process of changing their degree courses in Conference Interpreting or Translation from four to five years. The new syllabus comprises an initial 3-year qualification in Linguistic Mediation, followed by a 2-year specialisation in Conference Interpreting or Translation – i.e. the “Y” format (Mackintosh 1999: 71). The 2-year specialisation requires that interpreting students study three languages (A, B and C), Italian being the compulsory A language.

The degree thesis (known as a *tesi di laurea* or, more simply, *tesi*) is a standard requirement at Italian universities, which usually takes the best part of a year to prepare and must be defended before an examining commission. It generally accounts for about 10% of the overall final mark (slightly less at Forlì). Whatever the student's examination record, assessment of the thesis is thus an important part of the final grade – whether to ensure top honours or to improve the overall result. This helps explain why students rarely lack motivation and commitment when approaching this last hurdle before graduation.

The first thesis on interpreting at Forlì was defended in 1996. At the time of writing (summer 2001), a total of 36 have been completed, and several more are at an advanced stage of preparation. Details are regularly submitted to *The IRN Bulletin* (<http://perso.wanadoo.fr/daniel.gile/>), and can also be found in issue number 10 of *The Interpreters' Newsletter* (2000). Output is steady, generally not fluctuating much from an average of about seven theses per year. Studies of interpreting are thus a relatively small part of the School's overall production,

for two main reasons: (i) many students specialise in translation, not interpreting; (ii) students often opt for research projects within related or complementary disciplines (ranging from terminology and linguistics to literature, cinema and history).

2. Thematic breakdown and examples

In terms of thematic breakdown, theses on interpreting so far completed at Forlì cover the following subjects:

topic:	number of studies:
experimental studies of interpreting	18 (14 simultaneous, 3 consecutive, 1 comparison simult. vs consec.)
observational studies	2
media interpreting	1
court interpreting	2
dialogue/community interpreting	3
perception of quality	2
surveys on topics other than quality	1
description and reflection	5
literature review	1
history of interpreting	1
total	36

Table 1: topics of graduation theses on interpreting at Forlì (up to July 2001)

While there is no single dominant theme, empirical theses account for more than half the total (20/36), as compared to just over a third in Gile's (2000) statistics for production of theses by the five leading countries during the 90s (see section 1.1).

Of the 20 empirical studies in Table 1, almost all report experimental research (18 theses), generally on simultaneous interpreting (14 theses). Observational research is the subject of only two theses – actually three, since the category “dialogue/community interpreting” includes an interesting observational study by Elena Fogazzaro (1998). However, quantitative trends do not necessarily reflect an institutional bias towards experimentation as opposed to observation. The probable explanation is simply that “field” recordings of professional interpreting are not readily available (except in the context of media interpreting). On the other hand, experimental studies can readily be set up with students, graduates and interpreting lecturers as subjects. Recently, some

authorised recordings of professional interpreting at congresses have been made available for research at the School, and a number of students are currently working on these. One such study, nearing completion at the time of writing, examines speed of the source and target speeches in simultaneous interpreting. Gile (1998: 72) argues that observational research of this kind can afford a valuable descriptive base for the study of interpreting.

Experimental theses have to date focused on a variety of topics. One of the subjects examined is the *comparison between students and professional interpreters*. Germana Tassora (1999) compares consecutive interpretations from French to Italian, by six students and six professional interpreters, with specific reference to handling of phatic speech items and fidelity to the source speech. Each subject interpreted two speeches. By comparison with students, professional interpreters: (i) reproduced more effectively the speaker's initial greetings and strategies to establish contact with the audience; (ii) conveyed more information; (iii) reproduced expressions from the source speech less literally. Elena Esposito (1999) compares simultaneous interpretations, again from French to Italian, by six students or recent graduates and six experienced professional interpreters. The specific focus of the study, in which each subject interpreted two speeches, is a quantitative analysis of filled pauses as an index of fluency. Esposito notes that the professional subjects, while making fewer filled pauses than students, tend to pause before major reformulations. Both groups pause before certain items, like numbers, dates and names.

Other experiments have been based on *theories and concepts in the literature*. For example, two major sources of difficulty in comprehension identified by Gile in the *Effort models* (e.g. Gile 1995: 106-108) are: (i) speech characteristics requiring increased processing capacity (e.g. bad pronunciation by a non-native speaker); (ii) problems associated with "vulnerability" of certain speech segments to momentary processing capacity shortage (e.g. numbers). These points are addressed in studies by Elisabetta Sabatini (1999) and Cristina Mazza (2000). Sabatini examines simultaneous interpretation of "non standard" speech, while Mazza focuses on numbers in simultaneous interpretation. Both studies analyse interpretations from English into Italian, by final year students at Forlì.

Sabatini's sample comprises 10 subjects. Using two English speeches with many examples of "non standard" usage (one by an Indian and one by an American), subjects were tested in listening comprehension, shadowing and simultaneous interpretation. Different speech sections were used for each exercise, scores being compared to ascertain whether they reflect: (i) consistent comprehension problems; (ii) differing degrees of complexity in the three tasks (i.e., listening comprehension easier than shadowing, and shadowing easier than simultaneous interpretation). While general comprehension of the two speakers

was not problematic, simultaneous interpretations contained many errors and omissions triggered by “non standard” lexical, phonetic and other features. This finding is consistent with the theoretical background provided by the Effort models. In terms of the relative difficulty of the three tasks, a frequent tendency to “correct” the source speech during shadowing introduced an unexpected confound and scores for shadowing were on the whole not better than those for interpreting – sometimes they were actually lower.

Mazza evaluates the “signal vulnerability” associated with numbers, examining the hypothesis that, if the interpreter does not write them down immediately, the need to store them in the short term memory can create problems in overall coordination of listening/analysis, memory and production. The study (reported elsewhere in this volume) compares simultaneous interpretation of two speeches containing large quantities of numbers, the independent variable being that subjects are allowed to use a pen and paper in only one of the two speeches. The error rate with numbers indeed proves high, especially when subjects cannot take notes – though notes are not particularly helpful for complex large numbers.

Other empirical theses by Forlì students have investigated concepts put forward, but not systematically tested, by Seleskovitch. An example is a study focusing on the concept of *deverbalisation*, by Barbara Rizzoli (2000). The study is based on the idea that, if *deverbalisation* occurs, the interpreter should achieve limited verbatim recall of the source speech. This idea has already been examined by Isham (1994) and Gran and Bellini (1996), investigating simultaneous interpretation from English into French and Italian respectively. Rizzoli’s study tests 32 Italian native speakers for verbatim recall of two recorded speeches – one in Italian and one in English. Sixteen subjects listened to the speeches; the other 16, all final year interpreting students with English as their B language, interpreted them simultaneously (from English to Italian and vice versa). In both groups, the cassette was stopped at certain points and subjects were asked to write down the words they had just heard. The analysis was based on the last three clauses heard, to compare verbatim recall across clause and sentence boundaries. A possible explanation for the finding that interpreters on the whole returned lower scores than listeners is that simultaneous interpreting involves *deverbalisation*. However, the variability in results suggests that this is not necessarily the case. Verbatim recall by interpreters was actually better in English (i.e., when they were interpreting *from* their B language) than in Italian (interpreting *into* B). Probably the most interesting and original part of Rizzoli’s work is the final discussion, in which she argues that some instances of incorrect recall (e.g., “election system”, sometimes recalled as “electoral system”) were caused by problems of retrieval from memory. This consideration raises doubts as to whether errors in verbatim

recall necessarily indicate that the words concerned have disappeared without trace from the subject's memory (i.e. been "deverbalised"). Rizzoli's final appraisal of her data thus introduces a critical perspective on the idea, central to the study, that the extent of verbatim recall can be taken as an index of deverbalisation.

Rizzoli's thesis is an example of how it is possible to use the methodology of other authors (in this case Isham, and Gran and Bellini) without actually replicating their studies. While replication consolidates available data and can provide valuable learning experience for researchers, they often find it relatively unattractive because it involves no innovation (Gile 1995: 227-228).

Michela Minelli (2001) addresses *language specificity in interpreting*, an issue which attracts more attention nowadays than in the 70s and 80s. Minelli analyses 32 simultaneous interpretations into Italian – 16 from an original English speech, and 16 from a French version of the same speech. All subjects were final year interpreting students at Forlì, having English or French as their B language. The analysis focuses on how subjects conveyed the original speaker's exhortations and promises. Generally, subjects interpreting from French remained closer to the *form* of the source speech than those working from English. This probably reflects the greater formal similarity between two Romance languages than between a Romance and a Germanic language. It does not necessarily give any indication as to how faithfully the *sense* of the source speech is conveyed. The study highlights that language combination is not the only variable affecting the degree to which subjects reproduce the form of the source speech. The extent to which they did so, in both languages, was associated with two factors: (i) length of speech segments, the tendency being to maintain the form of short segments, but not of longer ones; (ii) the tendency to translate more literally in the second part of the speech than the first. A possible explanation for this is that subjects lapsed into what they found less demanding when they started to tire. Though each speech lasted little more than 10 minutes (and was thus relatively short by professional standards), this is more or less the standard length of speeches in simultaneous interpreting examinations at Forlì, suggesting that subjects might have felt tired by the final part of the speech.

Cerebral lateralisation, a prominent topic of research at Trieste, has to date been the subject of only one thesis at Forlì (Baldi 2001). This is not surprising, given the need for an interdisciplinary approach involving expertise in neurolinguistics. Interestingly, Lucia Baldi's study considers *manual preference* as an independent variable for qualitative evaluation of simultaneous interpretation from English (B) to Italian (A), by 25 final year students of interpretation: 10 right-handers, 10 left-handers, and also five ambidextrous subjects who were not included in the statistical comparison of error counts as a function of manual preference. Comparing subjects according to manual

preference is actually not common in research on cerebral lateralisation in interpreting. This is understandable, since studying only right-handed subjects (as in Gran and Fabbro 1988) ensures that manual preference is not a confound in comparison of cerebral lateralisation at different stages in interpreter training. Baldi's study examines two simultaneous interpretations performed monaurally – one with the subject's "preferred" ear for simultaneous interpretation, the other with the "non preferred" ear. The main objective was to compare errors of content according to two variables: (i) subjects' manual preference (right- or left-handed); (ii) which ear they listened with. On the whole, left-handers made significantly less mistakes than right-handers, and subjects preferring the left ear made less mistakes than those preferring the right ear. At the same time, subjects generally made more mistakes with the preferred ear than the non-preferred ear. This suggests that any actual advantage gained by preference for one ear can in some way be compensated for when using the other – perhaps by increased attention. Baldi's results provide an interesting complement to Sylvie Lambert's (1989) finding that eighteen right-handed simultaneous interpreters, working in both directions between English and French, performed better when listening with the left ear. Lambert considers two possible explanations: (a) the tendency to prefer the right ear for self-monitoring; (b) the effectiveness of the left ear in channelling the incoming acoustic signal to the right hemisphere, indicating that both hemispheres are involved in the interpreting process.

While the above examples are only a few of the theses completed at Forlì in the last five years, they illustrate the kind of theoretical background and practical work which can be involved. Consecutive interpreting has to date prompted fewer theses than simultaneous (3, as opposed to 14), possibly reflecting a preference for simultaneous interpreting among students. Palazzi's (1999: 43) comments on the psychological tension that students tend to associate with consecutive suggest that they often see it as a necessary evil – a phenomenon which Ilg (1988) observes even among professional interpreters. However, it seems unlikely that the preference for research on simultaneous interpreting at Forlì stems from consistent aversion to consecutive. A number of studies currently in progress are either specifically about consecutive or compare the two modes.

Dialogue/community interpreting and court interpreting have been the subject of few theses. There are two probable explanations for this: (i) as in the case of observational research on conference interpreting (see comment on Table 1, above), "field" recordings are not readily accessible, particularly if they contain personal or confidential information; (ii) experimental studies involving fellow students are arguably less practicable and appropriate for these forms of interpreting than for conference interpreting. However, given the increasing interest in dialogue/community interpreting and court interpreting as subjects of

academic study, they are likely to become more prominent as research topics for theses over the next few years.

3. Taking stock and looking ahead

While no sweeping generalisation can be made about the qualities and weaknesses of *tesi di laurea*, one aspect which has continued to improve over the years is the breadth and organisation of prior reading. There are a number of reasons for this. First, library facilities have developed considerably, giving students readier access to the literature than a few years ago. This applies not only to text books and standard works of reference, but also to journals covering translation and interpreting topics. Second, Internet has perhaps also contributed in this respect, with increasing on-line availability of bibliographic references and “virtual” publications (for example, *META*). Third, a number of good theses have set a precedent, presenting well argued examinations of relevant sources rather than an unstructured survey of the “classics”. Finally (but perhaps not least), several seminars and courses in theory have been run in recent years. One point which could perhaps be stressed more in such seminars is the wealth of information and data to be tapped in other theses. It is not suggested that summarising and commenting on data reported in earlier theses should *replace* a comprehensive review of standard text books and studies. However, theses can prove an excellent source of empirical data on a specific subject and, as such, are an important complement to the theoretical basis provided by books.

In terms of weaknesses, these tend not to differ much from the faults which often mar more advanced research – for example, failure to focus on a workable topic, to base empirical work on a well reasoned initial argument, or to present results clearly (and to best effect). In this respect, Mead’s analysis of problems in doctoral research (Mead 2001) offers practical information relevant to work on graduation theses. Perhaps the main problem is difficulty in establishing (and maintaining!) a realistic time schedule. Sometimes, procrastination and/or poor planning in the early stages entails a rush to meet the final deadline. In other cases, understandable impatience to graduate (and possibly avoid paying further enrolment fees) curtails work on a lengthy but far from perfect manuscript.

Some of the best theses lead to publications. Francesca Gaiba’s 1996 thesis about simultaneous interpreting at the first Nuremberg Trial provided the basis for her book on the subject (Gaiba 1998; review by Baigorri-Jalón 2000). However, there is no guarantee that a good thesis will be published, even as a short article. There are two frequent obstacles in this respect. First, once graduation is over, the author may not find the time or motivation to work at revising, adapting and/or summarising a thesis for publication. One way of ensuring that a potential publication is not wasted in this way is to share the

work – and the authorship – with the supervisor and/or co-supervisor. A second limiting factor for publication in international journals is that many theses defended at Forlì are written in Italian. Indeed, out of 36 theses, 28 have been written in Italian and only 8 in another language (English). Since texts in Italian are not accessible to an international readership, it may prove advisable to rewrite them in a language like English or French. Simply editing and summarising the thesis may thus not be enough to ensure publication in a widely read journal. Pöchhacker's (1995: 23) survey of the 1989-1994 period indicates that authors of theses in other countries face the same problem, with 5 theses out of 60 in English, 25 in German, 3 in Spanish, and the remaining 27 in languages less accessible to an international readership (Italian, Czech/Slovak, Finnish, Swedish). If it proves possible one day for centres with a regular output of theses to post at least an abstract in two or three languages on Internet, this could allow valuable exchanges of information between different research groups.

In Italy, it is still too early to know what effect, if any, the university reform will have on the quantity and quality of theses about interpreting. Prospects will become clearer only from about 2005 on, when the new “3+2” system hits its stride. However, the indications are that Forlì is well placed to ensure a steady output of theses in the foreseeable future. One positive sign in this respect is the number of academic staff involved in supervision of research. While a nucleus of less than ten individuals have been regularly involved in supervising the theses so far completed, the number of colleagues contributing continues to increase. Some teachers of interpreting are committed essentially to the practical business of training interpreters, and take little or no part in supervision of research. Those who do may thus work in tandem with language or linguistics specialists, and a variety of disciplines are represented on the commissions which assess theses. This means that interpreters have no monopoly on the supervision and assessment of research work on interpreting. Though consensus is not always easily reached, this system makes for cross-fertilisation – staff not directly involved in interpreter training can learn about empirical work on interpreting, while interpreters can learn to appraise their work by the standards of “mainstream” academic disciplines. Such exchanges are surely going to prove a vital factor if the momentum gained during the last five years is to be maintained and further developed.

References

I. General

- Baigorri-Jalón J. (1999): “Review of Gaiba F., 1998, *The Origins of Simultaneous Interpretation: the Nuremberg Trial*”, *Meta* 44/3, pp. 511-514.

- Falbo C., Russo M. e Straniero Sergio F. (a cura di) (1999): *Interpretazione Simultanea e Consecutiva. Problemi Teorici e Metodologie Didattiche*, Milano, Hoepli.
- Gaiba F. (1998): *The Origins of Simultaneous Interpretation: the Nuremberg Trial*, Ottawa, University of Ottawa Press.
- Gile D. (1995): *Regards sur la recherche en interprétation de conférence*, Lille, Presses Universitaires de Lille.
- Gile D. (1998): "Observational and experimental studies in the investigation of conference interpreting", *Target* 10/1, pp. 69-93.
- Gile D. (2000): "The history of research into conference interpreting. A scientometric approach", *Target* 12/2, pp. 297-321.
- Gran L. and Bellini B. (1996): "Short-term memory and simultaneous interpretation: an experimental study on verbatim recall", *The Interpreters' Newsletter* 7, pp. 103-112.
- Gran L. and Fabbro F. (1988): "The role of neuroscience in the teaching of interpretation", *The Interpreters' Newsletter* 1, pp. 23-41.
- Gran L. and Viezzi M. (1995): "Development of research work at SSLM, Trieste", *Target* 7/1, pp. 107-118.
- Ilg G. (1988): "La prise de notes en interprétation consécutive. Une orientation générale", *Parallèles* 9, pp. 9-13.
- Isham W. (1994): "Memory for sentence form after simultaneous interpretation: evidence both for and against deverbalization", in *Bridging the Gap. Empirical Research in Simultaneous Interpretation*. Ed. By S. Lambert and B. Moser-Mercer, Amsterdam-Philadelphia, John Benjamins, pp. 191-211.
- Lambert S. (1989): "Simultaneous interpreters: one ear may be better than two", *The Interpreters' Newsletter* 2, pp. 11-16.
- Mackintosh J. (1999): "Interpreters are made not born", *Interpreting* 4/1, pp. 67-80.
- Mead P. (2001): "Doctoral work on interpretation: a supervisee's perspective", in *Getting Started in Interpreting Research*. Ed. By D. Gile, H.V. Dam, F. Dubsclaff and B. Martinsen, Amsterdam-Philadelphia, John Benjamins, pp. 121-143.
- Palazzi M.C. (1999): "Aspetti pratici della professione", in *Interpretazione Simultanea e Consecutiva. Problemi Teorici e Metodologie Didattiche*. A cura di C. Falbo, M. Russo e F. Straniero Sergio, Milano, Hoepli, pp. 41-59.
- Pöschhacker F. (1995): "Writings and research on interpreting: a bibliographic analysis", *The Interpreters' Newsletter* 6, pp. 17-31.
- The IRN Bulletin*, <http://perso.wanadoo.fr/daniel.gile/> (current issue and previous five issues usually available on line).

II. Graduation theses referred to in the article

- Baldi L. (2001): *Interpretazione simultanea e preferenza manuale: un contributo sperimentale.*
- Esposito E. (1999): *La resa interpretativa: l'incidenza dell'esperienza professionale sull'interpretazione simultanea.*
- Fogazzaro E. (1998): *L'interprete di trattativa: la gestione dell'informazione tra accordo e conflitto.*
- Gaiba F. (1996): *The Origins of Simultaneous Interpretation: the Nuremberg Trial.*
- Mazza C. (2000): *Numbers in Simultaneous Interpretation.*
- Minelli M. (2001): *Analisi di forma e contenuto nell'interpretazione simultanea dal francese in italiano e dall'inglese in italiano.*
- Rizzoli B. (2000): *Verbal Recall in Simultaneous Interpretation: A Contribution to Empirical Study of the "Théorie du Sens".*
- Sabatini E. (1999): *Comprehension Difficulties in Simultaneous Interpretation from "Non-Standard" English.*
- Tassora G. (1999): *L'incidenza dell'esperienza professionale sulla resa interpretativa nell'interpretazione consecutiva: risultati di un esperimento francese-italiano.*

**SIGN LANGUAGE:
A NEWCOMER TO THE INTERPRETING FORUM**

Cynthia Jane Kellett Bidoli
SSLMIT, University of Trieste

1. Introduction

The vast majority of us perceive language as a form of oral communication, which is taken for granted like the air we breathe. For a minority however, the ability to hear spoken language and use it as a normal means of communication has been lost through deafness, which may have developed gradually through illness or encroaching age, or may never have been acquired because of a congenital condition from birth. Most of us live and work in a spoken-language environment rarely encountering the invisible reality of deafness, which exists in our midst; it is not immediately tangible when one walks down a street. One instantly recognises a Blind person or someone in a wheelchair as having a physical deficiency, but it is impossible to single out the Deaf, unless they are spoken to.

Although most of us have no direct contact with Deaf people, all of us know what deafness is and that the Deaf generally use sign language as a means of communication amongst themselves composed of seemingly incomprehensible, extremely complex, rapid hand movements and exaggerated facial expressions. It should be noted however that not all Deaf people use sign language nor wish to be associated with the Deaf community, preferring to socialize and work in the hearing environment (Kyle and Woll 1985: 7, Paoli 2000).

People associate interpretation with the transfer of a message from one spoken language into another rarely taking into consideration the fact that sign languages are languages in their own right too. The newly arrived migrant lacking the language skills necessary for him/her to cope with certain situations in the new host country may call upon the aid of a community interpreter. Hearing delegates of any nationality may need interpreters in order to follow proceedings during an international conference or to converse during official meetings. Likewise, Deaf people may need interpreters to communicate information to and from their non-verbal signed languages.

This latter form of interpretation (generally considered within the domain of public service interpreting) has gradually become officially recognized as an occupation in many countries throughout the world over the past forty years. People with strong or total hearing impairment attempt dozens of community-related communicative feats every day which the hearing take for granted. In order to successfully accomplish them they often require the aid of an

interpreter; to fix appointments, seek the advice of a lawyer, consult with their children's teachers and so on. The Deaf often have to rely on the help of close friends and relatives, but those luckier ones who live in a country which recognizes sign language on a par with spoken language, may choose to call a professional community interpreter specialised in signing. Although the Deaf are greatly dispersed within the hearing population – their total number in the world being proportionally much lower than those with normal hearing – there is nevertheless in most industrialized countries, a growing number of Deaf people who join Deaf clubs and associations and who are beginning to learn about and ask for interpreter services. Furthermore, they may attend conferences on Deaf issues organized by these organizations, various foundations and universities at both national and international level (for example the regular conferences of the World Federation of the Deaf). Unfortunately, in many parts of the globe there still exist countries where professional interpreter training programmes and facilities for the Deaf are sadly lacking or struggling for recognition because of official disregard or lack of funding.¹ Sign language interpreters at the dawn of the 21st century are facing new challenges² and are having to adjust to a wide variety of working environments including the conference setting and having to adapt their skills accordingly (Kellett Bidoli in press a). Conferences today cover a wide variety of subjects of direct interest to the Deaf such as education, social aspects of deafness, medical advances, linguistic aspects of sign language and interpretation issues, as well as an enormous range of subjects of interest to the general hearing public.

2. The rejection and acceptance of signed languages

Deafness has followed man through the centuries affecting only a small proportion of the total population. The condition may be total or partial, persisting from birth or may develop at any stage during one's lifetime caused by trauma, disease or aging. Advances in modern medicine and technology have done much in improving early detection, identifying causes, enhancing impaired hearing or in extreme cases, inserting cochlear implants or bionic ears in profoundly Deaf children. Despite all the technological advances, there are still many people with varying degrees of hearing impairment. Worldwide there are

1 For example, articles on the emerging interpreting profession in its many guises in South Africa can be found in Erasmus (1999).

2 Papers on a wide variety of issues are presented in the Proceedings of the 1st Forlì Conference on Interpreting Studies, *Interpreting in the 21st century: Challenges and Opportunities*, 9-11 November 2000, edited by G. Garzone and M. Viezzi (in press).

over 70,000,000 Deaf people. In the past they were ignored or treated as imbeciles, considered incapable of speaking or communicating. It was often presumed that if they could not talk then they could not think and therefore if they could not think they had no culture or language like the rest of mankind. They were thus condemned to the edges of society, ridiculed and rejected. Kyle and Woll (1985) mention a case reported in the Glasgow Herald of 26th September 1817. A woman, deaf and dumb from birth, was accused of drowning her child by throwing him into the river from a city bridge. Her solicitor put up the defence that as it was impossible to communicate with her, she could not be tried. Being unable to speak implied that she could distinguish neither right from wrong, nor the gravity of the situation nor the normal course of court proceedings. However circumstances changed when an interpreter was found (Kinniburgh, the principal of the Edinburgh School for the Deaf), who by communicating through gesture led the court to pass a verdict of accidental drowning.

In brief, in Europe, sign languages began to be adopted in special schools for the Deaf after Abbé de l'Épée in Paris in the mid 1700s discovered how to exploit the natural sign language used among his Deaf pupils in order to devise a method to teach them French. Schools based on this methodology spread as far as the USA. In America, French Sign Language (FSL) began to mix with the existing sign languages of the American Deaf to form what is now called ASL (Volterra 1987: 9). The Italian Abbot Tommaso Silvestri was sent to France to study the famous French method. He returned to Italy to open a school for the Deaf at La Casa Di Pietro in Rome only to later abandon signs in favour of oralism (Boggi Bosi 1939 and Perini 1902, cited in Radutzky 1983: 153). Padre Ottavio Assarotti established a teaching method in Genoa based on mime that spread to many Italian cities – Siena, Modena, Turin, Cremona, Milan, Verona and Rome – (Grimandi 1960 and Picanyol 1941, cited in Radutzky 1983: 153). Despite debate between educators and ear specialists in Italy in the 1800s, oralist methods began to dominate the country (Facchini and Rimondini 1983) and culminated in an *International Congress* in Milan in 1880. 'International' delegates – seven-eighths of whom were from Italy and France (Lane and Battison 1978: 77) – were invited to visit oralist institutions for the Deaf in the area before the Congress began, to see the achievements of the oralist method for themselves. They were so impressed that at the first session of the Congress a swift majority vote was cast in favour of the oralist system, which was deemed far superior to methods using signs (Kyle and Woll 1985: 42). The oral method took firm hold and dominated education of the Deaf in Europe (and British Commonwealth countries), rejecting sign language in the classroom for a century. The Deaf had thereafter to learn to speak and thus there was no need for interpreters of sign language. Lane and Battison (1978: 77-78) reported at the

NATO Symposium *Language, Interpretation and Communication* in Venice, September 1977, that as a result of the Congress of Milan, for a century the education of most Deaf children worldwide was not conducted in their primary language, leading as with other minority language users around the globe, to the social, economic and political consequences of an inferior education. They appealed to:

Let us undo in Venice what was done in Milan. Let us set right in 1977 what was set wrong in 1880. Let us, in this international symposium on language interpretation, affirm that no language is incontestably superior to any other, that every language is the priceless heritage of all mankind, and that we particularly cherish the free use and development of minority languages precisely because they are subject to repression at the hands of the majority.

The tide began to turn in favour of the use of sign from the 1960s onward when researchers in the USA began to show interest in gesture from a linguistic perspective (Stokoe 1960, Stokoe *et al.* 1965, Bellugi and Klima 1972, Stokoe 1972, Battison 1974, Friedman 1976). Research revealed a complex autonomous language with its own ‘phonology’ and grammar (Bellugi and Klima 1983: 131-134). Research spread to European and non-European countries and advances in psycholinguistics and increased public awareness led the way to revised theories in the teaching of spoken language to the Deaf such as The Philosophy of Total Communication which “specifies the use of signs and speech together in classroom activities” (Kyle and Woll 1985: 32). Murphy (1978: 88) comments that through the late 1960s and 1970s, “research was reported on the educational, psychological and social gains of children who used, and did not use, sign language” and studies³ “showed superiority of early users of sign language over non-users or late users of sign language”.

The advancement of knowledge about sign language proceeded at varying rates. Italy for example has been a latecomer in this sector with research starting in the 1980s (Volterra 1981, Attili and Ricci Bitti 1983, Volterra 1987). Over the past four decades world-wide research into deafness and sign language and an increased assertiveness within minority groups have played a role in leading to more awareness of the needs of the Deaf among hearers and the Deaf themselves are starting to take a more active role in the diffusion of Deaf culture outside the confines of their associations and clubs. Ladd (in press) contrasts the medical concept of ‘deafness’ with his new concept of ‘Deafhood’ which is the identification of deafness by each and every Deaf individual. He draws parallels

3 Mindel and Vernon (1971) and Schlesinger and Meadow (1972), cited in Murphy (1978: 88).

between Deaf cultures and the cultures of other linguistic minority groups in their struggle for recognition. Woll (1988: 194) states that: "With the greater recognition of minority group rights has come a greater acceptance of the right of deaf people to choose the language they wish, and an understanding that sign language may provide the key to greater integration of the deaf".

Though, fortunately, the negative attitude of the past is disappearing, it must not be forgotten that even in the USA, where sign language has been the object of study for a longer time and where Gallaudet University (exclusively for Deaf students) is to be found, it was only in the early eighties that ASL was officially recognised as a minority language.

Historically worldwide, standard national sign languages based on a common set of rules for all Deaf people in each country, as in the case of most spoken languages, did not develop and cultural and linguistic differences still abound among different Deaf communities: "Sign languages are not the same across cultures, and there are differences between the vocabulary of BSL [British Sign Language] and that of American Sign Language (ASL) even though there are strong cultural and spoken similarities between the two countries" (Kyle and Woll 1985: 24). The norm in all countries was the development of numerous signed dialects. Experts have identified dominant dialects which in some cases have become or are becoming recognised as the official sign language of a particular country as for example in Italy where Roman sign language was and still is the most diffuse dialect. CNR (Italian National Research Council) researchers based in Rome in the early eighties (see Volterra 1981, 1987), began analysing the language of the Roman Deaf community and began gathering signs in the Roman dialect recognizable in other parts of the country to form a corpus which is known as LIS (Lingua Italiana dei Segni – Italian Sign Language). LIS is the signed version now most frequently seen on Italian national TV or found in dictionaries of Italian sign (see Angelini *et al.* 1991, Magarotto 1995, Romeo 1991, Romeo 1997) and is becoming a standard notwithstanding the continued evolution of traditional signing in dialect by Italian Deaf communities throughout the peninsula. The Deaf associations are still debating the need for a standard signed form despite their respect for dialect (Volterra 1987: 13). Indeed, the lack of a common standard can lead to problems of comprehension among different Deaf groups or for example by the viewing Deaf audience on national TV (see Steiner 1998).

3. The rise of professional signed interpretation

At the above mentioned watershed NATO Symposium in Venice, several papers on sign language interpretation (illustrating the pioneering American experience) were presented indicating interest within the interpreting community in the then

emerging, 'new' form of professional interpretation which was in a short span of time to cross the Atlantic (see Gerver and Sinaiko, 1978). Since then, progress has been made (mostly in North America) and the general public too has become more sensitive to the consequences of deafness. Many people with no prior knowledge of sign language are enrolling on courses out of interest and curiosity to learn it. Deaf people's rights are beginning to be supported by sporadic favourable legislation. For example in Italy, a law was passed by the Italian Parliament in 1992 which now gives Deaf children the right to obtain the service of an interpreter throughout their education through to university level.⁴ In 1997, LIS was inserted by law for the first time among university disciplines. These two major legal accomplishments have opened the door to formal interpreter training in LIS (see Gran and Kellett Bidoli in press). Today's interpreter training services in sign language in Europe and abroad are developing and expanding, catering principally to community related needs.

The USA has always been at the forefront of developments in sign language interpreter training. The United States Registry of Interpreters for the Deaf (RID) was founded in 1964 to determine the professional interpreter's role and functions as well as set guidelines in the specialized field of interpreting for the Deaf. Since then, steps have been taken in establishing evaluation procedures for confidential interpreter certification in all American states, which outline basic competency in most situations evaluated by a specialist team (see Solow 1981). The RID continues to provide regular conferences and publications on all aspects of interpretation.

In the rest of the world few countries have national registers of professional interpreters. In Europe only a handful do (see Woll 1988). In Italy for example, despite a growing demand for sign language interpreter services over the past 20 years there is still need for homogeneity in the quality of services provided and as yet there is no official Italian register of professional sign language interpreters. Girardi (2000) emphasises the need for good quality, stating that in Italy there are few truly competent professional interpreters who can translate the whole message adequately; sections of discourse are often omitted and little attention is given to the culture and needs of the Deaf.

In Italy, in the past few years, workshops and various initiatives for the provision of good quality training of sign language interpreters have been offered by official authorities (Radutzky 2000) such as ENS – Ente Nazionale Sordomuti: Italian Deaf Association – and the Mason Perkins Deafness Fund, as well as by both accredited private and public educational institutions (Ricci Bitti 2000). Cortazzi (2000) however, cautions about the ease with which

4 For information on interpreting services at the University of Padua see De Gasperi (2000).

unscrupulous individuals can still offer courses under present Italian law with little regard to accepted standards of professionalism. The teaching of sign language and interpretation at the SSLMIT in Trieste began in 1998 with a successful two-year course including *Italian Sign Language* and *Interpretation between LIS and Italian* which provides university students with a basic grounding in the discipline (see Gran and Kellett Bidoli in press and Castiglione in press).

Contrary to common knowledge, Deaf people themselves can also serve occasionally as interpreters: "The deaf person can serve as an intermediary interpreter. This occurs most often when an interpreter cannot adequately interpret for a deaf person who possesses minimal language skills" (Domingue and Ingram 1978: 83). The Deaf interpreter is more sensitive to dialectal variations or to minimal gestures and movements as in the case of mentally ill Deaf patients. Furthermore, the Deaf can communicate effectively with Deaf-Blind people and are increasingly becoming involved in this kind of interpretation in the United States (Steven Collins, personal communication)⁵.

4. Sign language research and quality assessment

The discussion of sign language at international conferences on mainstream interpreting has remained sporadic; at least in Europe. Pöchhacker (1995) conducted a bibliographic analysis of a corpus of 945 items with a 'European' perspective and a strong bias towards conference interpreting, divided into two distinct periods; 1952-1988 and 1989-1994. In the later period, out of over 600 items analysed, written in a dozen languages (though English dominated at 55.7%), only 12 items resulted specifically on sign language interpretation. Despite the limited diffusion in Europe of research on sign language and interpretation in mainstream journals, signed interpretation (community and conference interpreting) is an issue discussed frequently at conferences on deafness and Deaf culture organized by Deaf Associations. Papers are indeed published in their proceedings but as they are written in the national standard language of their country of origin they do not easily reach the international circuit.

Research into signed interpretation is certainly less widespread than in the more common spoken modes; consecutive and simultaneous. Research is hindered firstly, because there is a scarcity of researchers with the necessary linguistic skills in sign language. Secondly, because there is difficulty in finding statistically viable samples to work on especially in those countries where

5 For more on the Deaf working as interpreters for the Deaf-Blind see Collins (1993).

professional sign language interpretation is in its infancy. Lastly, it is no easy task to find an adequate notation system for the graphical representation of this three dimensional language.

The American literature on sign language generally tends to focus on community interpreting (see Patrie and Mertz 1997). Discussion of 'platform' interpreting for the Deaf – as conference interpreting is called across the Atlantic – is not widely covered, but useful tips can be obtained in Solow (1981), and especially in RID publications (see for example, Kirchner 1975). Little has been written on it specifically as it is still in its infancy in most parts of the world. For an overview of American research on interpreting with signed languages concerning modality used, sociolinguistics, cognitive aspects and performance factors see Isham (2000).

The literature on sign language and interpretation in Europe has been catching up with the USA since the mid 90s. It is dominated by linguistic aspects of the interpreting process and reports on new training initiatives and teaching methodologies that are indeed welcome additions to the growing wealth of knowledge in this field. A special edition of *Meta* (September 1997) deals with sign language interpreting in Europe and references to European work can be found in Patrie and Mertz's annotated bibliography (1997), though predominantly it covers American research. Isham (2000: 35) laments that there is not enough communication between signed-language interpreters and researchers in North America and Europe. However, this is inevitably caused by the European Continent's rich linguistic diversity. Sign is used in all of Europe's non-English speaking nations and subsequently, papers on sign language research tend to be written in numerous national standard spoken forms, rarely reaching the English-speaking community or international researchers who use English.

An aspect of interpretation which is becoming increasingly recognized as an essential element in the training of interpreters and interpreting research is quality.⁶ It is an aspect that concerns both spoken and signed interpretation. Quality is a degree of excellence, a relative, intangible essence, which is perceived by each one of us in a unique manner. Its enigmatic nature renders any measurement or assessment of it extremely arduous and challenging.

Since the 70s, numerous aspects of performance (especially in the simultaneous spoken mode) have been scrutinized such as prosody, non-verbal aspects of communication, stress, fatigue and memory as well as factors external

6 A conference was held on this very subject in Almuñécar, Spain, 19-21 April 2001. Papers on a wide range of quality issues can be found in the Proceedings of the Conference, *International Conference on Quality in Conference Interpreting*. For quality in sign language interpretation see Kellett Bidoli (in press b).

to the interpreter such as lighting, seating arrangement and prior access to subject material (for overviews see Kellett Bidoli 2000, Shlesinger 1997 and Viezzi 1996, 1999). This has led to the formulation of a bewildering number of parameters and variables to describe and scrutinize the quality of interpretation (Kellett Bidoli 2000). Studies of hearing end-user reactions to conference interpreting have revealed that people's opinions may vary according to gender (Ng 1992), or nationality of the assessor (Gile 1990), to whether the assessor be a professional interpreter (Bühler 1986, Altman 1990), or an interpreter trainer (Schweda Nicholson 1993). Assessment may vary among different user groups (Kurz 1993, Marrone 1993, Kopczynski 1994, Weller 1996) or there may be differences of opinion among individuals of the same user group (Meak 1990). It may happen, as Gile (1991) pointed out, that people are not equally interested in all the information offered by the interpreter and that attention may be paid to only portions of speech, resulting in the comprehension and retention of only a small part of the whole. Therefore our opinions are formed, not only by the visual and acoustic signals from what we see and hear, but also according to personal factors such as, interest, level of concentration or state of mind at any given time and place.

Similar interest in sign language interpreting quality first emerged in the United States where professional interpreting in various signed languages (the sign languages of China, Vietnam, Korea, Mexico etc. and ASL) has become widely established since the 60s. There are few specific studies on quality as it generally tends to be included together with other aspects of interpreting research. Furthermore, it is more difficult to determine sign language interpretation quality as opposed to spoken because only the Deaf can do it or hearing people with an excellent knowledge of sign, both of whom are few and far between with respect to spoken language experts in the total hearing population. See Strong and Rudser (1985, 1986) on instruments for quality assessment. For a Deaf end-user's view see Abbou (1994), Bienvenu (1988) and Brasel *et al.* (1974). Two Italian examples are Cameracanna and Franchi's paper (1997) on quality in signed conference interpreting and Del Vecchio and Franchi (1997) on strategies to adopt during the viewing of visual material which may cause problems for the signer.

According to Solow (1981) attributes required of the interpreter in order to produce good quality interpretation for the Deaf end-user are:

- 1) *flexibility* in order to fit into any situation when and where required, ranging from athletic events to religious ceremonies, in the oral or spoken mode and being prepared to adapt to particular consumer requests such as heavy reliance on lip reading or fingerspelling.
- 2) *objectivity* so as not to reveal ones own feelings and influence the interpretation in any way;

- 3) *self-discipline* in order to work unsupervised (in the community setting), maintaining a low profile and working with punctuality and responsibility.

5. Sign language conference interpreting

Sign language conference interpreting is closely related to spoken language interpreting and there are similarities which few oral interpreters are aware of (Kellett Bidoli in press a). Differences can be more readily identified such as the most obvious one which is the mode used: vocal vs. gestual. However there are a number of differences in the conference setting, some of which are outlined below, which do not immediately spring to mind.

First and foremost at a conference, Deaf individuals in the audience may be either the majority (at conferences on Deaf issues), or a minority having specifically requested the aid of an interpreter at conferences organized for the general hearing public. In both cases the prime concern is **visibility**: the Deaf must be able to **see** the translation taking place.

The quality of interpretation from speech-to-sign will depend fundamentally on how far the Deaf clients are seated away from the front of the conference hall and whether certain aspects have been taken into consideration to provide optimal visibility such as illumination of the platform, the provision of a white background and a raised pedestal not too far from the speaker for the interpreter to stand on. The Deaf should always be given front seats in order for them to see all movements and facial expressions made by the interpreter and speaker with ease. They find it particularly annoying to find themselves seated several rows back having to crane and peek between the heads and shoulders of inconsiderate hearers. It can be likened to the acoustics being switched on and off for hearing people so that one persistently keeps missing chunks of information. Signs in the conference setting should be larger than during community interpreting, and avoid any coverage of the face. Facial expression and lip movements should be exaggerated, and fingerspelling kept to a minimum, but when necessary executed with precision.

The conference interpreter from speech-to-sign must at all times face the audience and thus, being unable to turn around and observe the oral speaker's non-verbal communication (NVC) markers, must be able to hear clearly everything that is said. (Voice-to-voice simultaneous interpreters have the advantage of looking directly at speakers from the booth, which aids the understanding of the source language). In some cases the speaker may be invited to sit in the front row, out of public view, so that the interpreter can see all NVC markers. However this solution is not favourably looked upon by hearing audiences. Another option is the engagement of two interpreters, one in the front row who can see the speaker and signs the target language (TL) to a second

interpreter who shadows it in sign language to the public. This second solution is often adopted when the TL is different from the national standard signed/spoken version such as in an Italian conference setting from spoken English to ASL (or BSL) to LIS. In Italy the reason for this relay system is that at present there are few sign language interpreters who can work into and from more than one signed/spoken language. At conferences attended by large numbers of Deaf participants it may be necessary to position several interpreters along the sides and central aisle of the hall and in the case of international conferences several language combinations may be required which greatly complicates the organization of the interpreting service. A recent symposium in Zagreb, Croatia – *Sign Language and Deaf Culture* 3-5 May 2001 – may serve as an example of the complexity involved in organizing interpretation for an international audience composed of a Deaf (majority), a hearing (minority) and two Croatian Deaf-Blind individuals (see figures 1 and 2). The three official working languages were Croatian, English and their respective sign languages. Also International Sign, Slovene and Tactile interpreting for two Deaf-Blind Croatians were provided during the event. Fig. 1 illustrates sign-to-speech interpretation during a signed presentation in ASL. Few Deaf participants could follow it, hence the provision of other signed varieties all stemming from the English oral rendition by an American interpreter (1) picked up by interpreters in the booths (2 and 3; English to Slovene and English to Croatian) and relayed through the various signers (4 - 9). In the case of tactile interpretation an interpreter was present for each client as needed and not just one as illustrated. Fig. 2 shows how speech-to-sign interpretation employed the same number of interpreters in almost the same configuration but input to the two booths was direct. Most hearing participants could follow the original English, but headsets were provided for the few who could not. All the Deaf participants relied on what the signers received from the booths. For the sake of clear graphics in the figure, interpreter 9 appears far from the Deaf interpreter 5, but in effect they were seated in front of each other.

Another aspect to take into consideration is the use of the signed version of the spoken language structure commonly used by interpreters in some countries (UK and Sweden) and rarely in others (Italy). Humphrey (1997: 20) states that for example when working between English and ASL, interpreters often slip into the grammatical structure of their native language (English) and conform to hearing cultural norms and behaviour especially when the text is complex, the source language (SL) is fast or the topic unfamiliar. Kyle *et al.* (1981), amongst the findings in a report on levels of BSL performance in the UK, found that even when signers had Deaf parents they were still strongly influenced by English syntax. They used little idiom and all had difficulty interpreting from speech-to-sign. The language of hearing people seemed to be geared towards an

interlanguage rather than the BSL used by the Deaf. Llewellyn-Jones (1981), reported that in the consecutive mode interpreters would more likely use a correct English form but in simultaneous interpretation there was a tendency to follow the SL structure with the production of non-English sentences, omissions or incorrect usage and added that a hearing audience will “assume that this was the function of the deaf person’s lack of knowledge of English (and feel that the interpreter was doing a good job)”.

Lag time depends very much on the speed of the SL. If long, important information may be lost, if short there is the risk of following the SL too closely leading to recurrent correction of the TL. From sign-to-speech if the signer has to resort to fingerspelling of proper names or unfamiliar terminology s/he may take a few seconds longer which may interfere with memory retention of what the speaker has said in the meanwhile, thus reducing the quality of the signed rendition. Evidence is offered by Cokely (1986) of a relationship between lag time and miscue occurrence during sign language interpretation: shorter lag times led to an increase in errors except omissions whereas longer lag times improved performance despite an increase in omissions. Quality assessment and discussion on several aspects of interpretation can be found in Cokely (1992).

Another difference to be mentioned is fatigue which may influence general interpreter performance and lead to a negative impression on behalf of the Deaf end-user/s as the use of gross motor articulators tires the interpreter quickly and frequent turns must be organized (Brasel 1975).

6. Conclusion

Until recently, sign language interpretation was rarely mentioned at conferences dealing with the interpreting profession, but as professional spoken- and signed-language interpreting evolve there will develop a growing awareness of the need to guarantee a good quality end-product in both modes. At the international Forli conference in November 2000 (Garzone and Viezzi in press) community interpreting emerged as a new and strong area of development in the interpreting world. Much debate centred on the need to cater for the emergence of a new type of client with linguistic communicative difficulties at the dawn of the 21st century: migrants, refugees, asylum-seekers, the Deaf and Deaf-Blind. Indeed, the need for more discussion at international level on the various types of community interpreting and their inclusion in the curricula of training establishments for interpreters is strongly felt.

The worldwide recognition of sign language and hence signed interpretation by the mainstream interpreting community has made much headway since Venice 1977 but more remains to be done. Spoken interpretation has much to learn from sign language as Isham (1995) has pointed out, in that research into

sign language can lead to a better understanding of the cognitive processes of mainstream interpretation in general. Interpretation enables communication between different languages and cultures, thus any discussion of its many facets cannot ignore the myriad of languages conveyed in signs:

[...] the interpretation of sign languages is an integral part of the general study of interpretation [...] no description (practical or theoretical) of interpretation which fails to take account of sign language interpretation can be regarded as complete (Ingram 1978: 109).

References

- Abbou V. (1994): "Sign language interpreting in France", in *The Deaf way: Perspectives from the International Conference on Deaf Culture*. Ed. by C.J. Erting, R.C. Johnson, D.L. Smith and B.D. Snider, Washington, DC: Gallaudet University Press, pp. 451-453.
- Angelini N., Borgioli R., Folchi A. and Mastromatteo M. (1991): *I primi 400 segni. Piccolo dizionario della Lingua Italiana dei Segni per comunicare con i sordi*, Firenze, La Nuova Italia.
- Altman J. (1990): "What helps effective communication. Some interpreters' views", *The Interpreters' Newsletter* 3, pp. 23-32.
- Attili G. and Ricci Bitti P. (eds.) (1983): *I gesti e i segni*, Roma, Bulzoni.
- Bagnara C., Chiappini G., Conte M.P. and Ott M. (eds.) (2000): *Viaggio nella città invisibile. Atti del 2° Convegno nazionale sulla Lingua Italiana dei Segni*, Tirrenia (Pisa), Edizioni del Cerro.
- Battison R. (1974): "Phonological deletion in American sign language", *Sign Language Studies* 5, pp. 1-19.
- Bellugi U. and Klima E.S. (1972): "The roots of language in the sign talk of the deaf", *Psychology Today* 6, pp. 61-76.
- Bellugi U. and Klima E.S. (1983): "Il Linguaggio visto attraverso un'altra modalità", in *I gesti e i segni*. Ed. by G. Attili and P. Ricci Bitti, Roma, Bulzoni, pp. 131-152.
- Bienvenu M.J. (1988): "Process diagnostics: The deaf perspective", in *New Dimensions in Interpreter Education: Evaluation and Critique*, Proceedings of the Seventh National Convention of the Conference of Interpreter Trainers. Ed. by S. Wilcox, Conference of Interpreter Trainers, pp. 99-112.
- Boggi Bosi G.R. (1939): *Istituti per i sordomuti*, Roma, Tipografia del Gianicolo.
- Brasel B.B. (1975): "The effects of fatigue on the competence of interpreters for the deaf", in *Selected Readings in the Integration of Deaf Students*

- at CSUN. Ed. By H.J. Murphy, Center on Deafness Publication Series (No. 1), Northridge, CA, California State University, pp. 19-22.
- Brasel B.B., Montanelli D.S. and Quigley S.B. (1974): "The component skills of interpreting as viewed by interpreters", *Journal of Rehabilitation of the Deaf* 7 (3), pp. 20-27.
- Bühler H. (1986): "Linguistic (semantic) and extra-linguistic (pragmatic) criteria for the evaluation of conference interpretation and interpreters", *Multilingua* 5-4, pp. 231-235.
- Cameracanna E. and Franchi M.L. (1997): "Difficoltà di traduzione in contesti diversi", in *LIS. Studi, esperienze e ricerche sulla Lingua dei Segni in Italia. Atti del 1° Convegno Nazionale sulla Lingua dei Segni*, Trieste 13-15 settembre 1995. Ed. by M.C. Caselli and S. Corazza, Tirrenia (Pisa), Edizioni del Cerro, pp. 228-232.
- Castiglione M. (in press): "L'insegnamento della LIS all'interno della Scuola Superiore di Lingue Moderne per Interpreti e Traduttori dell'Università di Trieste", paper presented at the Conference, *La Lingua dei Segni Italiana: Patrimonio di Vita*, 22 September 2001, ENS, Bologna.
- Cokely D. (1986): "The effects of lag time on interpreter errors", *Sign Language Studies* 53, pp. 341-376.
- Cokely D. (ed.) 1992, *Sign Language Interpreters and Interpreting*, Burtonsville, MD, Linstok Press.
- Collins S.D. (1993): "Deaf-Blind Interpreting: The structure of ASL and the interpreting process" in *Gallaudet University communication forum 1993*. Ed. by E.A. Winston, Washington DC, Gallaudet University School of Communication, pp. 20-36.
- Cortazzi M.C. (2000): "Curricolo formativo dell'interprete LIS: problemi attuali e possibilità di soluzione", in *Signed Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference "Meeting of Sign and Voice", Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 71-76.
- De Gasperi M. (2000): "La disabilità uditiva nell'università: difficoltà e metodologia di approccio", in *Signed Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference "Meeting of Sign and Voice", Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 90-98.
- Del Vecchio S. and Franchi M.L. (1997): "Strategie di traduzione durante l'esposizione di materiale visivo", in *LIS. Studi, esperienze e*

- ricerche sulla Lingua dei Segni in Italia. Atti del 1° Convegno Nazionale sulla Lingua dei Segni*, Trieste 13-15 Settembre 1995
Ed. by M.C. Caselli e S. Corazza, Tirrenia (Pisa), Edizioni del Cerro, pp. 276-280.
- Domingue R.L. and Ingram B.L. (1978): "Sign language interpretation the state of the art", in *Language Interpretation and Communication*. Ed. By D. Gerver and H.W. Sinaiko, New York, Plenum Press, pp. 81-85.
- Erasmus M. (ed.) (1999): *Liaison Interpreting in the Community*, Pretoria, Van Schaik.
- Facchini G.M. and Rimondini P. (1983): "Scontri e incontri fra otoiatri e pedagogi dei sordi nel 1800", in *I gesti e i segni*. Ed. by G. Attili and P. Ricci Bitti, Roma, Bulzoni, pp. 213-218.
- Friedman L.A. (1976): "The manifestation of subject, object and topic in American sign language", in *Subject and Topic*. Ed. by C.N. Li, New York, Academic Press.
- Garzone G. and Viezzi M. (in press): Proceedings of the 1st Forlì Conference on Interpreting Studies, 9-11 November 2000, *Interpreting in the 21st Century. Challenges and Opportunities*.
- Gerver D. and Sinaiko H.W. (eds.) (1978): *Language Interpretation and Communication*, New York, Plenum Press.
- Gile D. (1990): "L'évaluation de la qualité de l'interprétation par les délégués: une étude de cas", *The Interpreters' Newsletter* 3, pp. 66-71.
- Gile D. (1991): "A communication-oriented analysis of quality in nonliterary translation and interpretation", in *Translation: Theory and Practice, Tension and Interdependence*. Ed. by M.L. Larson, ATA Scholarly Monograph Series, vol. V, Binghamton, SUNY, pp. 188-200.
- Girardi P. (2000): "I sordi e gli interpreti LIS", in *Signed Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference "Meeting of Sign and Voice" in Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 63-67.
- Gran L. and Kellett Bidoli C.J. (eds.) (2000): *Signed-Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference "Meeting of Sign and Voice" Trieste, December 12-13, 1997, Trieste, Edizioni Università di Trieste.
- Gran L. and Kellett Bidoli C.J. (in press): "Sign language interpretation: a newcomer to Italian university studies", *Textus*, XIV, vol. 2.
- Grimandi A. (1960): *Storia dell'educazione dei sordomuti*, Bologna, Scuola Professionale Tipografica Sordomuti.

- Humphrey J.H. (1997): "Chopping down and reconstructing a tree" *Meta* XLII, 3, pp. 515-520.
- Ingram R.M. (1978): "Sign language interpretation and general theories", in *Language Interpretation and Communication*. Ed. by D. Gerver and H.W. Sinaiko, New York, Plenum Press, pp. 109-118.
- Isham W.P. (1995): "On the relevance of signed languages to research in interpretation", *Target* 7, pp.135-149.
- Isham W.P. (2000): "Research on interpreting with signed languages", in *Signed Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference "Meeting of Sign and Voice" Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 35-43.
- Kellett Bidoli C.J. (2000): "Quality assessment in conference interpreting: an overview", *Miscellanea* 4, Trieste, Dipartimento di Scienze del Linguaggio dell'Interpretazione e della Traduzione, pp. 105-145.
- Kellett Bidoli C.J. (in press a): "Spoken-language and sign-language interpretation: are they really so different?" in G. Garzone and M. Viezzi (eds.), Proceedings of the 1st Forlì Conference on Interpreting Studies, 9-11 November 2000, *Interpreting in the 21st Century. Challenges and Opportunities*.
- Kellett Bidoli C.J. (in press b): "Quality in sign language conference interpreting", in the Proceedings of the *International Conference on Quality in Conference Interpreting*, 19-21 April 2001, Almuñécar, University of Granada.
- Kirchner S. (1975): "Platform interpreting", in *Hands across the sea. Proceedings of the First International Conference on Interpreting*. Ed. by R.M. Ingram and B.L. Ingram, Silver Spring MD, Registry of Interpreters for the Deaf, pp. 173-184.
- Kopczynski A. (1994): "Quality in conference interpretation: some pragmatic problems", in *Bridging the Gap: Empirical Research in Simultaneous Interpretation*. Ed. by S. Lambert and B. Moser-Mercer, Amsterdam-Philadelphia, John Benjamins, pp. 87-99.
- Kurz I. (1993): "Conference interpretation: expectations of different user groups", *The Interpreters' Newsletter* 5, pp. 13-21.
- Kyle J.G. and Woll B. (1985/1993): *Sign Language: the study of deaf people and their language*, School of Education Research Unit, University of Bristol, Cambridge, Cambridge University Press.
- Kyle J.G., Woll B., Llewellyn-Jones P. and Pullen G. (1981): *Sign language learning and use. Final report to DHSS*, Bristol, School of Education, Bristol University.

- Ladd P. (in press): *Understanding Deaf Culture. In search of Deafhood*, Clevedon, Multilingual Matters.
- Lane H. and Battison R. (1978): "The role of oral language in the evolution of manual language", in *Language Interpretation and Communication*. Ed. by D. Gerver and H.W. Sinaiko, New York, Plenum Press, pp. 57-79.
- Llewellyn-Jones P. (1981): "BSL interpreting", paper presented to the Third international sign language interpreters conference, Bristol, London, RNID.
- Magarotto C. (ed.) (1995): *Vocabolario della lingua gestuale italiana dei sordi*, Roma, Armando Editore.
- Marrone S. (1993): "Quality: a shared objective", *The Interpreters' Newsletter* 5, pp. 35-41.
- Meak L. (1990): "Interprétation simultanée et congrès médical: attentes et commentaires", *The Interpreters' Newsletter* 3, pp. 8-13.
- Mindel E.D. and Vernon M. (1971): *They Grow in Silence*, National Association for the Deaf, Silver Spring MD.
- Murphy H.J. (1978): "Research in sign language interpreting at California State University, Northridge", in *Language Interpretation and Communication*. Ed. by D. Gerver and H.W. Sinaiko, New York, Plenum Press, pp. 87-97.
- Ng, B.C. (1992): "End-users' subjective reaction to the performance of student interpreters", *The Interpreters' Newsletter*, Special Issue 1, pp. 35-41.
- Paoli V. (2000): "Sordi, udenti o persone?", in *Viaggio nella città invisibile. Atti del 2° Convegno nazionale sulla Lingua Italiana dei Segni*, Ed. by C. Bagnara, G. Chiappini, M.P. Conte and M. Ott, Tirrenia (Pisa), Edizioni del Cerro, pp. 419-423.
- Patrie C. and Mertz J. (eds.) (1997): *An Annotated Bibliography on Interpretation*, Washington DC, Gallaudet University.
- Perini C. (1902): *Compendio della storia dell'arte di istruire i sordomuti*, Milano, Tipografia San Giuseppe.
- Picanyol P.L. (1941): *Rassegna di storia e bibliografia Scolopica*, Roma, P.P. Scolopi di S. Pantaleo.
- Pöchhacker F. (1995): "Writings and research on interpreting: a bibliographic analysis", *The Interpreters' Newsletter* 6, pp. 17-32.
- Radutzky E. (1983): "Un primo sguardo al lessico della lingua dei segni usata dalla comunità sorda Romana", in *I gesti e i segni*. Ed. by G. Attili e P. Ricci Bitti, Roma, Bulzoni, pp. 153-168.
- Radutzky E. (2000): "Le attività della Mason Perkins Deafness Fund nella formazione di interpreti in Italia", in *Signed Language*

- Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference “Meeting of Sign and Voice”, Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 77-88.
- Ricci Bitti P. (2000): “La LIS nei corsi universitari: riflessioni sulla situazione italiana”, in *Signed Language Interpretation and Training: Theoretical and Practical Aspects*, Proceedings of the International Conference “Meeting of Sign and Voice”, Trieste, December 12-13, 1997. Ed. by L. Gran and C.J. Kellett Bidoli, Trieste, Edizioni Università di Trieste, pp. 99-104.
- Romeo O. (1991): *Dizionario dei segni. La lingua dei segni in 1400 immagini*, Bologna, Zanichelli.
- Romeo O. (1997): *La grammatica dei segni. La lingua dei segni in 13.000 immagini e 150 frasi*, Bologna, Zanichelli.
- Schlesinger H. and Meadow K.P. (1972): *Sound and Sign. Deafness and Mental Health*, Berkeley, University of California Press.
- Shlesinger M. (1997): “Quality in simultaneous interpretation in conference interpreting: current trends in research”, in *Proceedings of the International Conference on Interpreting: What Do We Know and How?*, Turku, August 25-27, 1994. Ed. by Y. Gambier, D. Gile and C. Taylor, Amsterdam-Philadelphia, John Benjamins, pp. 123-131.
- Schweda Nicholson N. (1993): “The constructive criticism model”, *The Interpreters' Newsletter* 5, pp. 60-67.
- Solow N.S. (1981): *Sign Language Interpreting: a Basic Recourse Book*, Silver Spring MD: National Association of the Deaf.
- Steiner B. (1998): “Signs from the void: the comprehension and production of sign language on television”, *Interpreting* 3-2, pp. 99-146.
- Stokoe W.C. (1960): “Sign language structure; an outline of the visual communication system of the American deaf”, *Studies in Linguistics Occasional Paper* 8, University of Buffalo.
- Stokoe W.C. (1972): “Classification and description of sign languages”, in *Current Trends in Linguistics* 12. Ed. By T.A. Sebeok, The Hague, Mouton.
- Stokoe W.C., Casterline D. and Croneberg, C. (1965): *A Dictionary of American Sign Language*, Washington DC, Gallaudet College Press.
- Strong M. and Rudser S.F. (1985): “An assessment instrument for sign language interpreters”, *Sign Language Studies* 49, pp. 343-362.
- Strong M. and Rudser S.F. (1986): “The subjective assessment of sign language interpreters”, *Sign Language Studies* 53, pp. 299-314.

- Viezzi M. (1996): *Aspetti della qualità in interpretazione*, Trieste, SSLMIT, Università degli Studi di Trieste.
- Viezzi M. (ed.) (1999): *Quality Forum 1997: esperienze, problemi, prospettive*, Trieste, SSLMIT, Università degli Studi di Trieste.
- Volterra V. (ed.) (1981): *I segni come parole – La comunicazione dei sordi*, Torino, Boringhieri.
- Volterra V. (ed.) (1987): *La Lingua Italiana dei Segni. La comunicazione visivo-gestuale dei sordi*, Bologna, Il Mulino.
- Weller G. (1996): "The interpreter's performance from three points of view: His colleagues', the public's and the linguist's. Part 1", in *Global vision: Proceedings of the 37th Annual Conference of the American Translators Association*. Ed. by M.M. Jérôme-O'Keefe, Alexandria, VA, American Translators Association, pp. 113-122.
- Woll B. (1988): "Report on a survey of sign language interpreter training and provision within the member nations of the European Community", *Babel: International Journal of Translation* 34 (4): pp. 193-209.

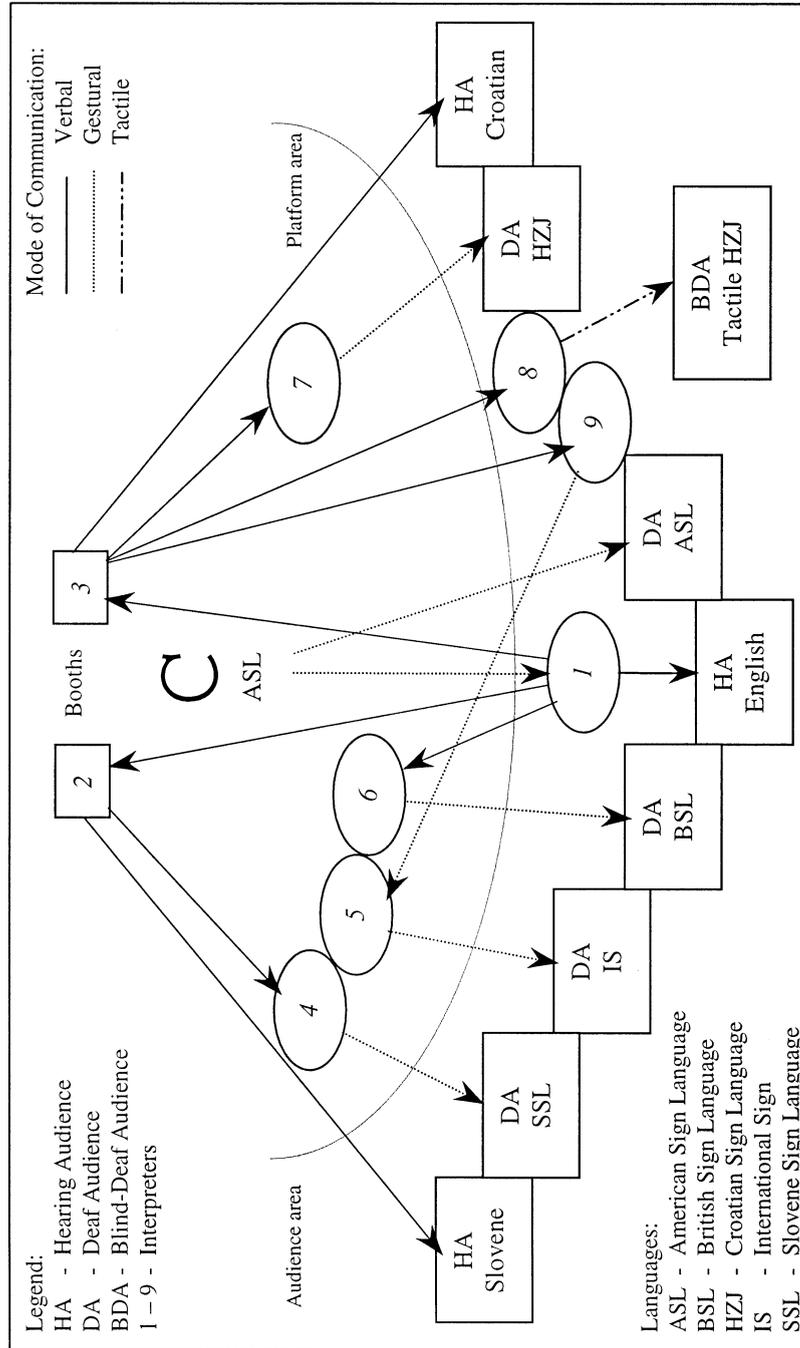


Fig. 1 – Situation 1: Sign-to-speech

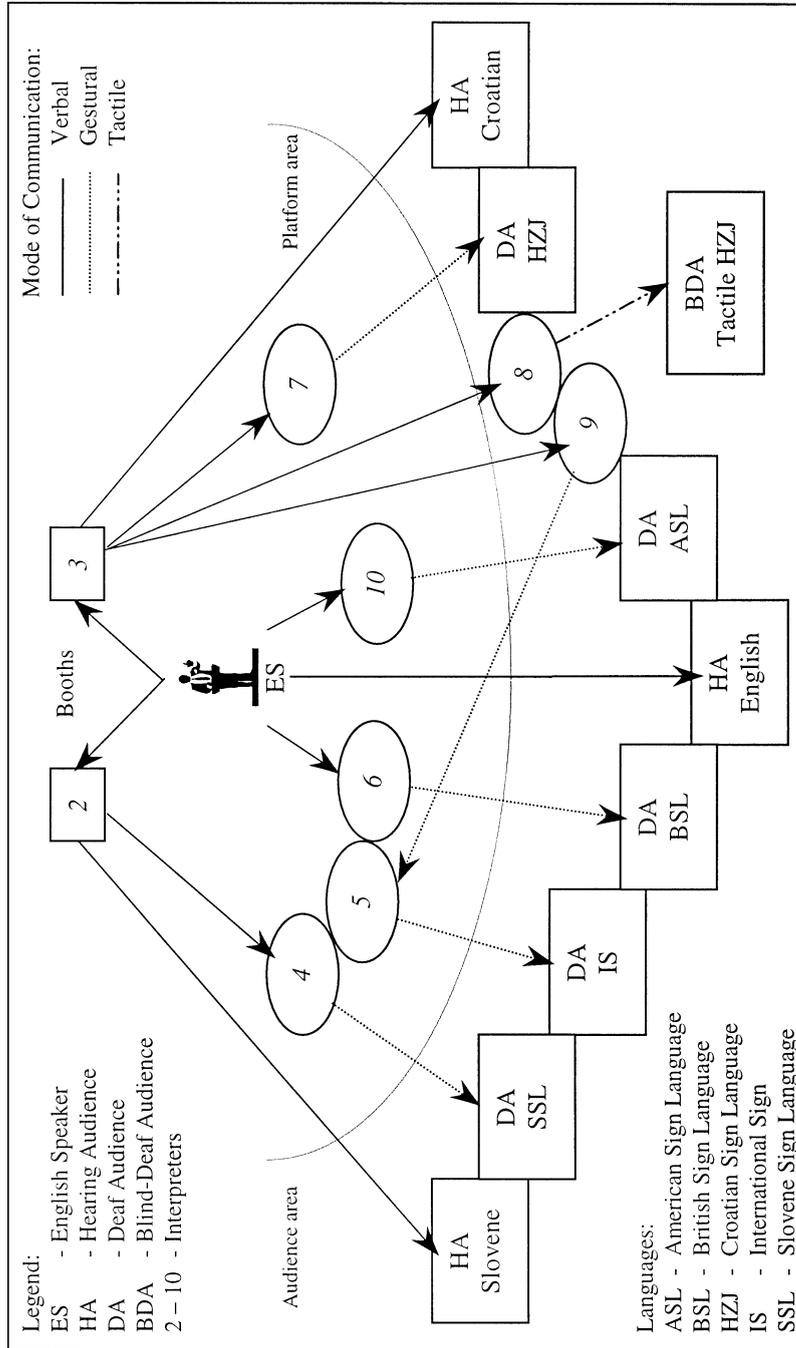


Fig. 2 – Situation 2: Speech-to-sign

**UNITED NATIONS GENERAL ASSEMBLY,
FIFTY-FOURTH SESSION A/54/176
21 July 1999**

Item 125 of the provisional agenda *
Pattern of conferences

Provision of interpretation services to other locations from permanent
interpretation structures in New York, Geneva, Vienna and Nairobi

Report of the Secretary General

I. Introduction

1. The present report is submitted in compliance with paragraph 20 of General Assembly resolution 53/208 A of 18 December 1998, in which the Assembly requested the Secretary-General, without prejudice to the practices currently used to meet interpretation requirements, to examine the provision of interpretation services to other locations from permanent interpretation structures based in New York, Geneva, Vienna and Nairobi and to report thereon to the General Assembly at its fifty-fourth session. In order to meet the request of the Assembly, the information and experience available in the field of remote interpretation has been gathered and is presented in part II of the present document. In part III, the financial aspects of remote interpretation are explored, taking into account the equipment and communications requirements of good quality remote interpretation.

II. Activities undertaken so far in the field of remote interpretation

2. The basic technical feasibility of remote interpretation was established in the course of three experiments conducted between 1976 and 1982, during the nineteenth session of the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) (Nairobi, 1976), the United Nations Conference on Technical Cooperation among Developing Countries (Buenos Aires, 1978) and the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (Vienna, 1982). The three experiments used costly satellite links and lasted only a few

* A/54/150.

hours. As long as resort to expensive satellite communications was required, remote interpretation was not considered a financially viable proposition. The introduction of high-capacity digital telephone lines (the integrated services digital network, or ISDN) brought about a significant lowering of communications costs and prompted consideration of remote interpretation as a possible means of increasing cost-effectiveness in the use of staff resources and improving the actual utilization of physical meetings facilities in different conference centres.

3. In order to move beyond the limited nature of earlier experiments and to reach meaningful conclusions, a comprehensive feasibility study of large-scale remote interpretation, conducted in a concerted fashion by the interpretation services at Headquarters and the United Nations Offices at Geneva and Vienna, was needed. The study had to cover the impact of new technology on the quality of services and the working conditions of staff, to deal with a wide range of interpreting situations and to cover a longer period of time than past experiments.
4. To this end, it was decided that a full two-week session, held at one of the established United Nations conference centres, would be serviced using remote interpretation provided from another centre. This would constitute the first experiment ever conducted on such a large scale and in conditions under which interpreters would be required to work in complete isolation from the reality of the event for which they would be interpreting. The experiment would test the reliability of the technology and determine the cumulative effect of remote interpretation on the work of the interpreters and other conference servicing staff, as well as on participants at the meeting.
5. The idea of using Headquarters as either the receiver or provider of the remote services was discarded because the time difference was considered an unnecessary complication in the context of the experiment. In view of the advisability of increasing the use of conference rooms at the United Nations Office at Nairobi, the possibility of the remote servicing of a meeting to be held there was considered but could not be pursued because there are no ISDN services to Nairobi. This left the combination of the United Nations Offices at Geneva and Vienna. It was decided that Vienna would service a meeting taking place at Geneva, and not the reverse, because the permanent interpretation establishment at Geneva was large enough to provide for almost immediate back-up in case of a communications or other technical failure.
6. It was assumed that not all meetings would lend themselves equally well to remote interpretation. Highly structured meetings, with little or no spontaneous interaction among participants, such as general debates, would be best suited for remote interpretation. The opposite would be the case of

meetings with constant interaction, such as small discussion and drafting groups. The meeting chosen for the experiment should ideally offer a wide variety of interpreting situations along this continuum. It also had to use all six official languages in order to test relays between languages and to assess the effects of remote interpretation on participants using different languages.

7. Considering these factors and the availability of interpretation staff at Headquarters, Geneva and Vienna, the session of the Working Group on a draft optional protocol to the Convention on the Rights of the Child on the sale of children, child prostitution and child pornography, which was held at Geneva from 25 January to 5 February 1999, was identified as a suitable meeting for the implementation of the experiment, conducted with the participation of interpretation staff from all three duty stations. The experiment was observed by members of the relevant services of the Food and Agriculture Organization of the United Nations (FAO), UNESCO, the International Civil Aviation Organization (ICAO), the International Telecommunication Union (ITU), the Organisation for Economic Cooperation and Development (OECD), the European Commission and the European Parliament, as well as by representatives of the International Association of Conference Interpreters and the University of Vienna.
8. The minimum technical requirements for good quality remote interpretation and the resulting general technical set-up used for the experiment are described in paragraphs 17 and 18 below. In addition to the information provided there, mention must be made of the fact that the United Nations Office at Vienna endeavoured to replicate, at the remote location, the conditions of on-site servicing, in particular to ensure the prompt transmission to interpreters of all new documents as soon as they became available to participants. Staff referred to as «remote interpretation assistants» in the context of the experiment worked from a booth contiguous to the remote interpreters' booths where equipment had been installed providing access to phone, facsimile and computer services, thus ensuring voice and data communications between the servicing site and the venue of the meeting. Documents originating in Geneva were received promptly and were photocopied and distributed to the interpreters.
9. Visual information was transmitted to the remote interpreters by means of two identical videoconferencing systems and was projected onto large screens. One projector provided a permanent view of the meeting room with a view of the presiding officer blended into one quadrant. The other projector received images from one of two cameras, which were switched, under operator control, to provide the best possible view of the speakers. The use of video monitors in the interpreters' booths was discarded because they produce fan noise and heat.

10. At Geneva, the interpretation coming from Vienna was fed into the conference room sound distribution system. Additionally, the system had a feature to accommodate speakers who listened to their headsets while speaking. If the sound had been sent to Vienna, from where it would have been retransmitted back to Geneva, the speaker would have heard himself with a 0.5 seconds delay. A relay system bypassed this loop. The substantive secretariat of the meeting and the participants cooperated fully.
11. The session of the Working Group was held without any disruptions, with interpretation provided at all times by the team of interpreters working at Vienna. The Working Group held 17 out of the 20 meetings programmed. With the exception of the three cancellations and some late starts, the session followed established schedules, with no requests for additional meetings. Its proceedings were mostly unstructured, with long periods of time devoted to drafting work and recesses. The meetings were easier to interpret than the average meeting. At the end of the session, participants were asked to answer a questionnaire on the interpretation services provided. Thirty-three replies were received. The quality of the sound was judged the same as that provided at on-site servicing by 75 per cent of the respondents, worse by 22 per cent and better by 3 per cent. The quality of the interpretations was rated the same as on-site servicing by 94 per cent of the respondents and worse by 6 per cent. The absence of interpreters from the conference room did not bother 84 per cent of the respondents and bothered 16 per cent.
12. Extensive information was gathered from the interpreters who worked during the experiment on the physical conditions of their work (sound and image transmissions, camera operation, screen placement, services of support staff), as well as personal conditions (stress, concentration, fatigue, motivation, perceived quality of one's own work, alienation from the conference room and the meeting location). In order to track patterns along the session and to detect any cumulative effects, interpreters completed questionnaires at the end of each meeting and one more general questionnaire at the end of the session. Analysis of the data indicated that the replies were consistent and provided reliable information pointing to increased stress and fatigue and less satisfaction with one's own performance.
13. The conclusions derived from the experiment are summarized in the following paragraphs. The experiment has shown that, during a continuous period of two weeks, meetings held at one location were successfully serviced by interpreters, technicians and meeting room personnel located at a remote location, without disruptions to the participants and to their nearly complete satisfaction. It has been established that sound of a quality very close to the standard requirements for simultaneous interpretation can be reliably transmitted using the required number of ISDN links. Some of the

adjustments that need to be made to the organizational arrangements and, in particular, to the functions and working environment of meeting room attendants at the interpreting site are now better understood, pointing to the need for support personnel with adequate skills in the use of telecommunications and computer equipment.

14. Findings concerning the nature of the meetings most suitable for remote servicing remain inconclusive. Contrary to what had been assumed, unstructured debates did seem to lend themselves to remote interpretation. During the experiment, however, there were no heated exchanges and few opportunities to cope with fine shades of meaning and precise choice of words. In addition, there were few statements in Arabic and Chinese, and many interpreters did not have the experience of working in relay. There were no last minute changes to the schedule of meetings and no additional, standby or night meetings were requested. Therefore, it cannot be said that the full range of interpreting situations were tested.
15. The experiment highlighted the differences in the physical working environment for interpreters between remote and on-site interpretation. Quality of sound was considered good and new documents were received very promptly. Interpreters were very appreciative of the close-up view of the speakers provided by the video transmissions, which enhanced their understanding of the speaker's meaning. On the other hand, interpreters had no control of the images other than those of the speakers that were projected and they tended to lose concentration when certain views of the room were selected for them by a camera operator at a time not of their choosing. In general, the video component of remote interpretation requires further refinement.
16. In their comments, the interpreters emphasized that they were able to maintain performance at acceptable levels, but at a higher psychological and physiological cost. Remote interpretation over a two-week period has a cumulative effect on health, pointing to stress, fatigue, eyestrain, loss of concentration, lack of motivation and overall anxiety, but the experiment did not measure these variables, which would have required medical expertise. Further information needs to be gathered in this connection. Since it could be argued that if the video component of the experiment had been as successfully implemented as the sound component the health impact could have been less significant, in future experiments both sound and image must be the best that available technology can offer.

III. Financial and technical issues and forthcoming activities

17. In order to get a very general picture of the comparative cost-effectiveness of each servicing modality, certain assumptions and highly approximate estimates have been made. The general principles are that: (a) in order to be both financially viable and of sufficient quality for simultaneous interpretation, communications for remote interpretation require the use of ISDN lines for the transmission of both audio and video; and (b) under the International Standards Organization standards applicable to simultaneous interpretation equipment, the minimum sound bandwidth acceptable for interpretation purposes is 12.5 kHz. The communications requirements specified below are based on these general principles and are identical to the arrangements in place during the experiment described in part II above.
18. The floor sound should be transmitted to the remote interpreters using a bandwidth of 20 kHz by means of an ISDN codec in high quality compression mode. The interpretations are transmitted back to the participants in the meeting via two ISDN codes but using less bandwidth. Two Picture Tel videoconferencing systems are used to transmit visual information from the conference room to the remote interpreters. This requires the use of 10 128 kbps ISDN lines altogether — each of the two video channels uses three lines, and each of the three voice codecs uses one line, plus one spare line.
19. It is customary for sessions of intergovernmental bodies and conferences to last two weeks. Although actual meeting time varies from case to case, it is assumed that during a two-week period, 20 meetings of three hours each are held. A three-hour meeting requires a three-and-a-half-hour connection to allow for checking before the actual opening of the meeting. This typical session, therefore, would require ISDN links for a total of 4,200 minutes.
20. ISDN rates vary widely. For one 64 kbps line, average rates for communications originating in the United States of America with 48 countries currently range from US\$ 0.23 to \$1.95 per minute. Therefore, depending on location, the cost of 10 128 kbps lines for 4,200 minutes, which is the link that a typical session or conference would require, can range from \$19,320 to \$163,800. The communications costs during the experiment conducted earlier this year between Geneva and Vienna amounted to about \$23,500. Since 17 meetings were held, assuming the need for a 210-minute connection for each, the unit cost was roughly \$0.33 per minute.
21. On-site servicing of a two-week session or conference comprising 20 meetings would require the presence of 20 interpreters and, for the purpose of this comparison, it is assumed that they are not available at the meetings

location. Travel and terminal expenses and daily subsistence allowances (DSA) would also vary considerably depending on the location of the conference as well as the place of recruitment of freelance staff specifically for the meetings in question or the duty station where regular staff might be available.

22. It is assumed that the established offices most likely to be involved in any possible combination of remote servicing arrangements are the United Nations Offices at Geneva, Vienna and at Nairobi (see para. 27 below). As indicated in the June 1999 DSA circular issued by the International Civil Service Commission (ICSC/CIRC/DSA/289), current DSA rates are \$170 in Vienna, \$184 in Geneva and \$188 in Nairobi, the average of these three amounts being \$181. The team of 20 interpreters travelling to service a two-week conference would be paid allowances over a period of at least 13 days and, if the average of \$181 is used, total expenditures on this account would amount to at least \$47,060.
23. A comparison limited exclusively to DSA costs and ISDN costs, therefore, would indicate that, for a two-week conference using six languages at a location where no interpreters were available, remote interpretation could become cost-effective roughly if ISDN rates were under the level of \$0.56 per minute for one 64 kbps line, that is $\$47,060 \div 84,000$ (4,200 minutes x 2 x 10 lines). Current information for communications originating in the United States indicates that international ISDN rates are lower than \$0.56 per minute in 19 countries (Australia, Canada, Chile, Japan and 15 countries in Europe) out of a group of 48 countries for which information was obtained. As a rule, communications originating in countries in Europe would be more expensive than in the United States. It may be of interest to note that, on the basis of this very limited comparison, the remote servicing from New York of meetings held in Jamaica would be more expensive than on-site servicing with non-local interpreters, since the current DSA for Jamaica is \$155, with an ISDN rate of \$0.85.
24. These are obviously crude comparisons. Since it is impossible to make assumptions about many servicing requirements, this oversimplification assumes that any other costs impacting either one of the terms of the equation would balance each other out. Any savings in interpreters' travel expenses, for example, would be counterbalanced by additional costs, such as camera operators' salaries, the salary of assistants at the remote site providing interpreters with the help that they receive from conference room staff normally available when working on-site, facsimile costs for the transmission to interpreters of documents originating at the conference site, telephone traffic between the meeting and the remote interpreters and perhaps a number of incidentals impossible to foresee.

25. As a matter of fact, it is not likely that a definite statement can be made in the near future about the general comparative cost-effectiveness of each servicing modality. Costs will vary depending on the combination of sites being considered, the number of languages and the length of the conference, three items that can impact greatly on the relevance of «fixed» costs like travel. Far from having any cost advantages, remote interpretation would evidently be an expensive proposition — unless there are unutilized interpreters at the meetings location — if it is decided that the risk of interruptions in the normal conduct of meetings as a result of communications failures should be avoided completely and on-site interpretation redundancy is essential.
26. This last item points to a crucial factor in the present discussion. In a global situation characterized by the limited availability of interpreters at peak periods during the year and by staffing arrangements based on the premise that permanent resources should be provided at a level lower than overall yearly demand, with routine recourse to temporary staff not always available locally even at well-established servicing sites, the cost-effectiveness of remote interpretation would depend basically on a higher degree of harmonization of the calendar of meetings at different duty stations. So far, the meetings requirements of international organizations have not made this possible. Another variable can be equally relevant. If remote interpretation proves more stressful for interpreters than on-site servicing, as indicated by the experiment described in part II of the present report, a reduction in normally expected workloads or a greater rotation of interpreters may need to be envisaged, with more staff becoming necessary than for on-site servicing.
27. In view of these considerations and given present circumstances, if remote interpretation is adopted, the United Nations Office at Geneva should perhaps be considered the most likely provider of services. The pool of interpreters available locally is greater in Geneva than in any other established conference centre, a situation that will most likely also prevail in the future. Furthermore, «vacant» meeting rooms with existing interpretation booths that could be used for remote servicing are available in Geneva. Conversely, at Headquarters, the pool of local staff is more limited and there are practically no meeting rooms unutilized, except during a few weeks around the year. Additionally, time differences make remote interpretation between Africa or Europe and North America more problematic and possibly more expensive, if staff or contractual technical personnel entitled to overtime payments need to work outside normal hours. The United Nations Office at Vienna has only one interpretation team, which is incomplete, and has vacancies that have been impossible to fill. For the United Nations Office

at Vienna to become a cost-effective provider of remote interpretation services, its staff resources would have to be strengthened and their adequate utilization would then have to be ensured. The United Nations Office at Nairobi does not have interpretation services and meetings held there are serviced by non-local interpreters. It could become a prime recipient of remote interpretation services, but Nairobi is not ISDN-connected.

28. The Mercure satellite available to the United Nations Office at Nairobi can perhaps be used to emulate ISDN communications. Preliminary investigations conducted from Vienna, however, indicate that technical obstacles remain to be overcome. In view of these circumstances, and seeking to gather more information on all aspects of the question of remote interpretation in the technical, financial and human resources fields, it has been provisionally decided to organize another experiment, as comprehensive as the one conducted earlier this year, but now entailing the servicing from Geneva of a two-week meeting to be held at Nairobi as early as possible in 2000. A determination will need to be made, however, of the suitability of Mercure-based communications for remote interpretation.

IV. Conclusions

29. Recent interest in remote simultaneous interpretation of intergovernmental meetings involving large number of participants has been prompted by several factors, including the need to ascertain whether more cost-effective alternatives to current methods of work exist, the attempt to improve the utilization of existing conference centres in certain locations, the use of remote servicing techniques in related conference-servicing activities, including videoconferencing, and the advent of new low-cost communications links. The amount of experience and knowledge in the field, however, is still quite limited, not allowing even for estimations of the relative cost advantages of remote versus on-site interpretation beyond ad hoc cases.
30. Inter-agency contacts indicate that interest in remote simultaneous interpretation is shared by all international organizations, both within and outside the United Nations system. Remote interpretation, however, has not been adopted or tested on a sufficiently large scale by any of them. The United Nations is the only organization that has conducted an experiment on the use of remote simultaneous interpretation from two different countries and covering more than isolated meetings, or sessions spanning two or three days. The results of the experiment have been very promising in some aspects. In others, they have underlined deficiencies in the arrangements used

for remote servicing so far. In still others, they have been inconclusive and have pointed to the need for further research.

31. Another experiment should be conducted in order to build on the results achieved by the experiment that took place early in 1999 and to gather missing information on relevant technical, financial and human resources issues. It should encompass the remote servicing of a full-scale intergovernmental meeting, with six languages, preferably to be held at the United Nations Office at Nairobi, where existing conference facilities are underutilized. It is intended to conduct this experiment as early as possible in 2000.

**UNITED NATIONS GENERAL ASSEMBLY,
FIFTY-SIXTH SESSION A/56/188
16 July 2001**

Item 136 of the provisional agenda *
Pattern of conferences

Remote interpretation

Report of the Secretary-General

Introduction

1. The present report is submitted in accordance with paragraph 5 of General Assembly resolution 54/248 D of 23 December 1999, and paragraphs 8 and 10 of section IV of resolution 55/222 of 23 December 2000. Other provisions of those resolutions that are relevant to the question of remote interpretation have also been taken into consideration in the preparation of the report.
- I. First experiment and its legislative mandate
2. The United Nations conducted its first full-scale remote interpretation experiment from 25 January to 5 February 1999, when a two-week session held at Geneva was provided with interpretation in six languages by a team of interpreters working from Vienna. The experiment was considered to be “full-scale” because it entailed the use of all six official languages and the continuous use of remote interpretation throughout the duration of a typical United Nations session. A report on that experiment (A/54/176) was issued in 1999 and was considered by the Committee on Conferences and the General Assembly.
3. The experiment was undertaken in compliance with paragraph 20 of General Assembly resolution 53/208 A of 1 December 1998, in which the Assembly had requested the Secretary-General, without prejudice to the practices already used to meet interpretation requirements, to examine the provision of interpretation services to other locations from permanent interpretation

* A/56/150.

structures based in New York, Geneva, Vienna and Nairobi and to report thereon.

4. One conclusion reached on the basis of the first experiment was that the use of high-capacity digital telephone lines (the integrated services digital network, or ISDN) made it technically possible for interpreters at a remote location to service meetings held at a different location, during a continuous period of two weeks, without disruptions to the participants and to their nearly complete satisfaction. Specifically, sound of a quality very close to the standard requirements for simultaneous interpretation was reliably transmitted thanks to the use of a sufficient number of ISDN links.
5. Other conclusions, drawn from questionnaires answered by the interpreters, were less positive. The quality of the visual information about the meetings and the speakers that the interpreters received by means of two videoconferencing systems was deficient in several respects. Interpreters found that video broadcasts using insufficient bandwidth led to considerable eye strain; that sudden camera movements caused dizziness and loss of concentration; and that it was difficult to find a satisfactory compromise between the amount of light used in the room where the screens were placed and the sharpness of the projected image. In general, interpreters indicated that they needed to see what was taking place in the meeting room. They said that, under normal on-site conditions, they selected various views of the speaker and their audience only when these views did not interfere with the simultaneous processing of all the other information required for interpretation. Working remotely, on the other hand, the interpreters felt that the selection and timing of video images by a camera operator for the entire team could not substitute for their own individual selection and timing of the images. Video broadcasts as a substitute for being in the meeting room had serious limitations.
6. Although 94 per cent of the users surveyed were satisfied with the quality of the interpretation during the session, interpreters were dissatisfied with the quality of their work. They stressed that they were able to maintain their performance at an acceptable level, but only at a higher psychological and physiological cost. The experiment established that remote interpretation had a cumulative effect on interpreters' health, pointing to stress, fatigue, eyestrain, loss of concentration, lack of motivation and overall anxiety. Since it could be argued that, with better visual information, the health impact perhaps would have been less significant, a major recommendation derived from the first experiment was that, in future experiments, technological solutions had to be sought that might bring the physical environment of remote interpretation as close as possible to normal on-site conditions.

II. Need for a second experiment and its legislative mandate

7. After the first experiment, it was felt that, since United Nations meetings for which the use of remote interpretation could be contemplated are convened in many different locations, the feasibility and potential of remote interpretation in the United Nations context needed also to be assessed in circumstances requiring the use of satellite services. That was highlighted by the objective of increasing the number of United Nations and other meetings held at the United Nations Office at Nairobi, where no ISDN services and no interpretation staff were available in 1999.
8. In late 1999, preparations were begun for an experiment involving the servicing from Geneva of a session held at Nairobi. Communications would be established through the Mercure satellite connection between Nairobi and Leuk, Switzerland, which the European Space Agency (ESA) makes available to the United Nations Environment Programme. The capacity of the satellite connection needed to be upgraded with additional bandwidth, which could be leased commercially. Other improvements in telephone lines at both ends and purchases or rental of videoconference and communications equipment were also necessary. In addition, some components used in the Vienna-Geneva experiment had to be shipped on loan from Vienna to Nairobi. In 2000, the calendar of meetings at Nairobi included only one session, scheduled for 8 to 12 May, that was suitable for a full-scale experiment.
9. Failure to secure timely confirmation from ESA that it would lend the six modems required for the experiment and delays in preparatory tests led to the cancellation of the experiment, which could not be rescheduled because, as indicated, there was no other meeting that would be suitable for a full-scale test. A report on the matter was issued in July 2000 (A/55/134) and considered by the Committee on Conferences, the Advisory Committee on Administrative and Budgetary Questions (ACABQ) and the General Assembly.
10. In 1999, the Committee on Conferences, having examined the report on the first experiment (A/54/176), commended the efforts of the Secretariat to develop a system of remote interpretation and looked forward to additional experiments in the future. The Committee requested the Secretariat to further refine the cost considerations of remote interpretation, taking into account not only technological possibilities but also the cost benefits of remote interpretation, including the relative cost advantages of the different

conference centres that were likely providers of remote interpretation services, and to report thereon.¹

11. The General Assembly, in its resolution 54/248 of 23 December 1999, decided that, in the absence of an Assembly decision to the contrary, the use of remote interpretation should not constitute an alternative to the current institutionalized system of interpretation, and that the use of remote interpretation should not affect the quality of interpretation or in itself lead to any further reductions in language posts, nor should it affect the equal treatment of the six official languages. At the same time, the Assembly requested the Secretary-General to keep under review the introduction and use of any new technology, in particular remote interpretation, and to report thereon to the Assembly on a regular basis.
12. In 2000, the Committee on Conferences, having considered the report on the cancellation of the Geneva-Nairobi experiment, requested the Secretariat to keep it informed of future activities; reiterated its understanding that remote interpretation was not intended to replace traditional interpretation without the explicit approval of the General Assembly; requested that future reports include an analysis of the cost of any proposed system and of its impact on the working conditions of interpreters; and recommended that remote interpretation not be confined to specific duty stations, that each duty station be considered both as recipient and provider and that the Secretariat explore every opportunity for its introduction.² ACABQ, for its part, regretted that the Geneva-Nairobi experiment had not taken place and urged the Secretariat to clarify the technical issues involved as quickly as possible (see A/55/430, para. 10).
13. The General Assembly, in its resolution 55/222 of 23 December 2000, reiterated the provisions included in resolution 54/248. In addition, it reiterated its understanding that the introduction of remote interpretation was not intended to replace traditional interpretation systems without the explicit approval of the General Assembly; it requested the Secretary-General to ensure that trials of remote interpretation not be confined to specific duty stations, and that each duty station be considered as both recipient and provider; and it requested the Secretary-General to ensure that future reports include an analysis of all costs of any proposed system, its impact on the working conditions of interpreters, the level of service provided to delegates, the satisfaction of delegations with the interpretation and the technical aspects of this method of interpretation. The Assembly also took note of the

1 See *Official Records of the General Assembly, Fifty-fourth Session, Supplement No. 32 (A/54/32)*, para. 61.

2 See *ibid.*, paras. 124 to 127.

technical difficulties and timing problems that had prevented the Geneva-Nairobi experiment and requested the Secretary-General to further clarify the technical issues involved.

III. Aims of the second experiment

14. In view of the conclusions drawn from the first experiment and considering the mandate developed by legislative bodies, it was decided to conduct a second full-scale experiment aimed at: (a) testing the suitability of satellite links for remote interpretation purposes; (b) designing and testing the best possible configuration of video technology that can be used for remote interpretation purposes; (c) assessing the impact of remote interpretation on interpreters' working conditions when the best possible video equipment is used; and (d) gathering information on the costs of remote interpretation systems.
15. As had been the case with the first experiment, the test had to cover a sufficiently long period of time in order to prove the sustained reliability of the technology and to determine the cumulative effect of remote interpretation on the work of the interpreters and other conference-servicing staff, as well as on participants at the meeting. The meetings chosen should offer a wide variety of interpreting situations (both highly structured meetings and meetings with frequent spontaneous interaction) and entail the use of all six languages, in order to test relays between languages and to assess the effects of remote interpretation on participants using different languages.
16. It was felt that those objectives could be achieved by means of an experiment in which interpreters would work from booths other than those of the conference room where the meetings were taking place, but still located at the same conference centre. That would simplify the organization of the experiment. It would prevent the reoccurrence of the coordination difficulties that had led to the cancellation of the Geneva-Nairobi experiment. It would also reduce the potential cost of the experiment, essentially because a second team of interpreters would not be needed as a standby to be used in case of a technical failure.
17. At Headquarters, the Information Technology Services Division, Office of Central Support Services, Department of Management, could provide technical support and use could be made of the United Nations satellite network; therefore Headquarters was selected as the site for the experiment. Considering the nature of the different forthcoming meetings and the availability on specific dates of a second conference room from which interpreters could work remotely, it was decided that remote interpretation

would be provided on a trial basis for the ninth session of the Commission on Sustainable Development, from 16 to 27 April 2001. The meetings would take place in conference room 3 and interpretation would be provided from the booths in conference room 6.

IV. Characteristics of the session of the Commission on Sustainable Development

18. In addition to representatives of the 53 States members of the Commission on Sustainable Development, participants included observers from many other States and representatives of local authorities, scientific communities, non-governmental organizations, trade unions and business and industry, as well as different international organizations. Interactive dialogues involving these varied groups of participants took place during the first two and a half days of the session, without prepared lists of speakers and at a rate of about two minutes allowed to each speaker. The following two days were devoted to the high-level segment, when government representatives (ministers and other high-level policy makers) delivered prepared statements at fast speeds limited to five minutes each. The second week of the session was entirely taken up by drafting work, involving a reduced number of active participants.
19. The session thus offered the opportunity to test remote interpretation in fairly different meeting formats. Contrary to the first experiment, when only a relatively small group of participants had been involved, the Commission on Sustainable Development resembled a full membership plenary conference. The proceedings were conducted in a large conference room, which was filled to capacity most of the time.
20. Remote interpretation was actually done during 16 meetings. In general, the first week called for the team of interpreters to work a full schedule of very demanding interpreting situations unrelated to the difficulties of remote interpretation. The second week proved easier in terms of interpretation content and workload (meetings started late, finished early or were interrupted and the Commission on Sustainable Development cancelled one meeting and devoted another one to informal drafting work without interpretation). The interpreters did not seem to think that one type of meeting lent itself more to remote interpretation than another. Under normal conditions, the first week would have been more difficult as well. As it turned out, most of the session was conducted in English. The spokespersons for the Group of 77 and the European Union, who were by far the most active participants during the drafting exercises of the second week, were both English speakers. Therefore, relay and retour could not be really tested during the experiment. During the mock meetings held the week before in

preparation for the experiment, however, interpreters were able to test the satellite link in those situations and the technical set-up was found to be suitable.

V. Organization and conduct of the experiment

A. Interpretation services

21. Interpretation was provided remotely by a team of 20 interpreters who volunteered or accepted to be assigned for the experiment. They were all permanent staff interpreters from Headquarters (eight), Geneva (six) and Vienna (six). The involvement of staff from the three main duty stations was considered important, in view of the possible implications of the use of remote interpretation for interpreters at all duty stations, as well as the requirement from the General Assembly that each duty station be considered both as recipient and provider of remote services.
22. One additional interpreter worked throughout the experiment from the remote location as a liaison with the conference officers working both on-site and at the remote location and with the audio and video technicians, with whom she remained in permanent contact via intercom headset. That connection was used to help spot the speaker by the cameras and also to receive feedback from the remote location to adjust the video coverage in accordance with requests from the interpreters, as conveyed by the interpreter providing liaison.

B. Conference officers and distribution officers

23. A senior conference officer working at the meeting site was designated the primary contact with the Secretary of the meeting. An additional conference officer was assigned to the remote site. The number of participants and the methods of work of the Commission on Sustainable Development require the assignment of an assistant conference officer to each meeting, in addition to the senior conference officer. During the experiment, the number of assistant conference officers was increased to two in an effort to speed up the collection of speakers' lists and all statements and texts available, which were delivered to the remote location by two messengers especially assigned to those meetings. Distribution services at the meeting site were provided by the normal number of staff, with one distribution officer being added at the remote site. The conference officer and the distribution officer working off-site were able to follow the proceedings via video and audio transmission.

24. The additional task of maintaining direct and timely communication with the remote location added to the workload of the senior conference officer working on-site. For the conference officer and the distribution officer at the remote location, the primary task was to receive documentation through the messengers and distribute it to the interpreters and to maintain communication with their counterparts working on-site. Not having to interact with participants reduced their overall workload in comparison with on-site conditions. This would make it possible for them to handle fax traffic or photocopying work during actual remote servicing conditions, when texts could not be walked to the remote location.

C. Sound transmission

25. Under the standards of the International Organization for Standardization applicable to simultaneous interpretation equipment, the minimum sound bandwidth acceptable for interpretation purposes is 12.5 kHz. Prior to the experiment, a sound quality test was conducted, during which interpreters were asked to rate remote connections through satellites providing feeds of 20 kHz and 14 kHz. Interpreters determined that the 14 kHz level assured good quality sound and was actually more suitable than the 20 kHz level, where background noise was a problem. On that basis, during the experiment the original statements were transmitted to the interpreters using one audio channel at 14 kHz. Since requirements for the satisfactory transmission of interpretation output are not as strict, and in order to save bandwidth, six channels at 10 kHz were used to transmit the interpretations to the participants.

26. From conference room 3 (the meeting location), the floor sound was transmitted, using cables, codecs and modems installed in the satellite earth station at Headquarters, to the satellite, where it was looped and sent back by the same means to the interpreters working in conference room 6 (the remote location). The floor sound and the six language channels were likewise transmitted via satellite back from conference room 6 to the participants in conference room 3.

27. Once the sound system was installed, no staff involvement was needed for the sound transmissions between the two conference rooms, which remained stable at the expected level of quality during the entire experiment. Two audio engineers, one in each conference room, worked during the experiment. The fact that the floor sound travelled throughout the circuit, all the way to the satellite and back, resulted in a clearly perceptible delay between the sound transmitted by the public address system in conference

room 3 and the sound received through the earphones. Comments about the presence of an “echo” were evidence of this.

D. Visual information

28. Since one of the purposes of the experiment was to improve as much as possible on the video system used in the first experiment, all efforts were made to use the best video technology and services available. Three cameras were installed in conference room 3 in booths above the meeting area, handled by three operators. One camera faced the participants and was used to capture the image of the speaker. The other two cameras faced the podium: one focused on the chairman or other officers, while the second one was used to provide general views of the room. In addition to the three camera operators, a television director, assisted by a technician, supervised the video transmissions and decided how to switch among the images captured by the three cameras.
29. In conference room 6, the set-up that was finally chosen by the interpreters consisted of six pairs of displays, each pair placed directly in front of each booth. Each pair consisted of one 42" plasma screen at booth level, 14 feet from the booth, and one 25" monitor at table level, 11 feet from the booth. The screen was used to project the image of the speaker and general views of the room, before the start of the meeting, while the monitor provided views of the podium and of the presiding officer as speaker.
30. Transmissions originated in the cameras in conference room 3. Via different combinations of videoconferencing systems, inverse multiplexers, codecs, modems, hard wire and ISDN phone lines, images were sent to the satellite, where they were looped and sent back using the same links. At the video control centre, the television director selected among the images received and forwarded them to the interpreters in conference room 6.
31. As the rates used for data transmission affect the quality of the image, the rates for each type of image were determined on the basis of the usefulness of each type for the interpreters. Interpreters considered that the image of the speaker was the most important one. Accordingly, it was assigned a rate of 512 kbps and was projected on the 42" plasma screen. The image of the podium was given a rate of 384 kbps and was projected on the 25" monitor. That was the set-up finally selected by the interpreters and it was used during the second week of the experiment. During the first week, the larger screen, with 128 kbps, had been used to provide general views of the meeting room, while one 25" monitor with 384 kbps gave a view of the speakers and a second 25" monitor with 256 kbps gave a view of the podium. Interpreters felt that those images were not clear enough to be useful and proposed

reducing the number of images from three to two, in order to achieve better quality within approximately the same available bandwidth. One monitor was removed, but the third camera was kept in operation and was used to feed alternating views of the podium or the room at the discretion of the television director. Therefore, between the first and the second weeks, the rate for the plasma screen (image of the speaker) was increased from 384 to 512 kbps and the rate for one monitor (alternating images of the podium or the room) was increased from 256 to 384 kbps.

E. Communications issues and technical findings

32. The United Nations leases satellite capacity from two service providers. The Information Technology Services Division uses 47 MHz of this capacity to support a total of 44 links via an earth station with an 11-metre antenna located at Headquarters. These links provide voice, data and videoconference communications services. For the experiment, the Division temporarily reassigned 4.85 MHz of its bandwidth and was thus able to support the experiment within its normally available capacity. An audio-video control centre was set up to route and control the transmissions to and from the two conference rooms and to and from the satellite earth station. The staff of the centre included two videoconference operators, two television engineers and one assistant, in addition to the television director and his assistant, who controlled the camera functions.
33. At most locations, the audio-video systems connecting the conference rooms and the control centres provide high-speed and reliable transmissions because they are hard-wired, since they are quite close to each other. This is not necessarily the case between control centres and satellite earth stations, which can be quite far away from each other. In these cases, the use of ISDN lines can offer a solution. In order to compare the performance and reliability of ISDN lines with those of hard-wire connections, both approaches were used in the experiment for the transmission of video. For audio, only hard-wire connections were used.
34. In the course of the experiment, the audio and video transmissions using hard-wire connections were never interrupted. This proved the reliability of cable connectivity and of satellite performance. Connections through ISDN lines, on the other hand, presented some problems. Following interruptions during the first few days and cases in which the images froze, the circuits used for the experiment were retested by the service provider and stability improved. Even so, video transmissions involving ISDN lines continued to go down once or twice a day for about one minute. This could be attributed

- to the quality of the ISDN lines or the interface between ISDN lines and the satellite, the videoconference equipment or the inverse multiplexers.
35. When several ISDN lines are used to transmit a particular image, the transmission will be interrupted even if just one line goes down. This means that, as the number of lines is increased to improve the quality of the image, the risk of interruptions will also increase, particularly if the lines are used for long periods of time (several hours in the case of remote interpretation). This risk factor must be kept in mind as a trade-off to improvements in video quality.
 36. Past experience with videoconferences shows that ISDN lines can provide acceptable communications links. The first full-scale experiment on remote interpretation also used ISDN lines and was not affected by interruptions. The quality of the lines, however, varies from one service provider to another and among different locations. It is necessary, therefore, to make sure that the best quality service available is used. Also, since the new models of videoconference equipment adjust themselves more flexibly for quick signal recovery and resynchronization, these new models should be used for remote interpretation.
 37. The experiment proved that satellite services are a viable communications means. The satellite service remained stable at all times. While the 4.85 MHz used for the experiment can be considered a large amount of bandwidth, this did not cause any interruption in other communications handled by the Information Technology Services Division through the satellite, and the normally available capacity could be used without additional cost. It should be noted, however, that satellite services for remote interpretation can be quite expensive if extra capacity needs to be obtained commercially. Besides, if remote interpretation is conducted in a location where an earth station is not available, this service must then be acquired commercially or a mobile station must be provided. Either option will be expensive.
 38. Images transmitted to a large 42" plasma screen using 512 kbps represented a marked improvement in comparison with the visual information given to the interpreters in 1999, during the first full-scale remote interpretation experiment. Further improvements should be weighed against the cost of data transmission. Although it was known that there would be a delay between the video and the audio at the remote site, resulting from the different rates at which audio data and video data were going to be transmitted to the satellite and back, the disruptive effect that the lack of synchronization had on the interpreters was originally underestimated. After the third day, the audio signal received from the satellite was delayed by 3 milliseconds before it was forwarded to the interpreters. This improved significantly the synchronization of audio with video.

F. Participants' assessment of the experiment

39. During the two weeks of the session of the Commission on Sustainable Development, no complaints or comments of any nature were received from members of delegations or other participants about the quality of the interpretation services being provided. At the last four meetings of the session, a questionnaire was distributed in all languages asking participants to indicate if, during the session, the sound and the remote interpretation had been (a) of about the same quality as the sound and the interpretation when on-site services were provided, (b) of poorer quality, or (c) of better quality. Some participants only became aware of the fact that interpretation had been provided remotely when they saw the questionnaire.
40. The response rate was very low. Only 23 completed questionnaires were received, 14 from persons speaking in English or listening to interpretation into English, and 9 from users of other languages (4 Spanish, 3 French and 2 Arabic). Among the 14 users of English, 13 found no differences in quality in either interpretation or sound, and one felt that both had been of poorer quality than under on-site conditions. Among the nine users of other languages, six saw no difference in sound and three found it to be worse. The rating of interpretation quality in this group was much less favourable: while four saw no difference in quality, five considered it of poorer quality than on-site interpretation.
41. The low number of responses limits considerably the validity of this information. However, in the light of the fact that interpretation into English was required very infrequently because most of the session was conducted in English, the views of users of other languages can be considered particularly relevant. In any event, as indicated in paragraph 39, the dissatisfaction that those replies show did not lead to complaints during or after the session.

G. Interpreters' assessment of the experiment

42. Using a questionnaire very similar to the questionnaire used during the first experiment, after each meeting the interpreters were asked to evaluate different components of the sound and video information and the support services available to them during the experiment, as well as to assess the degree of physical and psychological effort that working in remote conditions entailed. Interpreters were asked to compare these parameters with normal, on-site conditions and to use a scale ranging from -5 to +5, where the negative values represented a deterioration, and positive values an improvement vis-à-vis normal on-site conditions.

43. The response rate was high across the board, for all interpreters and all variables, and roughly equivalent to 85 per cent. The averages of the ratings from all 20 interpreters covering the 16 meetings for which remote interpretation was provided reveal that interpreters feel that the quality of sound (-0.3) and the quality of support services (-1) was comparable to or only slightly worse than the levels prevailing under normal on-site conditions. The overall sound quality was rated better than in the first full-scale experiment (up from -0.8 to -0.3) and it would have been even closer to normal conditions if it had not been for the echo and synchronization. The visual information, on the other hand, was seen as of clearly poorer quality than the visual information available when working on-site (-2.1). Remote interpretation also demanded greater physical effort (-2.1) and led to higher psychological stress than normal on-site work (-2.4).
44. The evolution of the ratings over the two-week period was also reviewed. Values do not reveal any consistent pattern. The reconfiguration of the video set-up between the first and the second week seems to have resulted in a very small improvement in the perceived quality of the visual information. Together with the fact that, during the second week, the meetings were less difficult to interpret, the reconfiguration may have contributed to a stabilization of, and even a slight reduction in, the physical and psychological effort accompanying remote interpretation.
45. The averages of all individual ratings are valid indicators of the most prevalent view of remote interpretation among the interpreters who participated in the experiment. As it is frequently the case with averages, they hide wide degrees of variability, or wide spreads around the average. On the other hand, a high degree of consistency at the personal level is evident: individuals who have a more positive view of the quality of the visual and sound information available to them also feel less burdened by remote working conditions, and vice versa.

H. Conclusions of the second experiment

46. The experiment allowed for testing remote interpretation in a variety of meeting formats: impromptu exchanges of views, prepared statements read at high speed, informal negotiations and drafting sessions. Interpreters did not seem to think that one type of meeting lent itself more to remote interpretation than another. Relay and retour could not be tested, since the overwhelming majority of the statements were in English.
47. The experiment showed that satellite communications can be reliably used in remote interpretation. The satellite link remained stable and provided very good sound and video transmissions when the ground segment was via hard

wire. The ISDN lines used for the transmission of video signals require further attention. The interruptions that were experienced in that connection may be due to different factors that need to be determined, but may partly be a result of the simultaneous use of a relatively high number of lines in an effort to improve the quality of the images transmitted. Trade-offs between visual quality and transmission stability may be required.

48. Apart from the information provided by means of the questionnaires, the interpreters who participated in the experiment considered that an acceptable level of service had been provided by them, but that striving to maintain high professional standards under adverse conditions and to compensate for a feeling of alienation had taken a toll on the team in terms of increased fatigue. Although the sound was very good, there was an echo problem and sometimes a disorienting lack of synchronization between sound and image. For many interpreters, that remained a major problem throughout the two weeks and added to the stress they experienced.
49. Many interpreters felt that the adjustments made to the video set-up had resulted in improvements in picture quality. The image of the speakers on which most interpreters relied, however, was not always clear or stable, causing loss of concentration. Interpreters who had participated in the first experiment felt that it was better to work in a lit room, with screens placed at a more natural distance from the booths. The loss of visual information, however, remained a definite handicap. A panoramic view of the conference room providing useful information was unattainable with the technology used during the experiment. In live meetings, interpreters rely on being able to see delegates other than those actually speaking, and excellent video information might go some way towards compensating for other inherent deficiencies of remote work.

I. Cost of the experiment

50. As indicated in the relevant sections above, in addition to the staff that would normally service a session of the Commission on Sustainable Development, it was necessary to redeploy the following staff from other duties to the experiment on a full-time basis for two weeks: one interpreter to ensure liaison between the servicing room and the meeting room, two conference officers, one documents distribution officer, two messengers, one audio engineer, two videoconference operators, two television control engineers and three wide area network technicians. Extensive work by regular staff was also needed before the session for preparatory work, including equipment tests. In addition, three camera operators, one television director and two assistants were recruited specifically for the experiment. Related

expenditures covering the salaries of the external staff and overtime for regularly available staff amounted to \$32,700.

51. Most of the equipment used in the experiment was already available in-house. However, it was necessary to purchase four low-speed satellite modems, four audio codecs, four audio receivers and one block deconverter at a cost of \$51,800. ISDN lines needed to be installed between the control centre and the satellite earth station. Installation costs amounted to \$4,063 and actual use to \$1,952. Satellite use did not give rise to additional expenditure, since part of the transmission capacity normally available to the Organization was reassigned to the experiment.

J. Observers attending the experiment

52. All organizations and academic institutions that have participated as members or observers in recent Inter-Agency Meetings on Language Arrangements, Documentation and Publications (IAMLADP) were notified of the experiment and were invited to send observers. Managers or senior members of the interpretation, administrative or technical services of the following organizations observed the experiment: International Civil Aviation Organization, World Bank, International Monetary Fund, International Telecommunication Union, International Maritime Organization, World Intellectual Property Organization, European Commission, European Parliament, Organisation for Economic Cooperation and Development, Organization of American States and United States Department of State.

VI. Conclusions: current perspectives on remote interpretation, including cost-effectiveness

53. After two full-scale experiments and although progress has been made, efforts to find technological solutions that could bring the physical environment of remote interpretation as close as possible to normal on-site conditions have been only partially successful. During the second experiment, by using higher rates of data transmission, camera operation that excluded sudden movements and panning and new screen technologies, it was possible to see the images without having to work in a dark or semi-dark room. However, the prevalent view among interpreters is still that remote interpretation will yield service at the level of quality that is customary in simultaneous interpretation only at the expense of added stress and fatigue. This health impact of remote interpretation is primarily due to the deficient

synchronization between sound and image and the inability to obtain the visual information that is available on-site — two problems which require technological solutions not found so far — and to the sense of alienation, which can only be overcome through a process of adaptation to a different working environment on the part of interpreters trained to work on-site. After the second experiment, it is evident that, so long as maintaining an acceptable level of quality of service in a new working mode requires additional physical and psychological effort, typical individual workloads expected during on-site work would need to be reduced if remote interpretation were to be used.

54. The audio, video and communications equipment and the staffing and organizational arrangements for remote interpretation should be at least those used in the second experiment and described in paragraphs 25 to 38 above. Although still imperfect, they represented a marked improvement in comparison with the first experiment and provided the best technical environment for remote interpretation in six languages currently available to the Organization.

55. Related communications capacity should be as follows:

(a) Sound:	
(i) One ISDN line for the transmission of the floor sound to the interpreters (14 kHz)	128 kbps (with data compression)
(ii) Three ISDN lines for the transmission of the six languages back to the meeting (10 kHz)	384 kbps
(b) Video:	
(i) Four ISDN lines for the transmission of the speaker image to a 42" plasma screen	512 kbps
(ii) Three ISDN lines for the transmission of the podium/room image to a 25" monitor	384 kbps
Total	1 408 kbps
(c) Satellite (when the two locations cannot be linked via ISDN)	4.85 MHz

When satellite service is involved, the need to use ISDN lines at the meeting location and/or at the servicing location depends on the proximity of the earth stations and on whether it is feasible or efficient to link them to the meeting place or to the interpreters' booths by hard wire.

56. Satellite links have proved to be reliable for remote interpretation purposes. The satellite capacity regularly available to the United Nations could make remote interpretation between Nairobi and New York financially viable, if

part of the existing bandwidth is reassigned for this purpose. Other existing satellite links cover communications with the locations of peacekeeping missions and it is highly unlikely that these could be assigned to remote interpretation. Geneva and Vienna are not covered by the Organization's satellite communications system. Since satellite services can be quite expensive, remote interpretation should not be considered if extra capacity has to be obtained commercially.

57. As was done in the report prepared after the first experiment (A/54/176), in order to have a very general picture of the comparative cost-effectiveness of each servicing modality, a comparison between the likely costs of daily subsistence allowance (DSA) for interpreters and of ISDN communications is given below for the venues of several forthcoming meetings. Information on DSA has been taken from the July 2001 circular issued by the International Civil Service Commission (ICSC/CIRC/DSA/314). In order to obtain up-to-date information on ISDN rates, different vendors were contacted. The rates used below are the most favourable rates for global ISDN services from New York offered to the United Nations as at the date of the present report.
58. Since it is impossible to make assumptions about many servicing requirements, this very crude comparison assumes that any costs other than DSA and ISDN communications impacting either one of the terms of the equation would balance each other out. Savings in interpreters' travel expenses, for example, would be counterbalanced by additional costs, such as labour costs for technical set-ups, camera operators' salaries, the salary of conference room staff needed at the remote site, the cost of the transmission to interpreters of documents originating at the conference site, telephone traffic between the meeting and the interpreters and perhaps a number of incidentals impossible to foresee.
59. Paragraph 55 above shows that remote interpretation communications require 1,408 kbps, that is, 11 ISDN lines of 128 kbps each. Assuming that a two-week session is held, consisting of 20 three-hour meetings, each requiring a three-and-a-half-hour connection to allow for checking before the actual opening, ISDN links are needed for a total of 4,200 minutes. For the on-site servicing of a two-week session comprising 20 meetings, the presence of 20 interpreters would be needed. They would have to be paid DSA for 13 days. Kingston, Jamaica, is a frequent venue of meetings provided with on-site interpretation. The cost of one 128-kbps line from New York to Kingston is quoted at \$1.71 per minute. Communications costs would amount in this case to \$79,002. The current DSA for Kingston is \$142. Total DSA would amount to \$36,920. In this case, communications costs are more than double the cost of DSA.

60. The ratio between DSA and ISDN rates varies widely depending on the location of meetings. In the case of Kingston, it is 0.47 (36,920/79,002). In 2001 and 2002, meetings are being held or are likely to be held in 12 other cities in countries to which ISDN rates from New York are available. The corresponding DSA/ISDN ratios estimated as explained in paragraph 59 are as follows:

The Hague	1.73	Brussels	0.92
Geneva	1.42	Madrid	0.73
Vienna	1.21	Johannesburg	0.45
Berlin	1.18	Indonesia*	0.44
Santiago	1.16	Bangkok	0.36
Bonn	1.05	Durban	0.30

* Based on the Jakarta DSA. The specific venue is still to be determined.

61. A convenient rule of thumb could be that, when a direct comparison of DSA costs and communication costs indicates that the former are lower than the latter, *prima facie* there would be no reason to consider the use of remote interpretation. On the other hand, when communications costs are clearly lower than DSA, there could be financial reasons to consider the use of remote interpretation, subject to further analysis of the overall relevant costs under specific and well-defined servicing assumptions.
62. However, the combination of currently available technical and human resources does not provide a working environment sufficiently conducive to effective simultaneous interpretation. At the technical level, the second experiment revealed that there can be uncertainties and trade-offs between the volume of data transmitted via ISDN lines and the stability of the transmissions, with resulting limitations in the search for ever better visual information. At the human resources level, interpreters trained to work on-site cannot perform with the same efficiency when they work remotely.
63. In these circumstances, future activities that foster the accumulation of experience among interpreters working on-site at meetings which have some of the characteristics of remote meetings, namely a videoconference component, will be of benefit. Future advances in the videoconferencing and communications areas must be continually assessed to determine whether they can offer solutions to the outstanding technical problems of remote interpretation. The potential financial advantages of remote interpretation in certain cases, together with the additional flexibility in the use of interpretation services that it can offer, justify further work along these lines.

BOOK REVIEWS

Franz Pöchhacker and Miriam Shlesinger (eds.), *The Interpreting Studies Reader*, London & New York, Routledge, 436 p., ISBN 0-415-22478-0.

On the market there are a few anthologies of selections from the “classics” of translation studies, some taking a historical approach, some giving more emphasis to theoretical issues, others focusing on “applied” aspects, but to date no such collection has been published in the field of Interpreting Studies. We should therefore be grateful to Routledge and to *Translation and Interpreting Studies Series* Advisory Editor Mona Baker for supporting Franz Pöchhacker and Miriam Shlesinger’s project of an *Interpreting Studies Reader*, intended as a counterpart to Lawrence Venuti’s successful *Translation Studies Reader*, as a section of which the collection was originally conceived.

What has resulted is a rich and comprehensive anthology, offering an overview of the development of the interpreting discipline and the profession, as well as an exhaustive state-of-the-art account of research in this field. While the selection of texts is in itself representative of the most significant writings in IS so far, the picture is made even clearer and more exhaustive by the careful and well thought-out accompanying commentaries, thus affording a more comprehensive perspective. Thanks to the in-depth introductory essay and the *ad hoc* introduction which opens each section of the anthology, the material is organised into a coherent overall picture. Each text is also preceded by background information about its author, helping to contextualise it.

Of course, in cases like this selecting texts can be a difficult, even painful, process and it is inevitable that the finished product should do full justice only to some aspects, sidelining others or leaving them only partially represented. In this respect, it is essential that the criteria of choice be made thoroughly clear. Here, they are illustrated in detail in the opening essay. The volume includes both theoretical and empirical (observational as well as experimental) studies, thus mirroring the “double soul” of the discipline. It also covers a wide spectrum of paradigms and methods - based on theoretical considerations, cognitive psychology, text linguistics, discourse analysis or sociolinguistics - as well as the different modes of interpreting - consecutive, simultaneous, *liaison*. The field of signed-language interpretation is also covered. Of course, much has had to be excluded, notably works dealing with specifically epistemological issues, interpreter training, professional ecology and neuropsychological-neurolinguistic paradigms. However, what has been lost in breadth of spectrum has been gained

in terms of depth of coverage and coherence of overall structure. In particular, the selection has privileged two categories of texts: the “classics” of the discipline, providing a diachronic account of its establishment and growth, and works representing research orientations with strong potential for future development.

Interestingly, the anthology also includes works which to date have been relatively inaccessible, in particular examples of early research in this field or writings so far available only in languages other than English, which are offered in translation for the first time. These include A. Hermann’s diachronic account of the origins of interpreting, P. Oléron and H. Nanpon’s historic essay on “Research into Simultaneous Translation”, and other seminal essays by H. Kirshhoff, D. Seleskovitch and A. Collados Aís.

If fault can be found with the selection of texts for the volume, it regards the works of the editors themselves: Pöchhacker and Shlesinger have contributed substantially to the development of the IS discipline and the volume would certainly have benefitted from the inclusion of a selection of their most significant studies.

Preceded by a short section on the early history of interpreting, the first Part presents some pioneering contributions by authors whom the editors define “ground-breakers”, mostly psychologists and psycholinguists who took up interpreting as an object of research for the first time and focused in particular on synchronicity patterns between source- and target-text in simultaneous interpretation and on error analysis.

The next two sections, “Laying Foundations” and “Modeling the Process”, feature works published from the late 1960s to the turn of the millennium, essentially aimed at constructing models of the interpreting process. These are situated at different levels of abstraction and take a variety of theoretical approaches.

The advent of a wider perspective, investigating the situational, interactional and sociocultural aspects of interpreting, is illustrated in the works collected in Part Four, while the following section features contributions representative of a product-oriented approach to interpreting, using text linguistics, discourse analysis, pragmatics or a socio-semiotic approach to analyse the interpreter’s output within a communication-oriented framework.

The essays collected in Part Six provide a significant sample of approaches on quality assessment, illustrating both the increasing interest in users’ expectations and the “norms” guiding the different subjects involved in interpretation - not only interpreters’ professional norms, but also users’ “expectancy norms”.

Part Seven takes up the crucial issue of the interpreter’s role and related deontological dilemmas in a context where new professional profiles have

emerged and conference interpreting is now part of a much more complex picture, including community interpreting, medical interpreting, signed-language interpreting, media interpreting etc.

The volume is closed by an essay by M. Cronin, evaluating the cultural and ideological importance of the interpreting profession, at odds with the “minorisation” of IS within the context of translation studies. Such a view ultimately advocates a shift towards a politically self-aware “material/cultural theory of interpreting”, which may restore it to the position it deserves.

This final appeal helps highlight the fact that the *Interpreting Studies Reader* is not only an invaluable source of information for scholars, students and practitioners alike, but itself testifies to the dignity and growing prestige of IS as an autonomous, fully fledged discipline.

Giuliana Garzone

Giuliana Garzone and Maurizio Viezzi (2001), *Comunicazione specialistica e interpretazione di conferenza*, Edizioni Università di Trieste, 231 p., ISBN 88-8303-081-8.

This book is an important addition to the literature on conference interpreting, in that it analyses language, rhetoric and formal conventions in two of the most prominent discourse types on the professional interpreter’s agenda. Giuliana Garzone examines technical and scientific discourse, while Maurizio Viezzi focuses on political discourse. Both studies analyse distinctive features of these discourse types from the interpreter’s point of view, with practical examples of how professional and trainee interpreters manage the two genres. The book thus offers useful insight into two major components of interpreting – the source speech which the interpreter is required to convey, and how s/he actually fares in doing so. The only part of the overall process not examined in detail is how the specialist interpreter’s production is then perceived by delegates, but this is a topic of study in its own right and the authors have understandably taken a different perspective. At the same time, there is some discussion of the issue in both studies, with major surveys of user expectations briefly reviewed by Garzone (pp. 114-115) and user reactions inevitably taken into account in Viezzi’s analysis of quality.

Both authors refer essentially to examples of simultaneous interpreting from English to Italian, and sensibly make no sweeping claims as to just how far the principles they highlight fit other languages and cultures. However, the interest of examining issues such as the structure and style of technical, scientific or

political discourse surely extends beyond the language combination on which the book focuses.

Giuliana Garzone's study comprises three chapters – an introduction to the conventions and features of conference speeches, a detailed account of scientific and technical discourse, and an analysis of relevant issues for the interpreter. The focus on interpreting issues includes comments on a small sample of professional and trainee performances. Apart from considerations on major features such as the macrostructure of specialist discourse and the linguistic features which contribute to its often impersonal nature, the study offers interesting insight into issues such as reinforcing and hedging strategies. There is also a case study in which a number of English texts from a gemmology congress are literally “checked against delivery”, i.e. compared with the recording of what the speakers actually said. This makes it possible to identify the various types of departure and gloss that can complicate the task of simultaneous interpreting with the speaker's text available in the booth. In focusing on points such as these, Garzone's analysis reflects the considerable scope for investigation of specific variables in the interpreting process.

Maurizio Viezzi's account of interpreting political discourse is also divided into three chapters – an introduction to political discourse, a detailed presentation of Viezzi's approach to quality evaluation, and a thorough illustration of how the interpreter might analyse a sample of political discourse (the example being a speech by Tony Blair). The chapter on quality assessment includes a case study of how a trainee interpreter actually fared in interpreting another speech by Tony Blair into Italian. Apart from the author's feel for the nuances of political speech, and his telling examples of how to read between the lines of the speaker's script, he argues a convincing case for not considering the tenets of the *théorie du sens* applicable to the language of politics and diplomacy. A variety of examples illustrate how the political interpreter's brief involves far more subtlety than plain statement of the speaker's (presumed) *vouloir dire* – though, interestingly, the reader can only conjecture whether the strategy of the English booth famously baffled by Ciriaco De Mita's “impenetrable” oratory was form-based or meaning-based!

Minor criticisms of the book stem more from its presentation than from its content. First, an index of key concepts and proper names would have been useful, as both studies contain a wealth of information not usually found in mainstream publications on Interpreting Studies. Second, the two bibliographies could perhaps have been combined to avoid a certain amount of overlap.

Such criticisms are essentially formal quibbles, which detract little if at all from this reviewer's unreservedly positive response to the book. It offers a great deal of interest to theoreticians and practitioners alike – not only as complementary reading for conference interpreting courses, but also as a very

readable source of information on text linguistics and genre analysis for research projects such as those covered in theses and dissertations at many interpreting schools.

In conclusion, it is a shame that the language of publication restricts the book's potential readership, as these studies deserve to be widely read. At the same time, it is interesting to see this as an example of how the literature on conference interpreting is by no means limited to more widely read languages like English and French. The range and quality of books, articles and dissertations available to an Italian readership affords a striking example of the contribution which different national or linguistic schools make to Interpreting Studies.

Peter Mead