EXPLORING THE COGNITIVE PROCESSES OF SIMULTANEOUS INTERPRETING

ENGLISH–ARABIC–ENGLISH DYNAMICS

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Exploring the Cognitive Processes of Simultaneous Interpreting

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English–Arabic–English Dynamics

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BP	Buffer Point
FS	False Starts
H	Hesitations
LGP	Linguo-Cognitive Processor
LI	Linguistic Input
LO	Linguistic Output
LTM	Long-Term Memory
N/A	Not Applicable
P	Pauses
(P)	Phase
SI	Simultaneous Interpreting
SL	Source Language
ST	Source Text
SVO	Subject Verb Object
T (1…)	Time
TL	Target Language
TT	Target Text
TU	Translation Unit
VSO	Verb Subject Object
WM	Working Memory

Chapter 1

Preliminaries

1.1 INTRODUCTION

There are two broad fields of investigation in translation studies: written translation and interpreting. Written translation research is mainly concerned with the transfer of meaning from the source language into the target language, with the medium being the written form, while simultaneous interpreting (SI) focuses on the transfer of meaning from the source language into the target language, with the medium being the oral form (if signed language interpreting is excluded). But there are two important facts that need to be stated. First, despite sharing some processes and strategies with written translation, simultaneous interpreting has its scholarly peculiarities, for, as Garzone and Viezzi (2002, p. 2) opine, simultaneous interpreting studies 'rely on accurately defined methodologies borrowed from the linguistic sciences, which in turn have witnessed some important evolutions, looking beyond grammatical well-formedness to include semantic, pragmatic and rhetorical aspects'. Second, written translation processes have received due attention, but little is known about the simultaneous interpreting processes despite some efforts that started in the 1960s.

Several studies have been made on how humans deal with written translation problems in the last two decades. A much-quoted study is Bell's (1991) which views the act of translating as based on problem-solving. In a tentative model of text-processing during translating, he maintains that there are five stages involved in text-processing: (a) linear sequence and grammatical structures; (b) propositions; (c) sequencing; (d) main ideas; and (e) plans and goals. Séguinot (1995), however, attempts a shift to a different gear; she investigates the causes of the errors made by translators, whether professionals or novices. She discusses the problem in terms of two broad headings:

errors and the individual translator and first and second language. She tackles factors like limitations on processing capacity, parallel processing and forwards processing, accessing knowledge and motor aspects of production. She states that human comprehension is non-linear (*pace* Bell, 1991) as it is based on predictions. Dancette (1996) attempts to reconcile the two rival positions of the linguistic and the cognitive. While the linguistic model captures meaning through 'the componentiality of different linguistic structures', the cognitive view makes use of the mental model to explain language comprehension.

Other paths of written translation research only focus on cognitive notions such as schemas and domains in translation. Olohan's paper (2000) attempts an investigation of domain conceptualization and scene construal in trainee translators. He maintains that L2/L1 mapping may occur during translating in the form of routines of frequently translated forms. In the case of experienced translators, conceptual structures can be evoked to provide a context rather than linguistic ones. To select but a few studies based on such cognition-grounded approaches, Al-Kufaishi (2004) and Kaur (2005) introduce the macro-skills of translation, which include among others the following:

1. Recognizing explicit and implicit semantic elements.
2. Identifying the rhetorical functions the writer has selected.
3. Understanding relations within the sentence, for example, premodification, postmodification, disjuncts and the like.
4. Using mental imagery.
5. Reading and comprehension.
6. Analyzing and reasoning – translating.
7. Choosing equivalent terms based on context and culture.
8. Selective attention – attending to one sentence at a time.

Despite the similarity between some of the strategies and processes involved in written translation and simultaneous interpreting (cf. Warner, 1997; Bajo et al., 2000; Lambert, 2004), the latter is yet to receive much scholarly attention due to the 'extra-linguistic' elements involved. As Setton (2005) notes:

> The question of why simultaneous interpreting merits our interest needs to be asked a priori because after sixty years of providing a vital daily service to the international community, the activity remains an arcane field of study. This status of the discipline is probably due in equal parts to the occult, not-quite-respectable odour of translation generally, and to the extreme difficulty of capturing SI for research. (p. 70)

Being a highly complicated process that draws on one's linguistic and non-linguistic resources (e.g. schemata and global discourse aspects), simultaneous interpreting puts linguistic and extra-linguistic processes in perspective: the

cognitive activities needed to process a text or even a sentence in one language are doubled by the need to reprocess it in the direction of another language (hence the errors resulting from directionality). This assumes that thinking in terms of the source language (SL) of the given text is repeated in terms of the target language (TL), depending on the information gleaned and stored in the short-term memory (STM). This complex activity can be detected in the light of actually translated texts from one language into another, which eventually evidence the fact that some syntactic, semantic and pragmatic shifts, all guided by pragmatic necessities and norms, are mandatory rather than optional, for example, the shift from the passive to the active in Arabic, the need to rephrase very long grammatical subjects to produce handsome versions, the process of adverb-readjustments, repositioning of adjuncts and so on.

Given the present state of affairs, the researcher has seen it important to examine the linguistic and cognitive processes that underlie the simultaneous interpreting of given texts. The paradigm in this research is to take the output, that is, the translations, as evidence for the presence or absence of certain linguistic options and cognitive processes that directly or obliquely have a bearing on translating.

1.2 RESEARCH FOCUS

This research mainly focuses on how media simultaneous interpreters deal with the source texts delivered to them. It also focuses on the linguistic and cognitive processes that are discoverable from the in-depth analyses of several political speeches translated from English into Arabic and vice versa. In fact, there are many examples which attest to the several linguistic and cognitive processes that interpreters perform in order to communicate meaning. Yet these examples include adjustments and preferences that are not sufficiently justified when it comes to the linguo-cognitive analysis. One of these examples is presented below to show how interpreters at times take decisions that need further evidence on the two levels of the linguistic and cognitive.

The simultaneous interpretation of the following extract is analyzed as an illustration of how the process of simultaneous interpreting is greatly complex:

ST

”أتوجه بحديث اليوم لشباب مصر بميدان التحرير وعلى اتساع أرضها أتوجه إليكم جميعاً بحديث من القلب حديث الأب لأبنائه وبناته أقول لكم إنني أعتز بكم رمزاً لجيل مصري جديد يدعو إلى التغيير للأفضل ويتمسك به ويحلم بالمستقبل ويصنعه، أقول لكم قبل كل شيء إن دماء شهداء وجرحاكم لن تضيع هدراً وأؤكد أنني لن أتهاون في معاقبة المتسببين عنها بكل الشدة والحسم.“

TT

> I address you today, to the youth of Egypt, stationed in Tahrir Square, and nationwide. I address you all with a speech from the heart, a speech from the father to his children, to his sons and daughters. I tell you I take pride in you the symbol of a new generation of Egypt, calling for the change to the better, adhering to the say, dreaming for a bright future, and shaping such a future. I tell you before any thing that all those who fell martyrs and injured the blood their will not go down the drain. And I confirm I will not relent to penalize all those responsible fiercely and strictly.

In this brief extract from Mubarak's speech on 11 February 2011, the Al-Jazeera interpreter has taken liberty with many words and syntactic structures. He plays it safe by using the hypernym of 'children' as a translation for شباب مصر و شاباتها, and then resorts to the hyponyms 'sons and daughters'. Similarly, he also inserts 'stationed' to syntactically find an agent to be described by the adverb 'nationwide', an acceptable translation for على اتساع أرضها. These two moves, so to say, are meant as highly anticipating strategies that guard the simultaneous interpreter against missing out any keyword in the speech delivered. Moreover, the interpreter maintains the repetitive use of أتوجه إليكم by opting for the formulaic 'I address you', which is duly formal and convenient for a president speaking in times of crisis. But, in the case of أقول لكم, he uses 'I tell you', which is rather informal. To offset the informality of 'I tell you', which will be overused in the course of this lengthy speech, the interpreter resorts to other highly formal and neutral words, such as 'relent' and 'confirm'. Generally, in this short excerpt, the syntactic structures are uniform and mostly English-sounding. Such a brief linguistic analysis can be further enhanced and even justified by the extra-linguistic factors.

The same excerpt can be analyzed on the cognitive or non-linguistic level. The disfluencies are represented by pauses in order to explore the hesitations which evidence the interpreter's cognitive processes (cf. Tissi, 2000):

> I address you today (PAUSE) to the youth of Egypt (PAUSE) stationed in Tahrir Square (PAUSE) and (PAUSE) nationwide (PAUSE) I address you all (PAUSE) with a speech from the heart (PAUSE) a speech from the father to his children (PAUSE) to his sons and daughters. I tell you I take pride in you the symbol of a new generation of Egypt (PAUSE) calling for the change to the better (PAUSE) adhering to the say (PAUSE) dreaming for a bright future (PAUSE) and shaping such a future. I tell you before anything that all those who fell (PAUSE) martyrs and injured the blood their will not go down the drain. And I confirm I will not (PAUSE) relent (PAUSE) to penalize all those responsible fiercely and strictly.

There are 18 pauses (long and short) in a 156-word text. The pauses are also so portioned out as to be mainly at sentence boundaries. This shows that

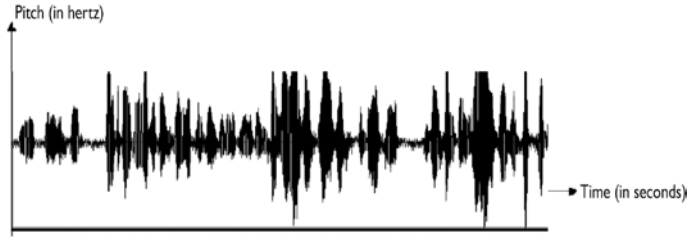

Figure 1.1 A Wave Spectrogram of the Major Pauses in the Extract.

the interpreter pauses at significant intervals, for he waits until grasping the meaning in full. The graph in figure 1.1 (produced by any speech analysis software) shows how the major pauses are displayed.

The vertical axis represents pitch in hertz and the horizontal axis represents time. The graph illustrates how the 13 disfluencies figure in the course of 2–20 seconds, where the interpreter steels to grasp the main points and adjusts to the speech rate. This graph attests to the salient cognitive processes involved; the interpreter starts out disfluently but proceeds smoothly by searching for semantic and syntactic information. The graph thus starts to take a rather uniform shape at 14 seconds, where the speech rate and the key points have been stored and maintained; therefore the ups and downs are regularly represented.

From this short discussion of the excerpt under study, it is clear that what simultaneous interpreters do in the course of communicating meaning is rather complex. The semantic and syntactic information is not what the interpreter aims at; s/he is first forced to determine the schemata and speech rate of the source texts before resorting to linguistic tactics and formulaic expressions. Such strategies and processes can be further investigated in several speeches and recordings in order to discover their regularities or to explore how certain strategies and moves are used, and why and how others are waived in the course of simultaneous interpreting. This may also lead to the expansion of the strategy list and the possibility of proposing one or more models which can account for the process of simultaneous interpreting from English into Arabic and vice versa. It is worth noting that many studies on this point are presented in chapter 2 about past attempts in the field.

The major challenges that bedevil the simultaneous interpreting process can be further clarified through a number of observations to be validated or invalidated in the course of this book. Simultaneous interpreting from English into Arabic primarily depends on lexical rather than semantic, syntactic or pragmatic considerations. This observation is verified by Papadopoulou and Clashen (2006), but their study is centred on written translation and the bilingual lexical access; their findings need to be re-evaluated in the context of simultaneous interpreting from English into Arabic. The two scholars also note that translation from Arabic into English is driven by semantics

rather than any other levels of linguistic analysis. This claim also requires tangible proof in the case of simultaneous interpreting. Moreover, simultaneous interpreting from English into Arabic and vice versa involves much more linguistic and cognitive strategies than those recorded in the relevant literature on other languages (see chapters 4 and 5). Based on these observations, it is possible to capture the basic linguistic and cognitive strategies involved in English/Arabic–Arabic/English simultaneous interpreting in two viable models.

1.3 CORPORA

Two corpora of 30 political speeches have been compiled. Fifteen speeches are in Arabic and translated into English, and 15 are in English and translated into Arabic in order to ensure an equitable and balanced analysis. The length of these speeches considerably varies from 30 seconds to 50+ minutes according to the actual occasions on which the speeches were delivered.

1.4 ANALYSIS INSTRUMENTS

The speeches are analyzed according to their semantic, syntactic and pragmatic considerations. They are also analyzed according to their disfluencies, using the specially designed software modelled on Speech Filing System (SFS).

1.5 BASIC TERMS

This section provides brief discussions of the basic terms that recur in the course of this book. The terms are arranged in alphabetical order. The objective of the discussions is to present the different points of view that shape the understanding of the term in question. At the end of each discussion, a clear definition is provided to act as a reference for the reader. When a term is undisputed, the definition is presented forthright without any argumentations.

Active Speech Level

The term is a technical one and not to be understood in a qualitative way. The term refers to the amount of speech done by the speaker relative to the pauses and silences detected. It can be measured by decibels and percentages.

A-Language versus B-Language

An A-language is the interpreter's mother tongue, while a B-language is the language into which a source text is interpreted, and is usually regarded as the interpreter's second language (cf. Szbari, 2002; Chang, 2005).

Anticipation/Prediction

There is some disagreement as to the nature of anticipation in the literature. There are some scholars who prefer to see it as a conscious cognitive activity (cf. Van Besien, 1999; Vandepitte, 2001; Chernov, 2004) while others hold the view that it is simply an automatized strategy made up of other sub-strategies (cf. Zanetti, 1998; Riccardi, 2005), and classify it as a comprehension strategy, like who views it as a cumulative, dynamic process. Camayd-Freixas (2011), however, offers an elaborate classification as follows:

- Syntactic prediction is the ability to anticipate how a phrase or sentence will end. There are three main types of syntactic prediction: formulaic, reiterative, and grammatical:
  a. Formulaic prediction is based on automatic, unconscious such as greeting formulae.
  b. Reiterations or repetitions create an anticipation to be verified by repeating a particular phrase or word such as politicians' slogans.
  c. Grammatical prediction works by anticipating certain parts of speech or syntactical structures, such as anticipating a noun after an adjective or verb after subject.
- Semantic prediction is the anticipation of meaning. It is based on the immediate co-text.
- Pragmatic prediction is a combination of semantic and syntactic predictions.

It can be said that, as its name implies, the term can be taken to refer to the interpreter's ability to predict the incoming output of the speaker.

Automaticity/Automatisms

The two terms are usually interrelated, being connotative of the process versus the product. Automaticity is 'the ease or efficiency with which knowledge can be retrieved or manipulated' (Field, 2004, p. 28), and releases the burden placed on the working memory. In simultaneous interpreting, automatisms, in turn, are the products of automatizing the output.

Chunking/Segmentation

The strategy is meant to cope up with the speaker's output, where the interpreter divides up long stretches of the target text into processable units. However, there is still much disagreement about the size of a chunk (see Yagi, 2000; Riccardi, 2005; Piccaluga et al., 2007; Camayd-Freixas, 2011).

Compression/Condensation/Summarization

The three terms are used interchangeably in the literature. There are several types of compression as Iacovoni (2010) observes:

- Syllabic compression involves the interpreter's choice of words with fewer syllables than the ones used in the source text in order to save time.
- Word (lexical) compression is typically the use of fewer words to express the same idea, being much like syntactic compression, where simpler structures are opted for.
- Meaning (semantic) compression is concerned with expressing the same meaning in equally idiomatic expressions, e.g. 'non-proliferation treaty' instead of 'treaty for nuclear non-proliferation'.
- Contextual (situational) compression refers to the elimination of speech chunks bearing information which is compressed for by the extralinguistic situation of communication.

It can be concluded that, in this strategy, the interpreter attempts to cope up with the source-text delivery by interpreting the basic information irrespective of the form. It is an attempt to reduce the number of linguistic units by eliminating those which are not necessary to carry the message across.

According to Seleskovitch (1968), the process of translation is divided into three **stages**: **comprehension**, **deverbalization** and **reformulation**; furthermore, *deverbalization* assumes a *vital* role between *comprehension* and *reformulation*. Deverbalization is usually defined as the process involved in meaning-based interpreting, yet Dejean le Féal (1997) questions the validity of the notion. However, key researchers (namely, Gile, Dam and Seleskovitch) agree that deverbalization stage occurs somewhere between the perception of the original speech and the reformulation of its 'message' into the target language by the interpreter (see the Buffer Point in chapter 3). It is thus the process of transforming the source-text form into a conceptualized entity capable of being relayed in the direction of the target language with drastic linguistic changes.

Disfluency/Dysfluency

Speech disfluencies are a much broader category than slips of the tongue. They are defined by Gósy (in Bakti, 2009, p. 2) as the speech 'phenomena that interrupt the flow of speech and do not add propositional content to an utterance'.

Explicitation versus Explicitness

In translation and interpreting studies, the two terms are not interchangeable according to Baumgarten et al. (2008). 'Explicitation' is the strategy or technique of making the information in the target text clear, while explicitness is the phenomenon of overt linguistic encoding. The two terms are based on conscious cognitive effort (cf. Blum-Kulka, 2000 and Becher, 2011).

Implicitation

Implicitation is observed where a given target text is less explicit (more implicit) than the corresponding source text (see Becher, 2011). Pym (2008) deems it as depending on contextualization.

Linguo-Cognitive Processes

Morell (2011, p. 109) prefers to define linguo-cognitive processes as mainly focused on 'visualization of the interpreter's mental process during the phases of comprehension, reformulation and re-expression of the message to be rendered'. The term is also recurrent in German and Soviet linguistic circles, where it is a near-synonym of cognitive linguistic processes, but it lays greater emphasis on the linguistic precedence as opposed to the cognitive one. It thus encompasses the linguistic components that can be taken as indications of cognitive aspects, including the role of prosody, quantification of linguistic notions and concept-modelling, among others (cf. Wode, 1986; Oliynyk, 2009; Volnakova, 2010; Radziievska, 2010; Drabovska, 2011).

Monitoring/Self-Monitoring

Monitoring is general, and can apply to anybody's output, including the output of a colleague in the booth. Self-monitoring refers exclusively to monitoring one's own output. Self-monitoring refers to the interpreter's conscious effort to observe his/her output. Shlesinger (2000) and Bakti (2010) distinguish between pre- and post-articulation monitoring, where the interpreter might stop the output or repair it onwards. Gile (1999) and Lee (1999) take it to be an essential component of the simultaneous interpreting process,

while Riccardi (2005) counts it among the skills that an interpreter needs to develop. However, Dejean le Féal (in Zahran, 2007) regards it as fiction, since the nature of the interpreting process and the efforts involved prevent the interpreter from giving much attention to monitor the output.

Omission/Hapology

Omission (which Bakti (2008) calls 'hapology') is a bone of contention in simultaneous interpreting research. A group of researchers (including Dam, Gile, Pym and Al-Khanji) prefer to consider it an error, and if recurrent, it would be tantamount to high-risk strategies (though Riccardi (2005) takes it to be an emergency strategy). However, Barik (1971) steers a middle course by adopting the following classification:

- Skipping omission: omission of a single word or short phrase by the interpreter, usually a qualifying adjective or the like.
- Comprehension omission: omission due to failure to comprehend part of the text.
- Delay omission: omission due to recombining material by dint of clause grouping.

The first category is not considered a grave error, but the rest are surely errors in Barik's view. Sharon (2004) also follows suit, but concludes that omission can be erroneous if the source text is delivered at a rate slower than 130 words per minute.

It can be said that omission is not always an error; it is rarely possible to interpret all the source-text segments as it is the case in written translation.

Prime/Priming

A prime is usually defined in the context of the process of priming. It is the process through which a word is recognized more easily and rapidly when another associated word occurs. Thus, the word 'doctor' is a prime if occurring prior to other associated words such as 'nurse' and 'patient', which in turn facilitate its recognition. Sometimes, more generally, it refers to or retrieval from long-term memory to produce output.

Simultaneous Interpreting Strategies

Riccardi (2005, p. 762) prefers to view strategies of simultaneous interpreting as knowledge-based rather than skill-based since they depend on 'conscious analytical processes'. They are based on online activation and target certain problems, such as time constraints and cognitive overload (see Chang, 2005). However, the

division of simultaneous interpreting strategies is not uniform in the literature. Al-Khanji et al. (2000) opt for classifying such strategies into achievement strategies which attempt linguistic solutions, while reduction strategies shun communicative problems by changing the source text, and thus include inter alia omissions, skippings and additions. Riccardi divides them into the following:

Comprehension strategies: anticipation, segmentation, selection of information, stalling or waiting.
Production strategies: compression, expansion, approximation strategies, generalization, use of linguistic open-end forms, morphosyntactic transformation and the use of prosody elements, such as pauses and intonation.
Overall strategies: décalage and monitoring.
Emergency strategies: omission of text segments, transcoding and parallel reformulation.

Chang (2005) prefers to handle them according to frequency and mentions anticipation, ear-voice span, reformulating, chunking, simplifying, generalizing, summarizing and omission.

Yet those scholars, among others, agree on the goal-oriented nature of simultaneous interpreting strategies. They are almost unanimous about the basic definition of strategy as a conscious cognitive effort aimed at addressing communicative barriers and solving problems.

Segment/Chunk

A segment or chunk is the translation unit that an interpreter can handle according to his/her short-term and working memory capacities (see Segmentation/Chunking). It is also a portion of speech that is rich enough to be processed as a single semantic unit (cf. Piccaluga et al., 2007).

Spectrogram

A spectrogram is a time-varying spectral representation that shows how the acoustic energy of a signal varies with time. It has two axes: the horizontal shows time durations, while the vertical illustrates the wave forms.

Speech Rate

The term refers to the speed of the speaker's output, and is usually measured by the number of words per minute. A normal speech rate in English is around 150 words a minute (cf. Field, 2004). In simultaneous interpreting, the optimal speech rate is between 100 and 120 words per minute.

Spillover Effect

The term is usually defined as the slow or deficient processing of input items as a function of the difficulty of processing preceding items (cf. Gernsbacher and Shlesinger, 1997), or the attrition of cognitive resources as a result of the effort exerted upstream, that is, in a preceding segment (cf. Shlesinger, 2002).

Stalling/Heeling

The two terms are used interchangeably. They refer to the interpreter's decrease of décalage by following the speaker word for word. Camayd-Freixas (2011, p. 20) defines it as 'bypassing acoustic memory and listening to the original voice directly', and considers it the opposite of queuing.

Time Lag (Ear-Voice Span/Décalage)

The three terms are generally used interchangeably in the literature, though décalage is regarded by some (see Riccardi, 2005; Pöchhacker, 2005) as a strategy for waiting for the speaker's output to be chunkable. Time lag can be defined as the time duration or number of words between the speaker's output and the interpreter's output. Relevant studies estimate it to be between 2 and 10 seconds (cf. Gerver, 1976; Cecot, 2001; Zahran, 2007; Li, 2010; Camayd-Freixas, 2011).

Transcodage/Transcoding

The term originally means 'literal translation' (cf. Dillinger, 1989), but it has been put to use in simultaneous interpreting research to mean the opposite of deverbalization. As Dam (2000) prefers to define it, transcodage is the procedure involved in form-based interpreting. It is the process of following the source-text form as a strategy to handle emergencies (see Simultaneous Interpreting Strategies).

TV Interpreter/Media Interpreter

This is the term used to describe the interpreter who carries out interpretation for various broadcast means of mass communication such as television, satellite TV or radio. S/he is also known as 'broadcast interpreter' (see Bros-Brann, 1997; Ino, 2004; Zahran, 2007).

Waiting/Queuing

Simply put, waiting or queuing is the situation when the interpreter interrupts the interpretation process in order to verify the output due to problems of reception or comprehension.

Chapter 2

Past Attempts

2.1 INTRODUCTION

Models and approaches of simultaneous interpreting (SI) are widely varied. This variation is problematic, since it leads to the disagreement among authorities in the field (cf. Dejean le Féal, 1998) and the difficulty of classifying relevant studies and exploring their common characteristics. Some scholars, especially Gile (1994, 1995, 1999) and Niska (1999), are in the habit of following a chronological order which makes interpreting studies constrained by certain periods, namely, the 1950s (i.e. the First Steps), the 1970s (i.e. the experimental psychology period), the 1970s up to the mid-1980s (i.e. the practitioners' period), and the post-1980s to date (i.e. the Renaissance). This classification is mainly focused on the timeline of progress regardless of the trends adopted, and may thus lead to oversimplification (cf. Schjoldager, 1994): What would be the case if a recourse to experimentation is made in the Renaissance period? Moreover, the emphasis on chronology, the methodology and the researchers' affiliations (i.e. the case of practitioners or professional interpreters) makes the classification roughly uniform, since it traces three discrete aspects at the same time.

Dillinger (1989) prefers to start by determining the sources from which simultaneous interpreting research has drawn, which ideally include:

1. The work of several investigators, particularly in the Soviet Union.
2. The work of interpreters and teachers of interpreting, which deals with pedagogical and methodological questions as well as intuitive views of the interpreting process.
3. The work of a few experimenters in Europe and North America.

These sources, as Dillinger (p. 10) contends, are the 'major' ones in the literature on simultaneous interpreting. They can be considered similar to Gile's (1994) classification, for they confuse researchers with the methods, and further emphasize the geographical factor of the Soviet Union, Europe and North America as impinging on the way the literature should be viewed. Thus, Dillinger's classification is defective insofar as it similarly simplifies the richness and complexity of the studies conducted on simultaneous interpreting and their increasingly interdisciplinary nature.

Lamberger-Felber's (2001) classification seems to be more plausible. She prefers to view simultaneous interpreting research as oriented to three major themes: content, process and form. Content-oriented research is concerned with comparing two target texts or more to the source text to discover errors, inconsistencies and frequencies of strategies. Process-oriented research focuses on discovering different interpreting strategies such as anticipation, condensation, deverbalization or time lag (i.e. décalage). Form-based research lays emphasis on cohesion in both source and target texts, density of information and lexicometric features. Lamberger-Felber, however, considers content-oriented research as didactic, and process-oriented studies as more product-based and thus not an accurate reflection of the actual process of simultaneous interpreting. Form-oriented research she takes to be the most suitable, since it reflects directionality errors, language specificity and the role of deverbalization (p. 41).

Despite being uniform and concise, Lamberger-Felber's (2001) account is too restrictive to be widely applicable. By criticizing error-typology as pedagogically didactic, she ignores the value of researching simultaneous interpreting: What is the use of studying simultaneous interpreting away from the errors committed by interpreters? Moreover, her downgrading of the observation of the simultaneous interpreting process through the output questions the basis of researching simultaneous interpreting at all, and discards the achievements of cognitive science in the field, which by far exceed those of linguistics- and strategy-based approaches (as will be illustrated later). Yet Lamberger-Felber's proposal of studying strategies alone in process-oriented research is a step towards recognizing interpreting strategies as an independent approach or subfield worthy of further investigation.

2.2 BASIC APPROACHES TO SIMULTANEOUS INTERPRETING

Seleskovitch (1968, 1975) can be considered the first to formalize a principled theory of interpreting, that is, the theory of sense. According to her, the process of translation is divided into three stages: comprehension,

deverbalization and reformulation. Deverbalization is located between both comprehension and reformulation. She first developed on the basis of empirical practice and observation of interpreting. Oral translation lends itself better than written translation to a detailed examination of the cognitive process of translation. Oral speech disappears instantly, but sense remains. Interpreters' formulations in another language show clearly that sense is the consequence of comprehension, itself made up of two elements: contextualized language meanings and cognitive complements. Seleskovitch started by the study of oral translation, focusing on comprehension. Soon, however, practicing translators and translation scholars recognized the validity of the theory for written translation and went on to extend it to the study of not only pragmatic and technical texts, but also literary text.

Gerver's (1975) model figures as one of the pioneering attempts at systemizing the cognitive processes involved in simultaneous interpreting. He divides the model into four major components, namely, input procedures, working memory, decoding and encoding and output procedures. Input procedures refer to the reception of the source text in the short-term memory, which is controlled by 'input routines', which in turn are affected by the source text and the segmentation strategy (see chapter 1). Working memory or operational memory, as Gerver (p. 125) alternatively calls it, is traditionally concerned with storing the incoming information for a very short time to be processed later. Decoding and encoding are those processes which receive and process the input only linguistically. Output procedures operate via two routes: the interpreter chooses either to release the output immediately or to 'check whether his/her segment of the source message is a satisfactory version' (p. 126). The idea of checking the output version is not an idealized one; Timarová (2007) considers it a buffer point where processed data are kept for final revisions.

In fact, Gerver's model is crucially important, since it has paved the way for other 'process' models (Moser-Mercer, 1995). As Timarová (2007) argues:

> Gerver's model is interesting in a number of ways. To begin with, it is the first model which considers both short-term and long-term memory in SI. … Secondly, it is interesting that Gerver proposed two buffers, one for each language. … This concept is very modern. (p. 12)

Yet Moser-Mercer (1995, p. 8) considers Gerver's model as ignoring the strategy of prediction (i.e. anticipation), and the fact that it has not been subjected to standardization in the experimental setting makes it open to doubt.

Dillinger's (1989) model presents a different approach to the component processes of simultaneous interpreting. Dillinger is intent on experimentation as a 'way of corroborating any complex psychological model' (p. 3). His objective is to identify where and when interpreters' processing is

intercepted. This leads him to analyze the interpreter's output as an indicator of the cognitive processes behind it. Dillinger's model is built around van Dijk and Kintsch's (1983) model of text comprehension and Frederiksen et al.'s (1989) process model. Thus, his model incorporates two overarching components, namely, the linguistic processor (after van Dijk and Kintsch, 1983) and the general cognitive processor (after Frederiksen et al., 1989). The linguistic processor includes the sub-components of the lexical access, where the mental lexicon is accessed via pre-lexical and post-lexical processes (exemplified in the selection and integration of lexical information); and syntactic parsing, where 'syntactic processes presumably buffer the lexical items categorized until such a time as a whole sentence, clause or phrase can be constructed, independently of any semantic information' (p. 22). The syntactic parsing process also includes proposition-construction and interleaved syntactic and semantic analysis. The general cognitive processor, on the other hand, includes inference generation, through enhancing the coherence of the propositions generated, and frame generation, which organizes the structure of the propositions by establishing links among them to conduce towards episodes, plans or schemata.

To validate his model, Dillinger recruits experienced interpreters and inexperienced bilinguals who interpret and recall two texts on an unfamiliar topic. He (1989, p. 86) concludes that experience has a weak quantitative effect on interpreting overall. His experienced interpreters performed 16.6% more accurately than the inexperienced bilinguals. He also concludes that clause density (i.e. the number of clauses per syntactic segment) has very little effect on either interpreting or recall, which means that syntactic processing of highly complex materials is automatized (p. 91).

Despite the rigorous analyses that Dillinger carried out, the model has come in for a number of criticisms. Moser-Mercer (1995) maintains that his findings are surprising, especially his proof that experienced interpreters are slightly better than inexperienced bilinguals. Moser-Mercer (p. 10) further questions the validity of Dillinger's (1989) model, since he omits to mention whether his findings can be the same with 'more complex text materials or at higher presentation rates': his research has been limited to comprehension without being specific on memory and production.

Lambert (1993) grapples with the same issue of the cognitive processes of simultaneous interpreting. She poses two general questions on reception and proficiency:

1. Are the cognitive strategies of simultaneous interpreters more like those of bilinguals than those of monolinguals?
2. Should the source message that interpreters are required to process be relayed through both headphones or via ear, be it left or right?

Her study thus investigates cognitive processes and cerebral divisions in simultaneous interpreting. Lambert uses two speeches, one in English and the other in French, delivered by native speakers at a rate of 108 words per minute. Both speeches were delivered by Canadian prime ministers, and each lasted for approximately 12 minutes. Her participants included 21 subjects: 13 professional interpreters and 8 student interpreters in the final year of a two-year Diploma Programme in Interpretation at University of Ottawa. Lambert concludes that interpreters are not aware of ear differences in efficiency. Moreover, from a cognitive point of view, interpreters engage in two concurrent activities, namely, listening and speaking. To reconcile the two activities, Lambert (pp. 207–208) maintains, 'interpreters unconsciously arrive at a potentially valuable means of solving the dual-task dilemma … by a monaural input'. In a sense, interpreters listen, hold in memory and switch the incoming message through left ear, leaving the right ear for monitoring.

Brisau, Godijns and Meuleman (1994) prefer to take a bird's eye view of the interpreting process by outlining the interpreter's psycholinguistic profile. They opt for distinguishing between linguistic and non-linguistic factors which operate on the input and output. Typically, linguistic factors include vocabulary, syntax, comprehension and delivery. Non-linguistic (cognitive) processes include psycho-affective elements, metacognition and real-world knowledge. They focus on the cognitive factors and discuss the distinction between top-down and bottom-up processing. They also explore world knowledge, which is located in the episodic memory, and metacognition, where awareness of language acquisition and language specificity is of paramount importance.

Sawyer (1994) thoroughly investigates the monitoring processes detectable in conference interpreting. He attempts to give insights into Krashen's Monitor Model as a starting point for his proposed one. Sawyer also invokes Gile's Efforts Model (1988) and strikes the balance between the two models and his proposal. He assumes that there are two monitors in the simultaneous interpreting process: a conscious one for learned language ability, and a subconscious one for acquired language ability. Both monitors are separated from each other. While focusing on form, the interpreter compares output with input by dint of syntactic analysis. Sawyer (p. 435) suggests that 'the ideal monitor in interpreting is better regarded as a single, comprehensive, subconscious system of integrated components that control individual operations'. He also contends that Gile's Efforts can be incorporated at such a subconscious level to ensure the efficient utilization of other capacities at the disposal of the interpreter.

Lambert, Daró and Fabbro (1995) also touch upon Gile's Efforts Model (as proposed in 1988, though later refined in 1999; see below) by reinvestigating

the effort of focalized attention on input versus output. Their study purports to answer the three following questions:

1. Is it really useful to focalize attention on the output or the input during simultaneous interpreting?
2. Does focalized attention affect interpreting performances depending on directionality and level of material's difficulty?
3. Is there any difference in interpreting performances with regard to input ear, and does focalized attention somehow affect such possible differences?

Lambert et al. recruited 16 French/English professional interpreters (13 females and 3 males) with ages between 30 and 82 years, and expertise of 29 years maximum. The texts used were divided into easy and difficult ones according to the number of simple and complex sentences. These texts were recorded by a French/English bilingual female speaker at a rate of approximately 110 words per minute. They were presented to the participants over headphones. For each language, the interpreting tasks were carried out under four different conditions: (a) control condition, or normal rendition; (b) focalized attention on the input; (c) focalized attention on the output; and (d) two voices, where the participants listened on track 1 to the original text, and on track 2 to a different text uttered by a male voice.

Lambert et al. conclude that professional interpreters gain no advantage by focalizing their attention either on input or output. They perform better when operating freely, since they apply their preferred interpreting strategies. Moreover, professional interpreters apply strategies that are mostly automatized, so to explicitly focalize their attention is to hamper the use of such strategies and to increase the possibility of committing errors. Finally, concerning ear-preference, the researchers opine that when interpreting complex material from L2 into L1, simultaneous interpreters use the left ear, and this is not affected by focalized attention either on input or output.

Gernsbacher and Shlesinger (1997) shift attention away from the overall process of simultaneous interpreting and ear-preference to the investigation of one cognitive mechanism, namely suppression. They examine this mechanism on the lexical, semantic and syntactic levels with a view to interference. On the lexical level of interference, they tackle false cognates (e.g. 'novel' and 'terrace' across two languages). Shlesinger observes that false cognates are more likely to be produced with a faster rate, that is, 140 words per minute. Other lexical problems include homophones and pseudo-homophones, where the greater the interpreter's proficiency is in the source language, the greater the likelihood of his/her suppression of the inappropriate homonym. Thus, the lexical item 'iceberg' in the context of cooking requires suppressing

the usual characteristics of an iceberg in the context of oceans. Semantic interference in simultaneous interpreting includes anaphora. Gernsbacher and Shlesinger notice that anaphoric references are particularly problematic when the interpreter works from a gender-unmarked language into a gender-marked one, for example, when interpreting the lexical items 'problem' and 'solution' from English into major Semitic languages. Syntactic interference requires linearization (see chapter 1), especially as the interpreter prefers to proceed in more or less left to right sequence. Other aspects that require suppression include literal expressions and erroneous inferences. Literal expressions are intimately linked to metaphors, where most interpreters are pressed for time, and apply any of the following strategies in ascending order: (a) finding a semantically appropriate target-language metaphor, (b) producing a lexically not semantically appropriate target-language metaphor (via calquing), and (c) paraphrasing. Erroneous inferences likewise require suppression, for example, 'rigade', 'brigade' and 'rig' require bridging assumptions and migration through their semantic networks.

MacWhinney (1997) ventures into applying his Competition Model to simultaneous interpreting. In this model, MacWhinney (1989, pp. 3–5) argues that the semantic range of each lexical item is determined by its range of values on a large number of dimensions. To him, each of the value sets of a given dimension is a sort of cue to the selection of the word. Collaborating with Kempe (1999), he further views such cues as depending on three factors: (i) their availability: that is, the portion of times a cue is present and can be used for accessing the underlying function; (ii) their reliability: that is, the portion of times a cue signals the correct interpretation given that it was present; and (iii) their cost, which depends on their perceptual salience and the burden they place on the working memory. Both MacWhinney and Kempe (1999, p. 3) believe in the importance of such cues provided that they serve what is often called the Competition Model. In this model, the matching of words to objects is governed by a seminal matching process. One interesting example is given by MacWhinney (1989):

> To illustrate, Warren and Warren (1970) examined the perception of the first sound of the word 'wheel'. If the sound is degraded or replaced with a beep, the stimulus '*eel' could be perceived as 'peel', 'wheel ', 'deal', or a variety of other words. (p. 6)

MacWhinney thus concludes that the Competition Model is supported by what he terms 'cooperation'. To him, the whole idea of language processing hinges upon a competition among lexical items, where 'the domain of each lexical item or word is shaped both by the meanings and sounds to which it responds' (MacWhinney, 1989, p. 6) and by the response of other competing

lexical items. He also maintains that when humans process sentences, each lexical item sets up anticipations for other lexical items.

MacWhinney, however, lends his model a new perspective when discussing simultaneous interpreting, since he emphasizes lexical functionalism, connectionism and capacity as playing important roles. Lexical functionalism refers to the communicative functions of linguistic structures, while connectionism concerns the links established among competing forms during comprehension. Capacity refers to the limitations of lexical and phonological memory. MacWhinney (1997, p. 227) believes that capacity is the most important of the three, since interpreting outputs follow any of the following routes: (a) passing to the vocal output in the case of adequacy, (b) held in verbal memory for correction (cf. Gerver's (1975) buffer) or (c) passing to the production phase even if it cannot be perfected. These options are clearly constrained by the storage space and time lag at the disposal of the interpreter, and the final option is usually criticized for depending on transcoding or literal rendition (see Dam, 2000).

Setton's (1999) model is a more elaborate framework than MacWhinney's (1997) observations. Setton opts for combining pragmatic and cognitive processes in an attempt at characterizing the major components and strategies of simultaneous interpreting from and into English, Chinese and German in the conference setting. Setton's main objective (p. 4) is to propose a new model by 're-injecting linguistics, updated with developments in pragmatics, into the interdisciplinarity' of simultaneous interpreting. He assumes that interpreters construct a 'task-oriented' mental model for the purpose of using their inferences from textual, situational and encyclopedic sources which they share with the addressees. Setton's model is further based on the Relevance Theory, cognitive semantics, mental models and the speech-act theory. Relevance Theory provides the basic mechanisms for contextualization, while cognitive semantics and mental models organize the mental representations of concepts and meanings in logical forms. The speech-act theory, as a final component, furnishes the necessary pragmatic relations between the speaker, the addressee and the interpreter.

Setton (1999, p. 22) utilizes the above-mentioned components to answer the following questions:

1. What kinds of cues are used by simultaneous interpreters? (See MacWhinney's approach above.)
2. What kinds of errors or failures reflect coordination problems (among the components), which reflect linguistic components, and a lack of extralinguistic knowledge?
3. Are differences in structural transformation patterns or the use of cues visible between language pairs, situations or discourse modes?

Setton discusses several pertinent issues in the course of his study, such as ear-voice span (time lag), segmentation, speech rates, speech processing, frames, deixis and anticipation, to name but a few. He concludes that the surface structure of the input is less constraining than is often presumed, and pragmatics, coupled with cognitive analysis, provides a second basis for reintegrating linguistic dimensions into the investigation of simultaneous interpreting.

Although proposed in 1988, Gile's groundbreaking Effort Models approach was continuously revised until 1999 (see Sawyer, 1994). The 1999 version is the one presented here, especially as it relates to the so-called tightrope hypothesis. Gile (1999) proposes his Models as a cognitive pool where the following factors are woven together as the operational components of interpreting, namely:

L – the Listening and analysis Effort.
P – the Production Effort (speech production in simultaneous, and note production during the first stage of consecutive – while the interpreter is listening, but not interpreting yet).
M – the short-term Memory Effort essentially dealing with memory operations from the time a speech segment is heard to the time it is reformulated in the target speech or disappears from memory.

The 'tightrope hypothesis', on the other hand, is based on the following elaboration:

> Most of the time, total capacity consumption is close to the interpreter's total available capacity, so that any increase in processing capacity requirements and any instance of mismanagement of cognitive resources by the interpreter can bring about overload or local attentional deficit (in one of the Efforts) and consequent deterioration of the interpreter's output. This 'tightrope hypothesis' is crucial in explaining the high frequency of errors and omissions. (Gile, 1999, p. 159)

To validate his hypothesis, Gile examines a sample of ten professionals interpreting the same source speech, taken from a video recording of a press conference given by George Fisher of Kodak, in the simultaneous mode. Gile finds that there are errors and omissions (e/o's) that affect different source-speech segments and a large proportion among them are only made by a small proportion of the participating interpreters. In a repeat performance, new e/o's have been detected in the second version when the same interpreters interpreted the same segments correctly in the first version. These findings strengthen the Effort Models' 'tightrope hypothesis' that many e/o's are due not to the intrinsic difficulty of the corresponding source-speech segments, but to the interpreters working close to processing

capacity saturation, which makes them vulnerable to even small variations in the available processing capacity for each interpreting component. It is worth noting that Mankauskienė (2018) presented a quantitative analysis of problems and difficulties that student interpreters and professionals face while interpreting simultaneously. The terms of difficulties, or subjective obstacles that are identified in the interpreting process by the interpreters themselves, and problems, or objective obstacles that are difficult to deal with irrespective of how well an interpreter learns to solve them rapidly and effectively. She concluded that although the difference in performance by student interpreters and professionals was largely predictable, in certain cases the performances of less experienced professionals were more similar to student interpreters than to the more experienced professionals, while the results of students with three semesters of training were more similar to the other two student groups than to the less experienced professionals.

Alexieva (1999) discusses a number of crucial issues of simultaneous interpreting in terms of understanding source texts. She revisits two important questions: (a) the specific textual parameters that may facilitate or hamper the comprehension of the SL text, and (b) the contextual and situational factors that make it possible for the simultaneous interpreter to grasp the content of the source text. To address the first question, she suggests that simultaneous interpreters are prone to condense nominal conglomerates at the beginning of a source text segment to cope up with fast delivery. This leads the interpreter's processing capacity, which is greatly influenced by the transition from one phase to another in the course of simultaneous interpretation. Failure to carry out necessary textual analysis is bound to lead to depending on knowledge analysis, which if weak will lead to more inferencing. The overload placed on any of these phases can result in failures in comprehension and hence in production. The second question is addressed by exploring a novel factor called the Familiarity Factor. Alexieva (p. 57) suggests that the feeling of familiarity can act as 'a compensatory tool facilitating text comprehension in the conditions of SI', and that it varies from one contextual situation to another, being very low in TV interpreting, where the interpreter is rarely allowed to review the task. However, her study is broad and provides fewer examples in tackling the various factors involved in the simultaneous interpreting process.

Vik-Tuovinen (2000) uses think-aloud protocols to investigate the processes of simultaneous interpreting, and so depends on intersubjective data that are not based on prior assumptions as in the case of the models and approaches reviewed thus far. He records the times when interpreters every now and again switch off their microphones for a few seconds to air out their observations about the interpreting process and their opinions on their assignments. The study involves the observation of the interpretations of two sessions of the town council in Vaasa, Finland, in the autumn of 1997.

The chairman conducts the meetings in both Finnish and Swedish, while the town councillors speak either Finnish or Swedish and are thus in need of simultaneous interpreting in either direction. This means that interpreters switch off their microphones when the chairman is speaking. The data analyzed consist of 56 dialogues and monologues. The researcher, who is one of those interpreters, divides the topics of those dialogues and monologues into linguistic topics (discussions of linguistic problems) and extra-linguistic topics (discussions of the cognitive procedures). The study concludes that linguistic problems are affected by the cognitive demands of the simultaneous interpreting process, which is not a new achievement in the field.

Working memory, as a component of the simultaneous interpreting process, is thoroughly investigated by Shlesinger (2002) with the added advantage of the complexity of Hebrew as a Semitic language. She weaves the cognitive with the linguistic in an experimental design centred on the Hebrew professional practitioners' capacity to retain long left-branching noun phrases (i.e. a noun preceded by a long string of adjectives) while interpreting into a head-initial language (i.e. one which requires that the noun be produced before its modifiers), and on the role of presentation rate in this process. The experiment entailed texts read at two delivery rates (120 and 140 words per minute). It attempts to test two seemingly conflicted hypotheses: on the one hand, recall was expected to be better if less time elapsed between the sounding of the SL string and its TL reconstruction; on the other hand, retrieval of TL replacement items from LTM was expected to be poorer when performed at the higher rate. The participants were sixteen experienced professionals, with the same translating from their B-language (English) into their A-language (Hebrew). The materials were six texts, comprising approximately 1,700 words each. Embedded within them and serving as the actual target utterances were a total of 180 strings. Shlesinger concludes that at some point the interpreter becomes aware of the buildup of material which cannot be dealt with in linear sequence and which requires storage and planning. She also concludes that performance at higher rates is better than at lower ones. Shlesinger's study thus utilizes linguistic data to discover how simultaneous interpreting, as a process, can be investigated.

Funayama (2004) proposes a theoretical framework for the conceptualization processes in simultaneous interpreting. He introduces the notion of cognitive tag (c-tag) to describe the on-line process of verbal comprehension. The c-tag is to be attached to an object, yet it is not fully crystallized when first generated but rather prone to be adjusted as a function of contextualization. C-tags are of two types: lexical and conceptual tags. A lexical entry in an utterance is supposed to trigger a cognitive object, which may later necessitate a conceptual tag. A conceptual tag, Funayama (p. 4) maintains, 'symbolically represents a chunk of concept just as a lexical

tag symbolically represents a certain lexical content'. Funayama gives the following example:

> I think what the United States may see as a liberating influence that should be welcomed by everybody, is considered to be a malign influence by others.

The sentence contains some hidden contrast relation, but the word 'contrast' is not explicitly mentioned. In this case, the lexical tags 'United States' versus 'malign influence' trigger the conceptual tag of contrast, and the simultaneous interpreter is obliged to highlight that relation in his/her rendition.

Chernov (2004) delves into the two mechanisms of inference and anticipation in simultaneous interpreting between Russian and English. His extended study is based on his long track record as a Russian interpreter, and it provides useful insights into the interpreting process. Chernov proposes the Probability Anticipation Model, which is built around the model of cumulative dynamic analysis of the discourse semantic structure. This semantic structure is governed by the following unities (pp. 96–97):

1. The unity of co-referential substructure, or the extent to which each utterance in discourse deals with the same matter.
2. The unity of its deictic universe.
3. The uniformity of value judgements about the objects of thought and their configurations (facts and events).
4. A single pragmatic framework.
5. Factive and modal unity, e.g. if an event or action is once mentioned as having occurred or existed, it cannot later be referred to as only a future possibility.

The model of cumulative dynamic analysis has several steps which represent inferences that construct the semantic structure of the entire discourse. Chernov (p. 135) also contends that the 'internal programme' in the mind of the interpreter is a broken one, since it follows and sometimes anticipates the stages of the source text. Thus, Chernov's model is based on the close relationship between the global structure of discourse and the limited capacities of the interpreter's mind in the course of receiving and processing the source text. The conflict between the two may lead to omissions or linearization. As Carlet (1997) believes, the text for Chernov is not conceived of as a finite work, but rather as a constantly evolving process.

Sharon (2004) examines the cognitive bases of omissions, additions and errors in four simultaneous interpretations of a speech by the Israeli President Chaim Herzog. She adopts the typology of errors proposed by Barik (1994) (see below). Sharon used a source text to be interpreted by four professional

interpreters whose mother tongue is English under laboratory conditions. The text was delivered at a fast rate of 138 words per minute. She concludes that the less the word output is, the greater the possibility of omissions and subsequent meaning loss and mistakes. She also notices that interpreters resort to various strategies to catch up with lexical density, including generic substitutes (i.e. the use of hyponyms), chunking or syntactic restructuring.

Mizuno (2005) revisits working memory in simultaneous interpreting between English and Japanese through a model based on Cowan's work (1999). Mizuno reviews Cowan's model which is divided into (a) central executive, (b) long-term memory, (c) active memory, and (d) the focus of attention. The central executive organizes the operations of the rest of the components in the course of incoming input. Mizuno suggests that, in simultaneous interpreting, interpreters are unlikely to divide attention adequately between listening and speaking. This leads to two options: automatization and attention-switching. Failure to manage these two options results in the accumulation of unprocessed information, disruption or deterioration in processing (p. 743).

The same trend of exploring the role of working memory is further pursued by other researchers, namely Christoffels, de Groot and Kroll (2006). In their seminal study, they examine performance on basic language and working memory tasks that have been hypothesized to engage cognitive skills important for simultaneous interpreting. The participants were native Dutch speakers proficient in English as a second language. The researchers compare the performance of trained interpreters to 40 Dutch bilingual university students (experiment 1) and to 15 highly proficient English teachers (experiment 2). It was found that the interpreters outperformed the university students in their speed and accuracy of language performance and on their memory capacity estimated from a set of (working) memory measures. The interpreters also outperformed the English teachers, but only on the memory tasks, suggesting that performance on the language tasks was determined by proficiency more than cognitive resources. Taken together, these data point to (working) memory as required for a critical subskill of simultaneous interpreting.

Sharon's (2004) interest in omissions is also pursued by Pym (2008) within the context of Gile's Efforts Model (1999) as a major avenue for examining memory and production processes. Pym applies risk analysis to simultaneous interpreting on first and second attempts, and provides the following hypotheses:

1. The segments that are most omitted tend to be low-risk due to time constraints.
2. Omissions on second translation are high-risk ones.
3. New omissions on second translation tend to be low-risk.

He also evaluates Gile's tightrope hypothesis as well. He contends that Gile's models seem to deny contextualization in interpreting. Pym succeeds in elucidating the role of context-sensitivity in simultaneous interpreting, and validates his hypotheses through authentic data.

Gile (2008) responds to Pym's (2008) queries by studying local cognitive load. Gile examines the cognitive load related limitations imported from the unified processing of a previous segment in the same source text. By claiming that the Efforts Model is a conceptual framework rather than a fully fledged theory, Gile acknowledges its high variability around a clause, a sentence or even a small set of sentences. An interpreter, while receiving a new sentence, 'may still need to retrieve the last part of a previous sentence from the short-term memory, decide how to reformulate it in the target language or … utter target-language version while monitoring his/her own output' (p. 61). Gile uses an extract from Obama's speech in Berlin on 24 July 2008, and examines its various renditions in terms of intra-sentential information density, language-specific difficulty, pauses and silence lengths. He concludes that pauses and sentence ending with low information density can reduce the effect of imported cognitive load at local levels.

Tzou (2008) utilizes the theoretical approaches of working memory to investigate the task of simultaneous interpretation. Her study recruited twenty student interpreters at two different levels of training in interpreting and sixteen bilinguals with no training in interpreting, all of whom spoke Chinese as a first language and English as a second language. They were compared on their performance for two measures of working memory (reading span and digit span) and on a simultaneous interpretation task. Moreover, a translation judgement task and proficiency self-evaluation measures were administered to explore if language proficiency mediates working memory in participants' L1 (native language) and L2 (second language). The findings of the study pointed to the fact that student interpreters performed better than bilinguals on simultaneous interpretation. Advanced-level student interpreters also outperformed bilinguals on all language versions of the memory span tasks, though first-year student interpreters did not show higher working memory than the bilinguals. Further, performance in simultaneous interpretation was related to working memory in both L1 and L2.

The same research topic of the role of working memory is further pursued by Signorelli (2008). Her study investigated working memory differences between interpreters and non-interpreters with four tasks that deconstructed working memory in an attempt to isolate the source of potential differences. Articulation rate and non-word repetition tasks assessed phonological working memory. Cued recall assessed phonological recall independent of semantic information and vice versa. Reading span assessed complex storage and processing. The participants included 13 older interpreters with a mean age of

56.3; 11 older non-interpreters with a mean age of 63.6; 12 younger interpreters with a mean age of 34.5; and 11 younger non-interpreters with a mean age of 31.8. The results of the present experiment suggest that working memory differences between interpreters and non-interpreters are related to aspects of working memory that are related to the task of interpreting. Extensive as it is, the study can be considered as moulded within the same framework of Dillinger's (1989), where the major disadvantage of comparing interpreters with non-interpreters negatively affects the reliability of the results.

Bakti (2009) examines the role of speech disfluencies in the output of trainee and professional simultaneous interpreters working from English into Hungarian as signals of lexical access and grammatical planning. Two experiments were conducted. In experiment 1, the output of seven trainee interpreters (five females; two males) is examined. The trainee interpreters engaged in interpreting a 12-minute English text into Hungarian. In experiment 2, the same English text was interpreted by three practicing interpreters (one female; two males). Bakti concludes that false starts are obvious in English-Hungarian simultaneous interpreting, much like restarts. Grammatical errors are also frequent due to the cognitive load that the interpreter experiences. This load stems from problems with the coordination between the lexical access and articulatory planning.

Camayd-Freixas (2011) attempts to advance a comprehensive theory of cognitive processes in simultaneous interpreting. His theory is based on the relevant principles of cognitive psychology and linguistics. The objectives of the theory are as follows:

1. To describe the different tasks involved in the process of SI;
2. To isolate each task in order to target the corresponding skill during focused training;
3. To describe the flow of tasks into a seamless SI process and the correct techniques that help to optimize performance; and
4. To lay the foundations for devising training methods and skills building exercises for advanced SI performance.

To achieve these objectives, Camayd-Freixas provides valuable insights into the basic strategies of simultaneous interpreting, such as queuing, stalling and omissions. He also discusses the six major processes of listening, understanding, abstracting, formulating, delivering and monitoring, with a view to allotting each stage a specific time that affects the times of other stages if any problem is encountered. He finally suggests necessary exercises that can be of benefit to the interpreter, such as paraphrasing, shadowing and segmentation.

Other approaches to cognitive processes in simultaneous interpreting are observed, but they start from the non-cognitive to reach cognitively

significant results. Ishikawa (1995) conducted a study which focused on the linguistic problems involved in professional simultaneous interpreting from Japanese into English. Her data were collected from a discussion session at the International Physicians for Prevention of Nuclear War Conference in Hiroshima in 1989. Her analysis is geared towards the syntactic, lexical and discoursal problems in Japanese-English simultaneous interpreting. Other problems include the ear-voice span (i.e. time lag) and the strategies or techniques used by professional interpreters when facing linguistic challenges. Ishikawa finds out that word order is a major obstacle in Japanese-English interpreting, and that lexical errors are usually attributed to sentential errors. However, despite the apparent rigorous analyses Ishikawa provides, the study is too general to be accurate: she should have chosen a sizeable sample.

In their book *The Translator as Communicator* (1997), Hatim and Mason propose a text-linguistic approach to simultaneous interpreting. They commence with a number of basic hypotheses on the mechanisms of simultaneous interpreting as a groundwork for a textual theory of how texts are organized in the target language. Chief among these hypotheses is that, in the case of simultaneous interpreting, context and structure are revealed only piecemeal and can thus be accessed more effectively via texture (i.e. coherence and cohesion). In a sense, immediate contextual and hence insufficient information is made available regarding context and structure in simultaneous interpreting. As a result, input for simultaneous interpreting is characterized by context and structure being less readily usable than texture. What the interpreter is required to achieve is to anticipate the textual pattern of the source text in order to proceed quickly. Yet their approach ignores the role played by semantics and acoustics as two important aspects in simultaneous interpreting. Reliance on textuality alone is a restrictive dimension (see Garzone, 2000).

Galina (1998) also approaches simultaneous interpreting through linguistics, but focuses on cohesion as an important aspect of textuality to account for the cognitive demands of SI. She adopts Halliday's systemic-functional grammar as a model for analyzing a number of political speeches, where the ideational, interpersonal and textual functions are highlighted (cf. Halliday and Hassan, 1976). Galina believes that simultaneous interpreting is inevitably affected by the type and density of cohesion, and thus it is methodologically more felicitous for suggesting texts as the units of simultaneous interpreting rather than sentences or words.

The same focus on textuality is maintained by Niska (1999). His aim is to assess some of the text linguistics models for the description of the process of simultaneous interpreting from Finnish and Swedish into English. Niska scrupulously transcribed speeches collected at two conferences in Finland in the autumn of 1990. The data consisted of 15 hours of audio recordings. His

analysis operates on the two levels of micro- and macro-linguistic, where the former relates to syntactic and lexical changes and mistranslations, while the latter includes editing, changing topic orders and certain speed-coping strategies. Niska concludes that simultaneous interpreting is generally dependent on the 'dragging' strategy, that is, the interpreter slows down his/her speech rate in order to organize and produce the incessant incoming text segments. Interpreters also apply the 'forcing' strategy, where they condense their utterances to speak less and listen more. Niska likewise emphasizes the role played by word order, for Swedish interpreters use the subject, finite verb and objects then adverbial expressions when translating into their mother tongue. However, the major defect of the study is the use of primitive recording equipment, and the citation of time lag without sufficient analysis of its significance and relation to the linguistic approach adopted.

A similar focus on textual analysis for cognitive aims is maintained by Garzone (2000). In her paper, a research model is proposed for simultaneous interpreting based on textual analysis with a view to contributing to a better understanding of simultaneous interpreting both as a text-processing task and a translation activity. The model focuses on a single text (hyper) genre, that is, on scientific papers presented at international conferences. Garzone sets out to criticize Hatim and Mason's (1997) views on textuality in simultaneous interpreting (see above), since linearity is the mainstay of the activity if it is realistically reconsidered. Reliance on texture (i.e. coherence and cohesion), she argues, may not be the best option. Rather, the interpreter is obliged to build up the text by applying anticipation to a great extent. Garzone proposes her model as based on top-down textual analysis, thus going further than Hatim and Mason's excessive attention to coherence and cohesion alone. She emphasizes that her model is based on the idea of analyzing 'background papers' and, more in general, drafts drawn up in advance by speakers as a basis for lecture delivery and comparison with the actual oral text produced in the course of the lecture in order to highlight the addition of 'bracketing' sections, digressions, metatextual or procedural commentary and so on. She concludes that the model proposed (though still in progress) is able to detect the ways and strategies interpreters apply in the course of anticipating textual features of particular genres.

Dam (2000) shifts attention to another linguistic aspect of simultaneous interpreting, namely semantics. She distinguishes between two key concepts: one is generally referred to as form-based (or word-based, structural, horizontal, sign-oriented, etc.) interpreting, and another labelled meaning-based (or conceptual, vertical, sense-oriented, etc.) interpreting. She defines form-based interpreting 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. She also adds that '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 labeled transcoding' (p. 27; original emphasis). She attempts a serious test of the 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 the source text form. Her data are based on extracts from two Spanish texts in two conferences organized as part of the interpreter training programme at the Aarhus School of Business, Denmark. Dam examines which segments can be used to describe the distributional patterns of several variables such as numbers, sentence/clause length and rate of delivery and discovers similarities and dissimilarities involved in both the source and target texts. She categorizes such segments into the following, where similarities sometimes override dissimilarities and vice versa, and where other times both paradoxically coexist:

- S-segments, i.e. similar segments
- S(d)-segments, i.e. dissimilar segments
- S/D-segments, i.e. similar(dissimilar) segments
- D(s)-segments, i.e. dissimilar (similar) segments
- D-segments, i.e. similar/Dissimilar segments

Text linguistics has also been the focus of attention in Lamberger-Felber's (2001) study. She tackles content, process and form as three important factors in analyzing texts presented for simultaneous interpreting. By content, she (p. 40) means 'the comparison of various interpretations of the same ST as to completeness and accuracy'. By process, he prefers to focus on strategies such as anticipation, condensation and deverbalization. Form, she maintains, includes cohesion and information density. Lamberger-Felber's study is based on 12 Austrian conference interpreters with at least 10 years of professional experience interpreting 3 read-out speeches of 8–10 minutes length from English into German. Each group interpreted one speech using a manuscript of the source text. She concludes that content-based analysis is the least valuable in simultaneous interpreting research due to the small number of subjects and its inattention to the strategies and cohesive links established by professional interpreters.

Directionality has likewise received due attention in simultaneous interpreting, being the second important issue after textuality. Szabari (2002) focuses on simultaneous interpreting into a B-language. She maintains that the greatest challenge of simultaneous interpreting into a B-language is the

interpreter's attempt at producing a target text that carries the natural 'composition' of the source language. This means that the interpreter has to depend on his/her huge repertoire which is unfortunately more limited than his/her A-language.

The same emphasis on directionality is further pursued by Al-Salman and Al-Khanji (2002). They seek evidence as to either support or refute the claim that simultaneous interpreters are more efficient when decoding/interpreting oral discourse from a foreign language into their mother tongue. The data for the study were collected by means of (a) a questionnaire which elicited the responses of a number of professional interpreters who participated in national, regional and international conferences, and (b) an analysis of the actual performance of some professional interpreters in actual interpretation tasks conducted in both languages. Their performance was analyzed according to some major criteria of linguistic adequacy, strategic competence and communication strategies. A theoretical framework based on the variability model was employed to validate the data. Al-Salman and Al-Khanji conclude that most interpreters involved in English-Arabic interpretation resorted to more use of reduction-type rather than achievement-type strategies. The two scholars believe that the standard Arabic used by almost all interpreters showed poor performance due to various factors such as familiarity with the subject matter, speaker's speed, skill and so on. In fact, the three varieties of Arabic, namely colloquial, 'standard' and classical Arabic are not the same or quite similar phenomena. Colloquial Arabic is what native speakers begin developing as they acquire language, and it serves as the medium for most spoken interaction throughout life. Standard Arabic (English, etc.) is learned rather than acquired. Consequently, oral production of colloquial language is in a sense 'more automatic' and more natural than oral production of a 'standard' variety.

A full-scale study on directionality is Chang's (2005) PhD dissertation. Chang addresses the linguistic problems embedded in simultaneous interpreting by examining how ten professional Chinese/English interpreters would interpret two speeches from English into Mandarin Chinese, and two speeches from Mandarin Chinese into English, each followed with a stimulated retrospective interview. The products of their interpreting, their linguistic outputs, are analyzed using a propositional analysis of the semantic content and an error analysis of the linguistic quality. The processes of their simultaneous interpreting are then explored through a qualitative analysis of their stimulated retrospective interviews. The study suggests that professional interpreters may behave differently from student interpreters when it comes to simultaneous interpreting in different directions. Chang's study not only sheds light on the differences in performance and strategy use between interpreters working with different language directions, but also can contribute to the design of more effective interpreting pedagogy.

Darwish (2006) attempts a shift of attention to TV simultaneous interpreting from English into Arabic. He observes talk shows, newscasts, ad-hoc conferences and other international events telecast on major TV satellites such as Al-Jazeera, LBC, BBC and CNN to discover how much an interpreter is linguistically faithful to the source text in terms of idiom and syntax. His study is longitudinal, being stretched over a period of two years. Darwish also proposes a tentative model including the following dimensions:

- Information integrity: completeness, precision and accuracy of information content.
- Communicative integrity: elocution, articulation, enunciation, fluency, comprehension.
- Linguistic integrity: sound, error-free grammar, syntax, lexis, idiom and so on.
- Propositional integrity: original thesis, line of argument, sequencing and thought patterns.
- Performance: confidence, effective and efficient delivery, attitude, recall, recovery strategies.
- Modes of delivery: rhetorical and expository.

His study shows that the claim that simultaneous interpreters in Al-Jazeera have set a new standard of excellence is a dangerous assertion that is statistically and empirically unsupported. The examination in this study of the translation standards used at Al-Jazeera has revealed serious flaws with these standards, which are far from being excellent.

Monacelli (2006) introduces a socio-pragmatic approach to simultaneous interpreting which makes use of face-threatening as an indicator of communicative appropriateness. Her study focuses on terms of personal reference, agency, mood and modality, being all components of face-threatening, as 'shifts'. Such shifts are traced in the output of 10 professional interpreters with 11–30 years of experience translating 10 speeches during an international conference. Five of the recruited interpreters were members of the International Association of Conference Interpreters (AIIC) and five are not. The source texts were interpreted from French into Italian, six from English into Italian and one from Italian into English. The texts ranged from 5 minutes to 42 seconds with a total of 119 minutes. Monacelli (p. 470) concludes that 'the trend of distancing, de-personalizing and mitigation of illocutionary force manifests itself in all the interpreted versions of the corpus texts'.

Setton (2006) studies the role of pragmatics as embodied in the cognitive contextualization of simultaneous interpreting. He contends that the simultaneous interpreter performs in live situations in which s/he shares most of the manifest cognitive environment with the participants, and is thus better

able to project and control the contexts in which his/her addressees process his/her utterances. Since the condition of simultaneity (see chapter 3) severely constrains the simultaneous interpreter's choice of stimulus, s/he heavily relies on access to immediate context and her audience's inferential abilities. Setton couches the discussion in terms of Relevance Theory, and sees professional interpreters as more successful when they depend on the written documents or even abstracts of what they are going to interpret. This decreases the effort of multitasking for the interpreter, and further maintains contextual uniformity.

Baumgarten, Meyer and Özçetin (2008) try to grasp the elusive and controversial concept of explicitation which has been considered from different perspectives in linguistics. They contend that explicitation is either lexico-semantic or syntactic but is usually driven by pragmatic considerations. Their study challenges the oft-postulated assumption that explicitation is a universal feature appearing in all kinds and all instances of language mediation. The study shows that explicitness does not result from the translation or interpreting process per se but that other factors need to be taken into account, especially conventional differences between the languages involved and the different interpreting strategies of the interpreters. The examination is based on data from a parallel corpus of German-English popular science texts and a corpus of interpreter-mediated discourse in a conference setting. The most important conclusion of the study is that explicitation in language mediation is clearly not a universal phenomenon. Sometimes it occurs, sometimes it does not, but it is triggered by the communicative conventions and stylistic norms of the target language community rather than being inherent in the process of interpreting.

Nielsen (2008) employs the notions of cohesion, coherence and informativity as major components of a model of error analysis in simultaneous interpreting. His data are based on eight target texts interpreted by postgraduate students during an exam at Aarhus Business School, Denmark, in 2006. Nielsen argues that it is incumbent upon the simultaneous interpreter to transfer the message (i.e. the meaning) from the source language into the target language by overriding several problems such as rate of delivery, incoherence and lack of world knowledge.

More recently, Barranco-Droege (2016) attempted to tinker with authentic input to investigate cognitive load in SI. His idea was to see whether lowering the cognitive load by reducing the speaker's speed of delivery would results in less errors and omissions. There were a number of potential ways to obtain such reduction of the speed of delivery, starting with expansion and compression software, which were tested in the first studies which produced interesting findings on the disturbing effects of automatic expansion and compression. He thus decided to lengthen pauses in order to relieve interpreters

of some cognitive load. He explains what pauses he lengthened, why and how. It turned out that such pause lengthening did indeed result in less errors and omissions in the target text, which is in line with the Gile's Tightrope Hypothesis.

Strategies applied in the course of SI are also discussed. They are mainly concerned with the solutions to the linguistic and non-linguistic problems that arise in the course of simultaneous interpreting. The solutions are usually regarded as institutionalized strategies that can be stored in long-term memory and automatized when similar problems recur. Although the field of investigating simultaneous interpreting strategies is of prime importance, the studies done so far are either tailored to the confines of certain strategies across particular language pairs, or assume a bird's eye view that overlooks salient issues. This section provides a review of the relevant research conducted on simultaneous interpreting strategies.

Zanetti (1998) tackles the strategy of anticipation from English into Italian. She conducts an experiment on 33 student interpreters, where 22 of them were asked to interpret into Italian an English text containing 15 non-legal items (adjectives and nouns) whose central or final part had been purposely distorted. Eleven students were asked to shadow the same text and acted as a control group. The text was one of Boutros Ghali's speeches at the UN, which lasted for 9 minutes and 52 seconds, and delivered at approximately 120 words per minute. A questionnaire on anomalous items was distributed during the experiment. Zanetti concludes that the strategy of anticipation exists despite the distortion of the morphosyntactic structures of the source and target texts, and that such a strategy is unconsciously applied. Yet her study suffers the disadvantage of subjectivity implicit in questionnaire-answering as a method of investigation.

Van Besien (1999) also discusses the same strategy of anticipation, but in the context of German-French simultaneous interpreting. He argues that anticipation should be explained as a result of the combination of a top-down strategy and a bottom-up one, which acts as a control. The data were based on two complete French interpretations of approximately 55 minutes of German spontaneous discussions, transcribed and divided into measures of 3 seconds. Two professional interpreters translated simultaneously in both directions during a meeting, then they swapped positions to translate what each missed. The total number of anticipations in the material amounted to 78. Van Beisen concludes that, in most cases, the verb is anticipated, which means that the strategy of anticipation is linguistic. In addition, in the course of anticipating, interpreters prefer top-down strategies to bottom-up ones, which strikes the balance between linguistic and extra-linguistic knowledge.

Al-Khanji, El-Shiyab and Hussein (2000) investigate the use of compensatory strategies in English-Arabic simultaneous interpreting. They divide these

compensatory strategies into achievement and reduction ones. Achievement strategies attempt are based on linguistic solutions, while reduction strategies shun communicative problems by changing the source text, and thus include inter alia omissions, skippings and additions. The researchers used four-hour recorded versions of interpretations carried out by four interpreters. The researchers reported 234 instances of compensatory strategies in the sample, and divided them into skipping, approximation, filtering, omissions and substitutions. Of the five strategies, skipping was the most widely used (72 times; 31%). Approximation and filtering followed (25% and 21%, respectively), and finally came omissions and substitution (14% and 9%, respectively).

Anticipation is further investigated in two seminal studies by Vandepitte (2001) and Seeber (2002). Vandepitte (2001) adopts the framework of Relevance Theory for two reasons. First, it is a well-founded cognitive approach to communication. Second, it offers conceptual tools appropriate to understanding the interpreting process. She (p. 330) defines anticipation as the interpreter's 'mental production of (parts of) relevant assumptions to be used in deliberately produced instances of enrichment'. Based on this definition, Vandepitte argues that anticipation is not always a matter of linguistics only, but occurs before the production level, and that is why it is not a bottom-up strategy (see Van Besien, 1999, above).

Instead of adopting a comprehensive approach to anticipation that overlooks some significant minutiae, Seeber (2002) collects a first set of data to investigate the potential role of intonation for anticipation in simultaneous interpreting (from German into English). The hypothesis to be tested is that monotonous intonation of the source text will have a negative effect on the interpreter's ability to anticipate the verb when working from German into English. In his 'pilot' study, two recent graduates of the ETI have been asked to interpret two German speeches of equal difficulty and on the same topic into English. The speeches were recorded by a native speaker of German who had been given instructions to deliver one speech in as lively an intonation and the other one in as monotonous an intonation as possible. Another version of the same speech was recorded with varying intonation patterns. The analysis of the two versions showed that the standard deviation of F0 of the monotonous speech (10 Hz) was considerably lower than the one of the lively speech (43 Hz). The speeches were subsequently presented to the subjects in a modified Latin square design in order to account for practice effect and fatigue. However, the data collected in the experiment did not support the author's hypothesis according to which monotonous intonation of the source text has a negative effect on the interpreter's ability to anticipate the verb when interpreting simultaneously from German into English. In fact, subjects anticipated the verb more accurately and more rapidly during the interpretation of the monotonous speech than during the lively speech. Based on the

data, particularly the number of placeholders used in the monotonous condition, it is this author's assumption that interpreters attempt to compensate for lack of intonation by increasing their cognitive effort and by adopting a more conservative interpreting strategy. In order to minimize anticipation errors they use placeholders, thus avoiding verb anticipation altogether.

Piccaluga and Harmegnies (2005) analyze the strategy of chunking by proposing a new variable called the Ecart Inter-Syllabique (EIS). The study is based on a sample of four subjects with a mastery of French and Spanish. The subjects were to interpret three speeches taken from the European Parliament according to combinations of French into Spanish and Spanish into French. Piccaluga and Harmegnies take the EIS to be the intensity of the syllables according to the inter-syllabic durations. The study concludes that EIS is viable in the context of simultaneous interpreting, since it impinges on the strategy of automatization, and improves the reception of the target text.

Morin (2005) shifts attention to the strategies that can help initiated Indonesian interpreters. These strategies include ones before, while and after performing simultaneous interpreting. Indonesian interpreters are advised to enhance their knowledge of the target text, and be psychologically ready for the stress incurred by time constraints. They are also advised to pay attention to address terms, as a major cultural component, and to prepare themselves by searching into the topic of their assignment if they have enough time to. Omissions are likewise recommended especially on occasions of taboo expressions or offensive statements. After interpreting, the interpreter should recall the missed or misunderstood parts to improve performance in the future.

To overcome the obstacle of fast delivery as outlined by Morin (2005), Li (2010) suggests a number of broad strategies that assist interpreters in coping with the source text. These strategies are ordered from the least effective to the most effective. Strategy one is to ask the speaker to slow down, and Li observes that it seldom works. Strategy two is for the interpreter to speed up, but if delivery is too fast to cope with, several parts will be missed out, since comprehension will be the driving force. Strategy three is summarization (Iacovoni's 'compression'; see below), and it operates well with impromptu speeches which contain many redundancies.

A recent study was conducted by Iacovoni in 2010, which is devoted to the compression strategy to seek evidence for its applicability across a wide range of instances. The researcher used a corpus of an audio recording of a press briefing downloaded from the European Commission in 2009 and interpreted from Italian into English. She observes that compression can occur at several levels, including syllables, words, syntax, meaning and context. Syllabic compression involves the interpreter's choice of words with fewer syllables than the ones used in the source text in order to save time. Word

(lexical) compression is typically the use of fewer words to express the same idea, being much like syntactic compression, where simpler structures are opted for. Meaning (semantic) compression is concerned with expressing the same meaning in equally idiomatic expressions, for example, 'non-proliferation treaty' instead of 'treaty for nuclear non-proliferation'. Finally, contextual (situational) compression, the most flexible strategy, Iacovoni argues, refers to the 'elimination of speech chunks bearing information which is compressed for by the extralinguistic situation of communication' (p. 14). She concludes that compression, though relieving short-term memory, increases the processing effort.

Omission is identified as a strategy rather than an error by Korpal (2012). He criticizes Barik (1994), Gile (1995, 1999) as well as Setton (1999) who have perceived omission in simultaneous interpreting either as a mistake or as a technique that interpreters may use only in extremely difficult conditions, when experiencing cognitive overload. He locates omission as a pragmatic strategy used by both trainees and professionals, and poses two important questions:

1. Is it possible for an interpreter to omit certain information deliberately due to the fact that some segments have been assessed as redundant or dispensable because they are implicitly present in the discourse?
2. Do omissions necessarily indicate lesser quality?

In an experimental design where 11 conference-interpreting trainees at Adam Mickiewicz University in Poznań, Poland, and 6 university graduates who work as professional conference interpreters (with a minimum of one year's experience) interpreted the recordings of 2 speeches in English found on the internet, similar in terms of their topic as well as syntactic complexity, followed by a questionnaire, she concludes that there is no statistically significant difference in the number of omissions made by the experiment groups. Furthermore, the evaluation of the questionnaire shows that the opinions on the use of omission do not vary greatly between the groups either. Despite the rigorous statistical methods Korpal applies, however, the findings carry the same disadvantage of Dillinger's (1989) study, where trainees and professionals perform alike.

Simultaneous interpreting pedagogy and quality assurance can be grouped together here because they are intimately related. Pedagogy proposes effective ways to prepare simultaneous interpreters through exercises and categorizations of the errors committed and their causes. Quality assurance, on the other hand, is concerned with the output of interpreters, especially trainees, and attempts to formulate criteria that assess this output with a view to improving the training of interpreters and developing their professionalism.

This section reviews the salient studies done in the two interrelated fields within the context of simultaneous interpreting.

Barik's (1971) study figures out as the first attempt at classifying the errors committed by trainee and professional interpreters. Barik summarizes simultaneous interpreting errors as omissions, additions or substitutions. The classification also includes sub-categories as follows (pp. 122–133):

1. Omissions: they can be divided into:
   - Skipping omission: omission of a single word or short phrase by the interpreter, usually a qualifying adjective or the like.
   - Comprehension omission: omission due to failure to comprehend part of the text.
   - Delay omission: omission due to recombining material by dint of clause grouping.
2. Additions: they can be divided into:
   - Qualifier addition: addition by extra qualifying elements such as adjectives or adverbs.
   - Elaboration addition: adding explanatory material.
3. Substitutions: they can be divided into:
   - Mild semantic error: error or inaccuracy of translation of some lexical item which may distort the intended meaning.
   - Gross semantic error: error of translating some lexical item which substantially changes the meaning of what is said. This type includes errors resulting from misunderstanding (e.g. the use of homonym or near-homonym), errors of false reference (e.g. the misuse of anaphora), and errors of meaning (not due to confusion).
   - Mild phrasing change: not saying the same thing, but the gist is not affected.
   - Substantial phrasing change: where the change in phrasing leads to a difference in meaning.
   - Gross phrasing change: a change which results in a considerable difference in meaning.

Barik (p. 135) argues that trainee interpreters should benefit from this typology of errors, since compared to professionals they commit more errors of comprehension which in turn impinge on the fidelity of their outputs.

Lambert (1989) focuses on the formation of interpreters, that is, how to prepare trainees to be professionals. She tackles several aspects that should be enhanced. Chief among these skills are shadowing, dual-task training, paraphrasing, closure exercises, sight translation, décalage and anticipation. Shadowing refers to the repetition of the source text without any interpretation with the sole aim of increasing the interpreter's speed of delivery. It is divided

into phonemic shadowing (i.e. repeating the first syllable in each word) and phrase shadowing (i.e. repeating the source text in a time lag not more than 250 ms). Dual-task training, Lambert maintains, is extremely important, especially as the interpreter is required to listen and produce at roughly the same time. This inherently assumes the automatization of certain strategies in order to overcome the barrier of speed. Paraphrasing is usually effectuated by means of source text re-expression first, which is of two types, namely, lexical paraphrasing and syntactic paraphrasing. Closure exercises are similar to stenography, since the trainee is required to eliminate redundant words, or to recombine several clauses together. Sight translation acts as a major preparatory exercise; it involves translating a written text into an audible one. Décalage or time lag is an exercise where the trainee repeats the source text and interprets it with one or five words lag. The exercise assumes that the trainee memorizes several terms and fixed expressions to overcome the obstacle of speed. Finally, in the anticipation exercise, the teacher reads a sentence or more out loud, or gets the trainees to listen to a recorded string, and stops reading or interrupts the recording to make the trainees complete the string on their own.

Dillinger (1990) examines the differences in comprehension between bilinguals and professional interpreters in an attempt to explore how bilinguals can be selected to be trained as interpreters. In a pilot experiment, he recruited eight experienced interpreters and eight novices. The first group had an active experience of 3,880 hours, with an average age of 45 years. The second group consisted of bilingual graduate students attending one of the two English-language universities in Montreal (McGill or Concordia). These subjects had never attempted simultaneous interpreting, and their average age was 29 years. The materials consisted of two 580-word texts in English, and the delivery rate was 145 words per minute for all subjects. The two groups were instructed to interpret then recall each experimental text. The resultant 16 interpreting protocols were transcribed including false starts, hesitations and so on, and were divided into syntactic units. Dillinger (pp. 47–49) concludes that experienced and inexperienced interpreters analyzed the grammatical properties of the texts chosen in the same way, while semantic propositions were different across the two groups. Dillinger considers the interpreting skill as a natural consequence of bilingualism, and that 'the differences between experienced and inexperienced interpreters will be mainly quantitative' (p. 52).

The same trend of investigating simultaneous interpreting skills is further pursued by Schjoldager (1993). She concentrates on English-Danish interpreting with a view to improving the simultaneous interpreting teaching situation. The data collected comprise four groups of interpreters and translators at varying levels of competence. Group 1 consisted of nine students in the final year at the Aarhus School of Business, Denmark. Group 2 consisted of

seven interpreter-trainees near the end of a six-month postgraduate course at the Centre for Conference Interpreting at the Copenhagen Business School, Denmark. Groups 3 and 4 consisted of 15 interpreters (13 for group 3, and 2 for group 4), whose performances were compared to the previous two groups. Schjoldager proposed three hypotheses to be validated or invalidated in the course of the study. The first hypothesis states that the main difference between simultaneous interpreting and translation is to be found in transmission conditions and process rather than in objective. The second hypothesis states that despite the adverse conditions of simultaneous interpreting, the target texts produced by interpreters may be just as communicatively adequate as translations of the same text. The third hypothesis is that a mediator's (i.e. interpreter's) reception and production of the progressive aspect in English may be used as an indicator for the communicative adequacy of his/her target text. Schjoldager (pp. 49–50) concludes that translation and simultaneous interpreting have the same objective, and thus may be communicatively adequately similar. However, the progressive aspect alone cannot be considered a sufficient indicator of interpreting between English and Danish.

Shakir and Fargahl (1997) analyze students' errors with particular emphasis on the pragmatic aspects involved. These aspects are manifested in conjunctives and key lexical items in Arabic-English simultaneous interpreting. The study investigates how five Arabic conjunctives and four emotionally loaded lexical items are rendered by ten MA students. The conjunctives are 'iza kana' (if), 'bal' (but), 'wa' (and), 'ayyan kana' (whatever) and 'mima' (so as). The loaded lexical items are 'mihna' (predicament), 'ibadah' (extermination), 'hamajiyah' (barbarism) and 'gholah' (extremists). The study shows that conjunctives were not appropriately rendered by most students, and that the emotive lexical items were likewise flattened and substituted for by less emotive ones. Although the study is one of the few with an emphasis on Arabic and English, the scope and methodology are too limited to provide useful generalizations.

The training dimension is further crystallized by Kornakov's (2000) suggestions. He introduces a number of guided training exercises which are used with groups and which can be used by all students outside the classroom as part of their self-training. These exercises include recalling the digits encountered by trainees on their way to the training centre. This exercise targets short-term memory, which is crucial for the interpreting process. Another exercise is a dictation of short texts containing interesting figures, dates, plusmarks or so on. The dictation may be in either language or may alternate between the two languages once self-confidence is gained and the exercise is being used purely to train STM and LTM. A third exercise is, Kornakov maintains, aimed at distracting the interpreter's attention, including noise or excessive gesticulation. However, Kornakov warns that any exercise should

have a rationale that is fully explained to the trainees in order to ensure their active participation.

The interpreter's competence as a major pedagogical focus is underlined in Kalina's (2000) study. Kalina (p. 4) attempts to define simultaneous interpreting competence as 'the ability to perform cognitive tasks of mediation within a bi-/multilingual communication situation at an extremely high level of expectations and quality'. This ability, she maintains, can be enhanced through identifying the basic skills that underlie interpreting, and each skill can be broken down into sub-skills that can be the focus of separate training stages. Some skills should be minimally there even before training, and testing can show such skills. Kalina concludes that training should focus on varying degrees of proficiency with a view to reaching a global framework that can characterize the simultaneous interpreting pedagogy, with the absence of clear-cut quality assessment criteria in the field.

Kalina's remarks on the need for quality assessment criteria have been the focus of Pöchhacker's (2001) study. He surveys the literature on simultaneous interpreting in an attempt to reach conceptual and methodological tools for empirical study and quality assessment. Pöchhacker tackles the problem according to several variables including, inter alia, interpreters, users, clients and experimentation versus observation. He considers the interpreters as important as the users and clients, since they cannot identify a good interpreter. Moreover, the reality of the interpreting output should be the focus rather than idealized criteria that overlook the basic standards and problems.

The issue of interpreting products' reality is further investigated by Clifford (2001). He focuses on the interpreters' performance and contends that the lexico-semantic aspects of the text should not be the motive for assessing students' outputs, since discourse theory provides a better corner of vantage. Discursive aspects include the features of utterance, the utterer's intent and the receiver's interpretation (p. 368). Thus, Clifford integrates the pragmatic aspect into the assessment process and considers it a basic discursive aspect. He concludes that he only proposes a framework that can further materialize into a viable rubric.

Stantualli (2002) revisits the issue of simultaneous interpreting pedagogy by envisaging a curriculum for training interpreters. She acknowledges the importance of linguistics as a core course in simultaneous interpreting. Such a linguistic approach should start with a study of the history of the A-language and B-language, with particular emphasis on grammatical description and typological differences. Textual analysis should also be included both on micro- and macro-textual levels. Other aspects like morphology and syntax as well as dialect and idiolect should be studied as discrete components.

Kalina (2007) provides valuable insights into the interpreting class. She considers interpreting pedagogy as composed of four processes: pre-process,

peri-process, in-process and post-process. The pre-process phase includes preparatory activities, coordination and meetings. The peri-process phase describes the working conditions (e.g. participants, languages, team), while the in-process phase covers the actual production by speakers and interpreters. The post-process phase is primarily concerned with quality assurance. Kalina (p. 113) maintains that the measurement or assessment of quality within each phase can ensure optimal performance. She also concludes that actual performance and training should be reconciled if expertise is to be enhanced.

Sachtleben and Denny (2012) focus on raising pragmatic awareness in trainee interpreters. They used an undergraduate class of trainee interpreters of 1 New Zealand-born and 28 migrant students. The latter had been in New Zealand for varying lengths of time, ranging from many years to as little as 3 weeks. There were 27 females and 2 males. Native languages in that class included: Mandarin (14 students), Cantonese (3 students), Japanese and Korean (2 each), and 1 each of Bulgarian, French, Hungarian, Maori, Punjabi, Russian, Tongan and Urdu. Age ranges were 20–30 (19), 31–40 (9) and 41 or older (1). Class learning focused on the parameters of English oral discourse and included English phonology and pronunciation and NZE pragmatic norms. Idiomatic language and basic interpreting skills were also addressed. The materials used included three recordings expressly created for the interpreting class using spontaneous native speaker role-plays in three situations involving face-threatening acts: clarification and repair after an inferred insult, a complaint with resolution and disagreement avoidance. Sachtleben and Denny conclude that even those students who reported feeling bicultural commented on the value of becoming consciously aware of the need to examine the purpose of an utterance, and not just its lexical message. Classroom discussion often led to insights as students investigated their disagreements about the pragmatic content.

2.3 MISCELLANEOUS APPROACHES

Miscellaneous approaches are characterized by the fact that they do not tackle any of the issues presented thus far. They focus instead on the role played by other factors that tangentially affect simultaneous interpreting, namely neurophysiology, written translation, corpus studies and expertise, among many other issues. It is difficult to label such miscellaneous studies with a particular name or attribute them to a specific research trend. This section provides a review of these approaches.

Lambert (1989) explores the neurophysiological aspects of simultaneous interpreting. She conducted an experiment in which two 12-minute speeches

taken from Hasards (1984 and 1988) were recorded at approximately 110 words per minute. One speech was in French; the other in English. Twenty-one subjects from Ottawa, whose experience varied from studentship and graduation, participated in the experiment. Each 12-minute speech was divided into four 3-minute segments. The first segment served as a warm-up and was never evaluated. The researcher set three main conditions for the rest of the segments: (a) both ears simultaneously, (b) right ear only, and (c) left ear only. The findings of the study indicate that since interpreters are basically involved in two concurrent activities (listening and speaking), they prefer the left ear to right-hemisphere route in order to monitor their own output. Moreover, a high percentage of interpreters release one headphone (usually from the right ear) to consider monitoring.

The reconciliation of written translation studies and simultaneous interpreting research is attempted by Schjoldager (1994). She integrates the theoretical framework of the Manipulation School into the investigation of simultaneous interpreting. Manipulation School scholars distinguish themselves as searching for the norms of translation, which are largely cultural. They also invoke interdisciplinary studies as a vehicle for establishing such normativity. Schjoldager evaluates Gile's Efforts Model (1999) according to the Manipulation School perspective, and contends that Gile's approach does not amply differentiate between linguistics-oriented research and the search for normativity. Thus, the question of whether interpreting is norm-governed is unnecessarily begged. However, Schjoldager believes that the source text, relevant literature and the target culture do not supply sufficient norms; the lack of published research and the obstacle of public accessibility hamper the procedure of collecting a sizeable corpus.

The problem of compiling a representative corpus as hinted to above has been the focus of Shlesinger's attention (1998). She suggests two possible ways of using corpora as a descriptive tool: (a) the creation of parallel and comparable corpora, and (b) the use of existing monolingual corpora as sources for testing hypotheses on interpreting. The first method should not solely be confined to the collection of separate texts: the corpus should ideally include the interpreted texts, original oral discourses and written transcriptions. The second method may comprise artificial materials for experimental purposes as well as existing monolingual corpora, such as the British National Corpus. Shlesinger concludes that interpreting may be ready to use corpus linguistics to enrich its descriptive framework.

Rather than focusing on methodology, Setton (2001) dissects the interpreting process in order to settle a number of heated debates. He reviews the interleaved process of simultaneous interpreting according to automatization, expertise and the basic models and components. Setton considers Gile's Efforts Model as insufficient in terms of semantic and discoursal levels, and

that the complexity of the interpreting process is further curtailed by reliance on conceptualization alone. Setton also criticizes the excessive indebtedness to strategies of simultaneous interpreting, and prefers (p. 20) to view the process as made up of sub-skills and competences regardless of expertise:

- Comprehension of the source language at all levels (including pragmatic clues).
- Context acquisition: preparation, awareness and alertness.
- Metarepresentation: empathy and acting.
- Syntactic agility and a rich vocabulary in the target language.

He also advocates corpus-based research as providing 'a better fit to the problems encountered in the classroom than a theoretical division into sub-tasks' (p. 21).

Ericsson (2002) revisits expertise as a major impetus in simultaneous interpreting. He lauds Dillinger's (1989) study as bridging the gap between expert interpreters and mere bilinguals. However, he believes that experts do not always exhibit their special abilities and show their superiority in typical and representative situations. Thus, the key challenge to the study of expert performance is to identify the collection of tasks that pin down the real abilities. Moreover, Ericsson (p. 4) suggests that applying 'process-tracing' can help explore the differences among several experts and the mechanisms that they use. Ericsson's observations therefore point to the direction of studying the elusive concept of expertise, which may include special mechanisms and strategies not discoverable through other paths of research.

Finally, Seeber and Zelger (2007) discuss the ethical perspective of simultaneous interpreting. The study is based on the motivations behind the interpreter's decisions and action, which may diverge from mainstream ethics. The two researchers decompose the message into verbal, semantic and intentional components, and they believe that flouting any of the principles that underlie any of these components will result in an ethical deviation. They cite the example of an interpreter who refrains from interpreting a joke about a person in authority, and they question the rights vested on the interpreter in this regard. They (p. 297) conclude that 'it is when the interpreter alters the message in spite of an apparent congruence among the three message components that he is likely to betray the speaker'.

2.4 CONCLUSION

The approaches discussed in this chapter have their merits and demerits. They give the hyphenated fields such as sociolinguistics and text linguistics the opportunity to contribute to the cognitive study of simultaneous interpreting,

and emphasize the role of linguistics as a scientific discipline capable of enriching interpreting studies. By systemizing research, linguistics-oriented approaches make the simultaneous interpreting output amenable to in-depth analyses, especially on phonological and textual-discoursal levels.

Cognitive approaches, as occupying the bulk of research in recent years, are more fruitful. Studies which underline simultaneous interpreting mental processes and cognitive load are typically based on definite figures and can easily be useful in training programmes, where time lag and memory exercises interplay to foster the interpreter's expertise. However, the excessive emphasis on cognition eclipses the linguistic dimension (Setton, 1999). One way to restore the balance has been to reintroduce pragmatics as a bridging subfield that couples linguistically communicative functions with inferencing. Moreover, cognitive approaches, being led by key cognitive scientists, have been largely constrained by experimentation as a viable research method, where certain variables are controlled under laboratory conditions. As Straniero Sergio (2003, p. 171) contends, 'these studies are often not only based on self-prophesying hypotheses, but the hypotheses themselves are hardly valid'. The disadvantage of such experimentation thus lies in the unreal settings and the highly dubious findings, which are based on unfair comparisons between professional interpreters and trainees or even bilinguals.

Strategy-based approaches invoke both linguistics and cognitive science to investigate the diverse strategies that interpreters apply in real-life settings. The great benefit of these approaches lies in their focus on the strategies that are applied automatically, and how such automatization is managed and established. Anticipation and chunking, as two prominent strategies, have hitherto received much attention, but other equally effective strategies need to be investigated with the same rigour, for example, correction, restructuring and the salami technique, among others.

Pedagogical and quality-based approaches are also geared towards 'real-life' interpretation. Their focus on the product and on how interpreting can be taught lends them much importance. In fact, quality assurance and pedagogy are so interlinked that each feeds into the other: quality-based studies provide the basics for producing a barely acceptable output which trainee and student interpreters are required to achieve; and pedagogical approaches aspire to producing well-trained interpreters who meet the criteria or guidelines set by quality studies. Unfortunately, pedagogical approaches are still under-researched, for there are yet not clear-cut criteria for quality in interpreting, and the validation of the proposed pedagogical models needs to be highlighted in the literature.

Miscellaneous approaches equally need much effort. The issues they tackle are to guide future research in the field of simultaneous interpreting, for example, expertise, neurophysiology and corpora, to name but a few. These

approaches have the potential to open up avenues for more research which goes beyond the rigidity of cognitive science, and they can be of benefit to strategy-based approaches which need authentic corpora to enlarge their lists.

A balance needs to be struck among the approaches introduced in this chapter. They need to be more organized to provide a more coherent view of simultaneous interpreting, especially TV events. This gap is duly recognized by Sergio (2003), where he contends that TV interpreting is bedeviled by the fact that practice is a far cry from theory. Moreover, the marked gap in the studies which address interpreting from and into English and Semitic languages, particularly Arabic, is yet to be bridged; there is need for a linguo-cognitive model of simultaneous interpreting between English and Arabic, which will be the task in the next chapter.

Chapter 3

Re-Envisaging the Simultaneous Interpreting Process

3.1 INTRODUCTION

This chapter is mainly concerned with envisaging how English-Arabic-English simultaneous interpreting operates. The views expressed are not completely new in every sense of the word; it is built around many of the approaches briefly explained in chapter 2. What is new about this re-envisaging process is its focus on the two directions of English and Arabic as two languages of different linguistic families, which is what has been recognized by Gile (1992) as an area lacking in sufficient research.

The present re-envisaging is linguo-cognitive and not psycholinguistic. The difference between the two terms needs to be clarified at the outset. The term 'linguo-cognitive' touches upon two disciplines that are discrete but are usually interrelated in the study of simultaneous interpreting. It can be broken down into 'linguistic' and 'cognitive', with the former indicating a consideration of the full range of the term, while the latter being concerned with the memory and comprehension processes as the salient components of any interpreter's mental program. In this way, the linguistic and cognitive attention to language comprehension and production focuses on the occasions when linguistically encoded input is processed (i.e. decoded) in the comprehension 'compartment' and then re-encoded also linguistically in the production phase. This simplified process is usually included under both cognitive linguistics and psycholinguistics as the two branches of linguistics that combine language and memory processes in an attempt to understand how linguists, lay people and even simultaneous interpreters produce language under certain conditions. Cognitive linguistics is different from psycholinguistics in a number of ways. First, cognitive linguistics takes the surface linguistic forms as the springboard for the analysis of how to process and produce language,

whether L1 or L2. These surface forms are usually subsumed under several sub-fields such as cognitive semantics, cognitive phonology, frame semantics and cognitive grammar, which allot due attention to the ways in which the linguistic and the cognitive come into interplay. This is different from psycholinguistics which is mainly concerned with the mental skills underlying comprehension and production (cf. Field, 2004), especially in the case of simultaneous interpreting. This places the 'psycho-' aspects above the linguistic ones; that is, it takes the linguistic as a vehicle for the psychological causes of certain linguistic phenomena. Second, cognitive linguistics sets out by proposing the theoretical framework that leads to envisaging the mental operations of the linguistic production, unlike psycholinguistics which initiates proposals based on prior experimentation (cf. Evans and Green, 2006).

The views proposed in this chapter are linguo-cognitive: they are based on the tenets of cognitive linguistics, and attempts to redress the balance which is has hitherto been tipped in favour of psycholinguistic research on simultaneous interpreting. As Setton (1999, p. 4) contends: 'The application of generalized information-processing models to translation, perhaps because of its novelty, is fast becoming a dominant and almost exclusive paradigm, eclipsing the linguistic dimension'.

Yet, the views expressed herein are not a replication of the process of simultaneous interpreting as it actually occurs; it is an attempt at capturing the process as it typically occurs. As Moser-Mercer (1995, p. 14) believes, 'No model is meant to correspond exactly to the phenomena under study; if it did, it would no longer be a model but identical to the phenomena'.

3.2 SOURCES AND BASIC ASSUMPTIONS

3.2.1 Sources

The re-envisaging process proposed is based on many of the studies discussed in chapter 2. Chief among these studies are the linguistics-oriented and the cognitive ones. These studies furnish the necessary theoretical toolkit for the re-envisaging process, especially the semantic, syntactic, pragmatic and cognitive operations that are discoverable from speech disfluencies as will be explained later on. The semantic and syntactic dimensions are emphasized by Dillinger (1989), Gile (1999), Alexieva (1999), Tissi (2000) and Chernov (2004). Dillinger considers the linguistic processor as including the sub-components of the lexical access, where the mental lexicon is accessed via pre-lexical and post-lexical processes (exemplified in the selection and integration of lexical information), and syntactic parsing. The syntactic parsing process also includes proposition-construction and interleaved syntactic

and semantic analysis. This division of the linguistic processes involved gives the linguistic aspects of both the source and target texts significance, since it positions it as the first component or as the raw data to push into the cognitive processor. The generation of propositions is intimately related to the use of cognitive semantics as a major tool for analyzing simultaneous interpreting output on the linguo-cognitive level. This is tallied with the linguistic dimension of the present re-envisaging or approach which will underline the role and place of linguistically encoded data as both the starting and ending points.

Gile (1999) proposes his Models as a cognitive pool where the following factors are woven together as the operational components of interpreting, namely:

L – the Listening and analysis Effort.
P – the Production Effort (speech production in simultaneous, and note production during the first stage of consecutive – while the interpreter is listening, but not interpreting yet).
M – the short-term Memory Effort essentially dealing with memory operations from the time a speech segment is heard to the time it is reformulated in the target speech or disappears from memory.

However, the Effort Models are not that creative, unlike Alexieva's (1999) notion of phases, which figure predominantly in the present re-envisaging or approach. She believes that overload is the cornerstone of the simultaneous interpreting process, which is greatly influenced by the transition from one phase to another in the course of simultaneous interpretation. Failure to carry out necessary textual analysis is bound to lead to depending on knowledge analysis, which if weak will lead to more inferencing. The overload placed on any of these phases can result in failures in comprehension and hence in production.

The interaction and the monitoring processes, as emphasized in the present re-envisaging, ensures that what Chernov (2004) calls the interpreter's mental 'program' is not broken or intercepted (see the Interaction Assumption in the next section). Tissi (2000) takes the pauses in this program as an indication of the way semantic and syntactic processes occur. She is concerned with the role of speech disfluencies as an avenue to the interpreter's 'program'. This is the most important aspect of the present re-envisaging or approach because it will attempt to relay the process of simultaneous interpreting by measuring speech disfluencies such as pauses and hesitations to discover how the 'program' proceeds or is interrupted, and the linguistic and cognitive causes of the flow or breaks.

The re-envisaging will also make use of Chernov's (2004) insights. Although he tackles inference and anticipation in simultaneous interpreting,

his model of cumulative dynamic analysis of the discourse semantic structure is governed by the unity of co-referential substructure, the unity of its deictic universe and the uniformity of value judgements facts and events. Thus it is a pragmatics-oriented approach that takes the simultaneous interpreting process as operating on a communicative level broader that the interpreter's working environment. This pragmatic orientation is also what Clifford (2001) attempts, but on a limited scale. The use of speech acts, as a major pragmatic component, assists interpreters in achieving a high degree of correspondence between 'the utterer's contextualization of the source language utterance and their own performance and contextualization in the target language' (ibid., 370). This entails presenting the information encoded in the source language in a manner which is consistent with the expectations of the target language receivers.

The integration of the semantic, syntactic and pragmatic (and cultural) aspects does not operate in the void; it is geared towards exploring the cognitive demands and processes of simultaneous interpreting. Chernov (2004, p. 4) is of the opinion that the 'unique features of SI make purely linguistic analysis inadequate to explain the process. Linguistic analysis alone cannot explain why it is that'. The cognitive processes involved, or the 'why', can be discovered through the interruptions that occur in the course of simultaneously interpreting. These interruptions are exemplified by pauses and hesitations which, as Riccardi (2004, p. 757) contends, 'reveal that not all sequences of the process occur automatically, but are also the result of online processing that may end up in cognitive overload'. The importance of these interruptions is not unique to the present re-envisaging or approach; several studies have taken them as clues for cognitive activity. Bakti's (2008) extensive study is a valid example, where she concludes that these pauses are indications of problems at the stages of lexical access and grammatical planning.

These sources illustrate how the re-envisaging or approach proposed does not start in the void; it is triggered by several studies that underline the linguistic and the cognitive dimensions in tandem. The re-envisaging or approach is also geared towards taking the linguistic output with all its interruptions and segmentations as the data for the cognitive analysis which will be the focus in chapters 4 and 5.

3.2.2 Basic Assumptions

This section summarizes the basic assumptions that underlie the approach proposed. It is important to note that these assumptions are what governs the operation of the re-envisaging or approach, especially the movement from one phase to another and the relationship between these operations and time

factor, as a major obstacle faced by interpreters in both Arabic and English directions. The basic assumptions can be divided into the following:

Transitionality

This assumption is mainly based on the effective movement from one phase to another in the process of comprehending and producing the simultaneous interpreting output from and into English and Arabic. The transitional movement should be understood, however, as governed by two factors. The first is the completion of the prior phase, where the movement in this case is compulsory, since the effort made to process the incoming input is finalized, and is thus ready to be pushed forwards. The second factor is incompletion, where the effort to process the input seems to be more than what is expected, and the interpreter feels that it can be spared for other incoming input. In this particular case, the interpreter has the option to linger or to move forwards. The choice between the two is governed by the interpreter's skill which makes the processing automatized, and hence the input is processed faster than usual. Another possibility is the interpreter's need to skip or deliberately shorten this input in favour of the incoming one, which is usually exemplified by the strategies of omission and compression, respectively. In a sense, transitionality is the first assumption that grounds the idea that the simultaneous interpreting process should move forwards either speedily or extraordinarily slowly.

Time Factor and Simultaneity

The time factor governs the process of transitionality, but does not override it. Time is a major obstacle for the interpreter due to the incessant data that are processed within very tight time limits. The critical case of time as governing and following transitionality is exemplified by two phenomena: excessive speed of the speaker's output leads to compression, implicitation or omission and ample time leads to explicitation. This renders the process of simultaneous interpreting dependent on the memory or the linguistic store of the interpreter; the more the interpreter is attentive and experienced, the less time is consumed in the process of transferring the message across two languages simultaneously. The problem of time will be explicated in the formulae that will be presented in the section on the components.

Time is also related to the idea of simultaneity. Although it is called simultaneous interpreting, the process is not strictly simultaneous (see Seeber, 2011). The interpreter starts interpreting a few seconds after the actual speaker in order for the processing effort to be carried out uniformly; no overlap should be expected between the speaker's input and the interpreter's output.

Linearity

This visualization is linear: it operates either forwards or backwards in the push from input to processing to output, but top-down or bottom-up inside the comprehension phase. Linearity might also be interrupted due to time constraints or anticipation (cf. Chernov, 2004). The need for linearity is necessitated by the fact that the source-language input arrives in portions which move segment by segment according to the temporal continuum. These portions are usually sentences or clauses uttered by the speaker, and turned into meaningful segments by the interpreter. Thus, the interpreter is forced to follow the speaker across time and meaning. Any reversals or restructuring is usually preceded by linear decoding and understanding.

Interaction

Under the assumption of interaction, the two notions of inter-phasic interaction and intra-phasic interaction need to be discussed. The phases of the re-envisaging or approach, as will be explicated below, are discrete but at the same time interactive. In inter-phasic interaction, each phase is allotted a certain amount of time and effort, due to linearity, but at the same time, the data processed in one phase may be pushed forwards or pulled backwards in the course of simultaneously interpreting the source text. This movement is interactive, since the data processed is accumulated in one phase and pushed forwards with traces that are usually left behind for fractions of seconds. These traces might justify the errors of hesitation or mispronunciation due to the load of processing the incoming input and reconsidering its various semantic, syntactic and pragmatic (or cultural) appropriateness in the target language. Intra-phasic interaction concerns the process of checking the resources at the disposal of the interpreter: that is, linguistic and non-linguistic. Searching the mental lexicon, restructuring very long subjects and reactivating the long-term memory are all intra-phasic interactions necessary to comprehend the target text.

Backtracking

The present re-envisaging or approach includes the possibility of checking released and pre-released outputs through a return to the previous phase(s). This is possible in cases of doubt, hesitation or extraordinarily fast speech rates.

The Translation Unit (TU)

The issue of TU is a controversial one. Some scholars see the TU as a fixed unit that can be permanent and manageable, while others consider it

changeable and open to variation from one interpreter to another. Although Zhu (1999, p. 3) acknowledges the disputable nature of TU, thus citing opinions that take the morpheme, the clause and the sentence as basic TUs, he proposes the following as a 'working' definition:

> The smallest segment of an SL text which can be translated as an independent and integrated meaning entity in relation to other segments of the text. Its formal realization, if viewed in isolation, is analyzable on levels ranging from the morpheme to the sentence; its textual potential, however, is based on the completeness of its information structure, and is normally realized when it performs textual functions in the SL text. These textual functions are to be matched in the construction of a TL text. (p. 3)

Zhu (1999), however, contends that the sentence, and the sentence alone, can be a plausible UT. His lengthy arguments rest upon disproving the validity of target texts and clauses or even paragraphs as TUs. The target text, he maintains (p. 10), changes in its non-linguistic context, and TUs need to be precise. Paragraphs, on the other hand, are made up of sentences, and cannot be thought of as modifiable. Clauses are, to crown all, incomplete in meaning. Thus, according to Zhu (p. 18), 'Text translation can benefit from an active interaction between textual authority and sequential integrity as long as emphasis is placed more on the functional than formal aspects of a sentence'.

The other view on TU is held by Alves, Magalhães and Pagano (2001). Unlike Zhu (1999), they contend that the TU is changeable:

> It is a well-known fact that defining the scope and amplitude of translation units (henceforth, TUs) is a rather controversial issue in Translation Studies. … It is a segment in constant transformation that changes according to the translator's cognitive and processing needs. The unit of translation can be considered as the cognitive basis and the starting point for the translator's processing efforts. Their individual characteristics of delimitation and their extreme mutability contribute fundamentally so that target texts have forms that are individualized and differentiated. The translator's focus of attention and level of awareness are the guiding and delimitating factors for the establishment of a translation unit and it is through them that the TU becomes momentarily perceptible. (2001, p. 169)

What lends their position validity and applicability is the fact that they, instead of delving into theoretical debates like Zhu's (1999), investigate the 'cognitive paths' of translators through TAPs (short for think-aloud protocols).

Funayama (1996) and Galina (1998) likewise disagree on the nature of the TU or what they variously call 'the processing unit'. Funayama is in favour of the idea of cognitive files where the processing unit is changeable according to the interpreters' individual differences as regards the filing of such a

unit. Galina supports the view that texts are the only units of simultaneous interpreting, since interpreters do not deal with words or clauses but complete texts.

The position that is adopted in the present re-envisaging or approach and in the analyses carried out in chapters 4 and 5 is that of taking the input segment as the TU. This position rests upon three reasons. First, it is difficult in observational-analytic methodology to probe into the interpreter's mental profile online: it is even impossible to get the interpreter to relay and stop what he or she is interpreting in actual real-life simultaneous interpreting settings. The data collected for the purposes of this book are based on speeches that were delivered and simultaneously interpreted several months and years ago; most of the interpreters' identities are unknown and the authenticity of the data depends on its reality as indications of the process in its actual setting (i.e. as broadcast live on TV). Second, the source texts used here are all transcripts of the originally delivered speeches; it is the norm that speeches are delivered in segments set off by pauses rather than sentences. Third, the adoption of pauses and hesitations as indicators of cognitive activity in this methodology leads to assigning extra significance to the pauses and hesitations that occur mid-clause or mid-sentence.

Type of Bilinguality

It is assumed that the interpreter in this re-envisaging or approach is a coordinate bilingual, for s/he is able to control shifts from his/her A-language to B-language and vice versa by means of inhibiting or waiting for extra input (Proverbio, Leoni and Zani, 2004), unlike compound bilinguals who cannot control these shifts. These shifts necessitate that the two languages are treated as separate components. This view is supported by Mahmoodzadeh (2000) and Kaya (2007).

3.3 THE SI NATURE AND COMPONENTS

3.3.1 The Operational Multitasking Nature

Before introducing the components of this visualization, it is important to discuss the multitasking nature of SI. According to Gile (1999), there are two types of SI models: operational and architectural. Operational models operate according to constraints, for they postulate minimal information-processing phases through which the input must pass. By so doing, such models achieve several practical results and observations without much complexity. Architectural models invoke several built-in complex processes that decrease practical value due to over-attention to details. In a sense, they leave little room

for unexpected cognitive processes and automatisms that can be further tested and highlighted in the subsequent modifications of operational models.

Another classification is presented by Seeber (2011). He refers to single-resource and multiple-resource models. Single-resource models do not account for the time shared among different phases, and thus fail to explain why interference occurs among different tasks at the same time. Multiple-resource models, on the contrary, are capable of allowing for selection from several cognitive and attentional resources at the same time. In a sense, instead of allotting one resource per phase, they allow several resources for several phases at the same time. Thus, competition among several phases can be explained according to the best recourse for each phase to process the input.

The present re-envisaging or approach is operational and multiple-resourceful rather than architectural and single-resourceful: it makes use of discrete phases that are amenable to overlapping and jostling as an indication of the complexity and unpredictable nature of SI. It allows the Linguo-Cognitive Processor (as is explained below) several phases, which in turn can access WM and LTM, singly or together. Thus, the proposed re-envisaging or approach can give room for jumps and automatisms.

3.3.2 The Components of the SI

The present re-envisaging is composed of four phases that operate linearly in order to produce a simultaneous interpreting output within tight time limits. The four phases follow the assumptions presented in the previous section and are also based on the various sources discussed in both chapter 2 and this chapter. These phases are also based on a number of salient studies done in the field, especially Moser-Mercer (in Lambert, 1988), Schjoldager (1994), Zanetti (1998), MacWhinney (1997), Daró (1997), Gile (1999), Chernov (2004), Russo and Salvador (2004), Setton (2005) and Mizuno (2005). These phases can be outlined as follows:

Phase One: Linguistic Input (LI)

This phase is what first encounters the interpreter, namely, the auditorily encoded input. It is made up of the TUs that the interpreter receives as raw data amenable to decoding and processing to be pushed to the other phases. Ideally, the interpreter receives this input as a listening material that includes semantic, syntactic and pragmatic (or cultural) layers within. The identification of these layers does not start until the interpreter sees that it is temporally appropriate to start interpreting, which usually results in insignificant lag, that is, less than 1,350 milliseconds (cf. Bilá and Džambová, 2002). This phase

is reported in Schjoldager (1994) and Gile (1999) as 'listening' or 'listening effort'. It is important to note that any failures on the part of the interpreter in carrying out the necessary effort of listening may lead to more time lag by means of recalling, or missing out some of the semantic, syntactic or pragmatic (or cultural) minutiae that will negatively affect the processing needed in other phases.

Phase Two: Linguo-Cognitive Processing (LGP)

In this phase, there are many processes that take place in order for the source-text segment to be ready to move forwards to the next phase. Although this phase is usually regarded as the memory phase, it contains several linguistic sub-processes that are mandatory for the success of the interpreting process. Under this phase are subsumed the following sub-components:

- Semantic Processor
- Syntactic Processor
- Pragmatic and/or Cultural Inferencing

The semantic processor is concerned with discovering the relevant meanings of the words or lexical items received. This component largely depends on the memory processes that are instrumental in retrieving lexical meanings from the mental lexicon or the lexical access. The interpreter starts with the individual meanings of his or her input in the source text and the target text with a view to automatically retrieving the most frequent ones. The retrieval process is built around the Forster Model (1976). In this model, the perceptual input is used to build a representation of the word to be recognized which is then checked in two stages by comparisons with a series of access files, which are analogous to the cards in a library index system. Once an input string is matched to an access file, it is then linked to the master files, analogous to the books on the shelf, which contain the full lexical entries for each word. The files are organized to expedite the process of word recognition (Frauenfelder and Tyler, 1987).

This process should save much time, since the lexical decisions taken at this stage will be automatized for the rest of the source and target texts to achieve consistency. The retrieval of the words or lexical items usually follows two routes: the long-term memory and the episodic memory. The long-term memory is concerned with the already stored linguistic and experiential data which are easily recollected by the interpreter, while episodic memory is used to store experiential input (see figure 3.1).

The syntactic processor operates on the amalgamation of semantic data to be combined into phrases, clauses or sentences. This processor is also

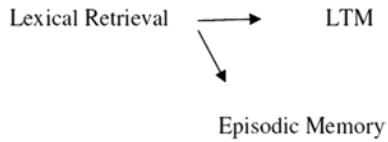

Figure 3.1 The Two Routes of Lexical Retrieval.

related to memory, especially long-term memory and working memory. The major structure of the source-text language is stored as a general blueprint in the interpreter's long-term memory, that is, as a SVO or a VSO language. The observation of this general structure acts as a caveat against any faulty structure or inappropriate inversions in the target text language. Working memory is usually regarded as responsible for collecting data pieces as they are processed online; the collection process is significant for the present re-envisaging or approach, since it is considered the cause of major errors or pauses that occur due to the overload of such a memory type due to excessive speed on the part of the speaker or to the interpreter's failure to automatize certain linguistic decisions. Working memory is also responsible for the restructuring of very long grammatical subjects or lengthy predicates to achieve cohesion and coherence. This restructuring can be highly problematic when the interpreter operates linearly to translate metaphors or idioms (cf. Gernsbacher and Shlesinger, 1997). As a result, working memory requires due attention from the interpreter.

Pragmatic and/or cultural inferencing is not a processor but a major subcomponent. It aids both semantic and syntactic processors in checking the data retrieved from the long-term memory. It also assists working memory in quickly choosing among the different equivalents that are proposed by the long-term and episodic memories. In fact, pragmatic and/or cultural inferencing can be considered part played by the episodic memory, that is, the part concerned with the interpreter's linguistic 'experience'. Pragmatic inferences are typically grounded in context of situation, presuppositions, cultural specificity and relevance. The interpreter is to heed all these aspects before taking a linguistic decision in the direction of the target language, since the choice of the appropriate lexical item is informed by politeness, formality and user's expectations, which are all pragmatic and/or cultural aspects. Similarly, counterfactuals in the source text may be relayed as temporal structures, for example, 'if' structures versus 'when' clauses. Another example is the omission of inappropriate expressions such as unsuitable address terms.

It is important to note that pragmatic and/or cultural inferencing can be considered an intra-phasic interactive component. It guides semantic and syntactic decisions and prepares the somewhat raw input to be pushed forwards. Although it is not used by many Arabic experienced interpreters working

from their mother tongue into English, it remains as a major component for them when working in the reverse direction.

Phase Three: The Buffer Point (BP)

This phase is largely based on Gerver's (1975) model and MacWhinney's (1997) elaborate framework. The buffer point is basically a store for data that have been processed and ready for production. The buffer point occupies a central place in Gerver's and MacWhinney's models. In Gerver's model, there are two buffers: one for each language (cf. Timarová, 2007), and he calls them 'the output buffers'. MacWhinney also stresses the need for a buffer point, but considers it part of the working memory; he terms it the 'verbal memory', which has an unlimited capacity. Gerver's model is usually graphically represented as follows (in Timarová, 2007, p. 13).

In this approach, the buffer point is taken to be similar to Gerver's. It acts as a 'checkpoint' for all the data that have been gathered and processed in the previous two phases. This buffer functions as the final point before the output is released in the production phase. Its functions may include reintegrating pragmatic and/or cultural inferences or rechecking the semantic and syntactic information processed thus far. Without a complete check of the processed data, the interpreter may commit errors on various levels, and in the case of anticipation, where highly automatized strategies are applied, the buffer point may be dispensed with. The buffer point may also operate as a place where cognitive overload is discharged, that is, where the 'worrying' bits of data that have not been sufficiently verified in the second phase may be either deleted or compromised.

3.4 HOW SI OPERATES

Having reviewed the components of the re-envisaging of SI, it is fitting to discuss how these components function in tandem. The phases outlined above can be graphically represented in figure 3.2.

Figure 3.2 illustrates the operational nature of the approach. As has been stated before, the re-envisaging process is composed of four main components, namely the linguistic input (LI), the linguo-cognitive processor (LGP), the buffer point (BP) and the production phase or the linguistic output (LO). These four components together with their sub-components form the basis of the re-envisaging or approach and operate near-simultaneously to produce an acceptable output. The re-envisaging or approach starts with the linguistic input from the speaker or deliverer, which contains semantic, syntactic and pragmatic and/or cultural information, all phonologically encoded in

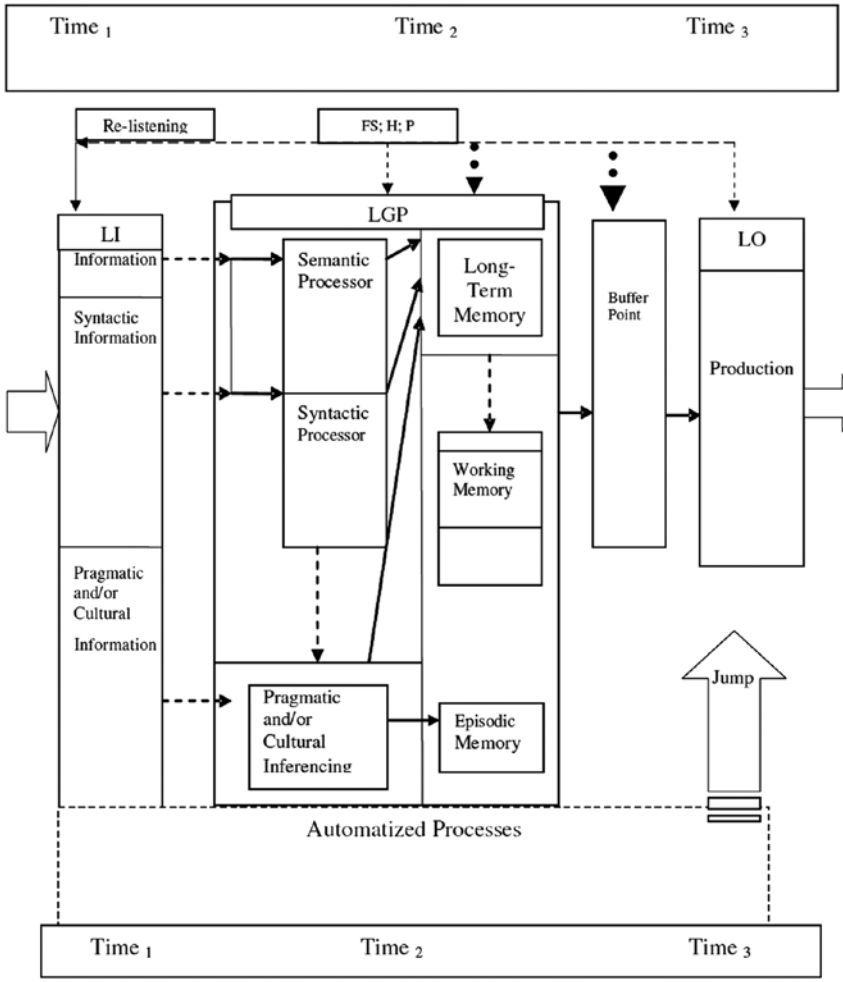

Figure 3.2 A Graphic Representation of the Proposed Approach.

phonemes or strings of phonemes. These pieces of information enter into their slots in the linguo-cognitive processing phase (excluding visual aids such as appear on screen or non-verbal signals, since they are not typically or ideally part of SI). Thus, semantic information is processed in the semantic processor, while syntactic and pragmatic and/or cultural information feeds directly into the syntactic processor and the pragmatic and/or cultural inferencing slot. The aforementioned slots depend on the data stored in the long-term memory and the episodic memory; long-term memory is consulted for the sake of retrieving lexical items that are part or not of the interpreter's active vocabulary. Episodic memory is also consulted for establishing ties

with the pragmatic inferencing slot and the long-term memory. Pragmatic and/or cultural inferencing is the cornerstone in the linguo-cognitive processor, since it takes the partially processed output from the semantic and syntactic processors and relates it to the episodic memory to avoid informalities or inaccuracies on the pragmatic and experiential levels. The dotted arrow from the bottom of both the semantic and syntactic processors indicates partially processed output, while the solid arrows from the three sub-components show how the long-term memory and the episodic memory are directly consulted in order to 'automatize' the process of interpreting as much as possible. Working memory, on the other hand, takes the partially processed output from the pragmatic and/or cultural inferencing compartment to be prepared for the next phase; it monitors its readiness for the buffer point to be checked for consistency.

The buffer point represents the pre-final phase. The output from the linguo-cognitive processor is pushed to the buffer point, which may or may not make minor changes before releasing it in the production phase. The buffer point just makes certain that sentences are well formed; words are properly chosen; semantic, syntactic and pragmatic/cultural processing has properly functioned and the communicative function of the utterance is fulfilled. In the case of uncertainty or untimely released outputs, the buffer point sends rough outputs to the linguo-cognitive processor to be reconsidered as is indicated by the dotted arrows above the buffer point in figure 3.2. Another possibility is that of false starts, hesitations and pauses (aka FS, H and P) in figure 3.2. The unduly processed output may be pushed back for reconsideration (see backtracking in the Basic Assumptions section) after it has been erroneously released, thus resulting in speech errors. This may mean that interpreters' speech errors are true indications of the cognitive processes of simultaneous interpreting.

Interpreters, however, might choose to automatize the entire process by jumping one or more phases. This automatization is a major goal of interpreting strategies, especially anticipation, besides optimization of the output in terms of both form and content. The jumping action is indicated in the figure by means of a dotted box to its end is appended a large arrow. The dotted box may start right after the listening process and end at the production phase. It might also partake from the linguo-cognitive phase or the buffer point. The nature of this action is greatly idiosyncratic and depends on the interpreter's expertise and resources.

Time plays an overarching role in the entire process of simultaneous interpreting in the present re-envisaging or approach. It is important to note that there are three times in figure 3.2. Time One is allotted to the listening effort, Time Two to linguo-cognitive processing and Time Three to the linguistic output. The division of time, as a major criterion, is driven

by the need on the part of the interpreter to deliver the processed output as quickly as possible with minor errors as more input is being received from the speaker. The times consumed in each phase should be proportionate to each other, otherwise, data will accumulate and time lag will increase beyond control. The problematic relationship between time lag and simultaneous interpreting strategies can be represented in the following formulae which will be of benefit to the analyses that will ensue in chapters 4 and 5:

1. (P)T1 > (P)T2 > (P)T3 = excessive lag = major omission
   (P: phase; T: time)
2. (P)T1 < (P)T2 < (P)T3 = minor lag = anticipation
   (P: phase; T: time)
3. (P)T1 = (P)T2 = (P)T3 = NA
   (P: phase; T: time; NA: not applicable)
4. (P)T1 > (P)T2 = (P)T3 = minor lag = compression
   (P: phase; T: time)
5. (P)T1 = (P)T2 > (P)T3 = minor lag = omission or hesitation
   (P: phase; T: time)
6. (P)T1 = (P)T2 < (P)T3 = ideal SI = complete sense
   (P: phase; T: time; SI: simultaneous interpreting)
7. (P)T1 < (P)T2 = (P)T3 = minor lag = anticipation or compression
   (P: phase; T: time)

These formulae can be explained as follows:

- Formula 1: if the time spent on listening is greater than the times spent on linguo-cognitive processing and greater than buffering and production, then the interpreter will not be able to catch up with the speaker. The result will be excessive lag due to excessive waiting for the input. Any attempt at interpreting after such a lag will lead to major omissions on the semantic, syntactic and pragmatic and/or cultural levels.
- Formula 2: if the time spent on listening is less than the times spent on linguo-cognitive processing and buffering and production, then the interpreter will be able to deliver the TU almost fully with minor lag. Anticipation at any linguistic level may be the reason for the interpreter's ability to cope.
- Formula 3: if the times spent on listening, linguo-cognitive processing, buffering and production are all equal, then no interpreting is possible.
- Formula 4: if the time spent on listening is greater than both linguo-cognitive processing and buffering plus production, then the interpreter has compressed some of the source text material to avoid excessive time lag. S/he might have also missed something in the input, or in the output, or is

faster in the target language than the speaker in the source language, which can be due to linguistic factors and to speaker-specific features.

- Formula 5: if the times spent on listening and linguo-cognitive processing are equal, while buffering and production consume less time, then the interpreter has omitted some source text material or hesitated when delivering some of it.
- Formula 6: if the times spent on listening and linguo-cognitive processing are equal, while buffering and production consume more time, then the interpreter has managed to transfer all the linguistic information fully, and the result is no lag, i.e. ideal simultaneous interpreting.
- Formula 7: if the time spent on listening is greater than the times spent on linguo-cognitive processing, buffering and production (which are all equal), then the interpreter has either omitted minor source text material or compressed some of it.

It is important to note that these formulae are only meant to approximate the process of interpreting; some changes might occur in the actual process as will be indicated in chapters 4 and 5. It is also of note to state that these formulae are simplistic to say the least and do not take all situations and circumstances into account. For instance, when an incoming speech segment is followed by a rather long pause in the source speech, the interpreter has more time for production. Another example is the production of formulaic target speech output, which may require little processing capacity even if timewise, it takes longer. In such a case, the proportion of time required for the output is not critical.

3.5 CONCLUSION

The approach or re-envisaging outlined in this chapter is just a typical representation of the process of English-Arabic-English simultaneous interpreting rather than what actually happens. The main advantage of this approach is its emphasis on the ways in which simultaneous interpreting operates and the major processes involved. The basic assumptions here tally with the main components of the re-envisaging or approach, especially transitionality, time and backtracking. The approach is meant as a toolkit for the in-depth analyses that will be carried out in chapters 4 and 5, where the authentic corpus collected will test the applicability of the re-envisaging or approach across English and Arabic.

Chapter 4

Analyzing the English-Arabic Dynamics

4.1 INTRODUCTION

This chapter is concerned with analyzing the English speeches delivered and simultaneously interpreted into Arabic and broadcast on major TV satellite stations such as Al-Jazeera, Al-Hurra and BBC Arabic. The corpus collected is first described, then the method of analysis is fully explained in accordance with the model presented in chapter 3. The aim of this chapter is to illustrate how the model proposed is capable of explaining the decisions taken by interpreters when translating from their B-language (i.e. English) into their A-language (i.e. Arabic). These decisions are mediated by many linguistic and cognitive processes that attest to the complexity of the interpreting activity. These decisions together with the strategies that manifest them are thoroughly traced throughout the corpus by focusing on the linguistic inputs and outputs and how the cognitive processes can be detected through significant pauses and hesitations in the interpreter's production phase. In a sense, both linguistic and paralinguistic data (i.e. pauses and hesitations) furnish the necessary clues for the cognitive activities involved. Wave spectrograms with fractions of seconds are used to illustrate and verify these activities.

4.2 DESCRIPTION OF THE CORPUS

The corpus is made up of a set of data comprising 14 source texts and 15 target texts. This means that all the source texts except for one have one interpretation each. Only the speech by Netanyahu in the Congress is presented with two interpretations, one from Al-Jazeera and the other from BBC Arabic. The reason for this variation stems from two reasons. First, this is

the only English political speech found with two Arabic interpretations, at the time of compiling the corpus, in two renowned satellite stations which are supposed to recruit highly qualified interpreters. Second, there is a need to compare even briefly the outputs of two interpreters of the same source text to verify how the process of interpreting is too complex to be analyzed separately.

4.2.1 Source Texts

4.2.1.1 Rationale

The source texts are speeches that mark important political events or responses to major speeches delivered by renowned personalities. Their choice has been informed by their availability, authenticity and completeness. Their lengths vary from 3 minutes and 53 seconds to 48 minutes and 58 seconds with a total length of approximately 3 hours and 16 minutes. Their size is 16,904 words. Table 4.1 summarizes the lengths of the source texts in ascending order together with the TV channels on which the interpretations were broadcast and their occasions.

Table 4.1 A Summary of the Time Durations of the Source Texts, TV Channels and Occasions of their Interpretations in the English-Arabic Corpus

Text No	*Time Duration (minutes:seconds)*	*TV Channel(s)*	*Occasion*
Text 1 (Clinton, 19 May 2011)	3:53	Al-Hurra	Delivered prior to Obama's lengthy speech to the Middle East on 11 May 2011.
Text 2 (Obama, Marquette)	4:16	Al-Arabiya	Delivered on 10 February 2011 at Northern Michigan University after Mubarak's deposition.
Text 3 (Clinton's remarks)	5:20	BBC Arabic	Delivered on 27 January 2010 in the course of the diplomatic efforts made by Clinton in collaboration with the UK foreign secretary and Yemeni Foreign Minister Al-Qirbi.
Text 4 (Obama's remarks after Mubarak's resignation)	6:12	Al-Jazeera	Delivered on 11 February 2011 as an evaluation of the Egyptians' peaceful uprising and the reaction of the Military.

Table 4.1 A Summary of the Time Durations of the Source Texts, TV Channels and Occasions of their Interpretations in the English-Arabic Corpus *(Continued)*

Text No	*Time Duration (minutes:seconds)*	*TV Channel(s)*	*Occasion*
Text 5 (Tea Party response)	6:23	Al-Hurra	Delivered by US Tea Party Spokesman Bachmann on 26 January 2011 as a critical response to Obama's speech on the reforms to be pursued in the US economy in 2011.
Text 6 (Miliband's speech, Security Council)	6:36	Al-Jazeera	Delivered on 6 January 2009 at the Security Council as part of Miliband's opinions on the atrocities committed in the Gaza War back in 2008–2009, and the solutions to steer out of the crisis.
Text 7 (Condoleezza Rice, Security Council)	7:54	Al-Jazeera	Delivered on 6 January 2009 at the Security Council as part of Rice's views on the Gaza War launched in 2008.
Text 8 (Ban Ki-moon, 6 January 2009)	8:13	Al-Jazeera	Delivered on 6 January 2009 at the Security Council, and is concerned with his view on the Gaza War in launched in 2008, and the efforts made by the UN to shelter the Palestinians and cure the wounded.
Text 9 (Obama, killing Bin Laden)	9:46	Al-Jazeera	Delivered on 2 May 2011, and is concerned with the US achievement of capturing Bin Laden and shooting him dead by a group of American troopers.
Text 10 (GOP response, Paul Ryan)	10:31	Al-Hurra	Delivered by US GOP (Grand Old Party) Representative Paul Ryan and is concerned with his response to Obama's State of the Union address on the attempts at reforming the US economic system in 2011.

(Continued)

Table 4.1 A Summary of the Time Durations of the Source Texts, TV Channels and Occasions of their Interpretations in the English-Arabic Corpus *(Continued)*

Text No	*Time Duration (minutes:seconds)*	*TV Channel(s)*	*Occasion*
Text 11 (Obama, troop withdrawal)	13:09	Al-Jazeera	Delivered on 22 June 2011. The text is concerned with Obama's decision to withdraw US troops from Afghanistan in 2010.
Text 12 (Israeli Rep., Security Council)	15:07	Al-Jazeera	Delivered by Israeli Representative to Security Council Ambassador Shalev on 6 January 2009. The text is concerned with her evaluation of the Gaza War in 2008, and the losses sustained by Israel.
Text 13 (Obama, AIPAC)	26:11:00	Al-Hurra	Delivered by US president Barack Obama on 22 May 2011 at the AIPAC (The American-Israeli Public Affairs Committee)* Conference. The text is concerned with his commitment to safeguard the Israeli interests and the US readiness to ward off any threats against Israel.
Text 14 (Netanyahu's speech, Congress)	48:58:00	Al-Jazeera; BBC Arabic	Delivered on 7 July 2011 at the US Congress. The text is concerned with Netanyahu's response to Obama's call for Israel to retreat to the 1967 lines in one of his speeches.
Total number: 14	Total duration: approx. 3 hours and 16 minutes	N/A	N/A

*The American-Israeli Public Affairs Committee (AIPAC) is one of the most powerful lobbies in the United States. They describe themselves as 'America's Pro-Israel lobby'. See: https://en.wikipedia.org/wiki/American_Israel_Public_Affairs_Committee.

They are also recent speeches, for they are located between 2008 and 2011. This adds to their importance and shows how current interpreting activity is managed on TV satellites.

4.2.2 Target Texts

The target texts are all the telecast interpretations of the English source texts. They total 15 speeches. They have been transcribed verbatim with all the

pauses and hesitations included. Even cheers have been included between parentheses in order not to interfere with the sound analyses carried out by specialized software.

4.3 METHOD OF ANALYSIS

4.3.1 Preparing the Data for Analysis

4.3.1.1 A Note on Pauses and Hesitations

The scripts of source texts were transcribed verbatim with all pauses, hesitations and cheers included. The two sets of data were matched to ensure clarity and completeness. In the target texts, pauses were divided into very long, long and short in order to take benefit of their significance. Very long pauses were marked by more than three dots [….] and long and short ones were marked by three dots […] and two dots [..] respectively. Combinatory symbols are allowed, where excessively long pauses are indicated by means of five or more dots […..]. Cheers were included between parentheses and indicated by the Arabic word تصفيق. Hesitations, on the other hand, were intratextually glossed and transcribed as they are without any special annotations. It is important to note that the classification of pauses and hesitations adopted in this analysis is a reconciliation of that of Tissi (2000) and Cecot (2001). In this classification, pauses are divided into silent and filled ones. Hesitations are called interruptions and are subdivided into repetition, correction and false starts. This classification suffers the major disadvantage of considering pauses as non-fluencies (i.e. unintentional), rather than disfluencies (i.e. intentional). In fact, pauses are shortcomings of speech production and cannot be considered acceptable in delivery unless they serve a rhetorical purpose. Moreover, this classification ignores the several subdivisions of very long, long and short pauses, and does also not provide a precise length in milliseconds or otherwise.

Cecot (2001) presents a classification where silent and filled pauses are separated by being considered either communicative or non-communicative. This overrides the major obstacle of the rhetorical effect of pausing. Moreover, Cecot considers Tissi's correction mainly syntactic and calls it 'restructuring'. Cecot also adds segmentation pauses which are instrumental in dealing with complex constructions and lengthy sentences or clauses. Décalage or time lag is likewise acknowledged as a major feature of SI delivery. However, Cecot's classification misses intra-sentential pauses (i.e. Tissi's 'clause-internal pauses'), which are of paramount importance as an indicator of the cognitive process of restructuring complex and long sentences, and parenthetical phrases and clauses.

The classification in table 4.2 is adopted based on the attempts of Tissi (2000) and Cecot (2001).

Table 4.2 A New Classification of Speech Non-Fluencies in SI

Speech Non-fluencies in SI				
Silent Pauses				*Hesitations*
Very Long	*Long*	*Optimal*	*Short (Insignificant)*	*Filled Pauses*
Sentence- or clause-initial (i.e. initial décalage)	Sentence- or clause-initial (i.e. initial décalage)	Sentence- or clause-initial (i.e. initial décalage)	Sentence- or clause-initial (i.e. initial décalage)	False starts: Restructuring; Lexical correction
Intra-sentential or intra-clausal (internal décalage)	Intra-sentential or intra-clausal (internal décalage)	Intra-sentential or intra-clausal (internal décalage)	Intra-sentential or intra-clausal (internal décalage)	Repetition
Breathtaking	Breathtaking	Breathtaking	Breathtaking	
Nil	Rhetorical			

This classification is rather elaborate, but it has a number of advantages. First, it acknowledges initial and internal silent pauses as two important subcategories, unlike Tissi's and Cecot's classifications which emphasize one at the expense of the other. Second, silent pauses are subdivided into very long, long, optimal and short (or insignificant). This subdivision is based on Bilá and Džambová (2002, p. 110), where they include, inter alia, the following in milliseconds:

1. Short pause (100 ms – ≤ 300 ms)
2. Normal/optimal (300 ms – ≤ 1350 ms)
3. Long pause (1 350 ms – ≤ 2 200 ms)
4. Very long pause (2 200 ms – ≤ 2 800 ms)

Third, this classification considers filled pauses as a subdivision of hesitations. This gives room to more flexibility in dealing with the several types of hesitations, rather than considering hesitations as a subdivision of filled pauses.

4.3.1.2 Coding

Coding refers here to the way the source and target texts are represented in the course of this chapter and in the appendices. Each source text is given a distinct number, and in parentheses is included its title briefly. This is meant to make the speeches separate and to avoid any confusion that may arise due to the similarity of the titles of any two or more speeches.

4.3.1.3 Technical Equipment

The material was filtered to reduce noise, especially background noise and hums and hisses at a −28 dB rate with a multi-band noise utility expressly designed by the author. The speaker's voice was also muted to < 0.5. Afterwards, the audio track was examined for pauses in milliseconds. To produce wave spectrograms, the target texts were analyzed at a 1,600 kHz by another program expressly designed (modelled on SFS) by the author. These spectrograms were then zoomed in on to every 1/4 or 1/2 of a second. The benefit of this zooming is to obtain the pauses and hesitations very precisely.

4.3.2 Dimensions of Analysis

The analyses carried out here are based on the discussion of the model proposed in chapter 3. The two dimensions of the linguistic and cognitive are interleaved in such a way as each feeds into the other. The method of analysis is divided into two dimensions: quantitative analysis and qualitative analysis.

Quantitative analysis is concerned with the sum-total of pauses, mean pause duration, the numbers of optimal, long and very long pauses in each target text and active speech levels. Qualitative analysis mainly focuses on the linguistic choices, and errors are first related to the interpreter's linguistic competence, which is made up of lexico-semantic, syntactic and pragmatic processors and sub-components. The interactions and competitions among these phases together with the processing of tropes are also analyzed. The cognitive processes of these processors are explored by inferring the phases they represent in the model. Pauses and hesitations that are detected in the course of this analysis are graphically represented by dint of wave spectrograms that illustrate their durations and the intonation contours involved, especially in the case of hesitations. This double approach ensures that the linguistic and the cognitive dimensions are always in interplay, and that the model proposed is doubly evaluated as a viable toolkit. It also provides in-depth analyses of the strategies applied and their cognitive activities.

4.4 ANALYSES OF THE INTERPRETATIONS OF THE SELECTED TEXTS

4.4.1 Quantitative Analysis

4.4.1.1 Pauses

The analysis of pauses focuses with the number of pauses, mean pause duration, the numbers of short, optimal, long and very long pauses in each target text, and active speech levels. The values provided in table 4.3 shed light on the way the simultaneous interpreting task from English into Arabic is carefully managed within tight time limits, in addition to clarifying how the cognitive processes are performed. They also furnish the overall picture for the qualitative analysis that ensues in the next section.

It is clear from table 4.3 that the interpreters maintain a reasonable number of pauses in relation to the time durations of the speeches interpreted. They do not exceed 233 pauses in a speech of approximately 26 minutes, and keep the minimum to 23 pauses in a speech of approximately 4 minutes. The variations observed between these two extremes can be attributed to the length and cognitive demands of the STs. The interpreters also succeed in maintaining their very long pauses between a maximum of 101 times and a minimum of 4 times for the same reasons. However, each decrease in the number of very long pauses leads to a noticeable increase in the numbers of optimal pauses.

Their mean pause durations are located along a scale ranging from 2,350.96 milliseconds to 407.27 milliseconds. These values are largely within the

Table 4.3 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the English-Arabic Corpus

Text No	*Time Duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 1 (Clinton, 19 May 2011)	3:53	Number of pauses	125	N/A
		Mean pause duration	407.27 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	80	N/A
		Number of long pauses	12	N/A
		Number of very long pauses	14	N/A
		Active speech level	−49.7 dB Activity: 100.0%	Min:--- Max: 100%
Text 2 (Obama, Marquette)	4:18	Number of pauses	23	N/A
		Mean pause duration	817.45 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	14	N/A
		Number of long pauses	2	N/A
		Number of very long pauses	4	N/A
		Active speech level	−39.5 dB Activity: 94.6%	Min:--- Max: 100%
Text 3 (Clinton's remarks)	5:20	Number of pauses	116	N/A
		Mean pause duration	550.43 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	60	N/A
		Number of long pauses	11	N/A
		Number of very long pauses	14	N/A
		Active speech level	−45.2 dB Activity: 99.9%	Min:--- Max: 100%

(Continued)

Table 4.3 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the English-Arabic Corpus *(Continued)*

Text No	*Time Duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 4 (Obama's remarks after Mubarak's resignation)	6:12	Number of pauses	57	N/A
		Mean pause duration	439.71 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	22	N/A
		Number of long pauses	2	N/A
		Number of very long pauses	5	N/A
		Active speech level	−35.1 dB Activity: 98.8%	Min:-- Max: 100%
Text 5 (Tea Party response)	6:23	Number of pauses	69	N/A
		Mean pause duration	414.40 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	29	N/A
		Number of long pauses	6	N/A
		Number of very long pauses	4	N/A
		Active speech level	−48.1 dB Activity: 100.0%	Min:--- Max: 100%
Text 6 (Miliband's speech, Security Council)	6:36	Number of pauses	95	N/A
		Mean pause duration	474.05 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	61	N/A
		Number of long pauses	6	N/A
		Number of very long pauses	8	N/A
		Active speech level	−32.5 dB Activity: 97.0%	Min:--- Max: 100%

Text 7 (Condoleezza Rice, Security Council)	7:54	Number of pauses	96	N/A
		Mean pause duration	578.10 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	44	N/A
		Number of long pauses	12	N/A
		Number of very long pauses	11	N/A
		Active speech level	−40.0 dB Activity: 96.3%	Min:--- Max: 100%
Text 8 (Ban Ki-moon, 6 January 2009)	8:13	Number of pauses	61	N/A
		Mean pause duration	814.35 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	22	N/A
		Number of long pauses	9	N/A
		Number of very long pauses	11	N/A
		Active speech level	−45.9 dB Activity: 99.5%	Min:--- Max: 100%
Text 9 (Obama, killing Bin Laden)	9:46	Number of pauses	153	N/A
		Mean pause duration	537.35 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	59	N/A
		Number of long pauses	0	N/A
		Number of very long pauses	5	N/A
		Active speech level	−30.9 dB Activity: 97.5%	Min:--- Max: 100%

(Continued)

Table 4.3 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the English-Arabic Corpus *(Continued)*

Text No	*Time Duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 10 (GOP response, Paul Ryan)	10:31	Number of pauses	123	N/A
		Mean pause duration	1,128.40 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	10	N/A
		Number of long pauses	17	N/A
		Number of very long pauses	14	N/A
		Active speech level	−47.9 dB Activity: 98.0%	Min:--- Max: 100%
Text 11 (Obama, Troop Withdrawal)	13:09	Number of pauses	214	N/A
		Mean pause duration	687.69 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	80	N/A
		Number of long pauses	17	N/A
		Number of very long pauses	8	N/A
		Active speech level	−30.9 dB Activity: 97.5%	Min:--- Max: 100%
Text 12 (Israeli Rep., Security Council)	15:07	Number of pauses	212	N/A
		Mean pause duration	607.20 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	86	N/A
		Number of long pauses	21	N/A
		Number of very long pauses	15	N/A
		Active speech level	−33.5 dB Activity: 96.0%	Min:--- Max: 100%

Text 13 (Obama, AIPAC)	26:11:00	Number of pauses	233	N/A
		Mean pause duration	1,494.21 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	31	N/A
		Number of long pauses	19	N/A
		Number of very long pauses	48	N/A
		Active speech level	−38.8 dB Activity: 83.6%	Min:--- Max: 100%
Text 14 (Netanyahu's Speech, Congress; Al-Jazeera Interpretation)	48:58:00	Number of pauses	206	N/A
		Mean pause duration	1,547.77 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	174	N/A
		Number of long pauses	12	N/A
		Number of very long pauses	16	N/A
		Active speech level	−37.5 dB Activity: 94.3%	Min:--- Max: 100%
Text 14 (Netanyahu's Speech, Congress; BBC Interpretation)	48:58:00	Number of pauses	208	N/A
		Mean pause duration	2,350.96 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	1,000 ms	N/A
		Number of long pauses	0	N/A
		Number of very long pauses	101	N/A
		Active speech level	−41.1 dB Activity: 95.5%	Min:--- Max: 100%

optimal levels, that is, Min. 100 milliseconds, Max. ≤ 2,800 milliseconds, according to the ranges provided by Bilá and Džambová (2002). Moreover, they manage to miss few source-textual segments by way of omission and compression as is manifested by their active speech levels. These levels range between 100% and 90.6%.

The above-mentioned values are mainly an indication of the high performance of the interpreters, and their ability to use their attentional and cognitive resources appropriately with a minimum of effort waste. This runs contrary to the findings of Darwish (2006), who contends that Arab interpreters lack sufficient training and so perform poorly when interpreting telecast speeches.

4.4.1.2 Ear-Voice Span (EVS)

The analysis of the Ear-Voice Span values is concerned with the differences in time between the speaker's output and the interpreter's output. The importance of this analysis stems from the influence of the speech rate on the reception and production of the interpreter. Major time differences may indicate

Table 4.4 The Speech Rates of Speakers and Interpreters, Together with the Calculated EVS in the English-Arabic Corpus

Text No	*Speaker's Rate (Words Per Minute)*	*Interpreter's Rate (Words Per Minute)*	*EVS (Words Per Minute)*
Text 1 (Clinton, 19 May 2011)	162.5	111	51.5
Text 2 (Obama, Marquette)	122.22	83.57	38.65
Text 3 (Clinton's remarks)	137.04	99.42	37.62
Text 4 (Obama's remarks after Mubarak's resignation)	139.12	103.27	35.85
Text 5 (Tea Party response)	142.05	104.49	35.79
Text 6 (Miliband's speech, Security Council)	140	115.16	24.84
Text 7 (Condoleezza Rice, Security Council)	128.32	105.15	23.17
Text 8 (Ban Ki-moon, 6 January 2009)	117.63	104.44	13.19
Text 9 (Obama, Killing Bin Laden)	145.34	101.37	43.97
Text 10 (GOP response, Paul Ryan)	158.97	93.6	65.37
Text 11 (Obama, Troop withdrawal)	156.27	97.02	59.25
Text 12 (Israeli Rep., Security Council)	116.47	91.97	24.5
Text 13 (Obama, AIPAC)	103.3	73.11	30.19
Text 14 (Netanyahu's Speech, Congress; Al-Jazeera version)	68.63	64.72	3.91
Text 14 (Netanyahu's Speech, Congress; BBC version)	68.63	60	8.63
Average	127.09	93.89	33.09

that the interpreter either fails to cope with the speaker, or he/she anticipates more than normal. Table 4.4 summarizes the speech rates of speakers and interpreters, together with the calculated EVS.

It is evident from table 4.4 that interpreters operating from English into Arabic are prone to have a maximum EVS of 65.37 words per minute and a minimum of 3.91 words per minute. This great variation is indicative of the way their cognitive processor operates in relation to the speed of delivery of STs. As the EVS increases, cognitive processes become more complex, since they require more time and effort. Speech rates also indicate that fast delivery adds to the problem of lag: the upper bound of EVS as mentioned above is a sequel to the fast delivery rate of 156.27 words per minute (cf. Text 11). With lower bound is similarly a sequel of a relaxed delivery rate of 68.63 words per minute (cf. Text 14). However, with normal delivery rates, as in the texts from 2 to 9, and texts 12 and 13, the EVS is situated within acceptable limits of 40 to 12 words per minute. This means that the cognitive processes involved in interpreting in the English-Arabic direction are normally sporadic, with less extreme pausing or lag. The averages provided at the end of table 4.4 corroborate this finding, where a general EVS of 33.09 words per minute.

4.4.2 Qualitative Analysis

The dimension of qualitative analysis is concerned with the detection of the various cognitive processes involved in interpreting from English into Arabic. According to the model proposed in chapter 3, these processes are divided into lexico-semantic, syntactic and pragmatic inferencing. Each of these processes is mediated by linguistic decisions that are also taken to be their manifestations in the form of utterances. Specific occurrences of pauses are pinpointed and analyzed under each process, coupled with the strategies applied, to gain more insight into how much the simultaneous interpreting process is complex, with a view to the cognitive causes of the adoption or exclusion of one strategy or another.

4.4.2.1 Lexico-Semantic Processing

The lexico-semantic processor is a major component of the Linguo-Cognitive Processor (LGP) as indicated in model proposed in chapter 3. It is sometimes highly successful in dealing with lexical problems in simultaneous interpreting from English into Arabic by taking the right decision with the least cognitive effort involved. Other times, it exhibits much hesitation and silences due to the complexity of the task. The following examples illustrate how the lexico-semantic processor behaves according to the interpretations of the speeches selected.

Consider the interpretation of the following extract in Text 1:

ST	*TT*	*Back Translation*
Mr. President, from your first days in office you have charged us with implementing a bold new approach for America's foreign policy	سيادة الرئيس منذ يومك الأول لقد كلفتنا بتطبيق ...طريق جديد للسياسة الأمريكية و مشرو جديد لكيفية ...نقدم قيادتاتنا و نقوي من شركائنا	Mr. President Since your first day, you have required us to implement ... a new road for US policy and new guidelines for how ... we offer our leadership and strengthen our partnership.

In the second paragraph, which is made up of two sentences, the interpreter pauses over 'bold' long before omitting it. His long pause is represented graphically in figure 4.1.

The pause after بتطبيق is estimated to be approximately 0.6 seconds, that is, 615 milliseconds. This pause is considered an optimal one according to the classification presented by Bilá and Džambová (2002). The significance of this pause relates to the interpreter's search in the mental lexicon located in the LTM; the lexico-semantic lag leads to the omission of 'bold' and the interpretation of 'approach' as طريق rather than مدخل. It is also somewhat tallied with Formula 5 in chapter 3, which runs as follows:

(P)T1 = (P)T2 > (P)T3 = minor lag = omission or hesitation
(P: phase; T: time)

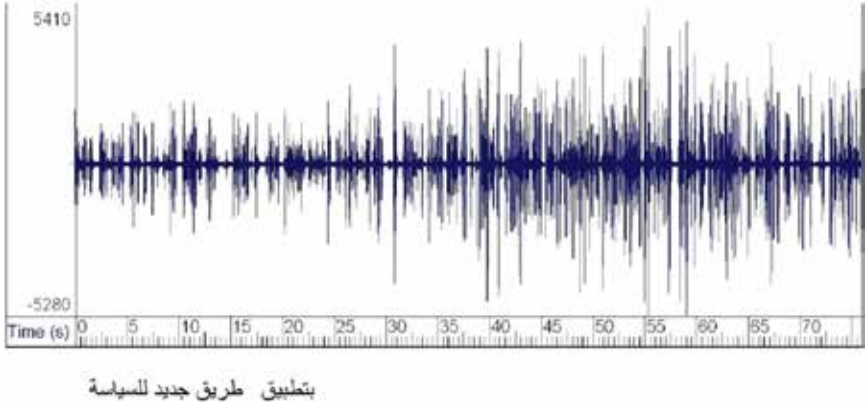

Figure 4.1 A Wave Spectrogram for the First Pause in Text 1.

(If the times spent on listening and linguo-cognitive processing are equal, while buffering and production consume less time, then the interpreter has omitted some source text material or hesitated when delivering some of it.)

According to this formula, the interpreter has spent much time on the lexico-semantic phase by searching in the LTM. This leads to omitting 'bold' and compromising 'approach'.

In the same text, the lexico-semantic processor is faced with certain problems, so hesitations are detected in the following extract:

ST	*TT*	*Back Translation*
America's diplomats and development experts of the State Department and USAID are on the front lines of protecting America's security, advancing America's interests, and projecting America's values…	فإن خبراء التنمية في وزارة الخارجية و في وكالة التنمية هم في ...في ..على الجبهة في حماية أمن أمريكا و دعم مصالح أمريكا و التعبير عن قيم أمريكا و كوس..و باستمرار عملية التغير في الشرق الأوسط وشمال أفريقيا	The development experts at the State Department and the Development Agency are ... in ... on the front in protecting America's security, supporting America's interests, expressing the values of America and as a mea... and constantly changing the Middle East and North Africa

The interpreter again hesitates on 'on the front lines'. This hesitation may be due to the lexico-semantic processor's preferences. A search for the idiomatic phrase in Arabic is governed by its pragmatic appropriateness as being borrowed from the military register (cf. Fayed, 2003). The interpreter also hesitates on 'as a wave of change', which he translates as و كوس..و باستمرار عملية التغير في الشرق الاوسط. The lexical correction of وكوس as a means to use كوسيلة indicates the interpreter's complex cognitive process; he is to use وسيلة, which is halfway in the production phase, but the buffer point receives extra information from pragmatic and/or cultural inferencing, which opts out of وسيلة and chooses استمرار as more durable. This change in course is actually at the expense of the lexico-semantic processor; the phrase موجة تغيير would have been adequate and central to the ST's meaning.

In Text 3, the interpreter faces a lexical problem, which takes toll on his lexico-semantic processing demands. Consider the following extract:

ST	*TT*	*Back Translation*
And it is a privilege to be here with Minister Qirbi. I met with him about a week ago and we talked in depth about a lot of the issues confronting Yemen..	إنه من دواعي الاعتزاز أن أكون معه و قد التقيت به قبل اس..بووع وقد تحادثنا بعمق حول العديد من القضايا التي تواجه اليمن	It is a great honor to be with him and I have met him before..a w..eak and we have talked deeply about many of the issues facing Yemen.

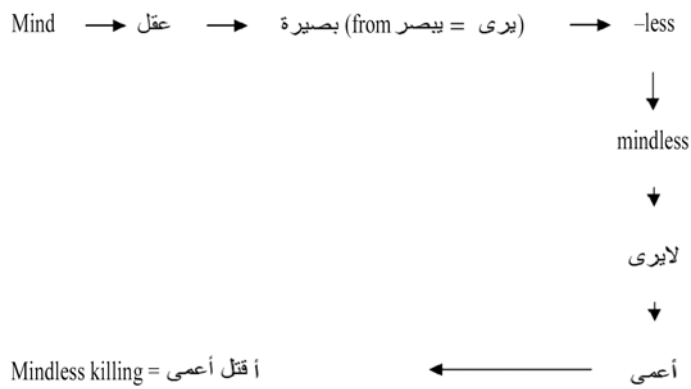

Figure 4.2 A Schematic Representation of the Deverbalization Process.

The interpreter's lexico-semantic processor is detected at 'it is a privilege', which is rendered idiomatically as إنه من دواعي الاعتزاز, in order to preserve the first sense of 'privilege' as an added advantage as reported by Random House Webster's Unabridged Dictionary (2009):

1. A right, immunity, or benefit enjoyed only by a person beyond the advantages of most: *the privileges of the very rich*.

This sense is carried further by the interpreter in the form of deverbalization to mean 'an advantage worthy of pride', so to say, and this what might have led to اعتزاز.

In Text 4, the effort made in keeping as close as possible to the speaker's rate is reflected in the error committed in translating 'Indonesian students' into التونسيون, probably due to misperception. However, the interpreter takes a well-justified decision in translating 'mindless killing' into القتل الأعمى, where the sense 'reason, sanity, or sound mental condition' (cf. *Random House Webster's Unabridged Dictionary*, 2009) is deverbalized through a number of steps as shown in figure 4.2.

This complex process is supposed to have occurred in the lexico-semantic processor and in tandem with the WM.

In Text 5, the interpreter resorts to sense relations as a sub-component of lexico-semantic processing resources in the following extract:

ST	*TT*	*Back Translation*
• The president could agree to an energy policy that increases American energy production and reduces our dependence on foreign oil. • The president could also turn back some of the 132 regulations put in place in the last two years, many of which will cost our economy $100 million or more.	الرئيس يمكن أن.. يو..وقف إدارة حكومية من فرض ضرائب جديدة و يمكن أن يدعم التعديل الخاص بالموازنة المتوازنة أو الميزانية المتوازنة و أيضا زيادة إنتاج الطاقة الأمريكية و تقليل اعتمادنا على النفط الاجنبي الرئيس يمكن ا..أن يلغي بعض اللوائح ال 132 التي وضعها في العامين القادمين و الكثير منها ستكلف الاقتصاد 100 مليون دولار أو أكثر.	The president could ... s .. stop the government administration from imposing new taxes. It can support balanced budget adjustment or balanced budget. And also increase US energy production and reduce our dependence on foreign oil. The president could ..cancel some of the 132 regulations he has set up in the next two years, many of which will cost the economy $ 100 million or more.

The interpreter is faced with the acronym EPA, which is a U.S. Govt. Environmental Protection Agency, an independent federal agency created in 1970 that sets and enforces rules and standards that protect the environment and control pollution (see *Random House Webster's Unabridged Dictionary*, 2009). Here, the risk of omission is high, since the acronym is central to the meaning. The interpreter opts for a broad hypernym, namely إدارة حكومية, as a barely acceptable equivalent (cf. Sharon, 2004). He then faces another lexical obstacle, namely the 'cap-and-trade system', which is not present in his mental lexicon.

On certain textual episodes, the lexico-semantic processor takes precedence and handles all the lexical problems on one level. The following extract in Text 6 illustrates how this is clear:

ST	*TT*	*Back Translation*
There could not be a greater contrast between the daily regime …	لا يمكنني أن أقول هناك مقارنة عظيمة و فرق عظيم للنظام اليومي و الدبلوماسية الحساسة	I cannot say there is a great comparison and a great difference to the daily system and sensitive diplomacy

The interpreter resorts to his lexico-semantic processor right from the beginning: he provides two words for 'greater contrast' which are مقارنة عظيمة و فرق عظيم. This explicitation strategy is applied because the interpreter recalls from his lexical lexicon in the LTM that 'contrast' is either فرق or مقارنة لتبيان الفروق. The competition between the two leads to using both to avoid any ambiguity.

In the same text (i.e. Text 6), the interpreter also starts to process the sentence, 'the immediate trigger for Israeli military action was the end of the truce' lexico-semantically, but the search for 'trigger' in the mental lexicon takes long to find the appropriate equivalent. This search consumes approximately 0.5 seconds (i.e. 524 ms) as shown in figure 4.3 by the wave spectrogram.
This relatively optimal pause affects the syntactic processing of the sentence; the interpreter produces لكن ا...لاطلاق ل..العملية الإسرائيلية الحالية كان نهاية, which is transcoded to save time.

In Text 9, lexico-semantic processing succeeds in solving all the lexically problematic parts as in the following extract:

ST	*TT*	*Back Translation*
In Afghanistan, we removed the Taliban government, which had given bin Laden and Al-Qaeda safe haven and support. And around the globe, we worked with our friends and allies to capture or kill scores of Al-Qaeda terrorists, including several who were a part of the 9/11 plot.	و كما أننا استطعنا أن نمنع ..ب..ب..أسامة بن لادن و رفاقنا من الحصول على ملاذات آمنة و قد سجلنا نجاحات كبيرة ضد الكثيرين من الذين ساهموا في ..الهجوم في الحادي عشر سبتمبر أيلول.	We have also been able to prevent b..b..Usama bin Laden and our comrades from getting safe havens and we have scored great successes against many of those who contributed to the .. attack on September the eleventh.

Earlier in the Text 9, the interpreter inappropriately expands 'tireless and heroic' into تكل أو تمل, thus omitting 'heroic' and breaking down 'tireless' into two words in the TT. This leads to hesitation at 'we've made great strides',

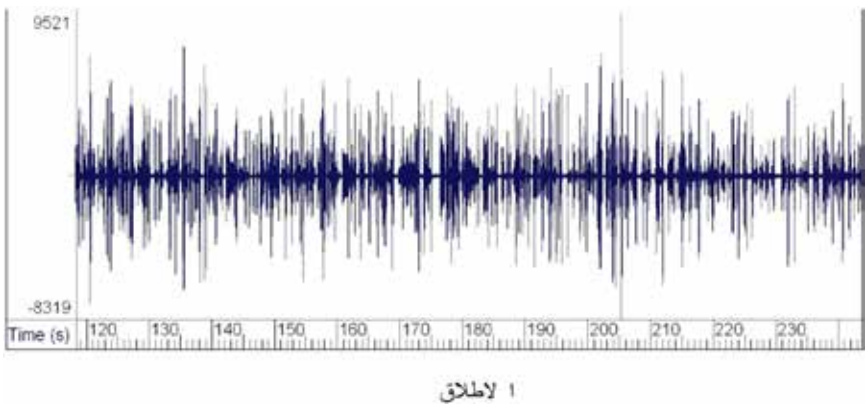

Figure 4.3 A Wave Spectrogram for the Fourth Pause in Text 6.

which he turns into قدمنا..تقدمنا تقدم كبير. This also results into loss later on, as is the case in the omission of 'in Afghanistan, we removed the Taliban government'. Worse still, the interpreter misperceives 'scores' as 'success', and interprets it as سجلنا نجاحات.

In the same text (i.e. Text 9), the lexico-semantic processor experiences some problems which render the processing phase clearly intractable. The interpreter hesitates at 'we know well the costs of war' by inserting a false start مجد جيدا. This false start illustrates his lexico-semantic processor at work. The interpreter might have been thinking of ما هي, then in the buffer point the TL output is revised, and thus opts for جيدا. Due to the 'broken program' (see Chernov, 2004), the two words compete resulting in the blend مجد. The interpreter quickly corrects the utterance to achieve جيدا ماهي. Coupled with the lexical difficulty of 'weigh on me', this complex operation affects the syntactic processing of the parenthetical phrase 'as Commander-in-Chief', which is also revised resulting in the ill-formed sentence إنني اتذكر ذلك كلما.. كل مرة أوقع فيها ..قاعدة على ك..قوات مسلحة أوقع فيها كتابا اله..الى أحد قتلنا ..إلى عائلة أحد قتلانا as a translation for 'These efforts weigh on me every time I, as Commander-in-Chief, have to sign a letter to a family that has lost a loved one, or look into the eyes of a service member who's been gravely wounded'.

In the same text, the interpreter experiences similar difficulty with lexico-semantic processing. He likewise hesitates at 'stand idly by', which he translates into نقف نقف مكتوفي الايدي by retrieving the meaning of the verb 'idle' as explained by *Random House Webster's Unabridged Dictionary* (2009):

—**idleness**, n. —**idly**, adv.
/uyd"l/, adj., **idler**, **idlest**, v. **idled**, **idling**, n.
v.i.
10. to pass time doing nothing.
11. to move, loiter, or saunter aimlessly: to idle along the avenue.
12. (of a machine, engine, or mechanism) to operate at a low speed, disengaged from the load.
v.t.
13. to pass (time) doing nothing (often fol. by away): to idle away the afternoon.

He also hesitates at 'justice has been done' for the same reason.

Anaphora resolution is a major challenge for the lexico-semantic processor. This is clear in Text 9 when the interpreter omits the entire sentence 'I know that it has, at times, frayed' apparently for two reasons. First, he is unable to determine the anaphoric reference of 'it'. Second, he is faced with 'frayed', which might not be among his active vocabulary. These two

lexico-semantic problems lead to the omission at the syntactic processor, since no data are carried over.

Another strategy adopted to facilitate lexico-semantic processing is transcodage. However, it results in much literalism that verges on incomprehensibility. In the following extract in Text 11, the interpreter attempts to break away from transcodage by taking a number of strategic decisions:

ST	*TT*	*Back Translation*
Tonight, I can tell you that we are fulfilling that commitment. Thanks to our men and women in uniform, our civilian personnel, and our many coalition partners, we are meeting our goals.	الليلة..أستطيع أن أقول لكم إننا نوفي بهذا الجزاء...بفضل..جهود الرجال و النساء في قواتنا و المدنيين أيضا و كثير من شركائنا في التحالف نحن..نحقق هذا الهدف	Tonight, I can tell you that we are meeting that reward… Thanks to .. the efforts of men and women in our forces, civilians, and many of our coalition partners, we are.. achieving this goal.

The interpreter commits a lexico-semantic error by translating 'commitment' into الجزاء. This error can be justified if anticipation is taken into consideration. The interpreter is driven by 'fulfilling' to the equivalent نوفي, and so anticipates the full range of the words that collocate with وفى in Arabic. Yet his mental lexicon has the prime وفى in the meaning of لبى, as the second sense in MSA Dictionary shows:

- وفي الشخص الوعد/وفي الشخص بالوعد: حافظ عليه وعمل به، أتمه وأنجزه، ضد غدر "وفى بالعهد- وفى بما التزم به من مهمات".
- وفى بالغرض: لبى الحاجة

The interpreter's lexical access is thus organized in a way different from the dictionary. This organization leads the lexico-semantic processor to opt for the collocate الجزاء as the first after لبى (i.e. أعطى). This anticipation strategy is the reason for the error of translating 'commitment' into جزاء.

The opposite of transcodage is deverbalization. In the same text, the interpreter translates 'men and women in uniform' into الرجال و النساء في قواتنا. The idiomatic use of 'uniform' is transformed into a sense group of equivalent meaning.

4.4.2.2 Syntactic Processing

The syntactic processor is limited due to its nature; it operates on the transformation of certain ST structures into acceptable, well-formed ones in the direction of the TT. This means that any attempt to overload the syntactic processor inevitably leads to interrupting the process of simultaneous interpreting, since

the lexico-semantic processor cannot play its role. Certain problems left over by the lexico-semantic processor are to be handled by the syntactic processor, only after the former fails. This may be one reason why the syntactic processor seems to be cognitively overburdened. Another reason is the strange syntax that might supervene in the course of interpreting, and necessitates adroit solutions such as compression, shortening or even transcodage. The following examples well illustrate how the syntactic processor operates.

In the following extract taken from Text 3, the interpreter resorts to syntactic processing in the rendition of 'with Minister Qirbi', which is compressed by the anaphoric pronoun هـ in معه to save time for monitoring the rendition of 'about a week ago', which exhibits short lag and hesitation, that is, قبل أسـ..بووع:

ST	*TT*	*Back Translation*
And it is a privilege to be here with Minister Qirbi. I met with him about a week ago and we talked in depth about a lot of the issues confronting Yemen, and I appreciated he and the prime minister coming to this meeting so committed and so well prepared.	إنه من دواعي الاعتزاز أن أكون معه و قد التقيت به قبل أس..بووع وقد تحادثنا بعمق حول العديد من القضايا التي تواجه اليمن و أنا اقدر أنه بحضوره مع رئيس الوزراء إلى هذا الاجتماع بمنتهى الالتزام و التحضير و قد عرض وثيقة كانت واضحة المعالم في شأن تقييم التحديات التي يواجهها اليمن	It is a great honor to be with him and I have met him before. We have talked deeply about many of the issues facing Yemen. I am sure that in his presence with the Prime Minister to this meeting with the utmost commitment and preparation, he presented a document that was clear in assessing the challenges facing Yemen.

Yet the syntactic processor loses track with 'They presented', where the pronoun is incorrectly interpreted as referring to Minister Qirbi alone, while it is in fact co-referential with both Mr Miliband and Qirbi. The syntactic processor, later in the same text, also faces the obstacle of restructuring 'a good basis on which to conduct our international consultation', which is rendered as أساسا جيدا..نرتكز عليه..في مشاوراتنا الدولية, where short pauses set off the Arabic phrase, and 'conduct' is replaced by the preposition في.

The utilization of syntactic processing probably leads to cognitive overload, which is detected in the hesitation and long pause in the following extract from Text 3:

ST	*TT*	*Back Translation*
The United States is intensifying security and development efforts with Yemen.	إذن الولايات المتحدة تركز جهودها ..في مجال الأمن جهودها لدعم...ال.الا..اليمن	So the United States is concentrating its efforts..in the area of security, its efforts to support the ...Yemen.

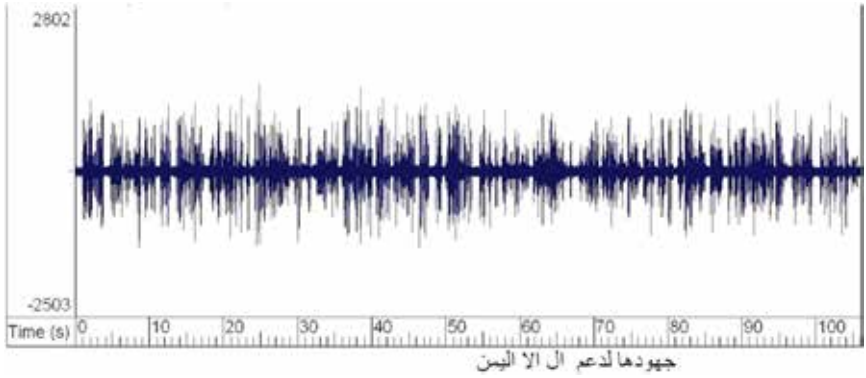

Figure 4.4 A Wave Spectrogram for the First Pause in Text 3.

The interpreter hesitates and pauses at 'development efforts with Yemen' to render it as جهودها لدعم...ال الا..اليمن, which can be graphically represented as shown in figure 4.4.

Here, the interpreter is baffled by the word 'development' just before 'efforts', and attempts to render it, but pauses after monitoring the generic definite article ال, and thus lags for 0.9 seconds (i.e. 939 ms), preferring to omit 'development'. This lag, however, later leads to other major omissions later in 'We are encouraged by the Government of Yemen's recent efforts', and the result is an incomplete sentence إجراءات ضد القاعدة و جماعات أخرى متطرفة.

In another extract from Text 5, the dependence on transcodage in the following paragraph makes the syntactic processor follow the SVO structure of English sentences and sacrifice the tense of the ST utterance:

ST	*TT*	*Back Translation*
Well, deficits were unacceptably high under President Bush, but they exploded under President Obama's direction, growing the national debt by an astounding $3.1 trillion.	العجز غير مقبول في عهد الرئيس بوش و أيضا فجر و ازداد ..في عهد الرئيس أوباما و ال.. الديون..الامريكية و صلت إلى 3.1 تريليون دولار.	Deficit is unacceptable under President Bush and also exploded and increased .. In the era of President Obama the .... US debts reached to $ 3.1 trillion.

Thus, 'deficits were unacceptably high under President Bush' is interpreted into العجز غير مقبول في عهد الرئيس بوش, which should have been كان العجز غير مقبولا في عهد الرئيس بوش. This insistence on transcodage is not uniformly maintained, however, with the interpreter's omission of the leading question at the beginning of the third paragraph. Numbers are also misinterpreted with 16.500 being turned into 16 ألف مسؤول.

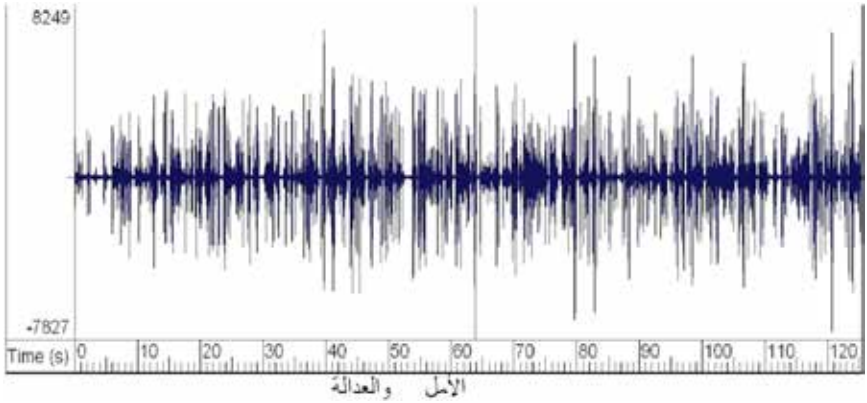

Figure 4.5 A Wave Spectrogram for the First Pause in Text 6.

Restructuring is detected in Text 6. The interpreter restructures 'the daily regime of delicate diplomacy at the United Nations' by considering the 'greater contrast' mentioned in the beginning as the one between 'the daily regime' and 'delicate diplomacy', while the fact is that it is the 'contrast of the daily regime dedicated to delicate diplomacy'. This may be due to trying to apply syntactic explicitation at the expense of the ST meaning. The same processor is utilized in the clause 'to bring about the two-State solution', since it contains a compound noun used as an adjective. The syntactic processor quickly breaks down the compound into 'a solution built on two states', and the interpreter provides الحل المبني على دولتين. However, this explicitation leads to a long pause later in 'which offers the only hope for security and justice for Israelis and Palestinians alike' to be interpreted into ...الذي يقدم الأمل و العدالة للإسرائيليين و الفلسطينيين. . This pause leads to the omission of 'security', and can be plotted on the wave spectrogram in figure 4.5.

The pause consumes approximately 0.3 seconds, that is, 348 milliseconds. It may be also due to the three successive nouns following each other and the interpreter's excessive queuing. This justifies Formula 5:

(P)T1 = (P)T2 > (P)T3 = minor lag = omission or hesitation
(P: phase; T: time)
(*Formula 5: if the times spent on listening and linguo-cognitive processing are equal, while buffering and production consume less time, then the interpreter has omitted some source text material or hesitated when delivering some of it.*)

Transcodage is also applied afterwards, for the interpreter's WM operates close to the syntactic processing of the above-mentioned sentence. The

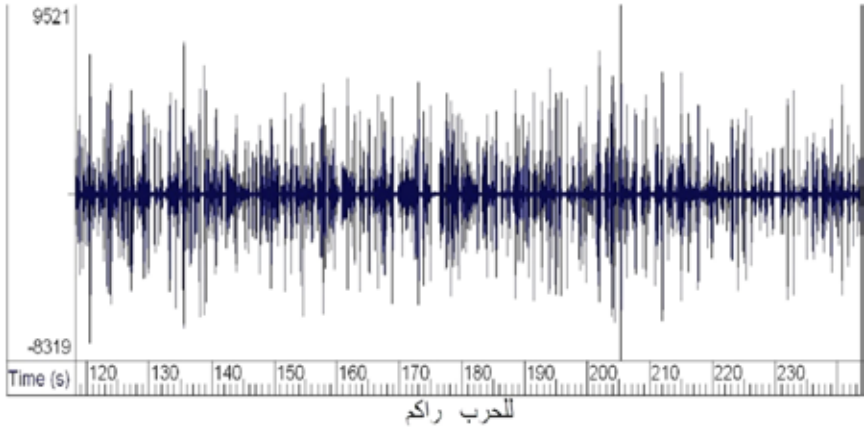

Figure 4.6 A Wave Spectrogram for the Fifth Pause in Text 6.

insistence on transcodage is manifest in the interpreting of the two successive sentences: 'The horror of war piled upon months of deprivation' and 'The confirmation just a few hours ago that 30 civilians were killed today in a United Nations school in Gaza is a devastating reminder of the urgency of our responsibilities'. The interpreter follows the SVO structure of the English sentence, starting with the subject الترويع; this results in the pause intra-sententially after للحرب, as illustrated by the wave spectrogram in figure 4.6.

The pause consumes approximately 1 second (i.e. 1,081 ms). This pause may be due to searching in the mental lexicon for the appropriate equivalent for 'piled up', and the difficulty with proceeding with transcoding the sentence linearly.

Towards the end of Text 6, the interpreter similarly applies transcodage to syntactic processing in 'keep alive the vision' by imitating the English structure verb+ adverb+ noun in Arabic, namely نبقي حيا الرؤية. He applies this strategy to save time, while, in fact, a more time-saving strategy would have been syntactic compression by using another form of the stem بقي, that is, نبقي, to produce نبقي على الرؤية.

In Text 7, the syntactic processor applies queuing to handle the shift from passive to active structures in the ST:

ST	*TT*	*Back Translation*
The November 26th Arab League statement will serve as an important guide in these efforts that are led by Egypt and the international community…	بيان الجامعة العربية في نوفمبر 2006 يعتبر دليلا يسترشد به في هذه الجهود التي تقودها مصر...و أيضا المجتمع الدولي	The Arab League statement in November 2006 is a guiding guide in these efforts led by Egypt ... and also by the international community

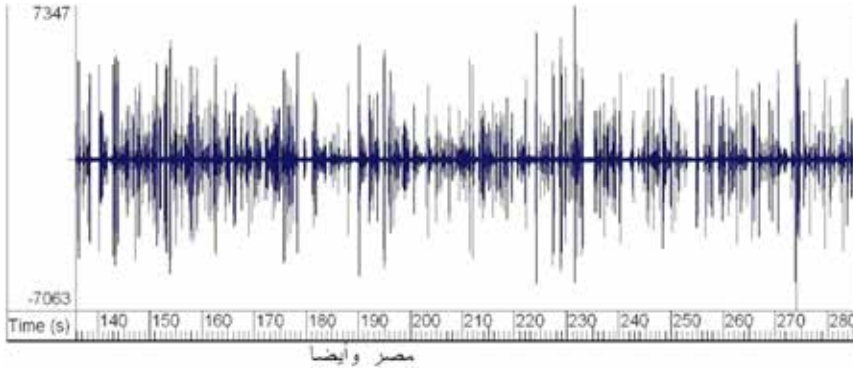

Figure 4.7 A Wave Spectrogram for the Third Pause in Text 7.

The interpreter pauses significantly before the sentence starting with 'and the international community' due to queuing for its active structure after the passive structure of 'efforts that are led by Egypt'. This pause can be plotted on the wave spectrogram in figure 4.7.

The interpreter's pause approximates 1.2 seconds, that is, 1,224 milliseconds. He then proceeds with a nominal syntactic structure in Arabic to overcome the obstacle of restructuring the English sentence by starting with a verb in Arabic. The net result is المجتمع الدولي ينبغي له.

Explicitation is also one reason why the syntactic processor may be overloaded. The following extract from Text 7 well illustrates the point:

ST	*TT*	*Back Translation*
The United States is of course deeply concerned about the situation in Gaza which is clearly worsening.	الولايا ت المتحدة قلقة جدا بسبب الوضع في غزة و..و واضح أنه يزدادا تفاقما وسوءا.	The United States is very concerned about the situation in Gaza, and.. and it is clear that it is getting worse and worse.

In the very first sentence, the interpreter prefers the nominal sentence in Arabic, since the noun is followed by an adjective. This correct decision makes him apply explicitation to the translation of 'worsening' by choosing two words, namely تفاقما و سوءا. He also opts for the progressive aspect in Arabic for the translation of 'have been working around the clock' as a broad equivalent for the present perfect progressive. This decision may be driven by the time consumed when making 'worsening' explicit.

However, as a means of releasing the cognitive overload, syntactic compression (cf. Iacovoni, 2009) is utilized in Text 8:

ST	TT	Back Translation
The situation on the ground demands nothing less. The Israeli military operation, with the stated purpose of bringing an end to rocket attacks by Hamas militants and a change in the security conditions in Southern Israel is in its eleventh day.	الوضع على الأرض يتطلب ليس شئ أقل من العمليات العسكرية أن تتوقف و وقف إطلاق الصواريخ من قبل حماس إسرائيل كثفت هجماتها الجوية وهجماتها و البحرية على غزة هذه الهجمات تسببت بأضرار و تدميرا لمنشآت حماس و بمنشآت حيوية للناس كالمدارس و الجامعات.	The situation on the ground requires nothing less than military operations to stop and stop rocket launchers by Hamas Israel intensified its air attacks, attacks and naval attacks on Gaza. These attacks damaged and destroyed Hamas facilities and vital facilities for people such as schools and universities.

The interpreter compresses the first two sentences into one in the Arabic text, thus producing الوضع على الأرض يتطلب ليس شئ أقل من العمليات العسكرية أن تتوقف و وقف إطلاق الصواريخ من قبل حماس for 'The situation on the ground demands nothing less. The Israeli military operation, with the stated purpose of bringing an end to rocket attacks by Hamas militants and a change in the security conditions in Southern Israel is in its eleventh day'. The process is complex, and can be broken down into the following steps:

1. Choosing an SVO structure in Arabic.
2. Making the object of the English sentence the complement of the Arabic sentence by dint of the comparative Arabic structure, that is, أقل من.
3. Using the connector و to proceed to the second sentence in Arabic.
4. Shortening the compound subject 'Hamas militants' to be حماس.

Yet this syntactic compression takes much time, and the result is an omission of 'a change in the security conditions in Southern Israel is in its eleventh day'. This confirms Formulae 4 and 7 in chapter 3:

4. (P) T1 > (P)T2 = (P)T3 = minor lag = compression
(P: phase; T: time)
(*Formula 4: if the time spent on listening is greater than both linguo-cognitive processing and buffering plus production, then the interpreter has compressed some of the source text material to avoid excessive time lag.*)
7. (P)T1 < (P)T2 = (P)T3 = minor lag = anticipation or compression
(P: phase; T: time)
(*Formula 7: if the time spent on listening is greater than the times spent on linguo-cognitive processing, buffering and production (which are all equal), then the interpreter has either omitted minor source text material or compressed some of it.*)

In Text 11, the syntactic processor leads to major deficits in the WM as shown by the following extract:

ST	*TT*	*Back Translation*
Of course, our efforts must also address terrorist safe-havens in Pakistan. No country is more endangered by the presence of violent extremists	علينا أيضا أن نستهدف الملاذات الآمنة للإرهاب في باكستان لايوجد...باكستان..لايوجد دولة..تتعرض لمثل هذا الخطر أكبر من باكستان و بالتالي علينا أن نسعى لتحقيق الاستقرار في هذا البلد وسنعمل مع الحكومة الباكستانية لـ..التخلص من هذا التطرف المتشدد	We also have to target the safe havens of terrorism in Pakistan. There is no… Pakistan ... no country ... there is a greater danger than Pakistan, so we have to seek stability in this country and we will work with the Pakistani government to .. get rid of this radical extremism.

The interpreter omits the emphatic 'of course' and syntactically processes the sentence 'our efforts must also address terrorist safe-havens in Pakistan' non-linearly into علينا أيضا أن نستهدف الملاذات الآمنة للإرهاب في باكستان. This syntactic processing negatively affects the WM by exhausting its store. The word 'Pakistan' is repeated in the second TT sentence due to its proximity to the one mentioned at the end of the preceding sentence. This clearly shows that the working memory[1] has been busy processing the last sentence when the interpreter's mental program is broken by the next sentence.

The interpreter then applies explicitation through the use of conjunctive 'or' in the translation of the acronym 'IDF' into قوات الجيش أو الدفاع الإسرائيلية. This strategy is used to cover up any shortage in lexical access, but has not been hitherto reported in the literature. However, this strategy leads the interpreter to omit some material from the ST, namely 'phone' and 'terrorist' in the TT sentence تـ..تقول لهم أن يخرجوا من مناطق العمليات لتجنب الضرر.

4.4.2.3 Pragmatic and/or Cultural Inferencing

Pragmatic and/or cultural inferencing is included in the model proposed in chapter 3 as a sub-processor, not a discrete one. It is not strictly a processing phase, nor is it intended as performing cognitively demanding tasks alone. Rather, it operates in the vicinity of the other processors by pruning their choices and informing certain decisions that cannot be located in lexico-semantics or syntax. The following examples illustrate how pragmatic and/or cultural inferences may act to change certain linguistic decisions.

Consider, for example, the following extract taken from the very beginning of the Text 2:

ST	TT	Back Translation
Thank you all, and welcome to the State Department. I am delighted to be here to welcome the President as well as our colleagues from the Diplomatic Corps, … many young Foreign Service and Civil Servants who are here today.	أرحب من السلك الدبلوماسي السيناتور ك..كيري و كبار المسئولين بال..الحكومة و بشكل خاص ..رجال السلك الدبلوماسي من الشباب و ..الخدمة المدنية أيضا	I welcome from the diplomatic corps Senator K .. Kerry and the senior officials of .. the government, in particular, the.. young members of the diplomatic corps and the civil service.

In this preliminary extract, the interpreter compresses the welcome note by using أرحب followed by the job titles of the attendees. This compression process is driven by both pragmatic and/or cultural inferences and time constraints. The interpreter makes advantage of the polite formula of يرحب بـ to replace 'thank you' as the starting phrase and continues with it till the end of the first paragraph of the source text. This actually saves time, for the calculated lag for the entire speech is 111 words per minute for the interpreter, and 162 words per minute for the speaker. This short lag is managed throughout by such pragmatic and/or cultural choices.

In Text 4, pragmatic inferences change some lexico-semantic decisions:

ST	TT	Back Translation
The military has served patriotically and responsibly as a caretaker to the state and will now have to ensure a transition that is credible in the eyes of the Egyptian people.	العسكريون خدموا بشكل وطني و مسؤول و كخ..ومعتنين بأمور الدولة و الآن عليهم أن يتاكدوا من عملية انتخابية جيدة في عيون الشعب المصري و هذا يعني حماية حقوق الشع..المواطنين المصريين.	The military has served nationally, responsibly,... and they are concerned with the affairs of the state and now they have to make sure that they have a good electoral process in the eyes of the Egyptian people, and this means protecting the rights of Egyptian peop..citizens.

The interpreter changes the collective noun 'military' into a human agent, that is, العسكريون (military officers). This is not a syntactic error, but it is surely a pragmatic one: the military means in this context the Supreme Council of Armed Forces, which became responsible for running Egypt's affairs shortly after Mubarak's resignation. The interpreter also later hesitates on 'caretaker', which should be translated as مسيير للأعمال, yet he opts for معتنيين. This is coupled with an error of perceiving 'transition' as 'election', and the result is 'transition' is erroneously interpreted as عملية انتخابية.

In cognitively demanding textual segments, pragmatic inferences lead to omission as is clear from the following extract from Text 5:

ST	*TT*	*Back Translation*
After the $700 billion bailout, the trillion-dollar stimulus, and the massive budget bill with over 9,000 earmarks	هناك خطط إنعاش و إنفاق كبير و الكثير منكم طلبتم من واشنطن التوقف عن انفاق أموالا لا نمتلكها	There are plans to revive and spend a lot, and many of you have asked Washington to stop spending money we do not have.

The interpreter omits numbers at the very beginning of the first paragraph, and depends on pragmatic inferencing for making the speech tenor rather formal; he interprets 'many of you implored Washington to please stop spending money that we don't have' into الكثير منكم طلبتم من واشنطن التوقف عن انفاق اموالا لا نمتلكها.

Pragmatic inferencing leads to a change of tenor in the following extract from Text 7:

ST	*TT*	*Back Translation*
The United States is of course deeply concerned about the situation in Gaza which is clearly worsening.	الولايا ت المتحدة قلقة جدا بسبب الوضع في غزة و..و واضح إنه يزدادا تفاقما وسوءا.	The United States is very concerned about the situation in Gaza, and ..and it is clear that it is getting worse and worse.

Pragmatic inferencing is used in the interpretation of 'it is imperative that', where ضروري is shunned lest it should pragmatically imply impoliteness or being bold on record. The presupposition is that the American Secretary of State expresses the opinion of one of the Security Council member state and does not issue orders. However, the interpreter later misinterprets 'ceasefire' into إطلاق, then quickly allows monitoring and backtracking at the buffer point, and corrects it to وقف إطلاق النار. This hesitation consumes the necessary time to process the two near-synonyms 'durable' and 'sustainable', and the result is a semantic compression into دائمة.

Formulaic greetings provide a prime example of pragmatic and/or cultural inferencing at work. The following extract from Text 8 illustrates this point:

ST	*TT*	*Back Translation*
Excellencies, Ladies and Gentlemen, As the Council meets to address the grave crisis in Gaza, I welcome the leader of the Palestinian people, President Mahmoud Abbas…	أصحاب السعادة السيدات و السادة في لقائي في هذا المجلس لمعالجة الأزمة الخطيرة في غزة فإنني أرحب بزعيم الشعب الفلسطيني الرئيس محمود عباس	Excellencies Ladies and gentlemen In my meeting in this Council to address the serious crisis in Gaza, I welcome the leader of the Palestinian people, President Mahmoud Abbas

As the interpreter is faced with the formulaic greetings, he quickly applies the automatized input at his disposal. This strategy is meant to save time. The interpreter translates 'excellencies' and 'ladies and gentlemen' into the pragmatically and/or culturally equivalent formulae أصحاب السعادة السيدات و السادة. He also applies pragmatic inferencing while syntactically processing the first sentence. This is clear in his shift to the personal pronoun in لقائي as an anticipation of the pronoun 'I' that will ensue. He then resorts to syntactic processing to deal with the long subject 'his presence, and that of high-level representatives of members of the Security Council, as well as Arab and other Member States', which he fronts in Arabic with the emphatic particle إن . This leads to using the verb form of 'reminder' in Arabic to produce a well-formed TL sentence.

However, pragmatic and/or cultural inferencing may lead to longer pauses, and thus disrupts the entire processing of ST segments. The following extract from Text 10 illustrates this problem:

ST	*TT*	*Back Translation*
What we can do is assure them that the nation is praying for them; that, in the words of the Psalmist, the Lord heals the broken-hearted and binds up their wounds; and that over time grace will replace grief.	نستطيع أن نؤكد لهم أن الأمة تصلي من أجلهم...و أن الله سيقوم ب...التخلص من جراحهم.	We can assure them that the nation is praying for them ... and that God will ... rid them of their wounds.

It is clear from this extract that the interpreter omits major parts. These omissions are largely due to pragmatic choices that consume more time than usual. He omits the clause 'that, in the words of the Psalmist' by pausing for approximately 3.7 seconds, that is 3,704 milliseconds (see figure 4.8).

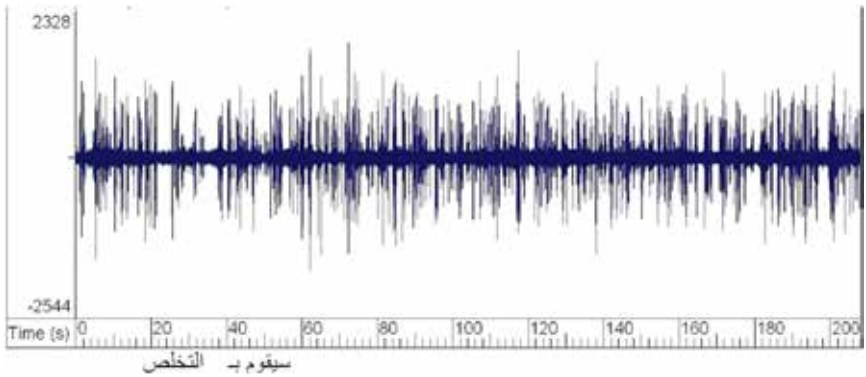

Figure 4.8 A Wave Spectrogram for the First Pause in Text 10.

This pause leads to another major omission of 'and that over time grace will replace grief'. This omission can be a validation of Formula 1 in chapter 3, which runs as follows:

(P)T1 > (P)T2 > (P)T3 = excessive lag = major omission
(P: phase; T: time)
(*Formula 1: if the time spent on listening is greater than the times spent on linguo-cognitive processing and greater than buffering and production, then the interpreter will not be able to catch up with the speaker. The result will be excessive lag due to excessive waiting for the input. Any attempt at interpreting after such a lag will lead to major omissions on the semantic, syntactic and pragmatic and/or cultural levels*).

In addition to its contribution to online processing, pragmatic inferencing can provide a good opportunity for anticipating the ST segments that ensue. This it acts as justification for releasing cognitive overload by jumping several phases. The following extract from Text 12 illustrates the point:

ST	*TT*	*Back Translation*
We did this to try to create an opening for peace and for Palestinians to build a prosperous society.	قمنا بهذه المحاولة خلق فرصة للسلام و للفلسطينيين كي يبنوا مجتمعا مزدهرا.	We made this attempt to create an opportunity for peace and the Palestinians to build a prosperous society.
But the Hamas regime that brutally seized control of Gaza, murdering scores of fellow Palestinians, has no interest in peace and prosperity.	و لكن نظام حماس ..الذي..سيطرت على غزة بشكل تام و..قتل العديد من الفل سطينيين ليس لديه مصلحة في السلام و الاستقرار و الازدهار.	But the Hamas regime.. which has completely ..controlled Gaza and killed many Palestinians, has no interest in peace, stability and prosperity.

The interpreter anticipates that after 'every', the word 'day' is most frequently predicted. This is why he misinterprets 'every way' into كل يوم in the first paragraph. In the second paragraph, he misperceives 'synagogues' as 'standards', and the result is that he opts for the erroneous معايير. However, he attempts a pragmatic decision by deverbalizing 'opening' as فرصة, in the third paragraph, instead of the negative فتحة or مخرج. In the fourth paragraph, he also applies pragmatic inferencing in interpreting 'brutally' into تام, and uses the strategy of explicitation in the translation of 'peace' to be السلام و الاستقرار probably to offset the difference in meaning between 'brutally' and تام.

Finally, through the comparison between the two versions of Netanyahu's speech in the Congress (i.e. Text 14), pragmatic inferencing appears to be different between the two interpreters. The following extracts illustrate the differences detected:

ST	*TT1 (Al-Jazeera)*	*TT2 (BBC)*	*Back Translation (Al-Jazeera)*	*Back Translation (BBC)*
Israel has no better friend than America. And America has no better friend than Israel. We stand together to defend democracy. We stand together to advance peace. We stand together to fight terrorism. Congratulations America, Congratulations, Mr. President. You got bin Laden. Good riddance!	إسرائيل ..ليس لديها صديق أفضل من أمريكا و أمريكا ليس لديها صديق أفضل من إسرائيل إننا نقف مع بعضنا البعض ..للدفاع عن الديموقراطية إننا نقف مع بعضنا البعض لتعزيز السلام..نقف مع بعضنا البعض لمكافحة الإرهاب ..تهانيي لكم الأمريكيين تهانينا لك السيد الرئيس ..لقد..وضعت يدك على بن لادن حمدا لله.	إن...إسرائيل ليست لديها صديق أفضل ..من أمريكا و أ..أمريكا ليست لها صديق أفضل من إسرائيل نحن..نـ..معا نقف معا للدفاع عن الديمقراطية و نقف معا لانجاز و تحقيق السلام و ..معا لـ..مكافحة الإرهاب أ..تهانينا إلى أمريكا تهانينا إلى السيد الرئيس لأ..تـ..تمكنت من إيقاف بن لادن.	Israel.. has no better friend than America and America does not have a better friend than Israel. We stand with each other..to defend democracy we stand with each other to promote peace. ..We stand with each other to fight terrorism. Uh..Congratulations to you Americans. Congratulations, Mr. President. I have put your hand on bin Laden, thank God.	..Israel does not have a better friend.. than America and America does not have a better friend than Israel.. We stand together to defend democracy and stand together to achieve and achieve peace and together ..to fight terrorism. Uh..Congratulations to America Congratulations to Mr. President for .. .. I managed to detain bin Laden.

Both differ in their pragmatic decisions in the translation of the congratulatory remark. The Al-Jazeera interpreter considers السيد الرئيس more bold on record than أمريكا, while the BBC interpreter sticks to the letter of the ST. Similarly, the final exclamative 'Good riddance' is maintained by the Al-Jazeera interpreter, but turned into the polite formula حمدا لله (i.e. 'Thank God'). The BBC interpreter opts for omitting it to save the speaker's face.

4.4.2.4 Interaction

Interaction is not a novel process; it has long been emphasized by Gile (1992, 1999) in his different versions of the Effort Model under the name 'coordination' and by Hatim and Mason (1997) under the name 'trade-off'.[2] However, their concept of coordination or trade-off is limited to the cooperation between the Listening and Comprehension Efforts or among any two broad processors, with little mention about the sub-components. In this model and analysis, it is clear that coordination or interaction is much detailed. It exists between each two processing phases, and may at times completely fail (as is explained in the next section). Thus, it may be between lexico-semantic and syntactic processors, lexico-semantic processor and pragmatic and/or cultural inferences, and syntactic processor and pragmatic inferences. In each of these possibilities, the processing demands cooperate to conduce towards the order and tasks of each processing phase or sub-component. The aim of coordination or interaction is ultimately to release cognitive overload on the WM, and to allow for more choices for the solutions of the various problems that recur in the course of simultaneous interpreting.

4.4.2.4.1 Lexico-Semantic and Syntactic Interaction

As is emphasized in the above section, the interaction between lexico-semantic and syntactic processors is meant to release the cognitive burden. Moreover, the two processors constitute, so to say, the bulk of the processing effort needed when interpreting from the interpreter's B-language (i.e. English) into his/her A-language (i.e. Arabic). The following instances illustrate this close interaction.

The coordinate activation of both lexico-semantic and syntactic processors is clear in the following extract from Text 1:

ST	*TT*	*Back Translation*
…they seek to move from protests to politics; with NGOs and businesses working to create new economic opportunities; and with transitional leaders trying to build the institutions of genuine democracy. They represent the best of America, and I am so proud to have them as our face to the world.	نخ.. نحاول خلق فرص جديدة و مع القيادات الانتقالية نحاول أن نؤسس مؤسسات ديمقراطية حقيقية وهم يمثلون أفضل مالدى امريكا و أنا فخورة بأن يكونوا وجها لنا ف..مع العالم.	..We are trying to create new opportunities and with the transitional leaders we are trying to establish real democratic institutions and they represent the best of America and I am proud to be a face to us with .. the world.

The lexico-semantic and syntactic processors start to be activated, especially in dealing with 'working to create'; the interpreter hesitates and produces نخ.. نحاول خلق. This hesitation indicates his need to maintain a balance of precision after several parts have been compensated and omitted. The syntactic processor sticks to the progressive aspect, while the lexico-semantic processor ensures that نخلق alone is not enough due to the use of 'working' before 'to create'. But it is important to note that the cognitive overload of two processors working in tandem leads to what Gile (1999) and Seeber and Kerzel (2011) call 'the spillover effect'. The interpreter in translating 'build the institutions of genuine democracy' uses نؤسس مؤسسات ديمقراطية حقيقية. The use of نؤسس then مؤسسات may be idiomatically inappropriate, but it attests to the interpreter's LTM as accessed in the same periphery. It also indicates that the interpreting process from English into Arabic is not usually governed by transcodage (*pace* Dam, 2000); the movement from مؤسسات backwards is responsible for the choice of يؤسس.

In some textual episodes, the two processors may work in tandem, that is, one at a time. The following extract from Text 9 illustrates the point:

ST	*TT*	*Back Translation*
which had openly declared war on the United States and was committed to killing innocents in our country and around the globe. And so we went to war against Al-Qaeda to protect our citizens, our friends, and our allies.	الذي أعلن الحرب علنا على الولايات المتحدة و تعهد بقتل أبرياء في امريكا و العالم و ذلك شنينا الحرب على القاعدة لحماية مواطنينا و أصدقائنا و حلفائنا	Which publicly declared war on the United States and pledged to kill innocents in America and the world, and waged war on al-Qaeda to protect our citizens, friends and allies.

The interpreter hesitates at the idiom 'bring those who committed this vicious attack to justice' but opts for the semantically neutral نلقي القبض على من قام بهذه

الهجمات الوحشية. He also makes use of the syntactic processor by shifting the anaphoric reference in 'which had openly declared war' into الذي أعلن الحرب علنا. The interaction between the lexico-semantic and syntactic processors is clear through these two examples.

In the same text, the lexico-semantic and syntactic processors are coordinately utilized, but automatisms are kept for the lexico-semantic processor to allow the syntactic processor more room, and to save time. The following example is clear manifestation of this complex process:

ST	*TT*	*Back Translation*
We give thanks for the men who carried out this operation, for they exemplify the professionalism, patriotism, and unparalleled courage of those who serve our country. And they are part of a generation that has borne the heaviest share of the burden since that September day.	إننا نتقدم بالشكر إلى الرجال الذين ..نفذوا هذه العملية لأنهم جسدوا شعورهم الاحترافي و الوطني وخدمة بلادهم و هم جزء من جيل ولد و هو يحمل عبئا ثقيلا منذ الحادي عشر سبتمبر أيلول.	We thank the men who.. have carried out this process because they have embodied their professional and national feeling and serve their country. They are part of a generation that has been born and has borne a heavy burden since 9/11.

The interpreter automatizes the use of شعورهم as a lexical equivalent for the meaning of the morpheme '-ism' in the two words 'professionalism' and 'patriotism'. However, this insertion consumes the time allotted to other parts in the same sentence, resulting in the omission of 'unparalleled courage', and the syntactic transformation of the verb phrase 'those who serve our country' into the Arabic noun phrase خدمة بلادهم. However, the interpreter is faced with the ambiguity of 'borne', which is phonetically similar to 'born'. The need to cope with the speaker forces him to take the more frequent one (i.e. 'born') to be the prime, but discovers that 'borne' is the one intended. He applies the strategy of addition-for-correction (not recorded hitherto in the literature) to redress error. The result is ولد و هو يحمل عبئا ثقيلا for 'has borne the heaviest share of the burden'.

The interpreter also omits the entire sentence 'I know that it has, at times, frayed', in the same extract above, apparently for two reasons. First, he is unable to determine the anaphoric reference of 'it'. Second, he is faced with 'frayed', which might not be among his active vocabulary. These two lexico-semantic problems lead to the omission at the syntactic processor, since no data are carried over.

4.4.2.4.2 Lexico-Semantic and Pragmatic and/or Cultural Inferences Interaction

As is explained in section 4.4.2.4, pragmatic and/or cultural inferences guide both lexico-semantic and syntactic processing. In this case, the interaction achieved is meant to lead to domesticating the TT. The following examples illustrate the interaction between the lexico-semantic and pragmatic and/or cultural inferences.

Pragmatic inferences may operate at the periphery of clauses. Consider the following extract from Text 2:

ST	*TT*	*Back Translation*
Before I begin, I just want to say that we are following today's events in Egypt very closely.	و قبل أن أبدأ أود أن أقول...بأننا نتابع اليوم أحداث مصر عن كثب	Before I start, I would like to say ... that we are following closely the events of Egypt today

The search for idiomaticity is further enhanced by resorting once more to pragmatic inferencing on the periphery of clauses. In the clause 'America will continue to do everything' (later on), the pronoun إننا replaces 'America', and this is meant to domesticate the speech rhetorically.

In Text 13, the interpreter preserves the balance between semantic compression and pragmatic inferencing in the following extract:

ST	*TT*	*Back Translation*
… so many young people around the world are standing up and making their voices heard, I also want to acknowledge all the college students from across the country who are here today.	في ..وقت هناك شباب كبير حول العالم ...يحاولون إسماع صوتهم..أريد أن ...أرحب بطلاب الجامعات من عدة دول الذين حضروا معنا اليوم	In a time there are great young people around the world ... trying to make their voices heard ... I want to ... I welcome university students from several countries who came with us today

The interpreter transcodes 'many' into كبير, but quickly redresses the situation by deverbalizing 'are standing up and making their voices heard' as يحاولون إسماع صوتهم. This deverbalization is accompanied with a pragmatic decision to turn the lexico-semantic content of 'acknowledge' into أرحب (i.e. 'welcome' (v.)), since he deems أعترف بجميل inappropriate if uttered by a president to college students. However, this decision takes long to be made; the interpreter pauses for some 1.3 seconds (i.e. 1,353 ms) as is illustrated by the wave spectrogram in figure 4.9.

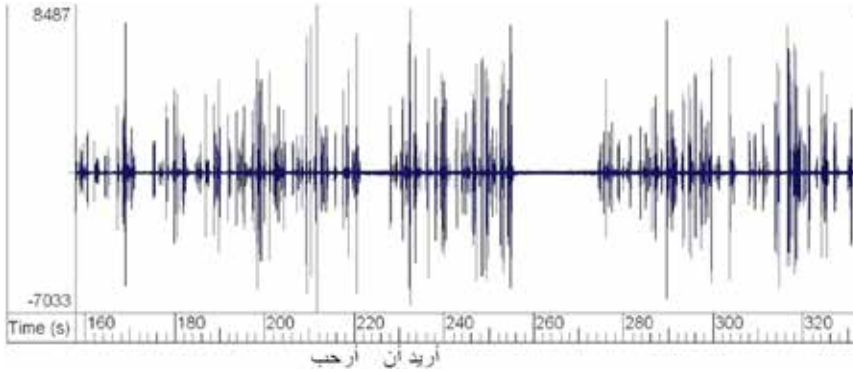

Figure 4.9 A Wave Spectrogram for the Second Pause in Text 13.

4.4.2.4.3 Syntactic and Pragmatic and/or Cultural Inferences Interaction

The interaction between the syntactic processor and pragmatic and/or cultural inferencing is achieved through the shifts of pronominal references. Such shifts are purposely done to ensure that the tenor of the TT segment is not offensive or bold on record. Only one example has been detected in the course of analyzing the English-Arabic corpus in Text 8 as follows:

ST	*TT*	*Back Translation*
As the Council meets to address the grave crisis in Gaza…	في لقائي في هذا المجلس لمعالجة الأزمة الخطيرة في غزة	In my meeting in this Council to address the serious crisis in Gaza
His presence, and that of high level representatives of members of the Security Council, as well as Arab and other Member States, is a reminder that we must move from debate to action, and must do so immediately.	إن وجوده ووجود ممثلين رفيعي المستوى من أعضاء مجلس الأمن بالاضافة إلى أعضاء عرب و آخرين يذكرنا بأننا يجب أن نتحرك من الحوار إلى العمل و التحرك و يجب أن نسعى وراء ذلك فوريا.	His presence and the presence of high-level representatives of the Security Council as well as Arab and other members remind us that we must move from dialogue to action and action, and we must seek it immediately.

The interpreter applies pragmatic inferencing while syntactically processing the first sentence. This is clear in his shift to the personal pronoun in لقائي as an anticipation of the pronoun 'I' that will ensue. He then resorts to syntactic processing to deal with the long subject 'his presence, and that of high-level representatives of members of the Security Council, as well as Arab and other Member States', which he fronts in Arabic with the emphatic particle إن. This

leads to using the verb form of 'reminder' in Arabic to produce a well-formed TL sentence.

4.4.2.4.4 Interaction among All Processing Phases

Interaction or coordination among the various processing phases can be seen in the way these phases interact and allow time and cognitive effort for each other to operate. Due to the complex task of simultaneous interpreting, it is rare to find a valid example in which all these phases work together. The reason may be the nature of simultaneous interpreting itself, where tight time limits take their toll on the ability of the interpreter to let the input pass through these entire phases one after the other, or even all at the same time. The latter choice may lead to overloading the WM, and the result may be total failure to cope up with the speaker, hence non-translation. Only two examples have been detected.

The following extract from Text 13 provides a valid example of a number problems in all the phases of the model proposed:

ST	*TT*	*Back Translation*
But even more, thank you for your many years friendship. Back in Chicago, when I was just getting started in national politics, I reached out to a lot of people for advice and counsel, and Rosy was one of the very first.	أشكرك روزي على سنوات صداقتك الكبيرة في شيكاغو عندما كنت أبدأ في السياسة..تواصلت مع كثير من الناس للحصول على...الن صيحة وروزي كان من أول هؤلاء الناس	Thank you Rosy for your years of great friendship in Chicago when I started politics ... I communicated with many people to get ... advice and Rosy was one of those first people

The interpreter applies pragmatic inferencing after allowing the Linguo-Cognitive Processor (LGP) to handle the lexico-semantic and input. He inserts the name 'Rosy' in the first sentence to ensure that the tenor of friendship is preserved. Yet this addition leads to the omission of 'national' in the second ST sentence due to taking more time than required for the LGP phase. This confirms Formula 5:

(P)T1 = (P)T2 > (P)T3 = minor lag = omission or hesitation
(P: phase; T: time)
(Formula 5: *if the times spent on listening and linguo-cognitive processing are equal, while buffering and production consume less time, then the interpreter has omitted some source text material or hesitated when delivering some of it*.)

4.4.2.5 Jostling or Overlap

'Jostling' or 'overlap' is a term coined in this research to refer to the competition among the different components and phases proposed in the model. When components jostle, this means that the Linguo-Cognitive Processor

experiences several inner sub-processes for the input to be pushed forwards to the next phase. This points to the intra-phasic and inter-phasic interactions as explained in chapter 3. These interactions may lead to the exclusion of one or more components or phases in favour of one two other components or phases. Sometimes the net result is a long pause or silence.

4.4.2.5.1 Jostling among the Linguo-Cognitive Components

It refers to the competition among lexico-semantic and syntactic processors, lexico-semantic processor and pragmatic and/or cultural inferences, and syntactic processor and pragmatic inferences. The examples below show how this may occur.

In the interpretation of the extract below from Text 1, a number of major linguo-cognitive processes are in conflict:

ST	*TT*	*Back Translation*
Now, on the back wall of this historic Benjamin Franklin Room is a portrait of the leader of Tunis, given as a gift in 1865 by the people of Tunisia in honor of the enduring friendship between our nations at the end of our Civil War.	و خلف هذه الحائط بل..هذه الغرفة هناك صورة لزعيم تونس قدمت كهدية سنة خمسة و ستين من الشعب التونسي تكريما للصداقة المستمرة بين بلدينا في نهاية الحرب الاهلية	And behind this wall, but this room is a picture of the Tunisian leader presented as a gift to the sixty-five Tunisian people in honor of the continuing friendship between our two countries at the end of the civil war.

The interpreter is here rather baffled; he commits a number of errors that show how his processors are competing together. The lexical correction of بل is followed by a long pause. This pause leads to the omission of the phrase 'historic Benjamin Franklin'. The omission is a major one (cf. Barik, 1973), for two qualifiers are omitted in a row. The pause can be graphically represented as shown in figure 4.10.

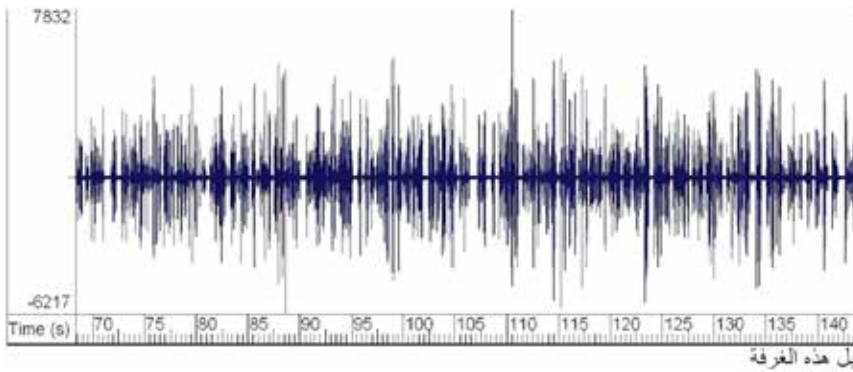

Figure 4.10 A Wave Spectrogram for the Third Pause in Text 1.

This pause consumes 0.3 seconds, that is, 389 milliseconds. This lag is also significant for the rest of the sentence, for the difficulty of processing numbers (as discussed by Mazza, 2001)[3] augments the problem for the interpreter, who is now forced to operate backwards to translate the number 1865. The result is the loss of the part of the number, namely سنة خمسة و ستين. Moreover, the interpreter decides to transcode the remaining part of the speech, but excessive transcodage makes him translate 'Tunisia' into تونيسيا. He also tries to apply the anticipation strategy in the last sentence, but fails due to being torn between receiving the linguistic input and predicting; the result is the hesitation and correction in تن..تف..اج. This may be due to the competition between processing the incoming data and processing the anticipated ones.

Another extract from the same text (i.e. Text 1) shows how the interpreter utilizes his lexico-semantic and syntactic processors to overcome some of the linguistic problems he faces towards the end of the speech. The interpreter lags before 'to the people of the Middle East and North Africa'. It can be graphically illustrated as shown in figure 4.11.

This pause is an optimal one, being 0.8 seconds, that is, 831 milliseconds. The interpreter lags due being faced with two compounds in a row, namely, 'the Middle East and North Africa'. This lag also leads to hesitation in يقر..ر..وا, which betrays a number of cognitive activities concurrently competing. The interpreter searches for an appropriate equivalent for 'seized control', but at the same time queues for the speaker (cf. Camyad-Freixas, 2011), and he likewise monitors the use of يقرر as a compressed output justified by the existence of 'determine' later on in the ST. These competing processes affirm what Chernov (2004) calls 'the interpreter's broken program', that is, the incomplete processing efforts carried out by the interpreter at the same time. This broken program is further manifested in the final sentence in the speech, where the interpreter automatizes the welcoming formula pragmatically without noticing that it carries new information that needs to be thoroughly interpreted.

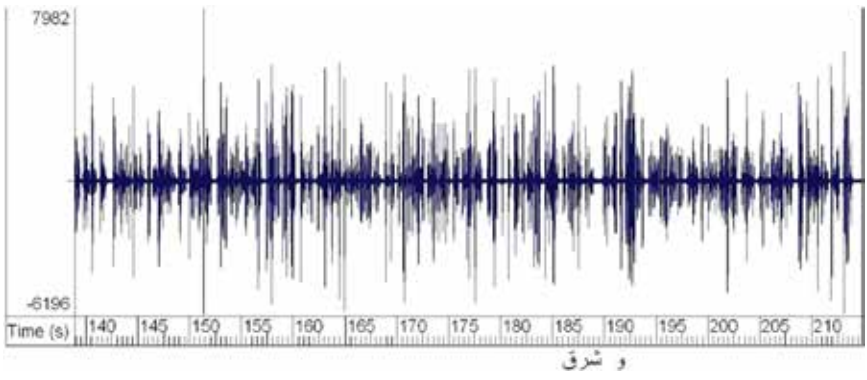

Figure 4.11 A Wave Spectrogram for the Fourth Pause in Text 1.

4.4.2.5.2 Jostling among Phases

'Jostling among phases' refers to the competition or interruption in the processing effort among the major phases such as the Linguo-Cognitive Processor, the buffer point and the production phase. This type of jostling usually results in ill-formed outputs, mediated by several hesitations and intra-clausal and intra-sentential pauses. It also corroborates Chernov's (2004) concept of the interpreter's 'broken program'. The following instances show how this happens.

In the following extract from Text 1, hesitations are detected:

ST	*TT*	*Back Translation*
America's diplomats and development experts of the State Department and USAID are on the front lines of protecting America's security, advancing America's interests, and projecting America's values. As a wave of change continues to sweep across the Middle East and North Africa…	فإن خبراء التنمية في وزارة الخارجية و في وكالة التنمية هم في ...في ..على الجبهة في حماية أمن أمريكا و دعم مصالح أمريكا و التعبير عن قيم أمريكا و كوس..و باستمرار عملية التغير في الشرق الأوسط وشمال أفريقيا	The development experts at the State Department and the Development Agency are ... in ... on the front in protecting America's security, supporting America's interests, expressing the values of America and as a mea ... and constantly changing the Middle East and North Africa

The interpreter hesitates on 'on the front lines'. This hesitation may be due to the lexico-semantic processor's preferences. A search for the idiomatic phrase in Arabic is governed by its pragmatic appropriateness as being borrowed from the military register (cf. Fayed, 2003). The interpreter also hesitates on 'as a wave of change', which he translates as و كوس..و باستمرار عملية التغير في الشرق الأوسط. The lexical correction of وكوس as a means to use كوسيلة indicates the interpreter's complex cognitive process; he is to use وسيلة, which is halfway in the production phase, but the buffer point receives extra information from pragmatic and/or cultural inferencing as a sub-component of the Linguo-Cognitive Processor, which opts out of وسيلة and chooses استمرار as more durable. This change in course is actually at the expense of the lexico-semantic processor: the phrase موجة تغيير would have been adequate and central to the ST's meaning.

4.4.2.6 Backtracking

As is explained in chapter 3, this model includes backtracking as the possibility of checking released and pre-released outputs through a return to the previous phase(s). This is possible in cases of doubt, hesitation or extraordinarily fast speech rates. The examples below illustrate this point.

In the following extract from Text 7, the interpreter misinterprets 'ceasefire' into إطلاق, then quickly allows monitoring and backtracking at the buffer

point, and corrects it to وقف إطلاق النار. This hesitation consumes the necessary time to process the two near-synonyms 'durable' and 'sustainable', and the result is a semantic compression into دائمة.

ST	*TT*	*Back Translation*
It is imperative that any cease fire is durable and sustainable and that it ensures the safety and security of Israelis and Palestinians alike.	من المهم إنه لأي..عملية إطلاق..وقف إطلاق النار أن تكون دائمة و تضمن.. أمن و سلامة الاسرائليين و الفلسطينيين على حد سواء .	It is important that it is not a firing operation. The cease fire must be permanent and ensure the security and safety of Israelis and Palestinians alike.

In the same text (i.e. Text 7), the interpreter starts to pause significantly as the number of sentences increases, and applies pausing and backtracking due to lexico-semnatic problems:

ST	*TT*	*Back Translation*
Moreover the people of Gaza watched as insecurity and lawlessness increased and as their living conditions grew more dire because of Hamas's actions which began with the illegal coup against the Palestinian authority in Gaza.	بالإضافة إلى ذلك شعب غزة ...و..اجه و رأى ..انعدام القانون و رأى وضعه يزداد تفاقما بسبب أعمال حماس التي بدأت بالانقلاب غير القانوني ضد السلطة الفلسطينية في ...في فلسطين.	In addition, the people of Gaza ... and ... saw and saw ... the lack of law and saw his situation increasingly aggravated by the acts of Hamas that began the illegal coup against the Palestinian Authority in ... in Palestine.

The interpreter pauses after 'the people of Gaza' to search for an adequate translation of 'watched'. His pause is optimal as can be shown on the wave spectrogram in figure 4.12.

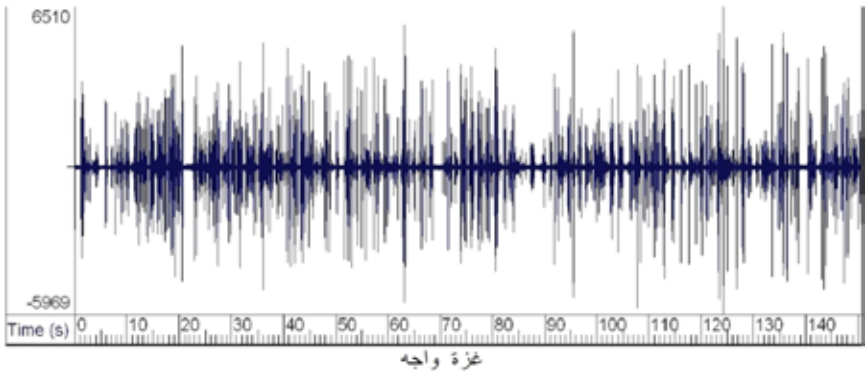

Figure 4.12 A Wave Spectrogram for the First Pause in Text 7.

The pause runs for approximately 0.5 seconds, that is, 567 milliseconds. The reason for this pause is the search carried out in the mental lexicon in the LTM for 'watched'. The interpreter opts for واجه but monitors it by applying quick backtracking to end up with رأى, which is a literal translation, in order to avoid inaccuracy. However, راقب would have been more appropriate.

The reinterpretation process reported above is the cause for excessive transcodage in the third paragraph of the interpretation of the extract. The interpreter produces the ill-formed TT sentence ثلاث مدارس للأونروا شكلت الأمم المتحدة كأماكن لملاجئ امنة for 'Three UNRWA schools, set up by the United Nations as places of refuge for civilians'. The SVO structure in Arabic leads the syntactic processor to opt for a strange output, coupled with the wrong collocate شكلت.

Finally, in Text 12, the interpreter hesitates two times in one sentence due to the cognitive overload incurred by backtracking:

ST	*TT*	*Back Translation*
Hamas rejects every core humanitarian principle. Instead of waging its battle openly between combatants, it directs its attacks against civilians.	حماس رفضت كل..مبدأ إنساني و الدعوة الإنسانية و بدلا من أن تخوض معركتها بشكل منفتح...انفتاح بين المقاتلين و لكنها تطلق صواريخها على المدنيين.	Hamas has rejected all humanitarian principles and humanitarian advocacy, rather than openly engaging in battle ... opening up the fighters but firing rockets at civilians.

The interpreter misperceives 'core' as 'call'; this is why he applies backtracking at مبدأ إنساني و الدعوة الإنسانية. .This cognitive action forces him to hesitate at 'openly' to be بشكل منفتح...انفتاح, which is incorrect due to the connotations of انفتاح (i.e. open-door policy) in Arabic.

4.4.2.7 Processing Failure

Processing failure is the result of the lack of sufficient interaction or coordination among phases and/or sub-components. It confirms Formula 3 proposed in chapter 3 as follows:

3. (P)T1 = (P)T2 = (P)T3 = NA
(P: phase; T: time; NA: not applicable)
(*Formula 3: if the times spent on listening, linguo-cognitive processing, buffering and production are all equal, then no interpreting is possible*).

However, processing failure is not usually left unchecked; interpreters attempt to rectify the situation by quickly attempting an output. This is why only two occasions are reported in this corpus.

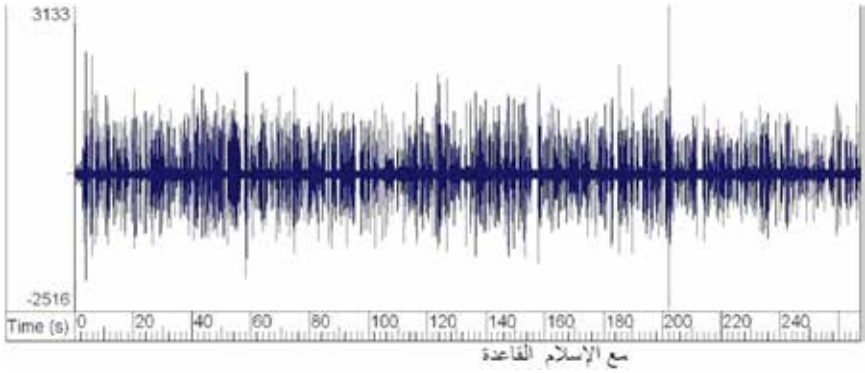

Figure 4.13 A Wave Spectrogram for the First Pause in Text 11.

However, in Text 11, semantic specification apparently leads to cognitive overload later in the omission of the clause 'thereby draining more widespread support' due to a long pause just before it as indicated by the wave spectrogram in figure 4.13.

The pause consumes approximately 2 seconds, that is, 1,907 milliseconds. This pause indicates failure of processing across all phases as shown by the model in chapter 3. To offset the major omission, the interpreter resorts to both transcodage and later explicitation in the translation of 'we have put al Qaeda on a path to defeat' into وضعنا القاعدة في مسار الفشل و الهزيمة, where the idiom 'put on a path to defeat' is literally translated, but 'defeat' is broken down into الفشل و الهزيمة.

4.4.2.8 Processing Figures of Speech

Figures of speech have not been included in this model as a separate topic. The reason for this is twofold. First, they are not recurrent in the TV simultaneous interpreting practice, since most of the telecast texts are political speeches, commentaries or reports that rarely make use of such tropes. Second, the cognitive challenges posed by figures of speech are usually addressed by the same processors and strategies as other difficulties. What is important, however, about figures of speech is how and why the interpreter chooses a particular cognitive strategy to deal with them, and how much is automatized in this process. The following examples well illustrate the point.

When stumbling, the lexico-semantic processor tends to omit figures of speech. The following extract in Text 10 is a clear example of the omission strategy as a valuable resource for lexico-semantic processing of tropes in simultaneous interpreting.

ST	*TT*	*Back Translation*
We are at a moment, where if government's growth is left unchecked and unchallenged, America's best century will be considered our past century. This is a future in which we will transform our social safety net into a hammock, which lulls able-bodied people into lives of complacency and dependency.	نحن في لحظة... إذا استمر النمو الحكومي...أفضل الحلول الأمريكية ستكون من الماضي..هذا هو المستقبل الذي سنحول شبكة الأمان ...التي لدينا...	We are at a moment ... if government growth continues ... the best US solutions will be from the past ... this is the future that we will transform the safety net ... which we have ...

In Text 11, figures of speech may cause one processor to push the ST to another without processing it:

ST	*TT*	*Back Translation*
Yet tonight, we take comfort in knowing that the tide of war is receding. Fewer of our sons and daughters are serving in harm's way.	لازال ذكرى هذه الحروب و لكن..نرتاح اليوم..في أننا نعرف أننا نعرف اليوم أن الحرب تتغير ...	The memory of these wars is still alive, but ... we are relieved today, knowing that we know today that the war is changing ...

The interpreter's false start at the very beginning of the TT indicates that his lexico-semantic processor is busy processing the image 'the tide of war is receding', but he decides to waive that image to syntactically process the sentence linearly. However, this attempt does not consume much time and the interpreter omits a large part of the ST by being faced once more by the image in its appropriate place. He omits the sentence 'fewer of our sons and daughters are serving in harm's way' due to a pause as illustrated by the wave spectrogram in figure 4.14.

The pause consumes approximately 0.5 seconds, that is, 557 milliseconds.

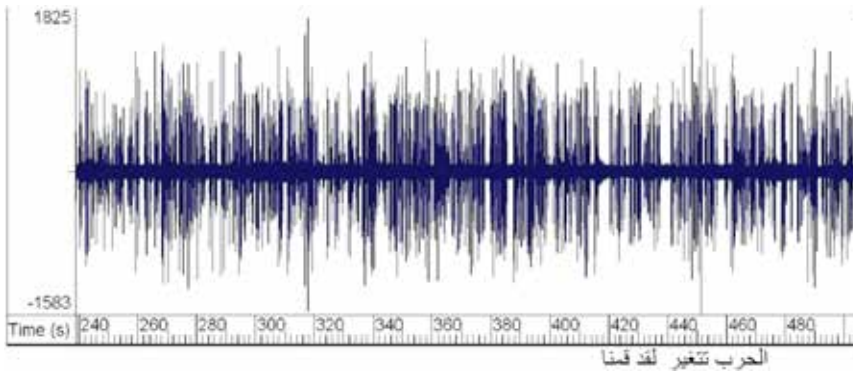

Figure 4.14 A Wave Spectrogram for the Third Pause in Text 11.

4.5 GENERAL OBSERVATIONS AND CONCLUSIONS

A number of points can be discussed based on the previous analyses of the English-Arabic interpretations. First, it is important to note that the interpreting process from English into Arabic is greatly affected by the interpreter's ability to manage the time factor. S/he is forced to strike a balance between the time allowed and the linguistic tools and cognitive capacity at his/her disposal. This balance is mostly achieved in the aforementioned analyses, where the interpreters operate from their B-language (i.e. English) into their A-language (i.e. Arabic). They are able to convey the sense groups (cf. Chernov, 2004), and when they are pressed for time, they capitalize on strategies that release the cognitive overload and save time, such as compression and omission. This observation clearly runs counter to what Chang (2005) believes as to the fewer linguistic resources when interpreters translate from their B-language to their A-language.

Second, it is also important to note that the model proposed in chapter 3 is instrumental in explaining many of the linguo-cognitive problems encountered by the interpreters of the texts chosen. The phases of LGP (i.e. Linguo-Cognitive Processor) with all its sub-components, especially the lexico-semantic and syntactic processors and pragmatic inferences, have proved to be essential in finding justifications for the errors and omissions committed. The interpreters seem to follow a 'domino effect', in which one decision influences the rest of the decisions to follow. When they venture on omitting some material from the ST due to excessive pausing or hesitation, they tend to compress or omit some material later on regardless of their importance. This is meant to relieve the Linguo-Cognitive Processor and save time. These strategies of compression and omission are coupled with transcodage as a way to linear processing which gives room to the interpreter to operate at a shallow level of cognitive activity and manage time pressure. These observations also attest to the validity of the formulae provided in chapter 3, which have succeeded in explaining compression and omission in a quantitative manner.

Third, there are a number of new strategies that have been detected in the course of analyzing the corpus. TV interpreters tend to depend on the fact that speeches are telecast live, and that viewers have the visual input at their disposal throughout the simultaneous interpretation. This facilitates deictic references for interpreters, and can act as a type of compression not hitherto recorded in the literature (see the analyses of Texts 2 and 14). Moreover, TV interpreters apply what can be termed the 'both-ends' strategy to handle long compounds in the ST. For example, 'Durban Review Conference' is reduced in the TT to مؤتمر ديربن in Text 13. It can be a unique strategy or a sub-type of

omission. Additions are also used in some novel ways. TV interpreters tend to add either for explicitation or for resolving phonological ambiguities. An example of the former is the use of conjunctive 'or' in the translation of the acronym 'IDF' into قوات الجيش أو الدفاع الإسرائيلية in Text 12. The latter can be detected in the use of ولد و هو يحمل عبئا ثقيلا for 'has borne the heaviest share of the burden' in Text 9.

The fourth point concerns pausing. The pauses analyzed thus far are all intra-clausal and intra-sentential. The mean pause duration in this corpus is 856.623 milliseconds, while the total pause duration is 689,424 milliseconds. These figures are related to the normal practice adopted by TV interpreters when simultaneously translating from English into Arabic. They tend to follow the normal range of pausing as proposed by Bilá and Džambová (2002). However, these pauses point to important facts about the linguo-cognitive processing demands for English-Arabic simultaneous interpreting. They are the longest before ST imagery and syntactic restructuring, while they are the shortest before lexico-semantic processing. Before processing images, pauses sometimes exceed 2,000 milliseconds. These facts show that TV interpreters try to follow the normal rate of pausing, but they are not always ready with automatisms that can be utilized to overcome the complexity of syntactic processing and imagery suppression as discussed by Gernsbacher and Shlesinger (1997).

Finally, although TV interpreters follow the standard strategies for dealing with imagery as proposed by Gernsbacher and Shlesinger (1997), they tend to prefer paraphrasing. Despite being one of the practices recommended, it is the least effective, since the expressive effect of the image is usually lost. Some TV interpreters, however, produce semantically appropriate images in the TT, and still others tend to omit the image altogether, which is not recorded in the literature as a valid strategy.

It can be concluded that the in-depth analyses of the STs and their TTs in this chapter have proved to be useful for the exploration of the linguo-cognitive processes involved in interpreting from English into Arabic. The model proposed in chapter 3 along with its assumptions and formulae seem to be fitting for the analysis of this corpus and can be extended to other corpora in chapter 5. The most important point to take into consideration here is that TV interpreters follow almost the same strategies and cognitive activities as recorded in the literature, but their deviations may be justified by the need to cope with the speaker. They pause excessively to go beyond the limits allowed for them, but this can be considered due to the rhetorical mode of Arabic, where words and structures are highly expressive. They also tend to use innovative strategies to manage time and convey as much of the ST message as possible. The next chapter provides more insights into their linguistic and cognitive problems by focusing on an Arabic-English corpus.

NOTES

1. Shlesinger (2002) maintains that interpreters are usually able to store stretches of the ST for over 2 seconds.

2. Hatim and Mason (1997, p. 51) highlight the idea of 'trade-off' as operating 'among the separate components of the task. For example, if syntactic processing becomes especially burdensome at a particular juncture, then time available for, say, lexical searching will be reduced'.

3. Mazza considers numbers as low-predictability items in simultaneous interpreting.

Chapter 5

Analyzing the Arabic-English Dynamics

5.1 INTRODUCTION

This chapter is concerned with analyzing the Arabic speeches simultaneously interpreted into English and broadcast on major TV satellite stations such as Al-Jazeera, Press TV, CNN and BBC English. The corpus collected is first described, then the method of analysis is fully explained in accordance with the model presented in chapter 3. The aim of this chapter is to illustrate how the model proposed is capable of explaining the decisions taken by interpreters when translating from their A-language (i.e. Arabic) into B-language (i.e. English). These decisions are mediated by many linguistic and cognitive processes that attest to the complexity of the interpreting activity. These decisions together with the strategies that manifest them are thoroughly traced throughout the corpus by focusing on the linguistic inputs and outputs and how the cognitive processes can be detected through significant pauses and hesitations in the interpreter's production phase. In a sense, both linguistic and paralinguistic data (i.e. pauses and hesitations) furnish the necessary clues for the cognitive activities involved. Wave spectrograms with fractions of seconds are used to illustrate and verify these activities.

5.2 DESCRIPTION OF THE CORPUS

The corpus is made up of a set of data comprising 13 source texts and 15 target texts. This means that all the source texts except for two have one interpretation. Only the speech by Omar Suleiman on Mubarak's resignation and the one by Mubarak on 10 February are presented with two interpretations, one from Al-Jazeera English and the other from CNN and BBC English. The

reason for this variation stems from two reasons. First, these are the only Arabic political speeches found with two English interpretations in two renowned satellite stations which are supposed to recruit highly qualified interpreters. Second, there is a need to compare even briefly the outputs of two interpreters of the same source text to verify how the process of interpreting is too complex to be analyzed separately.

5.2.1 Source Texts

5.2.1.1 Rationale

The source texts are speeches that mark important political events and delivered by renowned personalities. Their choice has been informed by their availability, authenticity and completeness. Their lengths vary from 31 seconds to 29 minutes and 21 seconds with a total length of approximately 3 hours and 41 minutes. Their size is 14,897 words. Table 5.1 summarizes the lengths of the source texts in ascending order together with the TV channels on which the interpretations were broadcast, and their occasions.

They are also recent speeches, for they are located between 2008 and 2011. This adds to their importance and shows how current interpreting activity is managed on TV satellites.

5.2.2 Target Texts

The target texts are all the telecast interpretations of the Arabic source texts. They total 15 speeches. They have been transcribed verbatim with all the pauses and hesitations included. Even cheers have been included between parentheses in order not to interfere with the sound analyses carried out by specialized software.

5.3 METHOD OF ANALYSIS

5.3.1 Preparing the Data for Analysis

5.3.1.1 A Note on Pauses and Hesitations

The scripts of source texts were transcribed verbatim by the author, then checked against their originals. The videotaped interpretations were then transcribed verbatim with all pauses, hesitations and cheers included. The two sets of data were matched to ensure clarity and completeness. In the target texts, pauses were divided into very long, long and short in order to take benefit of their significance. Very long pauses were marked by more than three

Table 5.1 A Summary of the Time Durations of the Source Texts, TV Channels and Occasions of their Interpretations in the Arabic-English Corpus

Text No	*Time duration (minutes:seconds)*	*TV Channel(s)*	*Occasion*
Text 1 (Mubarak's resignation)	0:33	Al-Jazeera English; CNN	Delivered by ex-Vice-President Omar Suleiman on 11 February 2011. The text is concerned with announcing Mubarak's resignation.
Text 2 (Shalgham, UN)	4:14	Al-Jazeera English	Delivered on 25 September 2009 at the United Nations. The text is concerned with Libya's historic decision to dismantle its nuclear program and its contribution to nuclear non-proliferation.
Text 3 (Egyptian Vic. Pr. Omar Suleiman)	4:24	CNN	Delivered on 10 February 2011. The text is concerned with the attempts made by the then Egyptian regime to terminate the 25 January uprising and the call to resume daily activities instead of demonstrating in Tahrir Square.
Text 4 (Abbas in Washington, peace talks)	7:21	Voice of America C-Span	Delivered by Palestinian president Mahmoud Abbas on 2 September 2010, and is concerned with the efforts made by Abbas in Palestinian-Israeli negotiations and the good offices offered by other countries including Egypt.
Text 5 (Mubarak, peace talks)	8:19	Voice of America C-Span	Delivered on 2 September 2010. The text is concerned with the Mubarak's efforts in the Palestinian-Israeli negotiations.
Text 6 (Alqassam Brigades Spokesman)	9:47	Press TV	Delivered by Al-Qassam Brigades Spokesman Abo-obaida on 5 January 2009. The text is concerned with the heroics of the Palestinian resistance and the heavy losses they caused the Israeli forces in the Gaza War in 2008–2009.
Text 7 (Meshaal, prisoners swap)	12:51	Press TV	Delivered by the senior leader of Palestinian Hamas organization Khaled Mashal on 11 October 2011, who declared the finalization of a deal with Israel for swap of 1,027 Palestinian prisoners with the captured Israeli soldier Gilat Shalit.

(*Continued*)

Table 5.1 A Summary of the Time Durations of the Source Texts, TV Channels and Occasions of their Interpretations in the Arabic-English Corpus *(Continued)*

Text No	*Time duration (minutes:seconds)*	*TV Channel(s)*	*Occasion*
Text 8 (Abbas 25 September, UN)	15:31	Al-Jazeera English	Delivered by Palestinian president Mahmoud Abbas on 25 September 2009. The text is concerned with the Abbas's reiteration of the need to establish an independent Palestinian state with Jerusalem as its capital as the fall-out of the peace process.
Text 9 (Mubarak's speech 10 February)	17:06	Al-Jazeera English; BBC English	Delivered on 10 February 2011. The text is concerned with Mubarak's stance towards the revolutionaries in Tahrir Square and his last attempts at reforming the Egyptian Constitution.
Text 10 (Nasrallah 8 May 2008)	25:54	Al-Jazeera English	Delivered by the Hizbollah leader Hassan Nasrallah on 8 May 2008. The text is concerned with Nasrallah's defence of his telecommunications network which he uses to manage the communication process among his armed factions.
Text 11 (Abbas, going to UN)	26:04	Al-Jazeera English	Delivered by Palestinian president Mahmoud Abbas on 16 July 2011. The text is concerned with the Abbas's decision to approach the United Nations to obtain an official recognition of the Palestinian State.
Text 12 (Khaled Meshaal speech – 10 January 2009)	27:14	Press TV	Delivered on 10 January 2010. The text is concerned with the Hamas resistance in the face of the Israeli forces in the Gaza War 2008–2009.
Text 13 (Abbas 31 December)	29:21	Al-Jazeera English	Delivered by Palestinian president Mahmoud Abbas on 31 December 2008. In this speech, Abbas stressed the Palestinians' need to be steadfast in the face of the Israeli aggression in the Gaza War 2008–2009.
Total number: 13	Total duration: approx. 3 hours and 41 minutes	N/A	N/A

dots [….] and long and short ones were marked by three dots […] and two dots [..] respectively. Combinatory symbols are allowed, where excessively long pauses are indicated by means of five or more dots […..]. Cheers were included between parentheses and indicated by the English word 'cheers'. Hesitations, on the other hand, were intratextually glossed and transcribed as they are without any special annotations. It is important to note that the classification of pauses and hesitations adopted in this analysis is the same one adopted in chapter 4. This subdivision is based on Bilá and Džambová (2002:110), where they include, inter alia, the following in milliseconds:

1. Short pause (100 ms – ≤ 300 ms)
2. Normal/optimal (300 ms – ≤ 1350 ms)
3. Long pause (1 350 ms – ≤ 2200 ms)
4. Very long pause (2 200 ms – ≤ 2800 ms)

5.3.1.2 Coding

Coding refers here to the way the source and target texts are represented in the course of this chapter and in the appendices. Each source text is given a distinct number, and in parentheses is included its title briefly. This is meant to make the speeches separate and to avoid any confusion that may arise due to the similarity of the titles of any two or more speeches.

5.3.1.3 Technical Equipment

The downloaded material was filtered to reduce noise, especially background noise and hums and hisses at a −28 dB rate with a multi-band noise utility expressly designed by the author. The speaker's voice was also muted to < 0.5. Afterwards, the audio track was examined for pauses in milliseconds. To produce wave spectrograms, the target texts were analyzed at a 1,600 kHz by another program expressly designed (modelled on SFS) by the author. These spectrograms were then zoomed in on to every 1/4 or 1/2 of a second. The benefit of this zooming is to obtain the pauses and hesitations very precisely.

5.3.2 Dimensions of Analysis

The analyses carried out here are based on the discussion of the model proposed in chapter 3. The two dimensions of the linguistic and cognitive are interleaved in such a way as each feeds into the other. The method of analysis is divided into two dimensions: quantitative analysis and qualitative analysis. Quantitative analysis is concerned with the sum-total of pauses, mean pause duration, the numbers of optimal, long and very long pauses in each target

text and active speech levels. Qualitative analysis mainly focuses on the linguistic choices, and errors are first related to the interpreter's linguistic competence, which is made up of lexico-semantic, syntactic and pragmatic processors and sub-components. The interactions and competitions among these phases together with the processing of tropes are also analyzed. The cognitive processes of these processors are explored by inferring the phases they represent in the model. Pauses and hesitations that are detected in the course of this analysis are graphically represented by dint of wave spectrograms that illustrate their durations and the intonation contours involved, especially in the case of hesitations. This double approach ensures that the linguistic and the cognitive dimensions are always in interplay, and that the model proposed is doubly evaluated as a viable toolkit. It also provides in-depth analyses of the strategies used and their cognitive activities.

5.4 ANALYSES OF THE INTERPRETATIONS OF THE SELECTED TEXTS

5.4.1 Quantitative Analysis

5.4.1.1 Pauses

The analysis of pauses focuses with the number of pauses, mean pause duration, the numbers of short, optimal, long and very long pauses in each target text and active speech levels. The values provided in table 5.2 shed light on the way the simultaneous interpreting task from Arabic into English is carefully managed within tight time limits, in addition to clarifying how the cognitive processes are performed. They also furnish the overall picture for the qualitative analysis that ensues in the next section.

It is clear from table 5.2 that the interpreters do not maintain a reasonable number of pauses in relation to the time durations of the speeches interpreted. They exceed 280 pauses in a speech of approximately 17 minutes, and keep the minimum to 5 pauses in a speech of approximately 33 seconds. This means that they cannot process the input as quickly as required, even when the ST is too short. However, the interpreters succeed in maintaining their very long pauses between a maximum of 58 times and a minimum of 3 times in order to offset their slow output rates. Moreover, each decrease in the number of very long pauses leads to a noticeable increase in the numbers of optimal pauses.

Their mean pause durations are located along a scale ranging from 2,497.35 milliseconds to 610.333 milliseconds. However, it should be noted that the minimum of 610.333 milliseconds is found in a time duration of 33 seconds. This detracts from the validity of this lower bound, for

Table 5.2 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the Arabic-English Corpus

Text No	*Time duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 1 (Mubarak's resignation, Al-Jazeera)	0:33	Number of pauses	15	N/A
		Mean pause duration	982.7 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	13	N/A
		Number of long pauses	0	N/A
		Number of very long pauses	0	N/A
		Active speech level	−36.5 dB Activity: 92.1%	Min:--- Max: 100%
Text 1 (Mubarak's resignation; CNN)	0:33	Number of pauses	5	N/A
		Mean pause duration	610.333 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	3	N/A
		Number of long pauses	0	N/A
		Number of very long pauses	0	N/A
		Active speech level	−32.3 dB Activity: 94.7%	Min:--- Max: 100%
Text 2 (Shalgham, UN)	4:14	Number of pauses	92	N/A
		Mean pause duration	770.07 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	38	N/A
		Number of long pauses	38	N/A
		Number of very long pauses	2	N/A
		Active speech level	−35.4 dB Activity: 88.9%	Min:--- Max: 100%

(*Continued*)

Table 5.2 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the Arabic-English Corpus *(Continued)*

Text No	*Time duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 3 (Egyptian Vic. Pr. Omar Suleiman)	4:24	Number of pauses	94	N/A
		Mean pause duration	1,100.43 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	62	N/A
		Number of long pauses	13	N/A
		Number of very long pauses	9	N/A
Text 4 (Abbas in Washington, peace talks)	7:21	Number of pauses	60	N/A
		Mean pause duration	891.01 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	40	N/A
		Number of long pauses	9	N/A
		Number of very long pauses	7	N/A
		Active speech level	−35.1 dB Activity: 93.4%	Min:--- Max: 100%
Text 5 (Mubarak, peace talks)	8:19	Number of pauses	102	N/A
		Mean pause duration	1,007.80 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	10	N/A
		Number of long pauses	8	N/A
		Number of very long pauses	6	N/A
		Active speech level	−36.1 dB Activity: 93.1%	Min:--- Max: 100%
Text 6 (Alqassam Brigades Spokesman)	9:47	Number of pauses	129	N/A
		Mean pause duration	747.41 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	20	N/A
		Number of long pauses	0	N/A
		Number of very long pauses	10	N/A
		Active speech level	−30.8 dB Activity: 91.0%	Min:--- Max: 100%

Text 7 (Meshaal, prisoners swap)	12:51	Number of pauses	186	N/A
		Mean pause duration	937.71 ms	Min 100 ms Max ≤ 2,800 ms
Text 8 (Abbas 25 September, UN)		Number of optimal pauses	110	N/A
		Number of long pauses	14	N/A
		Number of very long pauses	14	N/A
		Active speech level	−40.5 dB Activity: 85.1%	Min:--- Max: 100%
Text 8 (Abbas 25 September UN)	15:31	Number of pauses	96	N/A
		Mean pause duration	669.20 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	50	N/A
		Number of long pauses	12	N/A
		Number of very long pauses	4	N/A
		Active speech level	−36.2 dB Activity: 97.3%	Min:--- Max: 100%
Text 9 (Mubarak's speech 10 February; BBC)	17:06	Number of pauses	289	N/A
		Mean pause duration	2,497.35 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	100	N/A
		Number of long pauses	32	N/A
		Number of very long pauses	58	N/A
		Active speech level	−37.6 dB Activity: 96.6%	Min:--- Max: 100%
Text 9 (Mubarak's speech 10 February; Al-Jazeera)	17:06	Number of pauses	219	N/A
		Mean pause duration	1,518.99 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	40	N/A
		Number of long pauses	32	N/A
		Number of very long pauses	7	N/A
		Active speech level	−33.6 dB Activity: 95.2%	Min:--- Max: 100%

(*Continued*)

Table 5.2 The Sum-Total of Pauses, Optimal, Long and Very Long Pauses, Mean Pause Durations and Active Speech Levels for Each Text in the Arabic-English Corpus *(Continued)*

Text No	*Time duration (minutes:seconds)*	*Speech Features*	*Values*	*Reference Range*
Text 10 (Nasrallah 8 May 2008)	25:54	Number of pauses	147	N/A
		Mean pause duration	1,298.69 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	95	N/A
		Number of long pauses	22	N/A
		Number of very long pauses	14	N/A
Text 11 (Abbas, going to UN)	26:04	Number of pauses	119	N/A
		Mean pause duration	762.01 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	80	N/A
		Number of long pauses	9	N/A
		Number of very long pauses	3	N/A
		Active speech level	−40.7 dB Activity: 98.4%	Min:--- Max: 100%
Text 12 (Khaled Meshaal speech – 10 January 2009)	27:14	Number of pauses	186	N/A
		Mean pause duration	1,475.85 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	110	N/A
		Number of long pauses	14	N/A
		Number of very long pauses	14	N/A
		Active speech level	−40.5 dB Activity: 85.1%	Min:--- Max: 100%
Text 13 (Abbas 31 December)	29:21	Number of pauses	189	N/A
		Mean pause duration	1,218.53 ms	Min 100 ms Max ≤ 2,800 ms
		Number of optimal pauses	100	N/A
		Number of long pauses	33	N/A
		Number of very long pauses	15	N/A
		Active speech level	−30.2 dB Activity: 87.9%	Min:--- Max: 100%

it appears to be long in relation to the ST's length. Yet these values are largely within the optimal levels, that is, minimum 100 milliseconds and maximum ≤ 2,800 milliseconds, according to the ranges provided by Bilá and Džambová (2002). Moreover, the interpreters in this corpus manage to miss few source-textual segments by way of omission and compression as is manifested by their active speech levels. These levels range between 100% and 85.1%.

The above-mentioned values are mainly an indication of the relatively high performance of the interpreters, and their ability to use their attentional and cognitive resources appropriately with a minimum of effort waste. This runs contrary to the findings of Darwish (2006), who contends that Arab interpreters lack sufficient training and so perform poorly when interpreting telecast speeches.

5.4.1.2 Ear-Voice Span (EVS)

The analysis of the Ear-Voice Span values is concerned with the differences in time between the speaker's output and the interpreter's output. The importance of this analysis stems from the influence of the speech rate on the reception and production of the interpreter. Major time differences may indicate that the interpreter either fails to cope with the speaker, or he/she anticipates more than normal. Table 5.3 summarizes the speech rates of speakers and interpreters, together with the calculated EVS.

It is evident from table 5.3 that the delivery rates are all slow except for Text 11, where it is normal. It is also clear that interpreters operating from Arabic into English are prone to have a maximum EVS of 8.39 words per minute and a minimum of −65.5 words per minute. This great variation is indicative of the way their cognitive processor operates in relation to the speed of delivery of STs. As the EVS increases, cognitive processes become more complex, since they require more time and effort. However, the negative values provided attest to important facts. First, Arabic-English interpreters tend to use more words than the original, as is manifested by the chunking strategy examples quoted in the Qualitative Analysis section. Second, they tend to anticipate, as is manifested by the additions analyzed under the qualitative minutiae below. Moreover, speech rates also indicate that fast delivery is sometimes in converse relation with minus EVS, so to say. For example, in Text 12, where the delivery rate is 111.42 words per minute, the EVS detected is −14.56 words per minute. With a relaxed delivery rate of 66.48 words per minute (cf. Text 11), the EVS is −43.77 words per minute. This means that the cognitive processes involved in interpreting in the English-Arabic direction are normally sporadic, with less extreme pausing or lag. The averages provided at the end of the table 5.3 corroborate this finding, where a general EVS of −12.35 words per minute.

Table 5.3 The Speech Rates of Speakers and Interpreters, Together with the Calculated EVS in the Arabic-English Corpus

Text No	*Speaker's Rate (words per minute)*	*Interpreter's Rate (words per minute)*	*EVS (words per minute)*
Text 1 (Mubarak's resignation; Al-Jazeera English)	96.97	98.97	2
Text 1 (Mubarak's resignation; CNN)	96.97	98.97	2
Text 2 (Shalgham, UN)	99.97	96.41	3.56
Text 3 (Egyptian Vic. Pr. Omar Suleiman)	73.81	102.04	−28.59
Text 4 (Abbas in Washington, peace talks)	79.57	77.5	2.07
Text 5 (Mubarak, peace talks)	78.39	70	8.39
Text 6 (Alqassam Brigades Spokesman)	73.88	139.38	−65.5
Text 7 (Meshaal, prisoners swap)	96.48	96	0.48
Text 8 (Abbas 25 September UN)	74.32	96.41	−22.09
Text 9 (Mubarak's speech 10 February, BBC)	69	67	2
Text 9 (Mubarak's speech 10 February, Al-Jazeera.)	69	66.8	2.2
Text 10 (Nasrallah 8 May 2008)	87.56	110.32	−22.76
Text 11 (Abbas, going to UN)	66.48	110.25	−43.77
Text 12 (Khaled Meshaal speech – 10 January 2009)	111.42	125.98	−14.56
Text 13 (Abbas 31 December)	75.84	86.56	−10.72
Average	83.31	96.17	−12.35

5.4.2 Qualitative Analysis

The dimension of qualitative analysis is concerned with the detection of the various cognitive processes involved in interpreting from English into Arabic. According to the model proposed in chapter 3, these processes are divided into lexico-semantic, syntactic and pragmatic inferencing. Each of these processes is mediated by linguistic decisions that are also taken to be their manifestations in the form of utterances. Specific occurrences of pauses are pinpointed and analyzed under each process, coupled with the strategies applied, to gain more insight into how much the simultaneous interpreting process is complex, with a view to the cognitive causes of the adoption or exclusion of one strategy or another.

5.4.2.1 Lexico-Semantic Processing

The lexico-semantic processor is a major component of the Linguo-Cognitive Processor (LGP) as indicated in model proposed in chapter 3. It is sometimes highly successful in dealing with lexical problems in simultaneous interpreting from Arabic into English by taking the right decision with the least cognitive effort involved. Other times, it exhibits much hesitation and silences due to the complexity of the task. But what is noticeable is the close interplay between the lexico-semantic processor and the major strategies reported in the literature, such as transcodage, explicitation and deverbalization. The following examples illustrate how the lexico-semantic processor behaves according to the interpretations of the speeches selected.

Transcodage is a valid starting point, and is detected in the interpretation of the extract below from Text 3. The interpreter may have applied that strategy to save time:

ST	*TT*	*Back Translation*
والحفاظ على مكتسباتها، ودورها ودرء المخاطر عن أبنائها ... لقد فتحنا باب الحوار	and to safeguard the gains and achievements of its people and to put aside put away the dangers. We have opened the door for the dialogue	والحفاظ على مكاسب وإنجازات شعبها وتنحية الأخطار.. لقد فتحنا باب الحوار

The interpreter copies the ST lengthy syntactic structure by means of transcodage; however, his mental lexicon experiences shortage in finding a one-word equivalent for درء, which he interprets into the hesitant 'put aside put away'. Transcodage is also clear in 'we have opened the door for the dialogue' for لقد فتحنا باب الحوار. The disadvantage of this interpretation is that it is lengthy and slightly idiomatic. Wordiness is likewise detected in 'and demands will be accomplished on the timetable according to the timetable', where the repetition is only meant to make sure that idiomaticity is achieved despite the fact that 'on the timetable' is an adequate interpretation.

In the following extract from Text 6, the interpreter proceeds with applying explicitation, and this incurs more cognitive overload on his lexico-semantic processor. That is why he pauses at a certain point:

ST	*TT*	*Back Translation*
أولا فيما يتعلق بالضربة القاصمة للقسام فهذا محض افتراء و الوقائع على الارض تثبت كذب هذا الادعاء	First of all.. concerning …uh.. the blow against alqassam.. this is.. not true they have not dealt a severe blow to us and.. what hap.. what's happened on the ground show that this a lie..	بادئ ذي بدء .. بخصوص ... اه .. ضربة ضد القسام .. هذا هو .. غير صحيح أنهم لم يتعرضوا لضربة قاسية لنا .. وماذا حقاً .. ما حدث على الأرض يظهر أن هذا كذبة..

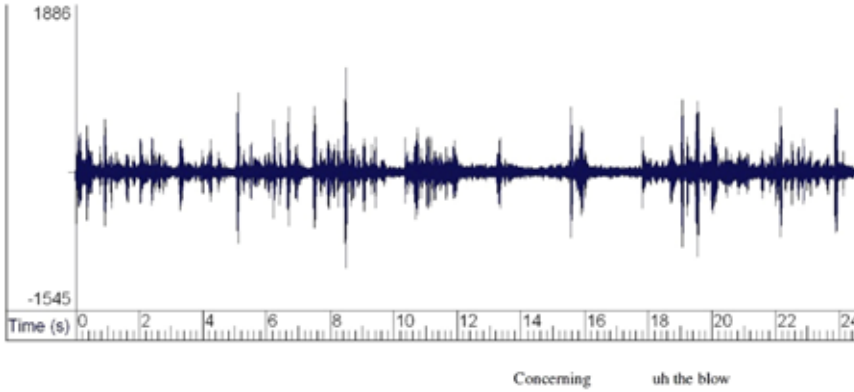

Figure 5.1 A Wave Spectrogram for the First Pause in Text 6.

The interpreter experiences a lexico-semantic difficulty with الضربة القاصمة. He pauses significantly, then uses a filler as is illustrated by the spectrogram in figure 5.1.

The pause consumes approximately 1.2 seconds (i.e. 1,290 ms). This pause can be justified by the failure of the lexico-semantic processor to move from automatized items such as أولا to an idiomatic expression, namely الضربة القاصمة. This justification is based on the ensuing ST textual material محض افتراء, which the interpreter quickly deverbalizes as 'this is.. not true', and here he finds an idiomatic equivalent to الضربة القاصمة as a 'severe blow'.

In Text 8, in the following extract, the interpreter once more resorts to explicitation, but this time it overloads the processor, and a relatively long pause is detected:

ST	*TT*	*Back Translation*
بجانب تجميد الاستيطان بشكل شامل هو الذي يمكن أن ينقذ عملية السلام ويفتح الآفاق أمام نجاحها.	in addition to a.. complete.. freeze.. of all settlement activities…can salvage the peace process and open horizons for its success.	بالإضافة إلى .. التجميد الكامل .. لجميع الأنشطة الاستيطا نية ... يمكن أن ينقذ عملية السلام ويفتح آفاقا لنجاحها.

The interpreter applies explicitation in the very beginning, but shortly pauses before تجميد, then pauses long before أن ينقذ, probably to search for 'salvage'. The pause can be plotted on the wave spectrogram in figure 5.2.

The pause consumes approximately 1.8 seconds (i.e. 1,792 ms). It is clear that the interpreter's Linguo-Cognitive Processor is exhausted; the acoustic energy just before the pause has dropped to less than 1,500 Hz.

On some occasions, the interpreter is forced to resort to automatisms to save time and cognitive effort. The example below from Text 11 illustrates this point.

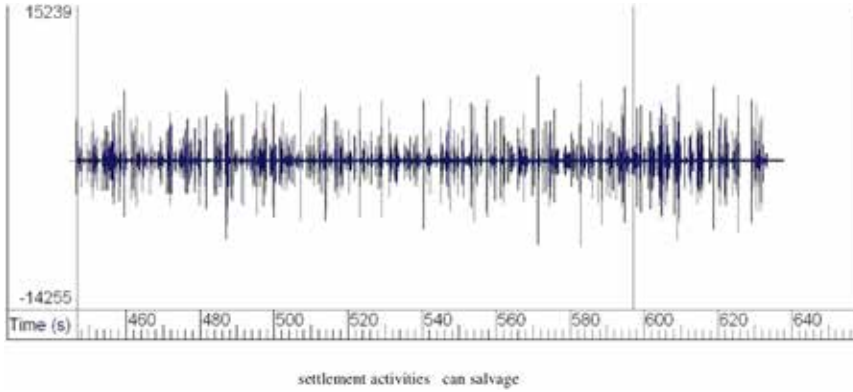

Figure 5.2 A Wave Spectrogram for the Third Pause in Text 8.

ST	*TT*	*Back Translation*
يراد للضفة أن تظل تحت الاحتلال وتقطيع الأوصال والاستيطان والجدار والتهويد وأن تظل تحت الهيمنة الأمنية الأمريكية عبر الجنرال دايتون. وأهيب بشريحة الطلاب التي صنعت الانتفاضتين في الضفة الغربية وأخرجت جيل الاستشهاديين.	They want to continue with settlement activities they want to continue with the separation wall and they want..the.. West Bank to stay under the American security hegemony under general bases…and..I'd like to speak to the students who were behind the June intifada in the West Bank.. the generations of martyrs.	إنهم يريدون الاستمرار في الأنشطة الاستيطانية ويريدون الاستمرار في الجدار الفاصل ويريدون ....الضفة الغربية للبقاء تحت هيمنة الأمن الأمريكية في ظل القواعد العامة ... و ... أود أن أتحدث إلى الطلاب الذين كانوا وراء انتفاضة يونيو في الضفة الغربية .. أجيال الشهداء.

The interpreter omits تقطيع الأوصال and التهويد successively due to the difficulty of searching for the two items at the same time in the LTM. His solution is to select the items in between which he uses as automatisms. He also semantically changes أهيب (i.e. 'call upon') into the contracted form 'I'd like to speak', and further omits شريحة as a kind of semantic compression. Similarly, the ST الاستشهاديين is replaced by the meronym 'martyrs'.

Automatisms are also detected in the following extract from the same text:

ST	*TT*	*Back Translation*
نريد انتفاضة ثالثة في الضفة وانتفاضة ثالثة في الشارع العربي والإسلامي حتى يتوقف العدوان	We need a third Intifada in the West Bank and third revolution and revolution in the Arab and Islamic World until the military campaign stops and the enemy	نحن بحاجة إلى انتفاضة ثالثة في الضفة الغربية وثورة ثالثة وثورة في العالم العربي والإسلامي حتى تتوقف الحملة العسكرية.

The interpreter accesses the prime of انتفاضة in the lexico-semantic part of the LTM under انتفض, which he equates with 'to revolt'. This leads him to transliterate the first mention of انتفاضة in the ST as 'Intifada', but renders انتفاضة ثالثة, as a second mention, into 'revolution'. This may be an automatized decision, for the interpreter succeeds in interpreting العدوان into 'military campaign' without any hesitations.

5.4.2.2 Syntactic Processing

The syntactic processor is limited due to its nature; it operates on the transformation of certain ST structures into acceptable, well-formed ones in the direction of the TT. This means that any attempt to overload the syntactic processor inevitably leads to interrupting the process of simultaneous interpreting, since the lexico-semantic processor cannot play its role. Certain problems left over by the lexico-semantic processor are to be handled by the syntactic processor, only after the former fails. This may be one reason why the syntactic processor seems to be cognitively overburdened. Another reason is the strategies of chunking, restructuring passive and active sentences, compression and queuing, coupled with the strange syntax that might supervene in the course of interpreting. The following examples well illustrate how the syntactic processor operates.

In the interpretation of the extract below from Text 2, the syntactic processor is faced with a passive structure that results in excessive pausing:

ST	*TT*	*Back Translation*
ولكن لابد أن تعلم الدول التي تحاول أن تمتلك أسلحة ذرية أن العالم لايمكن أن يقبل منها ذلك ...	States….must be encouraged to use a nuclear energy for peaceful means however… the world cannot accept.. attempt	الدول ... يجب تشجيعها على استخدام الطاقة النووية للوسائل السلمية ولكن ... العالم لا يمكن أن يقبل ... يحاول
فإن الوكالة الدولية للطاقة الذرية يجب أن تقوم بالتفتيش على جميع الدول بما فيها الدول التي تمتلك السلاح النووي, وأن لايقتصر دورها على الدول غير النووية حتى تكون هذه الوكالة فعلا وكالة دولية.	the international agency for ..atomic energy must inspect all states including those..uh.. possessing nuclear weapons.. Its role must not be limited to non-nuclear states alone.. if we wish the agency to be a truly effective international agency.	يجب على الوكالة الدولية للطاقة الذرية أن تقوم بالتفتيش على جميع الدول بما فيها تلك ..أه .. امتلاك الأسلحة النووية .. يجب ألا يقتصر دورها على الدول غير النووية وحدها .. إذا كنا نرغب في أن تكون الوكالة وكالة دولية فعالة بحق.

The interpreter pauses excessively after 'states' due to restructuring the passive sentence in Arabic. This pause consumes approximately 2.3 seconds (i.e. 2,387 ms) as is illustrated by the wave spectrogram in figure 5.3.

The syntactic processor is also at stake in processing the ST clause ولكن لابد أن تعلم الدول التي تحاول أن تمتلك أسلحة ذرية أن العالم لايمكن أن يقبل منها ذلك, where the

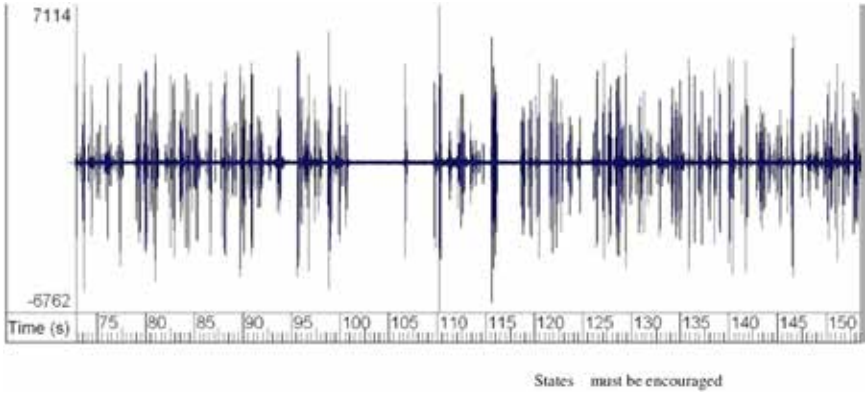

Figure 5.3 A Wave Spectrogram for the First Pause in Text 2.

pause after 'however' consumes approximately 2 seconds (i.e. 2,030 ms) as is illustrated by the wave spectrogram in figure 5.4.

This pause can be attributed to the complex syntax of the ST clause, and the attempt by the interpreter to syntactically compress it into 'the world cannot accept attempt by any state to produce nuclear weapons'. The syntactic processor is also operative in chunking the lengthy clause فإن الوكالة الدولية للطاقة الذرية يجب أن تقوم بالتفتيش على جميع الدول بما فيها الدول التي تمتلك السلاح النووي ، وأن لايقتصر دورها على الدول غير النووية حتى تكون هذه الوكالة فعلا وكالة دولية into two sentences as follows:

> The international agency for ..atomic energy must inspect all states including those..uh..possessing nuclear weapons.. Its role must not be limited to non-nuclear states alone... if we wish the agency to be a truly effective international agency.

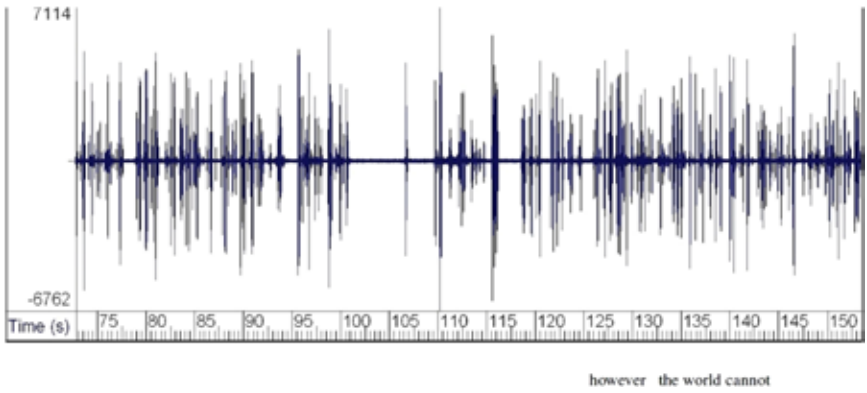

Figure 5.4 A Wave Spectrogram for the Second Pause in Text 2.

Towards the end of Text 3, the interpreter hesitates due to chunking and anticipates some ST material; compression is detected at certain points in the TT:

ST	*TT*	*Back Translation*
فالوطن يحتاج إلى سواعدكم لنبني وننمي ونبدع، لا تنصتوا إلى الإذاعات والفضائيات المغرضة التي لا هدف لها إلا إشعال الفتن والعمل على إضعاف مصر وتشويه صورتها	Our nation needs us and needs your hands to build.. to improve..to create..Do not listen to the stations.. the satellite.. stations that has no goal but to incite strife and weaken Egypt and…deface the image of Egypt	أمتنا تحتاج إلينا وتحتاج إلى يديك لتبني .. لتحسن .. لتنشئ .. لا تستمع إلى المحطات .. الأقمار الصناعية .. المحطات التي لا هدف لها سوى التحريض على الفتن وإضعاف مصر و ... تشويه صورة مصر

Chunking is clear in the first sentence, where the cause connector فـ in فالوطن is omitted, and a new sentence is started. Yet the interpreter hesitates later at الإذاعات والفضائيات المغرضة, where he experiences difficulty with المغرضة and omits, thus harming information integrity (see Darwish, 2006). He pauses at وتشويه صورتها to produce 'and…deface the image of Egypt', where the anaphoric ها is explicitly stated as 'Egypt'.

In Text 4, towards the end of the ST, the interpreter applies queuing to syntactically process complex constructions, but this leads to excessive pausing:

ST	*TT*	*Back Translation*
السيد نتنياهو، ما حصل بالأمس أدناه إدانة شديدة، وما حصل اليوم ندينه أيضا، ولا نريد إطلاقا أن تراق قطرة دم لا من الإسرائيليين ولا من الفلسطينيين.	Mr Netanyahu……what happened in yesterday.. and w..what is hap.. pening.. today is also condemned..uh we do not want at all.. that any blood be shed..One… uh uh uh drop of blood on the part of the only Israeli from the Israelis or the Palestinians.	السيد نتنياهو ..... ما حدث بالأمس .. و ... ما حد..ث هو ..أيضا .. يُدان اليوم أيضاً .. نحن لا نريد إطلاقاً .. أن أي دماء تسفك .. أو ... أه أه أه قطرة من الدم من جانب الإسرائيليين فقط من الإسرائيليين أو الفلسطينيين

The interpreter's pause after 'Mr Netanyahu' consumes approximately 2.9 seconds (i.e. 2,950 ms) as is illustrated by the wave spectrogram in figure 5.5.

This excessive pause leads to omitting أدناه إدانة شديدة, which appears to be lingering in the WM as it reappears in the insertion of 'also' before 'condemned' in the TT. The interpreter is further forced by means of backtracking to syntactically reprocess ولا نريد إطلاقا أن تراق قطرة دم لا من الإسرائيليين ولا من الفلسطينيين into 'we do not want at all.. that any blood be shed..One… uh uh uh drop of blood on the part of the only Israeli from the Israelis or the Palestinians'. This is obvious in the fillers inserted.

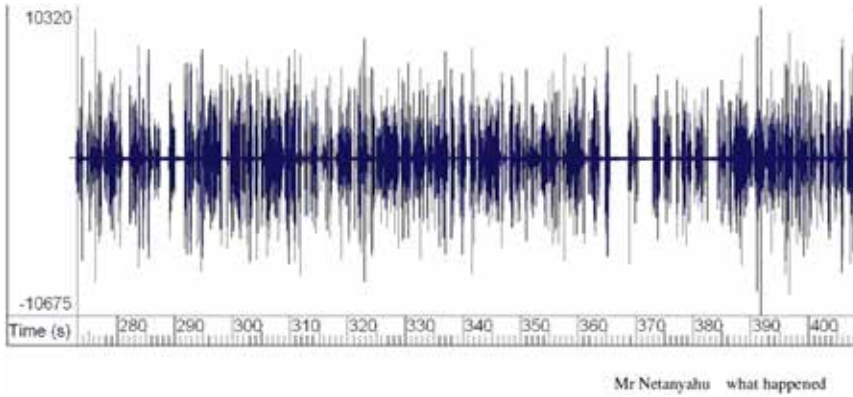

Figure 5.5 A Wave Spectrogram for the Third Pause in Text 4.

In the interpretation of the extract from Text 5, the interpreter attempts to cope up with the speaker, but fails at some point, and compresses some ST material:

ST	*TT*	*Back Translation*
صحيح أن التوصل الي اتفاق سلام فلسطيني اسرائيلي عادل.. ظل أملا يراودنا ويراوغنا طوال عقدين.. ...وبالتالي فإن المفاوضات المقبلة لن تبدأ من نقطة الصفر أو من فراغ.	It is true that reaching a just and comprehensive peace treaty between both sides has been an el..elusive hope for almost two decades … hence..it is.. expected..that the current negotiations will not start from scratch or in void.	صحيح أن التوصل إلى معاهدة سلام عادلة وشاملة بين الجانبين كان بمثابة أمل مطرد لما يقرب من عقدين من الزمان ...وبالتالي .. هو أمر متوقع .. أن المفاوضات الحالية لن تبدأ من الصفر أو في الفراغ.

The interpreter syntactically compresses يراودنا ويراوغنا into 'elusive hope for', which can be considered an appropriate decision. He also turns والتفاهمات التي عبر السنوات into a compressed form by omitting تم التوصل إليها عبر السنوات الماضية الماضية, and deverbalizing تم التوصل إليها as سابقة (i.e. 'previous'). However, to offset these compressions, he applies explicitation to وبالتالي فإن المفاوضات المقبلة by breaking the connector بالتالي into the verb clause 'it is expected', which is fronted by 'hence'.

In another extract from the same text, the syntactic processor experiences noticeable cognitive overload:

ST	*TT*	*Back Translation*
اتوجه اليكم بالاشادة والتقدير.. لمثابرتكم طوال الفترة الماضية.. من أجل تذليل الصعاب واعادة اطلاق المفاوضات.	I appreciate your..uh.. preservation throughout the past period…to over..come the difficulties…f.. facing the.. relaunching of the.. re.. negotiations	إنني أقدر لك ..ا .. الحفاظ على مدى الفترة الماضية ... إلى الإفراط في ... الصعوبات ... و .. وضع ... إعادة إطلاق ... .. المفاوضات

facing the.. relaunching of the..re.. negotiations

1 2 3 4 5 6 7

Figure 5.6 An Illustration of the Place of the Word 'Negotiations' in the TT Segment.

In the first paragraph, the interpreter mistakes 'preservation' for 'perseverance' due to cognitive overload, which is further manifested in the false start in 'facing the.. relaunching of the..re.. negotiations', where the first syllable of 'relaunching' lingers in his WM to reappear before 'negotiations'. This spillover effect is explained through the 7 plus or minus 2 principle as shown in figure 5.6.

It is clear that the syllable 're' appears as the sixth element in the row just before the seventh word.

In Text 5, compression by way of deverbalization and explicitation are dexterously applied to make full use of the syntactic processor's capacity. The interpreter syntactically compresses يراودنا ويراوغنا into 'elusive hope for', which can be considered an appropriate decision. He also turns والتفاهمات التي عبر السنوات تم التوصل إليها into a compressed form by omitting الماضية, and deverbalizing تم التوصل إليها as سابقة (i.e. 'previous'). However, to offset these compressions, he applies explicitation to وبالتالي فإن المفاوضات المقبلة by breaking the connector بالتالي into the verb clause 'it is expected', which is fronted by 'hence'.

In the interpretation of the extract below from Text 12, the problem of compounding, tense and aspect pose a serious challenge to the syntactic processor, which is forced to pause long:

ST	*TT*	*Back Translation*
نأخذ "جردة حساب" ما الذي أنجزه العدو؟ أستطيع القول بكل ثقة ومن واقع الميدان: على الصعيد العسكري العدو فشل فشلًا ذريعًا، لم يحقق شيئا، فهل أوقف الصواريخ؟ الآن يتكلم فقط كيف يوقف الصواريخ وعن صنع حقائق في جنوب غزة حتى يضمن أمنه ، كما يزعم. إنه لا يريد مقاومة في غزة.	Let's make calculations.. what has the enemy achieved..I can say with all confidence according to the facts of the battlefield from the military perspective the enemy has failed completely the enemy has failed completely to achieve anything militarily…has the enemy stopped the rockets from being launched.. now they are speaking how to stop the rockets from being launched.. they are speaking about imposing new facts on southern Gaza so that they ..can.. guarantee the security as they alleged..they do not want any resistance in Gaza.	دعونا نجري حسابات .. ما حققه العدو .. أستطيع أن أقول بكل ثقة وفقا لوقائع ساحة المعركة من منظور عسكري أن العدو قد فشل فشلا كاملا فشلت تماما في تحقيق أي شيء عسكري ... لقد أوقف العدو الصواريخ من إطلاقها .. الآن يتحدثون عن وقف إطلاق الصواريخ .. يتحدثون عن فرض وقائع جديدة على جنوب غزة حتى يتمكنوا .. من ضمان الأمن كما يزعمون .. لا يريدون أي المقاومة في غزة.

The colloquial ST compound جردة حساب is interpreted into 'calculations', where the sense of 'taking stock' is conveyed in one TT word. This strategy allows more cognitive space for applying explicitation to ومن واقع الميدان, which he turns into 'according to the facts of the battlefield'.

Finally, in the interpretation of the extract from Text 13, explicitation, implicitation, compression and omission are all in constant interplay:

ST	*TT*	*Back Translation*
معكم أبناء شعبكم في كل مكان داخل الوطن وخارجه ومعكم أبناء أمتكم العربية والإسلامية في أربع جهات الكون، معكم كل المؤمنين بالحرية والعدل والسلام في العالم..	We are standing here..You are supported by your fellow citizens..You are supported by your fellow..countrymen.. in the Arab and Muslim states..those who believe in justices and peace..	نحن نقف هنا من قبل ..أنتم مدعومون من مواطنيكم .. أنتم مدعومون من زملائكم..سكان ... في الدول العربية والإسلامية .. الذين يؤمنون .. بالعدل والسلام
فلا تهنوا ولا تحزنوا واصبروا ورابطوا يا أهل الصبر والرباط، في وجه هذا العدوان الهمجي البربري، ولا تقنطوا من رحمة الله في وجه هذا البلاء وهذه المحنة الشديدة.	Do not falter..Do not relent.. Hold steadfast..Hold steadfast in defiance..in the face of this barbarian.. enemy..Do not despair.	لا تتعثروا .. لا تلينوا .. اصمدوا .. اصمدوا في التحدي..في وجه هذا العدو البربري .... لا تيأسوا.

In the first paragraph of the ST, the interpreter places extra cognitive load on his Linguo-Cognitive Processor by applying explicitation to the ST segment ومعكم أبناء أمتكم العربية والإسلامية, where he adds the verb 'support' and syntactically processes it to be inserted in a passive structure. The result is 'you are supported by your fellow countrymen in the Arab and Muslim states'. However, this explicitation move leads to the omission of في أربع جهات الكون, and likewise the omission of في العالم later on. To offset the loss in meaning, the interpreter compresses يا أهل الصبر و الرباط into the preceding TT string, and so capitalizes on the strategy of implicitation. The same compression strategy is used in translating ولا تقنطوا من رحمة الله, where its sense group can be inferred from 'do not despair'.

5.4.2.3 Pragmatic and/or Cultural Inferencing

Pragmatic and/or cultural inferencing is included in the model proposed in chapter 3 as a sub-processor, not a discrete one. It is not strictly a processing phase, nor is it intended as performing cognitively demanding tasks alone. Rather, it operates in the vicinity of the other processors by pruning their choices and informing certain decisions that cannot be located in lexico-semantics or syntax. The following examples illustrate how pragmatic and/or cultural inferences may act to change certain linguistic decisions.

Text 1 provides a valid example of pragmatic and/or cultural inferencing at work by two interpreters from two TV satellites. The first name 'Mohammed' is omitted by the CNN interpreter to save time, while the Al-Jazeera interpreter sticks to it. This decision shows how the TV interpreter capitalizes on pragmatic inferences; the CNN interpreter applies the English system of address terms (as a pragmatic and/or cultural aspect), while the Al-Jazeera interpreter prefers to keep the Arabic one, since it is an official notice.

Another relevant example is towards the end of Text 13, where the interpreter capitalizes on omission and pragmatic inferencing to relieve the Linguo-Cognitive Processor:

ST	*TT*	*Back Translation*
المجد والخلود لشهداء غزة .. ولكل شهداء شعبنا العظيم الحرية لأسراه الأبطال والشفاء لجرحاه البواسل	Glory to all the martyrs ..and freedom to all the prisoners..and our prayers for our brave wounded..	المجد لجميع الشهداء .. والحرية لجميع السجناء .. وصلواتنا من أجل جراحنا الشجعان..
بسم الله الرحمن الرحيم	As God says in the holy scriptures:	كما يقول الله في كتابه المقدس:
'يا أيها الذين آمنوا اصبروا وصابروا ورابطوا واتقوا الله لعلكم تفلحون' صدق الله العظيم	O believers..hold steadfast in patience..forbearance..	'يا أيها الذين آمنوا اصبروا وصابروا ورابطوا واتقوا الله لعلكم تفلحون'
والسلام عليكم ورحمة الله	Thank you very much.	شكرا جزيلا.

The interpreter opts for the formula 'glory to' and thus omits الخلود and غزة, though the latter is omitted out of implicitation. He also uses 'as God says in the holy scriptures' instead of the Muslim religious formula 'In the name of Allah…' as a pragmatic and/or cultural choice; he is not ready to translate Qur'anic verses, and thus attempts to translate the gist. This may be the reason why he omits صدق الله العظيم. Finally, he opts for the pragmatic formula 'thank you very much' instead of the tenor-shifting literalism 'peace be upon you'. All these decisions can be viewed in the light of the need to automatize the TT output and release the cognitive overload.

5.4.2.4 Interaction

Interaction may be operative between lexico-semantic and syntactic processors, lexico-semantic processor and pragmatic and/or cultural inferences, and syntactic processor and pragmatic inferences. In each of these possibilities, the processing demands cooperate to conduce towards the order and tasks of each processing phase or sub-component. The aim of coordination or interaction is ultimately to release cognitive overload on the WM, and to allow for more choices for the solutions of the various problems that recur in the course of simultaneous interpreting.

5.4.2.4.1 Lexico-Semantic and Syntactic Interaction

As is emphasized in the above section, the interaction between lexico-semantic and syntactic processors is meant to release the cognitive burden. Moreover, the two processors constitute, so to say, the bulk of the processing effort needed when interpreting from the interpreter's B-language (i.e. Arabic) into his/her B-language (i.e. English). The following instances illustrate this close interaction.

In the following extract from Text 2, the interpreter depends on lexico-semantic and syntactic processing, though he hesitates:

ST	*TT*	*Back Translation*
تقديرنا لمبادرتكم بعقد هذه القمة... سيدي الرئيس: لقد قامت بلادي بمبادرة تاريخية عندما قررت طواعية التوقف عن إنتاج قنبلة ذرية...	the appreciation of the Libyan delegation.. Mr President my country undertook a historic.. initiative when it voluntarily ceased production of the.. nuclear bomb it was on the verge of producing..	تقدير الوفد الليبي ..وهذا .. لعقد هذه القمة السيد الرئيس قامت بلادي بمبادرة تاريخية .. عندما توقفت طواعية عن إنتاج ... القنبلة النووية التي كانت على وشك إنتاجها

The interpreter omits مبادرتكم due to hesitating, and opts for 'draft resolution' as a translation of القرار based on spreading the activation (see Graesser et al., 1997) of the word إعداد. He also compresses التوقف عن قررت طواعية into 'voluntarily ceased the production of', thus omitting قررت. Yet he mistakes ذرية for نووية by translating it into 'nuclear'.

Another valid example is from Text 11, where the interpreter experiences cognitive difficulties that stem from his inability to access the relevant processors quickly:

ST	*TT*	*Back Translation*
إننا نذهب إلى الأمم المتحدة للمطالبة بحق مشروع لنا وهو الحصول على العضوية الكاملة لدولة فلسطين في هذه المنظمة، نحمل معنا كوفد فلسطيني كل آلام وآمال شعبنا، لتحقيق هذا الإنجاز وإنهاء الإجحاف التاريخي بحقنا، لننعم كبقية شعوب الأرض بالحرية والاستقلال في دولة فلسطينية على حدود الرابع من حزيران عام 1967، وعاصمتها القدس الشرقية.	We go to the United Nations to ask and to demand for a legal right which is the full membership of the Palestinian state in this organization..We convey with us and we carry with us as a Palestinian delegation the pains.. of our people to achieve this goal ..and to put an end to the torture and to enjoy our right with enjoy our freedom and independence within the Palestinian state on the borders on the fourth of June 1967 with Jerusalem East Jerusalem as the capital of..our nation.	نذهب إلى الأمم المتحدة لنطلب ونطالب بالحق القانوني الذي هو العضوية الكاملة للدولة الفلسطينية في هذه المنظمة ... نحن ننقلها معنا ونحملها معنا بصفتنا وفدًا فلسطينيًا آلام .. شعبنا على تحقيق هذا الهدف .. ووضع حد للتعذيب والتمتع بحقنا في التمتع بحريتنا واستقلالنا داخل الدولة الفلسطينية على الحدود في الرابع من يونيو 1967 مع القدس الشرقية القدس عاصمة ..لأمتنا.

The interpreter applies explicitation in rendering للمطالبة بحق مشروع لنا, where المطالبة is broken down into 'to ask and to demand'. This move might be attributed to the untimely access to the lexico-semantic processor which provides 'ask' as the first prime, then the near-synonym 'demand' is provided shortly after. The result is that the TT appears to have explicitation, but the fact is that there are two outputs for one input. The interpreter also starts a new sentence at نحمل معنا by means of chunking, which places extra cognitive load on the syntactic processor. The same problem of apparent explicitation is detected in 'we convey with us and we carry with', where the ST نحمل معا is first processed at the lexico-semantic processor, which provides the two primes 'convey' and 'carry' one after the other, while the syntactic processor is forced to produce two well-formed sentences for the two primes. This consumes much time and even doubles the already incurred cognitive load. The interpreter thus fails to process the ST alliterative phrase آلام و آمال and so omits آمال in the TT segment 'we carry with us as a Palestinian delegation the pains'. Due to all this cognitive overloading, the interpreter resorts to linear processing in وعاصمتها القدس الشرقية, which he hesitates at and produces 'with Jerusalem East Jerusalem as the capital of..our nation'.

5.4.2.4.2 Lexico-Semantic and Pragmatic and/or Cultural Inferences Interaction

As is explained in section 5.4.2.4, pragmatic and/or cultural inferences guide both lexico-semantic and syntactic processing. In this case, the interaction achieved is meant to lead to domesticating the TT. The following examples illustrate the interaction between the lexico-semantic and pragmatic and/or cultural inferences.

However, it should be noted that no instance of interaction between lexico-semantic and pragmatic and/or cultural inferences are reported. This may be due to the interpreters' separation of the two processing effort, and the inability to analyze the cultural nuances involved in some words as a result of tight time limits.

5.4.2.4.3 Syntactic and Pragmatic and/or Cultural Inferences Interaction

The interaction between the syntactic processor and pragmatic and/or cultural inferencing is achieved through the shifts of pronominal references. Such shifts are purposely done to ensure that the tenor of the TT segment is not offensive or bold on record. However, what is noticeable is that the interaction usually leads to either pausing or WM saturation due to the complexity involved in moving from one processor to a sub-component peripheral to it. The two examples below show the process at work.

In the interpretation of the extract from Text 8, syntactic processing and pragmatic inferences interact, but this eventually leads to significant pausing:

ST	*TT*	*Back Translation*
تنعقد هذه الدورة وأمامها جدول أعمال حافل، فشعوب العالم بأسره تتطلع إلى ما يمكن عمله لإنقاذ كوكبنا من آثار تغير المناخ والاحتباس الحراري، وكذلك ما يمكن عمله من أجل مواجهة الأزمة المالية الدولية، وهناك دول عديدة تشمل الدول الصغيرة أو المتنامية، ترى ضرورة إصلاح الأمم المتحدة.	During this session we have before us a full agenda..the peoples of the whole world are looking to this august body for what can be done to save our planet..from the effect of climate change and global warming..and for what can be done..to interest the international financial crisis... There are several countries including..small and developing countries…who also stress the need to reform the United Nations.	خلال هذه الجلسة أمامنا جدول أعمال كامل .. تتطلع شعوب العالم كله إلى هذه الهيئة الموقرة لما يمكن فعله لإنقاذ كوكبنا..من تأثير تغير المناخ والاحتباس الحراري ... وماذا يمكن أن يحدث يجب الاهتمام ... بالأزمة المالية الدولية ... هناك العديد من الدول بما فيها البلدان الصغيرة والنامية ... التي تشدد أيضاً على الحاجة إلى إصلاح الأمم المتحدة.

The interpreter utilizes the syntactic processor in dealing with تنعقد هذه الدورة وأمامها, which she renders into 'during this session we have before us'. This syntactic restructuring leads to a pragmatic shift, where the pronoun 'we' changes the tenor of the string and decreases the level of formality. Compression and explicitation are clear in 'the whole world are looking to this august body for what can be done' as a translation for فشعوب العالم بأسره تتطلع إلى ما يمكن عمله. The interpreter semantically compresses شعوب العالم (i.e. peoples of the world) into 'the whole world', and applies explicitation to تتطلع إلى ما يمكن عمله by adding 'august body' as an object. However, the syntactic processor is cognitively overburdened, and this is clear in chunking the ST sentence

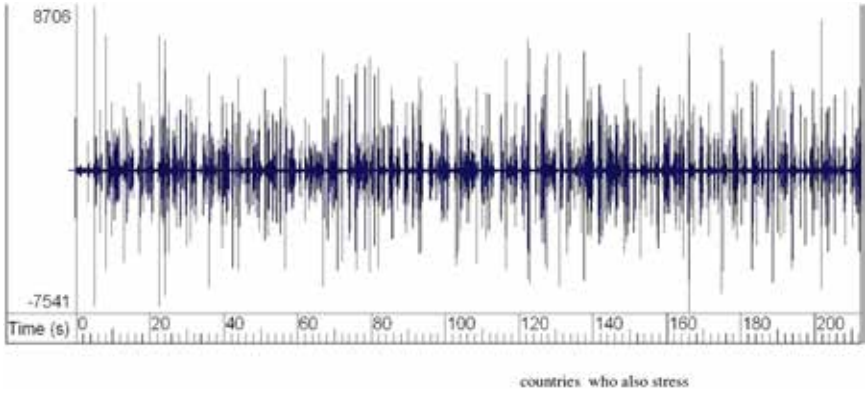

Figure 5.7 A Wave Spectrogram for the First Pause in Text 8.

starting with وهناك, and the significant pause before ترى. The wave spectrogram in figure 5.7 illustrates this pause.

This pause consumes approximately 3 seconds (i.e. 2,988 ms). It may be due to the cognitive overload on the syntactic processor after chunking the previous segment. This is clear in the acoustic energy just before the pause, which has dropped to less than 8,706 Hz.

In the following extract from Text 12, similar shifts are detected, but WM saturation is clear:

ST	*TT*	*Back Translation*
بوركتِ يا مقاومة غزة .. بوركتَ يا شعبنا العظيم على أرض غزة وفي كل فلسطين وفي كل مكان.	I pay tribute to Gaza holy Gaza holy people of Palestine and the people of Gaza.	أحيي غزة المقدسة شعب فلسطين المقدس وأهل غزة.
العدو وضع لنفسه أهدافًا، هذه الأهداف بدأت تتآكل مع مرور الزمن	The enemy..has..put aims..has assigned aims to achieve ..has specified aims to achieve these aims are now lessening with the passing by	العدو .. هدف..الهدف..يهدف إلى تحقيقه..يحدد أهدافه لتحقيق هذه الأهداف تقلل الآن مع مرور الزمن

In the first paragraph, the interpreter is forced to pragmatically shift the ST segment بوركتِ يا مقاومة غزة into 'I pay tribute to Gaza'. This shift is achieved syntactically by making the grammatical subject 'Gaza' the object of the preposition, namely 'to Gaza' in the TT. This shift clearly changes the tenor of the TT, and is further applied to the following string in the same ST sentence بوركتَ يا شعبنا العظيم على أرض غزة وفي كل فلسطين وفي كل مكان, where the interpreter compensates for the shift by using 'holy' for العظيم (i.e. 'great'). However, the cognitive effort required for this lexico-semantic choice results in jumbling the ST segment وفي كل فلسطين وفي كل مكان, which is turned into 'holy people of Palestine and the people of Gaza' due to the saturation of the WM. In the second paragraph, the interpreter applies explicitation by breaking down وضع لنفسه أهدافًا into 'has..put aims..has assigned aims to achieve ..has specified aims to achieve'. This places extra cognitive load on the syntactic processor due to producing three TT clauses for one ST clause. He also applies chunking by starting new sentences every time أراد is mentioned. This overburdens the syntactic processor even more, and leads to compression in processing other ST segments.

5.4.2.4.4 Interaction among All Processing Phases

Interaction or coordination among the various processing phases can be seen in the way these phases interact and allow time and cognitive effort for each other to operate. Due to the complex task of simultaneous interpreting, it is

rare to find a valid example in which all these phases work together. The reason may be the nature of simultaneous interpreting itself, where tight time limits take their toll on the ability of the interpreter to let the input pass through these entire phases one after the other, or even all at the same time. The latter choice may lead to overloading the WM, and the result may be total failure to cope up with the speaker; hence non-translation. Only one example has been detected.

The interpreter experiences some other processing problems in the following extract from Text 4, where he hesitates and pauses due to the checking operations of the buffer point (BP):

ST	*TT*	*Back Translation*
ونؤكد هنا باسم منظمة التحرير الفلسطينية أننا سنعمل بكل تصميم وجدية ونية صادقة من أجل إنجاح هذه المفاوضات.	It wi..uh..assure you in the name of PLO that we will.. draw on years of experience in negotiations and benefit from the lessons learnt ..and to make these negotiations successful.	إنه ... أنا ... أن أؤكد لكم باسم منظمة التحرير الفلسطينية أننا سنقوم .. بالاستفادة من سنوات الخبرة في المفاوضات والاستفادة من الدروس المستفادة .. وجعل ... هذه المفاوضات ناجحة

The interpreter's syntactic processing of the very first sentence is interrupted at the BP, where the TT sentence's grammatical subject 'it' is initially chosen and the modal 'will' is to follow. At this point, the BP point detects that the LI (Linguistic Input) includes the pronoun ن as an Arabic grammatical subject. Backtracking is thus allowed to check accuracy, and the interpreter uses the filler 'uh' before 'assure'.

In Text 8, the female interpreter significantly pauses before حيث in the ST due to the ambiguity of the following clause حيث تتسارع اليوم عبر وسائل مختلفة:

ST	*TT*	*Back Translation*
إن ما يُعانيه الشعب الفلسطيني نتيجة للاحتلال الاستيطاني الإسرائيلي واضح أمام العالم، فمنذ وقع الاحتلال للضفة الغربية بما فيها القدس الشرقية وقطاع غزة عام 1967، وإسرائيل ماضية في سياستها الاستيطانية في الأراضي الفلسطينية وخاصة في القدس، حيث تتسارع اليوم عبر وسائل مختلفة.	The suffering of the Palestinian people as a result of Israel's colonial occupation is crystal-clear to the world..Since the occupation of the West Bank and the Gaza Strip.. including East Jerusalem in 1967.. Israel continues with its settlement policy.. on all Palestinian land.. especially..in..holy Jerusalem….. where.. that policy is currently being.. accelerated and escalated through various means.	إن معاناة الشعب الفلسطيني نتيجة الاحتلال الاستعماري الإسرائيلي واضحة تمامًا للعالم ... منذ احتلال الضفة الغربية وقطاع غزة .. بما في ذلك القدس الشرقية عام 1967..إسرائيل مستمرة في سياستها الاستيطانية .. على جميع الأراضي الفلسطينية..خاصة..في .. القدس ... ... أين .. هذه السياسة يجري حاليا .. تسارعت وتصاعدت من خلال وسائل مختلفة.

Resolving this ambiguity ideally requires utilizing all the phases of the Linguo-Cognitive Processor. The result is use of explicitation in 'that policy is currently being.. accelerated and escalated through various means'.

5.4.2.5 Jostling or Overlap

'Jostling' or 'overlap' is a term coined in this research to refer to the competition among the different components and phases proposed in the model. When components jostle, this means that the Linguo-Cognitive Processor experiences several inner sub-processes for the input to be pushed forwards to the next phase. This points to the intra-phasic and inter-phasic interactions as explained in chapter 3. These interactions may lead to the exclusion of one or more components or phases in favour of one or two other components or phases. Sometimes the net result is a long pause or silence.

5.4.2.5.1 Jostling among the Linguo-Cognitive Components

It refers to the competition among lexico-semantic and syntactic processors, lexico-semantic processor and pragmatic and/or cultural inferences, and syntactic processor and pragmatic inferences. Only one example has been detected about how this may occur.

In the interpretation of the extract below from Text 11, the interpreter experiences several lexico-semantic problems, and is at times unable to convey the sense groups (see Chernov, 2004) entailed in the ST:

ST	*TT*	*Back Translation*
فجهودنا الحثيثة والمخلصة من أجل التوصل عبر المفاوضات إلى حل ينهي الاحتلال ويفضي إلى قيام دولة فلسطينية مستقلة وصلت إلى طريق مسدود، بسبب سياسات الحكومة الإسر ائيلية المتعنتة والرافضة للالتزام بمرجعية للمفاوضات على أساس قرارات الشرعية الدولية والاتفاقات الموقعة مع منظمة التحرير الفلسطينية ومواصلتها للاستيطان ... وتهويد القدس	Our efforts.. our continuous efforts so as to reach through negotiations a solution to end the occupation and to lead to the establishment of an independent Palestinian state is now reaching a deadlock because of the policies of the Israeli government that is rejecting to commit itself with negotiations on the basis of the international uh uh legal resolutions and the agreements signed with the PLO.. and its uh uh policy of settlements and the Jewish uh approach to Jerusalem.	جهودنا .. جهودنا المتواصلة من أجل التوصل إلى حل عبر المفاوضات للتوصل إلى إنهاء الاحتلال وإقامة دولة فلسطينية مستقلة وصلت الآن إلى طريق مسدود بسبب سياسات الحكومة الإسرائيلية الرافضة للالتزام المفاوضات على أساس أه أه القرارات الشرعية الدولية والاتفاقيات الموقعة مع منظمة التحرير الفلسطينية .. وسياسة أه أه المستوطنات والمقاربة اليهودية تجاه القدس

The interpreter is faced with the same problem of accessing two primes of the same ST word in فجهودنا الحثيثة والمخلصة, and the lexico-semantic and syntactic

processors seem to compete. This problem is apparent in the omission of the ST مرجعية in مرجعية المفاوضات, which is translated into 'with negotiations'. The interpreter is also unable to access the prime for شرعية in شرعية المفاوضات quickly enough, and hesitates by inserting the filler 'uh' two times, ending with the wrong equivalent 'legal'. The same lexico-semantic problem is detected in translating تهويد القدس into the hesitant version 'the Jewish uh approach to Jerusalem', where again the wrong equivalent 'Jewish approach' is used instead of 'Judaize'.

5.4.2.5.2 Jostling Among Phases

Jostling among phases refers to the competition or interruption in the processing effort among the major phases such as the Linguo-Cognitive Processor, the BP and the production phase. This type of jostling usually results in ill-formed outputs, mediated by several hesitations and intra-clausal and intra-sentential pauses. It also corroborates Chernov's (2004) concept of the interpreter's 'broken program'. No valid examples have been identified in this respect. This may be due to the close cooperation among the different phases involved as exemplified by the analyses of the various examples in section 5.4.2.4.

5.4.2.6 Backtracking

As is explained in chapter 3, this model includes backtracking as the possibility of checking released and pre-released outputs through a return to the previous phase(s). This is possible in cases of doubt, hesitation or extraordinarily fast speech rates. The examples below illustrate this point.

Backtracking may sometimes necessitate syntactic reprocessing as in the interpretation of the extract below from Text 4, but excessive pausing is usually the net result:

ST	*TT*	*Back Translation*
السيد نتنياهو، ما حصل بالأمس أدناه إدانة شديدة، وما حصل اليوم ندينه أيضا، ولا نريد إطلاقا أن تراق قطرة دم لا من الإسرائيليين ولا من الف .. لسطينيين	Mr Netanyahu……what happened in yesterday..and w..what is hap.. pening.. today is also condemned.. uh we do not want at all.. that any blood be shed..One… uh uh uh drop of blood on the part of the only Israeli from the Israelis or the Palestinians	السيد نتنياهو …… ما حدث بالأمس .. و ... ما حد..ث هو ..أيضا .. يُدان اليوم أيضاً .. نحن لا نريد إطلاقاً .. أن أي دماء تسفك .. أو ... أه أه أه قطرة من الدم من جانب الإسرائيليين فقط من الإسرائيليين أو الفلسطينيين

The interpreter's pause after 'Mr Netanyahu' consumes approximately 2.9 seconds (i.e. 2,950 ms) as is illustrated by the wave spectrogram in figure 5.8.

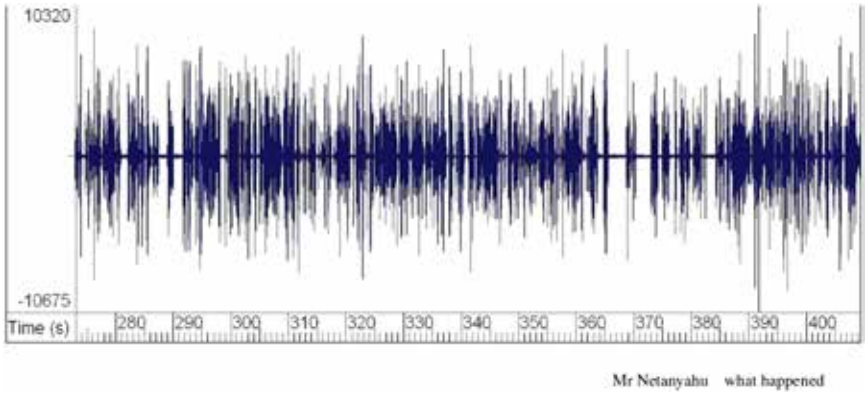

Figure 5.8 A Wave Spectrogram for the Third Pause in Text 4.

This excessive pause leads to omitting أدناه إدانة شديدة, which appears to be lingering in the WM as it reappears in the insertion of 'also' before 'condemned' in the TT. The interpreter is further forced by means of backtracking to syntactically reprocess ولا نريد إطلاقا أن تراق قطرة دم لا من الإسرائيليين ولا من الفلسط ينيين into 'we do not want at all.. that any blood be shed..One… uh uh uh drop of blood on the part of the only Israeli from the Israelis or the Palestinians'. This is obvious in the fillers inserted.

On other occasions, backtracking is mediated by pragmatic inferences as in the interpretation of the extract below from Text 7:

ST	*TT*	*Back Translation*
هذا الانجاز الكبيرة لهذا الحجم والنوعية المتميزة من أسيرانا وأسيراتنا مقابل الجندي الأسير الصهيوني جلعاد شاليط تشمل كل النساء 27 أسيرة مناضلة بطلة لم يبقى ولن تبقى أي أسيرة فلسطينية في سجون العدو هذا بفضل الله، هذه الصفقة في مرحلتها الأولى تضم 315 أسيراً مؤبداً بعضهم مؤبد\ وبعضهم عشر مؤبدات	It's a unique achievement regarding our detainees to be freed in exchange for the Zionist prisoner Gilad Shalit.. this includes all women 27 ..women..fighters…not one Palestinian woman will remain in the prisons of the enemy.. this swap in its first stage 450 it includes 315..315 prisoners who are sentenced to life imprisonment in imprisonment	إنه إنجاز فريد يتعلق بمعتقلينا ليتم إطلاق سراحهم في مقابل الأسير الصهيوني جلعاد شاليط..وهذه تشمل جميع النساء 27 .. إمرأة..المحاربات ... ولن تبقى امرأة فلسطينية واحدة في سجون العدو..هذا التبادل في المرحلة الأولى 450 وتشمل 315..315 السجناء الذين حكم عليهم بالسجن مدى الحياة في السجن

The interpreter transcodes في سجون العدو as 'the prisons of the enemy', which would have been replaced by 'Israeli prisons' for short. This transcoding attempt is set against a pragmatic inference, which necessitates the omission of بفضل الله, which requires a literalism difficult for TL receivers to decipher. This omission in turn allows the interpreter to reprocess the ST sentence

starting with هذه الصفقة في مرحلتها الأولى, which is broken by the number 450; the interpreter attempts backtracking at the BP at the second number 315. The result is the following jumbled output:

> This swap in its first stage 450 it includes 315..315 prisoners who are sentenced to life imprisonment in imprisonment..People sentenced to life imprisonment 315 of them will be..freed 315 out of the 450 in the first stage in addition to people who have been sentenced to tens of years in prison.

Finally, in the interpretation of the extract below from Text 13, the interpreter revisits the processes of handling the first sentence:

ST	*TT*	*Back Translation*
بالقسم الذي أقسمناه على كتاب الله، امتثالًا لإرادتكم وقراركم، وخدمة لمصلحة الوطن والمواطن، محل عزنا واعتزازنا، مصدر ثقتنا واطمئناننا، وعنوان وحدتنا وانتصارنا لن نساوم أو نفرط بقطرة دم واحدة أريقت على مذبح الحرية أو سفحت في وجه همجية العدوان ووحشية المؤامرة.	..we have sworn in..sworn on in ..on the holy scriptures to serve the interests of our country and to serve the interests of our fellow citizens..raising the slogan of victory..we cannot fail you and we cannot..waive..we cannot give up	وقد أقسمنا في .. نشرنا في.. الكتب المقدسة .. لخدمة مصالح بلادنا وخدمة مصالح إخواننا المواطنين .. رفع شعار النصر .. لا يمكننا أن نخذلكم .. لا يمكننا.. التفريط.. لايمكننا الاستسلام

The interpreter experiences backtracking in processing the ST الذي أقسمناه على كتاب الله, where the two words 'swear' and 'swear in on' are confused. The addition of 'holy scriptures' later on is further evidence that the interpreter is not sure how to proceed, for 'swearing in' is a ceremony that includes, inter alia, placing one hand on the holy scripture and reciting a formula of oath. The mental program of the interpreter is clearly interrupted or broken (see Chernov, 2004) by the competition between the incoming data and the processed items in the Linguo-Cognitive Processor, especially the lexico-semantic processing phase.

5.4.2.7 Processing Failure

Processing failure is the result of the lack of sufficient interaction or coordination among phases and/or sub-components. It confirms Formula 3 proposed in chapter 3 as follows:

3. (P)T1 = (P)T2 = (P)T3 = NA
(P: phase; T: time; NA: not applicable)
(*Formula 3: if the times spent on listening, linguo-cognitive processing, buffering and production are all equal, then no interpreting is possible.*)

However, processing failure is not usually left unchecked; interpreters attempt to rectify the situation by quickly attempting an output.

The interpretation of the extract below from Text 6 illustrates how the lexico-semantic processor sometimes fails to find the appropriate lexical equivalent, and a pause followed by a filler is inserted to compensate for the loss:

ST	*TT*	*Back Translation*
اولا فيما يتعلق بالضربة القاصمة للقسام فهذا محض افتراء و الوقائع على الارض تثبت كذب هذا الادعاء و اعلان العدو لهذه الاكذوبة يجعلنا متيقنين بمدى فشله و تخبطه ان ما نجح فيه العدو حتى الان هو قتل الابرياء قتل الاطفال	First of all.. concerning …uh..the blow against alqassam..this is.. not true they have not dealt a severe blow to us and.. what hap.. what's happened on the ground show that this a lie.. and the lie of the Zionist or the enemy makes us really believe that the enemy is..failing and the enemy is def..is defeated.. the.. enemy has only up to now been able to achieve the killing of.. children and women	بادئ ذي بدء .. بخصوص ... اه .. ضربة ضد القسام .. هذا هو .. غير صحيح أنهم لم يتعرضوا لضربة قاسية لنا .. وماذا حقاً .. ما حدث على الأرض يظهر أن هذا كذبة .. وكذبة الصهيونية أو العدو تجعلنا نؤمن حقا بأن العدو .. يفشل والعدو.. هُزم .. إن العدو لديه فقط حتى الآن قادر على تحقيق قتل .. أطفال والنساء

In the following interpretation of the extract from Text 11, the cognitively overloaded lexico-semantic processor experiences failure, which is clear in the hesitations detected:

ST	*TT*	*Back Translation*
نحن نريد أن نرتاح والعالم كله سيكون مرتاحا.	I think it's the time for us to be to be feel rest and to feel uh uhuh um honoured.	أعتقد أن الوقت قد حان لكي نشعر بالراحة ونشعر أه أه أم بالعزة.
نذهب إلى الأمم المتحدة متوكلين على الله، ومتسلحين بإرادة شعبنا الذي قدم الكثير من أجل وطنه ومن أجل أن يحيا حياة حرة كريمة	We need to go to the United Nations supported by Allah the Almighty and supported by the will of our people that offered a lot for this nation and a lot to live in a good way.	نحتاج أن نذهب إلى الأمم المتحدة مدعومين من الله عز وجل ومدعومين بإرادة شعبنا التي قدمت الكثير لهذه الأمة والكثير للعيش بطريقة جيدة

The interpreter succeeds in eliciting the sense group of the first paragraph of the ST, but fails to process it uniformly. He thus hesitates and applies explicitation but omits the ST segment والعالم كله سيكون مرتاحا. In the second paragraph of the ST, the interpreter prefers to access the already pushed-forwards WM input due to processing متوكلين as 'supported'; he quickly opts for 'supported' once more as a translation for متسلحين. This can be illustrated through the 7 plus or minus 2 principle (see figure 5.9).

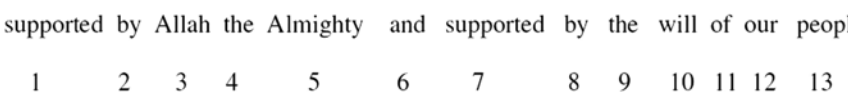

Figure 5.9 An Illustration of the Place of the Word 'Supported' in the TT Segment.

It is clear that the word 'supported' is repeated as the seventh element in the string.

Finally, the syntactic processors may at times consume the time allotted to the lexico-semantic processor, which eventually leads to failure of retrieval. The interpretation of the following extract from Text 12 is a manifestation of this problem:

ST	*TT*	*Back Translation*
سيكونون أسرى حرب.. وليسوا مخربين أو مجرمين، وحتى لو لم يكن هذا نضعهم على رأس أولويات مطالبنا، إنما هذه القضايا هي التي سنعود ونناقشها، كثير من الإخوة يقولون هذه قفزة في الهواء، قضية أحادية، خطوة أحادية؟ نخاطب 193 دولة وتسمى خطوة أحادية، أو قفزة في الهواء!	They will be war prisoners …they are not terrorists they are not criminals they are at that time they will be considered war prisoners and I always consider them at the top of our demands but all these issues are the issues that will be tackled and discussed that's why I am saying a lot of my brothers as I say it's a jump on air it's a unilateral move. from outside..it's a unilateral step..a unilateral step we are talking to 193 countries and you consider it a unilateral uh uh step or a jump on air.	سيكونون أسرى حرب ... ليسوا إرهابيين إنهم ليسوا مجرمين هم في ذلك الوقت سيعتبرون أسرى حرب وأنا أعتبرهم دائماً في قمة مطالبنا لكن كل هذه القضايا هي القضايا التي سيتم معالجتها ومناقشتها لماذا أقول الكثير من إخوتي وأنا أقول إنها قفزة على الهواء إنها خطوة أحادية الجانب. من الخارج .. هذه خطوة أحادية الجانب..خطوة أحادية الجانب نتحدث بها مع 193 دولة و تعتبرونها خطوة أحادية اه اه أو قفزة على الهواء.

The interpreter resorts to contractions throughout to save time, and he also compresses 'prisoners of war' to be 'war prisoners' (see Iacovoni, 2010). Yet he pauses significantly before syntactically processing ,ليسوا مخربين أو مجرمين where he produces two well-formed sentences in the TT. This pause can be plotted on the wave spectrogram in figure 5.10.

The pause consumes approximately 1.8 seconds (i.e. 1,749 ms). This lag can be justified by considering two factors. First, the syntactic processor takes the due time duration to chunk the ST sentence and adds the necessary slots for grammatical subjects and objects. Second, the lexico-semantic processor is to search for the appropriate prime for .مخربين This means that the lag can be portioned out between the two processors. However, it can be concluded that the syntactic processor has consumed much time, since it provides two well-formed sentences successively and the lexico-semantic processor has failed to find the prime 'saboteurs'.

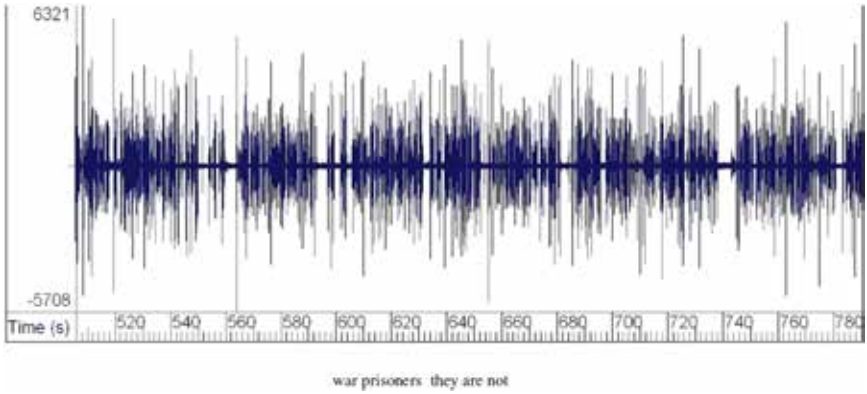

Figure 5.10 A Wave Spectrogram for the First Pause in Text 12.

5.4.2.8 Processing Figures of Speech

Figures of speech have not been included in this model as a separate topic. The reason for this is twofold. First, they are not recurrent in the TV simultaneous interpreting practice, since most of telecast texts are political speeches, commentaries or reports that rarely make use of such tropes. Second, the cognitive challenges posed by figures of speech are usually addressed by the same processors and strategies as other difficulties. What is important, however, about figures of speech is how and why the interpreter chooses a particular cognitive strategy to deal with them, and how much is automatized in this process. The following examples well illustrate the point.

In the interpretation of the extract below from Text 4, the image is lexically processed. The image الروح الوثابة التي أطلقتموها في العالم is turned into 'your firm and sweeping drive with which you.. engulf the entire world'. This translation can be considered the second option provided by Gernsbacher and Shlesinger (1997), that is, producing a lexically not semantically appropriate target-language metaphor. The word 'sweeping' is lexically appropriate, but semantically it does not collocate with 'drive'. Similarly, 'engulf' does not collocate with 'drive', since the former has negative connotations.

However, in Text 5, the image is semantically processed and the explicitation strategy is utilized to achieve optimal equivalence:

ST	*TT*	*Back Translation*
إنني أقول للإسرائيليين اغتنموا الفرصة الحالية ولاتدعوها تفلت من بين أيديكم. إجعلوا السلام الشامل هدفا.. ومدوا إيديكم لتلاقي اليد العربية الممدودة إليكم بالسلام.	I say to the Israelis..seize the current opportunity..do not let it slim through your fingers..make comprehensive peace your goal ..extend your hand.. to meet the hand already extended in the Arab ..peace initiative.	أقول للإسرائيليين .. أحصلوا على الفرصة الحالية .. لا تدعوها تنسل من أصابعك .. اجعلوا السلام الشامل هدفكم ..مد أيدكم .. لمقابلة اليد الممتدة بالفعل في المبادرة العربية .. للسلام.

However, he applies explicitation as a complementary strategy to the processing of the image اليد العربية الممدودة إليكم بالسلام, which is turned into English as 'the hand already extended in the Arab ..peace initiative'. Thus, he combines semantic appropriacy with explicitation to overcome the disadvantage of calquing the image in the TL.

Sometimes paraphrasing is used to process figures of speech as in Text 6. The interpreter applies paraphrasing to فلتفعلوا ماتشاءون ولتغرقوا في أوهامكم فإننا, which is rendered as 'dream as much as you can'. Another image towards the end of the speech is فإن بنك الأهداف لدينا لازال به الكثير من الخيارات, which is also paraphrased and broken down into two sentences due to explicitation as 'we have a lot of choices.. we have a lot of alternatives'. The processing of these images at such a shallow level points to the interpreter's inability to access the mental lexicon in the LTM quickly enough to find pragmatically and culturally appropriate TL images.

In Text 7, the interpreter faces some problems with processing certain images. For example, he succeeds in finding a semantically appropriate equivalent for the image في ميزان حسناتهم, which he turns into the lengthy backtracked version 'they are of course ..given all the blessings for all the sufferings which they suffered ..they are repaid with blessings'. However, he paraphrases الكواكب الجميلة العظيمة as 'we had very great negotiators'.

In some cases, the lexico-semantic processor alone is devoted to translating figures of speech. In the following extract from Text 10, the lexico-semantic processor is put to a difficult test, where an extended image is dexterously handled:

ST	*TT*	*Back Translation*
الذي يحب أن يكون هناك فليكن والذي يحب أن يكون هناك فليكن مهما كان لابسا إن كان لابسا مئة عمامة أو مئة قلنصوة أو مئة زي دين مسلم أو مسيحي أو سياسي، هذه طبيعة المعركة الموجودة في البلد.	It is up to everyone to choose the camp they want ..whether they are religious leaders..Christian religious leaders Muslim religious leaders or politicians.. This is the nature of the combat today in the country..	والأمر متروك للجميع أن يختاروا المعسكر الذي يريدون .. سواء كانوا من القادة الدينيين أو الزعماء الدينيين المسيحيين أو القادة الدينيين المسلمين أو السياسيين .. هذه هي طبيعة القتال اليوم في البلاد.

The interpreter is faced with the metonymies in لابسا مئة عمامة أو مئة قلنصوة أو مئة زي دين مسلم أو مسيحي أو سياسي, where the garment is indicative of the social, religious and political orientations. The interpreter combines paraphrasing with semantic equivalence (see Gernsbacher and Shlesinger, 1997). The words عمامة and قلنصوة are transferred to their cognitive domains 'religion' and 'politics', and the concept of 'leadership' is imported as a lexical slot-filler. The result is the TT 'religious leaders…Christian religious leaders Muslim religious leaders or politicians'. However, it should be noted that the

word مئة is omitted in favour of conveying the main sense of the extended image.

Towards the end of the speech (i.e. Text 10), another image is encountered, but again semantic equivalence takes precedence over paraphrasing:

ST	*TT*	*Back Translation*
وأملنا بالمستقبل كبير جدا، أنتم من بدأت أحلامكم تتلاشى، أنتم من أطلق النار على أحلامكم.	We are hopeful for the future of Lebanon..but you..your dreams are fading away..you have.. assassinated your own dreams.	نحن متفائلون بمستقبل لبنان ... لكنك .. أحلامكم تتلاشى .. لقد قمتم .. باغتيال أحلامكم الخاصة.

The interpreter uses a semantic equivalent for أطلق النار على أحلامكم by opting for the verb 'assassinate' as a tenor for the vehicle أحلام. This is, in fact, more complex than it might appear. The act of إطلاق النار (i.e. firing bullets) is semantically analyzed and a generic substitute is provided, namely 'assassination'. This substitute is then turned into a verb to figuratively collocate with 'dreams' in English, which allows the use of 'assassinate' with abstract entities, for example, 'to assassinate a person's character' (see *Random House Webster's Unabridged Dictionary*, 2009).

Omission and deverbalization may work its way through the processing of figures of speech, being a solution not hitherto recorded in the literature to deal with such a problem (see Gernsbacher and Shlesinger, 1997). In the following extract from Text 13, a number of images are detected in the following extract, where the interpreter hesitates before omitting them:

ST	*TT*	*Back Translation*
بالقسم الذي أقسمناه على كتاب الله، امتثالًا لإرادتكم وقراركم، وخدمة لمصلحة الوطن والمواطن، محل عزنا واعتزازنا، مصدر ثقتنا واط مئناننا، وعنوان وحدتنا وانتصارنا لن نساوم أو نفرط بقطرة دم واحدة أريقت على مذبح الحرية أو سفحت في وجه همجية العدوان ووحشية المؤامرة.	..we have sworn in..sworn on in ..on the holy scriptures to serve the interests of our country and to serve the interests of our fellow citizens..raising the slogan of victory..we cannot fail you and we cannot..waive.. we cannot give up	وقد أقسمنا في .. نشرنا في.. الكتب المقدسة .. لخدمة مصالح بلادنا وخدمة مصالح إخواننا المواطنين .. رفع شعار النصر .. لا يمكننا أن نخذلكم .. لا يمكننا.. التفريط.. لايمكننا الاستسلام

The interpreter experiences backtracking in processing the ST الذي أقسمناه على كتاب الله, where the two words 'swear' and 'swear in on' are confused. The addition of 'holy scriptures' later on is further evidence that the interpreter is not sure how to proceed, for 'swearing in' is a ceremony that includes, inter alia, placing one hand on the holy scripture and reciting a formula of oath. The mental program of the interpreter is clearly interrupted or broken (see Chernov, 2004) by the competition between the incoming data and the

processed items in the Linguo-Cognitive Processor, especially the lexico-semantic processing phase. The interpreter also experiences lexico-semantic difficulty with processing the ST images مذبح الحرية أو سفحت في وجه همجية العدوان ووحشية المؤامرة. He decides to deverbalize to a great extent by omitting the word 'blood', which can be considered the main thread of the image. However, the TT version 'we cannot give up' is obviously inadequate.

When two figures of speech successively supervene, the interpreter applies omission and waiting. The interpretation of the extract below from Text 13 well illustrates this case:

ST	*TT*	*Back Translation*
بوعي وحنكة وحكمة، بشجاعة وثبات وإيمان، وبصبر واستعداد دائم للتضحية والفداء، يرسم سيرته ومسيرته، وينقش حروفها المشرفة بصفحات تاريخه المجيد، بالدم والألم والإصرار على النصر.	We are pursuing them in prudence defiance and firm belief..with patience and forbearance and preparedness to sacrifice to write in history in golden letters the journey of struggle…writing them in blood with…steel resolve to continue..	نحن نلاحقهم في تحدي الحكمة والاعتقاد الراسخ ... بصبر وصبر واستعداد للتضحية كي يكتبوا في التاريخ بأحرف ذهبية رحلة النضال ... كتابتها بالدماء ... بعزم .. صلب على الاستمرار

However, his decision to process the rhyming binomial is not upheld till the end, for he omits سيرته و مسيرته in favour of processing the image ينقش حروفها المشرفة بصفحات تاريخه المجيد, where he skillfully finds an appropriate TL image, that is, 'write in history in golden letters the journey of struggle'. The same practice is followed in processing the extension of the same image بالدم والألم والإصرار على النصر, which he renders into 'writing them in blood with…steel resolve to continue'. However, it is important to note that the interpreter applies the 'both-ends strategy' reported in chapter 4. He selects الدم and الإصرار to produce the TT image, and further adds 'steel' before 'resolve' to compensate for the loss of النصر (i.e. 'victory').

Another notable strategy applied is replacing tropes with proverbs, being a commendable practice not mentioned in the literature, yet some pausing might be a by-product. In Text 13, the interpreter manages to find the appropriate TL proverb for the image وما بعد حلكة الظلام إلا الصبح والشمس.

Other images handled throughout the same text (i.e. Text 13) are either semantically processed or replaced by appropriate proverbs. These images include مدخلنا لاستعادة الوحدة, مدخلًا لتمزيق شعبنا وتفريق صفوفه, and الدم الزكي الذي يسيل بغزارة من عروقنا بغزة الحبيبة. The first image is handled through a devised TL image by means of semantic equivalence, that is, 'our unity is our ticket to victory', where 'ticket' is selected in accordance with its use in informal English in such examples as '*Warm milk and toast is just the ticket for you*' (see entry 7 under 'ticket' in *Random House Webster's Unabridged Dictionary*, 2009). The second image contains the same SL word مدخل, but the interpreter

prefers 'excuse' probably due to the informality of 'ticket' and its positive connotations. He succeeds in using the idiom 'drive a wedge between' as a translation for the rest of the image. His solution is 'an excuse to drive a wedge among our people'. The final image is translated into 'our blood is running as rivers'. The interpreter again selects the word 'river' due to its negative connotations in the TL, for example, 'rivers of tears'.

5.5 GENERAL OBSERVATIONS AND CONCLUSIONS

There are a number of observations that need to be taken into consideration after the corpus has been analyzed. These observations are important because they are germane to the complexity of simultaneous interpreting from Arabic into English. They also have implications for the cognitive demands of interpreting strategies as applied by TV interpreters.

The first observation is about the new strategies that have been recorded in the analysis of this corpus, and have not mentioned in the literature on simultaneous interpreting between any pair of languages thus far. Only one strategy, which can be termed the 'both-ends' strategy, is detected. It is mentioned in chapter 4 in the analysis of the English-Arabic corpus, but it is clear that it is not confined to that direction. It serves to capture the meaning of compound nouns, binomials and listings, and gives the receivers the impression that the interpreter has omitted nothing. However, it is put to another use in this corpus; the interpreters use it to compensate for loss of meaning while processing ST imagery.

The second observation concerns the established strategies, that is, the ones recurrent in the literature on simultaneous interpreting. The first strategy is explicitation. Despite the economy of English, TV interpreters opt for this strategy for two reasons. First, it frees them from the shortage they experience while accessing the LTM for processing ST words. They capitalize on it to paraphrase unknown words or clarify meaning. This is why it appears in 10 texts out of 13 in this corpus. It is also used in processing imagery as will be discussed later in this section. However, its main disadvantage is its 'knock-on' effect; whenever explicitation is applied, ST material is omitted in the following parts of the TT. In contrast, the second strategy of implicitation is applied less frequently. It appears in 6 texts out of 13. It is mainly used to save time. The third strategy is chunking, which is primarily syntactic in nature. It is used 9 times in the 15 TT analyzed, and is mainly instrumental in relieving the Linguo-Cognitive Processor, though at times it leads to some long pauses, since it requires restructuring well-formed sentences in the direction of the TL. The fourth strategy is transcodage, which is used 11 times in this TTs. This particular strategy is an emergency one (cf. Riccardi, 2005), since

it helps the interpreter deal with images and gives room for more cognitive activity later in processing other parts of the ST. Yet its literal output causes major harm to meaning. The fifth strategy is omission. Although considered by Barik (1971) as mostly erroneous, it is widely applied by TV interpreters, that is, 15 times in the corpus analyzed. It can be attributed to the interpreter's inability to cope with the speaker, or the failure to process complex chunks. Associated with omission is the sixth strategy of compression. It is also widely used, that is, 20 times. It is mainly necessitated by the interpreter's attempt at capturing the sense group (see Chernov, 2004), and is particularly indicative of the interpreter's ability to deverbalize and reproduce the ST content in the TL. The final strategy is queuing, which is the least applied, that is, 2 times. It stands in opposition to transcodage, since it is a mixed blessing, so to say. On the one hand, it allows for more uniform processing at all linguistic levels, and it leads to excessive pausing on the other.

The third observation concerns pausing. The pauses analyzed thus far are all intra-clausal and intra-sentential. The mean pause duration in this corpus is 2,938.462 milliseconds, while the total pause duration is 1,211,497 milliseconds. These figures are related to the normal practice adopted by TV interpreters when simultaneously translating from Arabic into English. They tend to exceed the normal range of pausing as proposed by Bilá and Džambová (2002). This might make the receiver believe that the interpreter has omitted some ST material. However, these pauses point to important facts about the linguo-cognitive processing demands for Arabic-English simultaneous interpreting. They are the longest before ST imagery and syntactic restructuring, while they are the shortest before lexico-semantic processing. Only one time in Text 6 does the interpreter succeed in restructuring the ST sentence while pausing for 1,000 milliseconds. Before processing images, pauses sometimes exceed 3,000 milliseconds. These facts show that TV interpreters do not follow the normal rate of pausing, and they are not always ready with automatisms that can be utilized to overcome the complexity of syntactic processing and imagery suppression as discussed by Gernsbacher and Shlesinger (1997).

However, it is important to note that the linguo-cognitive processing of images from Arabic into English does not always follow the same steps provided by Gernsbacher and Shlesinger (1997). While TV interpreters succeed in finding semantic and lexical equivalents and in paraphrasing (see Text 13 for more information), they make use of the already established strategies to convey imagery in the TL. They tend to omit imagery, though this practice is recorded one time in this corpus. They also tend to replace ST imagery with idioms and proverbs as a means of pragmatic inferencing. They might apply explicitation and implicitation as complementary strategies as is the case in Texts 4 and 9. This fourth observation points to the fact that TV interpreters

are eager to convey ST imagery, and provide more innovative solutions than those reported in the relevant literature.

It can be concluded that the in-depth analyses of the STs and their TTs in this chapter have proved to be useful for the exploration of the linguo-cognitive processes involved in interpreting from Arabic into English. The most important point to take into consideration here is that TV interpreters follow almost the same strategies and cognitive activities as recorded in the literature, but their deviations may be justified by the need to process complex constructions and convey the ST imagery as faithfully as possible. Their average pause duration is barely optimal, but this can be considered due to difficulty of translating from their B-language into their A-language. They also capitalize on all the components of the Linguo-Cognitive Processor as proposed in chapter 3, and this underlines the fact that the model along with its assumptions and formulae seem to be fitting for the analysis of this corpus.

Chapter 6

Discussions and Conclusions

6.1 INTRODUCTION

This chapter focuses on the major conclusions of the thesis, the implications that these conclusions point to, and the further research that can be done in the field. It attempts to answer Question 3 under Research Questions in chapter 1. The conclusions are based on the in-depth analyses performed in the preceding chapters, and how they provide new insights into simultaneous interpreting research from English into Arabic and vice versa. The implications drawn from these conclusions furnish fresh ideas on how the training of simultaneous interpreters and their outputs can benefit from the conclusions. The suggestions for further research include new topics that can contribute to the methodology and spectrum of simultaneous interpreting inquiry.

6.2 MAJOR CONCLUSIONS

6.2.1 The Model: The Linguistic and the Cognitive

The model proposed in chapter 3 has proved to be largely amenable to the purposes of this research. The division of cognitive labour among the phases, along with the intra- and inter-phasic relations, has provided a groundwork for the analyses of the texts selected and the intricacies of the simultaneous interpreting process. Yet it is important to note a number of points.

First, the TV simultaneous interpreter's cognitive activity while translating from English into Arabic is not as modular as it might appear. The phases proposed provide a simulation of the phenomenon, but not the phenomenon per se. There are occasions when two phases jostle (cf. Seeber, 2011), or

lexical search strategies consume much time than is actually allowed. The lexico-semantic and syntactic processors, as sub-phases under the linguo-cognitive processing phase, compete for the rapidity of access; the interpreter may at times adopt linear processing due to unusual time pressure, and so opts for following the speaker's output word for word. This practice generally leads to the precedence of lexico-semantic processing over syntactic processing. Other times, the interpreter attempts a restructuring of the entire translation unit, thus giving priority to the functions of the syntactic processor. Still, the interpreter might wish to turn to pragmatic and/or cultural inferences as a resource that gives more linguistic and cultural excuses than is permissible. On these occasions, automatisms appear to be the best recourse, since they save time and release the burden of searching the mental lexicon or syntactically repositioning sentential elements. This observation evidently validates Hatim and Mason's (1997) discussion of a trade-off among different processing levels in the course of simultaneous interpreting.

Second, the cognitive effort needed to deal with TV simultaneous interpreting from Arabic into English can be taken to be more demanding. The interpreter usually omits and restructures the source text rather than adopting lexical search. The target-text sentences appear to be shorter and yet more complex than the source-text ones. This is usually related to the interpreter's inability to render every word, or his/her lexical shortage, for s/he operates from his A-language to his/her B-language. However, this fact does not detract from the validity of this model. The model is proposed for both directions of English and Arabic (*pace* Chang, 2005); however, it assumes the near-proficiency of the interpreter in handling both English and Arabic source texts. For the interpreter to function deficiently when interpreting from Arabic into English is not an indication that the model is largely inadequate: Arabic-English interpreting in the Arab world needs to be revisited and improved to be close to the ideal practice. The deficient performance of some interpreters requires either more focused training or searching for more expert interpreters.

Third, TV simultaneous interpreting is a slightly different practice from other types of simultaneous interpreting, especially conference interpreting. As Ino (2004) contends, TV interpreting requires strong background knowledge, more fluency and more anticipation. These requirements do not operate in the void; they function as indications of several cognitive didactics. TV interpreters are required to apply 'jumping' as proposed by the model. They need to depend on pragmatic inferences and automatisms, which are mainly based on the rapid access of STM and WM. This drives the argument once more to the reality about simultaneous interpreting from English into Arabic and vice versa; TV interpreters operating between this pair of languages experience high expectations on the part of the TV audience, and are thus in need of more linguistic and cognitive resources than the conference interpreter, whose output is confined to a much smaller audience.

This discussion needs to be weighed against Gile's (1999) Effort Model and Alexieva's (1999) observations. Although it shares with the model proposed here the de-emphasis on directionality, it does not elucidate on the cognitive dimensions of strategic decisions. The Listening Effort as suggested by Gile is rather unclear and loose: what about cases of misperception? Moreover, the Memory and Production Efforts are also geared towards the surface of the interpreting process: what exactly is the role of the working memory (WM)? Even the emphasis on the 'tightrope hypothesis' is left to the broad discussion of errors and omissions as one category, though omission is a strategy not an error. A more mature view is that of Alexieva (1999), where the phasic division is brought to the fore, but again the loose discussion of how these phases interact or at times jostle is not given due attention.

It can be proposed that these models and approaches to simultaneous interpreting as provided in chapter 2 need a new classification, where linguistic and cognitive orientations are conflated. This conflation may be more beneficial, since it will open up vistas of research that combine intra- and extra-textual aspects in a new framework that is amenable to application to pedagogical contexts. It will also be instrumental in filling the gap recognized in both linguistic and cognitive studies in the field. Furthermore, it will help discover the cognitive demands of simultaneous interpreting strategies (cf. Gile, 1999; Setton, 1999) instead of relying on surface factors such as time pressure (see Riccardi, 2005). In a sense, the five categories proposed in chapter 2 (i.e. language and linguistic approaches; cognitive approaches; strategy-based approaches; pedagogical and quality-based approaches; and miscellaneous approaches) can be augmented by linguo-cognitive approaches. This addition can thus be more beneficial to SI pedagogy, and provide the final answer to Question 4 under Research Questions in chapter 1.

It can be concluded that TV interpreting is still a virgin field. The model, findings and conclusions provided in the course of this thesis are just a breaking into a new ground to be augmented with further research.

6.2.2 Pauses as Traces of Cognitive Activity: The Time Factor

The quantitative and qualitative analyses performed in chapters 4 and 5 depend to a large extent on the ability of the TV interpreter to handle cognitively demanding constructions and deliver the target text as fluently as possible. Pauses have been divided into short, optimal, long and very long, and into inter-sentential and intra-sentential. The analyses are mainly concerned with intra-sentential ones, with a view to significant pauses that either show that the interpreter has managed to handle problematic translation units or failed to provide acceptable linguistic output. This approach has proved that time, considered as playing an overarching role in the model proposed, is of paramount importance in the simultaneous interpreting process.

The Bilá and Džambová (2002) reference range has proved particularly suitable for the purposes of this research. It is built around bilingual reaction times as detected by Sabol and Zimmermann (1984). It also includes the minimum pause duration allowed for simultaneous interpreters, that is, 200 to 250 milliseconds. The adoption of this reference range has furnished necessary facts about the cognitive activity of TV interpreters. English-Arabic interpreters, in this corpus, have a mean pause duration of 856.6227 milliseconds, that is, normal or optimal. Their longest pause duration is 18,000 milliseconds, being longer than the longest pause reported in the literature so far (cf. Setton, 2001). The same is detected in the Arabic-English corpus, where the mean pause duration is 1,134.125 milliseconds, being normal or optimal. The longest pause duration is 6,696 milliseconds, being very long, but shorter than the longest pause reported in the literature so far.

It becomes clear that, in the English-Arabic corpus, pauses are the longest before ST imagery and syntactic restructuring, while they are the shortest before lexico-semantic processing. Before processing images, pauses sometimes exceed 2,000 milliseconds. This means that attention is normal when dealing with lexico-semantic problems that can be usually boiled down to word-choice. When faced with images in the ST, TV interpreters make use of high attentional resources without going straight to formulation for articulation. In the Arabic-English corpus, pauses are the longest before ST imagery and syntactic restructuring, while they are the shortest before lexico-semantic processing (being similar to the findings reported in Seeber, 2011). Before processing images, pauses sometimes exceed 3,000 milliseconds. Compared to Setton's interpretation, Arabic-English interpreters' cognitive resources are utilized almost to the full, for they are highly attentive to the input when processing images and complex syntactic structures, with exceptions in syntactic restructuring that might be attributed to automatization (only one time in Text 6 did interpreters succeed in restructuring the ST sentence while pausing for 1,000 ms). Like English-Arabic interpreters, they experience less cognitive overload in lexico-semantic processing, for they depend on 'routine planning' as suggested by Setton above.

TV interpreters operating from English into Arabic are, moreover, keen to follow the source-text order, and thus experience problems with lexical search. This justifies the longest pause duration reported above. However, most of them succeed in finding solutions for many of the semantic and syntactic problems they encounter because they either rely on expertise (as a *tertium comparationis*), on their proficiency in Arabic or simply on the general assumption that simultaneous interpreting from English into Arabic primarily depends on lexical rather than semantic, syntactic or pragmatic considerations as is claimed by Papadopoulou and Clashen (2006). Similarly,

Arabic-English TV interpreters experience difficulties with lexical retrieval, which is justified by the longest pause duration provided above. However, they generally manage to keep a normal mean pause duration. In a sense, the cognitive activity of both English and Arabic directions is veritably similar, and this again necessitates proposing one model for the two as is argued in the preceding section.

It is noteworthy to add in this respect that most of the TV interpreters' outputs examined in the course of this study point to their high professional level. Al-Jazeera, Al-Hurra and BBC interpreters appear to be well trained, especially when interpreting from English into Arabic. They manage to produce handsome interpretations, with minor pauses and errors. In addition, these errors are complex enough as is exemplified by the analyses done in chapters 4 and 5. Although they depend on omission as a major strategy, their omissions are usually justified either by time limits or by cognitive overload. Hence their omissions are mostly explainable. When operating from Arabic into English, CNN interpreters' outputs figure as less professional, being confined to the minimum requirement of communicating meaning in the broadest sense of simultaneous interpreting. Their omissions are therefore mostly erroneous, and their pauses are longer than usual. Press TV and Al-Jazeera interpreters excel them, producing adequate outputs. Voice of America C-Span interpreters appear to be the most highly trained, since their pauses and strategy-use betray the ability to manage time and render the ST accurately.

It is also important that the formulae proposed along with the model in chapter 3 have been proved to be applicable, except for a small number of cases. TV interpreters generally follow most of the formulae, but they at times manage to flout them by consuming less time than is expected. These exceptions have led to applying two formulae at the same time to the extract(s) analyzed. In the aggregate, English-Arabic TV interpreters have applied formulae 1, 4, 5, 6 and 7, while Arabic-English ones have applied formulae 1, 2 and 4. The conclusions that can be drawn from this application are that English-Arabic TV interpreters are prone to produce close-to-ideal simultaneous interpreting, since they depend on compression and minor omissions (*pace* Darwish, 2006). They never fully apply Formula 3, which states that the process is impossible. However, Arabic-English TV interpreters have applied anticipation, omission and compression, but their omissions are usually major ones. They share with English-Arabic interpreters the dismissal of Formula 3.

6.2.3 TV Interpreting Strategies

Based on the discussions provided in the preceding chapters, it appears that TV interpreters follow most of the mainstream strategies prevalent in

interpreter-mediated events, but the frequency of such strategies varies. They also adopt innovative strategies that can be considered peculiar to them.

TV interpreters operating from English into Arabic capitalize on strategies that release the cognitive overload and save time, such as compression and omission. Transcodage is also adopted to a great extent, coupled with pragmatic inferences. This can be related to Seeber's (2011, p. 190) explanation of the cognitive demands of transcodage, where the level of processing applied is 'no deeper than needed'. However, those interpreters count on the fact that source texts are telecast live; viewers have the visual input at their disposal throughout the simultaneous interpretation. This leads to the innovative strategy of deictic references, a type of compression not hitherto recorded in the literature. Moreover, they apply what can be termed the 'both-ends' strategy to handle long compounds in the source texts. Additions are also used in some novel ways. TV interpreters tend to add either for explicitation or for resolving phonological ambiguities.

TV interpreters operating from Arabic into English have adopted already established strategies according to the following order:

1. Paraphrase
2. Implicitation
3. Chunking
4. Transcodage
5. Omission
6. Compression
7. Queuing

It is important to note that these strategies have cognitive bases. They are mainly driven by the need to release the burden placed on the Linguo-Cognitive Processor (LGP) in the course of interpreting from English into Arabic. Paraphrasing depends on STM and WM to a great extent. Similarly, implicitation is an off-shoot of deverbalizing the source-text material and disregarding its formal properties, which is considered by Seeber (2011, p. 190) an implication that 'every part of the input is mediated through the conceptual stage'. Chunking is a means to chop the speaker's output into small processable units that can be interpreted without much omission. In a similar vein, compression saves time and cognitive effort by combining form with content. Queuing operates when semantic shortage or syntactic complexity is encountered, and cannot be resolved in due time.

The same interpreters, however, have applied one innovative strategy, that is, the 'both-ends'. It acts to capture the meaning of compound nouns, binomials and listings, and gives the receivers the impression that the

interpreter has omitted nothing. This lack of innovation can be attributed to the nature of their expertise and the difficulty they usually encounter with their B-language.

The typology of interpreting strategies provided by Riccardi (2005) merits discussion in this context as an indication of the TV interpreters' performance operating between English and Arabic. The typology is repeated here for convenience of reference:

Comprehension strategies: anticipation, segmentation, selection of information, stalling or waiting.
Production strategies: compression, expansion, approximation strategies, generalization, use of linguistic open-end forms, morphosyntactic transformation and the use of prosody elements, such as pauses and intonation.
Overall strategies: décalage and monitoring.
Emergency strategies: omission of text segments, transcoding and parallel reformulation.

TV interpreters operating from English into Arabic reverse the order of the strategies provided above. They rely for the most part on emergency ones, since they resort to transcoding. They also adopt strategies of their own, such as deictic referencing and 'both-ends' strategies. This means that TV interpreters do not follow the standard typology by Riccardi (2005). In addition, they introduce new strategies that can be taken to be peculiar to the English-Arabic direction of interpretation. Arabic-English TV interpreters, on the other hand, are prone to follow this standard typology; they capitalize on comprehension and production strategies, but their output is greatly affected by the target language, where they make much use of implicitation. They also tend to relegate emergency strategies to the end of the list (see above) by making less use of transcoding and omission.

What can be concluded from this discussion is that TV interpreters in the Arab world, and as it is clear from the corpora analyzed, are well up to the international standard. They are aware of the strategies of interpreting to a great extent, and are capable of managing time pressure. Their reliance on transcoding in the English-Arabic direction may be attributed to their resort to the cultural matrix of the media register, where linguistic simplifications and ambiguities are accepted as part of what the Arab receiver expects. The same can be taken as the reverse of the image in the Arabic-English direction, where the TV interpreters gear their linguistic repertoire towards providing what the English lay people expect from them, that is, the communication of basic information in sound English. This may be the reason why those interpreters apply paraphrasing and implicitation to a great extent.

6.3 PEDAGOGICAL IMPLICATIONS

The pedagogical implications of this study are focused on the salience of the linguistic and cognitive aspects of the source and target texts in the simultaneous interpreting class. Student interpreters, who are trained to be professionals, need practice in interpreting with particular emphasis on time constraints, how certain structures are automatically rendered in the target language, and how imagery is handled according to effective strategies. It is an exercise in futility to focus on vocabulary and semantics without emphasizing interpreting strategies that are grounded in linguo-cognitive processes. Practice in translation needs to be directed towards the cognitive dictates rather than unfamiliar vocabulary items that can be easily looked up in a robust dictionary.

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