A Cognitive Psycholinguistic Analysis of Simultaneous Interpretation Errors

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Abstract

This study is an interdisciplinary investigation of the output produced by Egyptian interpreters and trainees simultaneously interpreting from Arabic into English four inaugural speeches; namely, President El-Sisi (2014, June 3), President Adly (2013, July 4), President Morsi (2012, July 24) and President Mubarak (1981, November 9). The study attempts to integrate a triangulated approach into the theoretical framework: the Effort model, as categorized by Gile (2009), the Speech Production Model, as proposed by Levelt (1999) along with Error Analysis Taxonomies, as classified by Dulay et al. (1982), James (1998), and Ellis (1994). The research aims at demonstrating how speech production stages (i.e., conceptualization, formulation, articulation and self-monitoring) along with the cognitive processing capacity requirements (i.e., Listening and Analysis, Memory, Production, Coordination Effort) account for locating errors in the Target output, and accordingly determine the most triggering linguistic level (e.g., lexical-semantic, syntactic, morphological and phonological) for Egyptian interpreters. To achieve this objective, errors are collected, classified, and descriptively analyzed. The study hypothesizes that experienced interpreters, due to their greater expertise, have better task performance resulting in fewer linguistic errors. However, the analysis conducted demonstrated a contrasting outcome. Despite the interpreters' experience, the trainees demonstrated a lower overall frequency of linguistic errors. Notably, the lexical-semantic formulation has proven to be causing the most challenging cognitive load. Results confirmed that errors are attributed to the processing capacity and saturation level. Therefore, the interpreter's maximum cognitive capacity must be equal to or exceed the total processing requirement of the task; otherwise, problems are likely to be triggered.

1.1. Introduction

Cognitive psycholinguistics focuses primarily on how the brain processes language. The orientation towards exploring cognitive aspects of the mental processes increases interdisciplinary awareness in translation studies, in general, and simultaneous interpretation (SI), in particular, to better understand how these cognitive operations take place in translators' brains, or the black box, which inherently involves complex cognitive processing. These cognitive processes involve a set of mental activities that are related to attention, understanding, comprehension, working memory (WM), production of target language (TL), decision-making, etc.

SI is depicted as a speech production process in which the interpreter passes through conceptualization, formulation, articulation, and self-monitoring stages. However, it is a dual language process; SL and TL are concurrently accessed and activated in the mental lexicon. The concurrent activation of two linguistic codes imposes a higher level of cognitive demand in terms of executive control, cognitive function and processing to verbalize the required TL under heavy time pressure. As a result, errors and inaccuracies increase with the total immersion required to produce TL with limited cognitive capacity. Therefore, the quality of the output is not only determined by the interpreters' general cognitive function (e.g., attention management, language control and WM, but also by his or her linguistic and translation competence.

Therefore, the prime aim of this paper is to investigate SI errors produced by Egyptian interpreters. This is achieved by exploring Levelt's speech production models which explain processing levels responsible for conceptualization, formulation, and articulation. Furthermore, this paper seeks to demonstrate how speech production models account for errors in simultaneous interpretation and accordingly determine the most frequent linguistic level at which Egyptian interpreters encounter problems. Therefore, the paper deploys three theoretical frameworks: Gile's (2009) Effort model, Levelt's (1999) Speech Production Model together with Error Analysis Taxonomies, as classified by Dulay et al. (1982), James (1998), and Ellis (1994).

1.1.1. Objectives of the Study

The current paper aims at:

1- Investigating the simultaneous interpretation output and locating errors produced by two groups of Egyptian interpreters: experienced and trainees (i.e., students) who have been enrolled (at the time of the research) in a simultaneous interpretation-training course at their faculty as part of their curriculum,

2- Exploring speech production models to explain cognitive processing levels responsible for the conceptualization, formulation, and articulation of SI,

3- Demonstrating how speech production models account for errors in simultaneous interpretation and finally determining the most frequent linguistic level (e.g., lexical-semantic or syntactic) at which Egyptian interpreters encounter problems.

1.1.2. The Problem of the Study

A common problem that faces interpreters is the cognitive load while performing the task. The interpreters listen to the authentic speech while producing their version of TL as an utterance. This cognitive load makes the interpreter prone to produce speech errors in TL, which affects the quality of output. In addition, the high pressure of competence on mental resources has serious consequences for the interpreter's output. Therefore, errors are observed in the stages of conceptualization, formulation, articulation and self-monitoring of TL. Since interpreters are exposed to produce speech errors, a comparison of what the actual interpreter utters and what he/she intends to say leads to diagnosing the lexical, semantic, or syntactic linguistic problem that he/she faces. The quality of interpretation, however, may be improved by pinpointing errors Egyptian interpreters commonly make and finding possible communicative strategies that might help in this respect.

1.1.3. Research Questions

This paper endeavors to answer the following questions:

1- What are the main cognitive psycholinguistic levels responsible for conceptually generating, encoding or formulating, and articulating errors in SI?

2- Which linguistic level triggers more processing problems or contains the highest frequency of errors?

3- To what extent would Gile's Effort Model account for simultaneous interpretation errors?

1.1.4. Significance of the Study

Simultaneous interpretation is one of the most challenging skills to master because it demands linguistic and translational competence as well as higher-order cognitive skills. Since language proficiency affects performance, some professional interpreters take considerable pride in providing a coherent TL, assuming that their interpretation is free from errors. In reality, however, the skill they possess is not enough. Being engaged in the task cognitively makes them prone to several underlying errors, in the process in general, and conceptualization, formulation and articulation, in particular. This might not be noticeable in the output, which may still be too literal and even described as just being "faithful to what the speaker was trying to say". Therefore, their performance can be greatly accelerated just by raising their awareness of the

typical errors they unconsciously produce. The findings of the study intend to have implications that might be helpful for interpreters to avoid potential errors.

2. Literature Review

To situate the current study in the context of previous works, this section reviews some complementary works in the same domain of the study. Those studies are various as they are based on different theoretical backgrounds.

2.1. Approaches to SI: Product vs. Process

Cognitively, there are two main approaches in Translation and Interpretation studies. Some researchers have focused on processing or "the cognitive activity of producing a target text in one language based on a source text in another language" (Englund Dimitrova, 2010, p. 406), while others have investigated the product or the output and assessed the quality. In line with the integrated perspective of language processing presented in the study, the following studies consider both routes briefly.

2.1.1. Studies on Simultaneous Interpretation Errors

Within the product-oriented approach, several scholars have been directed towards a thorough analysis through a relevant systematic review. Eminent scholars have investigated the quality of interpreting (e.g., Buhler,1986; Kurz,1993), explored disfluencies in the output (e.g., Pöchhacker, 2004; Tissi, 2000; Bakti, 2009), identified linguistic grammatical constructions and stylistic errors affecting the interpreters' output (e.g., Shlesinger, 2003; Simon, 2019), utilised computer-assisted language learning (CALL) for evaluating online resources (e.g., Carsten et al., 2020) and Automatic Speech Recognition (ASR) on the performance of interpreters (e.g., Pisani and Fantinuoli, 2021), pinpointed errors in the interpretation of numbers (e.g., Alessandrini, 1990), paid particular attention to teaching purposes (e.g.; Živković, 2012), used error analysis (e.g., Presada & Badea, 2014; Wang, 2015) within translation and examined problem triggers and interpreting strategies (e.g., Gile, 1995, 1999).

Within the process-oriented approach, scholars descriptively focused on models and tested hypotheses to peek inside the interpreter's black box. Therefore, the interest has been shifted from the product as the primary object of study in T&I (i.e., a focus on target texts and their relation to source texts) to the producer (i.e., a focus on cognitive processes) (e.g., Angelone et al., 2016). Ample research covered the behavior of the interpreter adopting experimental methods (e.g., recall in listening and shadowing, Daro & Fabbro, 1994), critical aspects of simultaneous interpretation (e.g., de Bot, 2000), the interplay among the psychological, social, pragmatic and political dimensions of the multilayered process of interpreting (e.g., Dawud, 2017), and conceptual processing (e.g., Kotiat, 2019).

Addressing contemporary interdisciplinary studies, Liu (2021) conducted an empirical study to figure out which cognitive processing routes were reflected in English/Chinese CI and which route predominated: the form-based processing route or the meaning-based processing one. Evidence from the two parallel routes asserted that interdisciplinary collaboration created a more comprehensive and systematic picture of the interaction between the form-based route and the meaning-based route. However, it was stated that some findings that have been suggested were far from being conclusive.

Aal-Hajiahmad (2022) conducted a pilot study that aimed at exploring lexical, syntactic, and cultural problems and using strategies applied to prevent problems. The results showed that expert interpreters showed high proficiency in their cognitive processes and used more strategic behavior, while novice interpreters were unaware of most of the interpreting problems, which had a negative impact on their performance (e.g., omission of the Rich points).

Inspired by the aforementioned studies, the research gap can be identified by seeking an interdisciplinary conceptual framework that addresses research questions. When reviewing previous studies in the domain of translation and interpretation, the focus has been on linguistic, cultural, and communicative aspects of interpreting, and what strategies are used to avoid SI problems. Several interpretation studies addressed issues such as time pressure, WM, etc. Other studies focused on the cognitive process or product; not the two. Thus, there is a gap in the conceptual framework for understanding SI errors from both cognitive routes: process and product. To the best of the researcher's knowledge, no single study has so far adopted the proposed cognitive theoretical framework, which integrates recent models from psycholinguistics, simultaneous interpretation and error analysis. This serves the current need to conduct interdisciplinary or even multidisciplinary studies that encompass two or more research areas.

Although the existing literature may seem numerous, it is not sufficient to answer the research questions of this study. The available data on Egyptian interpreters' errors is limited and the corpus is not easily accessible. Furthermore, some studies have inconsistent findings because they lack authenticity and validity. Therefore, the data derived from both professional interpreters and trainees has significantly improved the understanding of actual errors. Therefore, it is hoped that the present work fills this gap, as it aims to help practitioners, interpreters, trainers and professors gain further insight into the realities of producing an error-free output. Therefore, this paper is designed to address the research gap.

3. Theoretical Framework

The current study attempts to integrate a triangulated approach into the theoretical framework three frameworks: Levelt's (1999) speech production

model, Gile's (2009) Effort Model and Error Analysis Taxonomies from eminent scholars such as Dulay et al. (1982), James (1998) and Ellis (1994).

3.1. Levelt's (1999) Model as a Cognitive Psychological Framework

Levelt has introduced four psycholinguistic models (1989, 1993, 1995, 1999). The four models emphasize three main stages: conceptualization, formulation and articulation. The most widely accepted model of speech production to date is that of Levelt (1989). However, the recent models (1993, 1995, 1999) explain speech production with additional sub-stages. For instance, Levelt differentiates between lemma and lexeme in the model (1993, 1999). The semantic and syntactic properties of items in the lexicon form lemmas, while the phonological properties form the lexemes. A schematic representation of Levelt's (1999) model is shown in Figure 1.

Figure 1

Levelt's (1999) Model of Speech Production
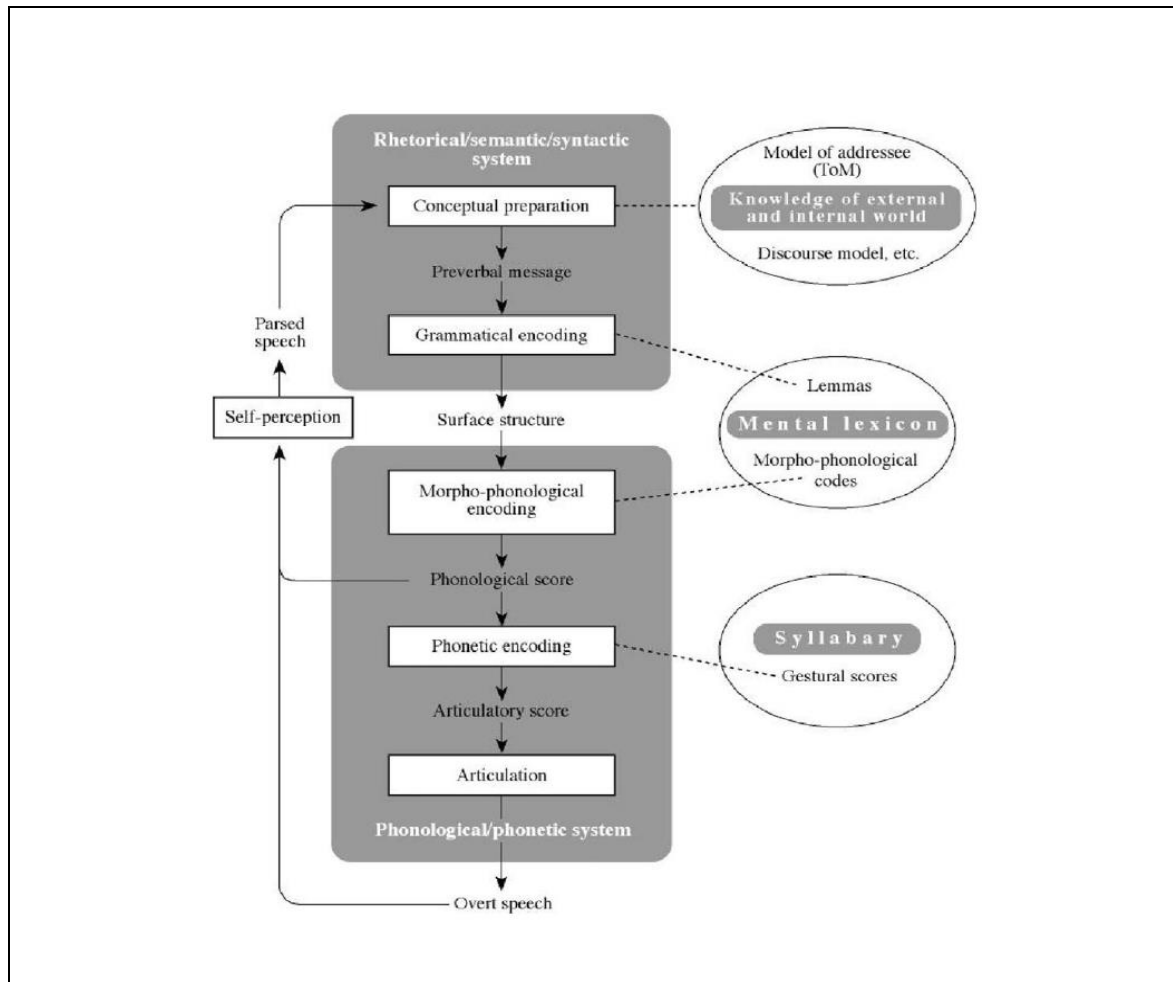
Note. A blueprint of speaker and the processing components perform the functions of speech production. From "Producing a spoken language: blueprint of the speaker", by W.J.M. Levelt, 1999, *The neurocognition of language*, p. 87. Copyright 1999 by Oxford University Press.

Figure 1 examines the skeleton of Levelt's (1999) model, shedding light on key elements: conceptualization, formulation, articulation, and self-monitoring. Although the four models explain processing spontaneous and induced speech, the self-monitoring component provides an in-depth understanding of self-correction as well as it additionally suggests a useful direction concerning processing two or multi-language.

3.1.1. Conceptualization

The first component of the speech production model is called "Conceptualization" or "The Conceptualizer" stage, which is responsible for three main tasks: generating the communicative intention, encoding it into a coherent conceptual structure or a message and later monitoring what is said and how it is said. In an article, entitled "Producing spoken language: a blueprint of the speaker", Levelt (1999) states that "The ultimate message is a conceptual structure, consisting of lexical concepts, that is concepts for which there are words in the language" (p.87). The intentional production of a meaningful word always involves the activation of its lexical concept (Levelt et al., 1999), and such activation of a lexical concept is called "Conceptual Preparation". For language use, a lexical concept is often activated as a part of a larger message that captures the speaker's communicative intention (Levelt, 1989). Therefore, the speaker has to select what is to be communicated and which aspects are to be presented as a message and the product is called "The Preverbal Message".

3.1.2. Formulation: Grammatical and Phonological Encoding

The second component of Levelt's model is called "The Formulator", which is responsible for transforming a conceptual structure into a linguistic structure. It accepts fragments of messages as input and produces the output as a phonetic articulatory plan. The formulation includes Grammatical and Phonological Encoding in which the output is structured as the surface structure that is formed by the selection of the lemma and its relevant syntactic information. The lemma's morphophonological structure is then triggered, activated and encoded while the surface structure is being produced.

Grammatical Encoding. Grammatical encoding is the process that organizes a non-linguistic message into an ordered set of representations that can then be phonologically formulated and eventually articulated. The grammatical encoding includes accessing lemmas and building the relevant syntactic structure. Accessing lemmas covers information related to the meaning of the lexical items, which is stored in the mental lexicon.

The first step in preparing a content word is lexical selection which begins by retrieving the appropriate words from the mental lexicon in the form of lemmas and then embedding them in the developing syntactic structure. When the lexical concepts in the message activate the corresponding syntactic lemmas in the mental lexicon, their selection makes the syntactic frames available for the sake of corresponding them to the semantic functions and arguments in the message. The speaker, therefore, uses this lexical syntactic information to build up the appropriate syntactic pattern, the "surface structure". Hence, the first core system of the process is completed, while the second will be later realised in the morphological encoding. For instance, the lemma

"parrot" in its meaning is a kind of bird, while the other lemma "give" in its meaning involves some actor x causing some possession to Y to go from an actor X to receiver Z. Syntactically, both lemmas, however, behave differently. "Parrot" is a noun phrase while "give" is a verb phrase that takes both a direct object and an indirect object.

Morphophonological Encoding. It is responsible for retrieving and building the phonetic plan for articulation. When lemmas become selected, their morphophonological codes become available in the emerging surface structure. Hence, the second core system of the process is completed. The phonological encoder accesses the lexical form (i.e., information about its morphology and phonology). The Formulator produces an articulatory or phonetic plan, which is used in the final stage of language formation. The generated speech plans are transformed into speech or body movements in the Articulator. The articulator receives input in the form of a phonetic plan from phonological encoding. The speaker can scan this phonetic plan internally using the speech comprehension system, which provides the first opportunity for feedback and self-correcting. In the mental lexicon, each lexical item is defined in terms of semantic and syntactic information (lemmas), as well as morphological and phonological information (lexemes). However, only lemmas will be activated if their meaning corresponds to a part of the preverbal message (Levelt, 1989). The mental representation of a lexical entry is shown in Figure 2.

Figure 2

A Representation of a Lexical Entry
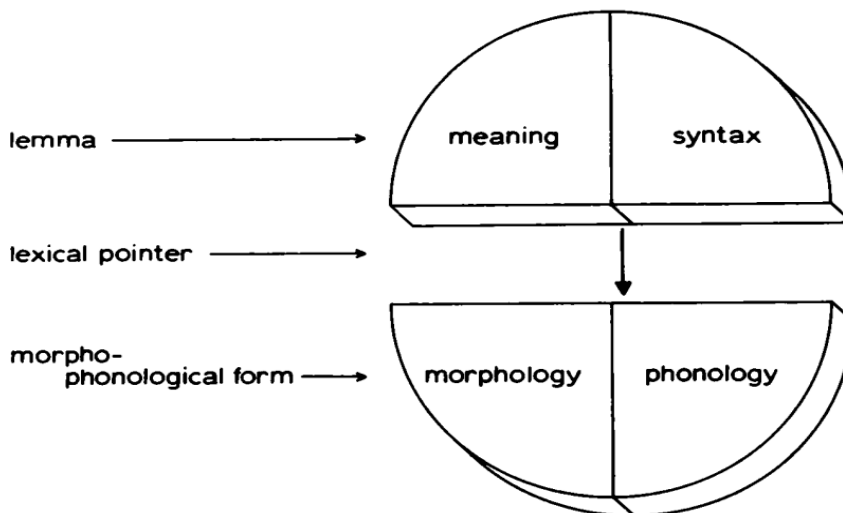
Note. The lexical entry consisting of a lemma and a morpho-phonological form. From *Speaking: From Intention to Articulation* (p.188), by W.J.M. Levelt, 1989, MIT. Copyright 1989 by MIT Press.

Figure 2 shows how the lexical entry is represented. It represents Levelt's (1989) view of a lexical entry. The lexical pointer, which is specified in the lemma, triggers the phonological encoding process, which results in the selection of specific morphological and phonological forms. The above Figure 2 also suggests that semantic or syntactic errors are located within the lemma spectrum, while morphological and phonological errors are located within the lexeme spectrum. Warren (2013) models the *Lexical Access Process* through lemma and lexeme where the first node is responsible for retrieving the abstract form of the word, or "lemma" from the mental lexicon and the second is responsible for specifications of the form of the word to its sound, or "lexemes". Levelt refers to this process as lexical selection and phonological encoding, while Warren (2013) calls it finding the word and building the word. This process has a further implication in the analysis of SI errors.

3.1.3. Articulation

The articulator is responsible for converting the speech plan into actual speech. The musculature of the respiratory, laryngeal, and supralaryngeal systems are all involved in articulation, which is the motor execution of the phonetic plan. Levelt (1989) elaborates, "It is the execution of the phonetic plan by the musculature of the respiratory, the laryngeal, and the supralaryngeal systems" (p. 12).

3.1.4. Self-Monitoring

A speaker is his own listener (Levelt, 1989, p. 13). The speaker accesses and monitors his/ her own internal and overt speech for appropriateness and grammaticality. The Conceptualizer can attend to internally generated messages and the output of the Speech Comprehension System (i.e., parsed internal and overt speech) to compare and analyse them with the same mechanisms used for analysing overt speech. With additional activation of the Working Memory, more errors can be detected from the internal speech. Self-correction occurs when the speaker monitors and compares the meaning of what was internally planned to what was intended as a response to his/ her own verbal behaviour.

3.1.5. Spreading Activation Theory

A core feature of the spreading activation theory is lexical selection which is conceived as retrieving a word, or more specifically, a lemma, from the mental lexicon to be expressed as an output. There is a mapping process in which a pattern of activation corresponding to the meaning of a word is mapped onto a pattern corresponding to the word's sounds. Levelt (1991) explains that the spreading activation theory is that the preverbal plan activates the lemma in the lexicon. Such activation spreads through a semantically organized network. Levelt also draws examples to differentiate between errors of lexical selection and phonological encoding, by stating:

If lexical selection goes awry, the errors such as these may occur: Errors of lexical selection and grammatical encoding. Examples of these errors are:

Don't burn your toes (intended: fingers)

Examine the horse of the eyes (intended: the eyes of the horse)

Incorrect phonological encoding leads to a very different kind of error: Errors of phonological encoding. Examples of this type of errors are:

Fart very hide (intended: fight very hard)

Face spood (intended: space food). (Levelt, 1991, p. 4)

Therefore, only active lexical concepts are the ones that spread their activation to their lemma node. The lemmas, which receive the highest activation, are the selected ones because they match the preverbal plan. Such activation spreads through a semantically organized network. Example 1 illustrates how it works.

3.2. Gile's (2009) Model as a Simultaneous Interpretation Framework

Gile (2009) outlines the Effort model of SI in his book *Basic Concepts and Models for Interpreter and Translator Trainings*;

Simultaneous interpreting (SI) can be modelled as a process consisting of the three core Efforts; namely, the Listening and Analysis Effort (L), the Short-term Memory Effort (M) and the Production Effort (P), plus a Coordination Effort (C), which is later added to correspond to resources required to coordinate the three other Efforts.

L = Listening   M = Short-term Memory Effort   P = Production C = Coordination

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

(In this formula, the 'equal' sign should be interpreted as meaning 'consists of, not as equality in the usual mathematical sense, and the 'plus' sign as addition 'in a very general sense, not as the usual arithmetic addition).

During simultaneous interpreting, there are other operational processing capacity requirements. The following sum represents the capacity requirements:

$$(2) \; TR = LR + MR + PR + CR$$

TR Total processing capacity requirements

LR processing capacity requirements for L

MR processing capacity requirements for M

PR processing capacity requirements for P

CR processing capacity requirements for C

Therefore, this simple condition has to be met in SI:

$$(3)\ TR \leq TA$$

TA represents the total available processing capacity

(Total processing capacity requirements should be less or equal to the interpreter's total available processing capacity.)

$$(4)\ LR \leq LA$$

LA being the processing capacity available for L

$$(5)\ MR \leq MA$$

MA being the processing capacity available for M

$$(6)\ PR \leq PA$$

PA being the processing capacity available for P

$$(7)\ CR \leq CA$$

CA being the processing capacity available for C

In the Effort Model framework, if the available capacity is less than the processing capacity requirement, problems are triggered and speech errors arise hereafter.

3. 3. Error Analysis

Dulay et al. (1982) descriptively classified errors as follows: 1) linguistic category, 2) surface strategy taxonomy, 3) comparative taxonomy, and 4) communicative effect taxonomy. In this study, only errors based on linguistic category and surface strategy taxonomies will be discussed with relevance to the data.

1) **Error Types Based on Linguistic Category.** The linguistic analysis includes the linguistic levels such as phonology (pronunciation), syntax and morphology (grammar), semantics and lexicon (meaning and vocabulary), and discourse (style).

2) **Surface Strategy Taxonomy.** According to Dulay et al. (1982), errors based on surface strategy taxonomy are seen in four categories. There are as follows: omission, addition, misformation, and misordering.

I. *Omission*. It is skipping an item that is required in a correct utterance. An example from data (e.g., *in thirties of June), where the definite article is omitted).

II. *Addition.* It is the presence of an item which must not appear in a well-formed utterance. Three types of addition errors are commonly reported: a) double markings: The addition in double marking in L2 is observed when the interpreter adds two tense

markers fails that are not required in particular linguistic constructions. (e.g., about 6 years *I did not got away from *him work and close at night and morning), where the past tense is added and marked in the auxiliary and the verb, b) regularizations: errors in which a marker is typically added to a linguistic item which is erroneously added to exceptional items of a given class that do not take a marker(e.g., It is really touch all hearts, fathers mothers *childrens, all *mens and *womens) , where - s plural is added to irregular nouns, and c) simple additions: errors other than double marking and regularization (e.g., He could *to change the history), where " to" is added.

III. *Misformation.* It is using the wrong form of a morpheme or structure in an utterance. Three types of misinformation errors are commonly found in participants' errors: a) Regularization: a regular marker is used for an irregular one (e.g., Anwar El Sadat, the dears of the million, he *is not stop thinking... not thinking for a day, but for a hour or a day in order to secure the needs of all the people), where the interpreter fails to put these lemmas into a correct grammatical structure. What she intends to use is the auxiliary "does" instead of "is", b) Archi-forms: the selection of one member of a class of forms to represent others in the class (e.g., in *this such hard moments as well as *its responsibilities), where the singular form "this" and "its" is uttered and used to modify the noun "moments" with "responsibility", c) Alternative forms: free alternation of various members of a class with each other (e.g., revolutionaries are still defending* this rights, where this is used as a demonstrative pronoun to refer to an antecedent which is "revolutionaries". Archi forms are peculiar to a specific interpreter while alternating forms are used frequently among participants due to L2 acquisition.

IV. *Misordering.* It is the incorrect position of a morpheme or a lexeme in an utterance (e.g., *during the coming period, transitional one), where the order of adjectives is violated as there is more than one adjective that comes before the noun, and they are normally in a particular order.

4. Methodology

4.1. The Sample

This study investigates a selected sample of errors committed by Egyptian interpreters and students who interpret from Arabic into English. This sample consists of interpreting four inauguration speeches whose duration ranges from approximately 4:22 minutes to 9:00 minutes per speech. The total recorded time for each interpreter is approximately 29:07 minutes. They are as follows: 16 speeches recorded by four interpreters and 12 speeches recorded by

trainees. The sample includes errors analysed according to Levelt's (1999) model and Gile's (2009) model at the formulation stage, where errors have been classified according to lexical-semantic, syntactic, morphological, and phonological level. The underlying rationale for this approach is to enhance the generalizability of the findings to a broad range of political speeches. By adopting this perspective, the aim is to ensure that the results obtained from the study can be applied to encompass a wide spectrum of political discourse, thereby increasing the overall applicability and relevance of the research outcomes.

4.2. Methods of Data Collection

The following section outlines the methodology utilized in collecting a sample of TL errors in this study.

1-Corpus has been collected from the participants after listening to the original Arabic speeches. Their T output was recorded individually.

2-After recording the Participants' interpretations, they are transcribed using a digital tool called Otter.ai which is an artificial intelligence platform that mainly records and prescribe conversations in real time.

3-The corpus has been filtered out through personal observation and the researcher double-checked the recorded audio for each participant for the sake of accuracy.

4- The original speeches which constitute the STs, their possible interpretations (or TTs) are discussed through informal interviews with some professional interpreters for the sake of finding the most suitable equivalence and avoiding any subjectivity.

5-Online websites and widely accepted dictionaries are consulted such as

i)   The *Longman Dictionary of Contemporary English* (1995)
     (A monolingual English Dictionary).

ii) *Online collocation dictionary*

iii) *Other online dictionaries and websites are also referred to and cited in their place*
     https://dictionary.cambridge.org/

iv) *Other bilingual dictionaries are also referred to and cited in their place*
     https://dictionary.cambridge.org/dictionary/english-arabic/

4.1.2.   Methods of Data Analysis

The study adopts the qualitative and quantitative approach to answer the research questions. Levelt's speech production model aligns with Gile's Effort

model to analyse errors qualitatively. Error analysis is used to classify errors. Findings have been summarized based on the classifications of error analysis in the form of tables to consolidate the qualitative analysis. Quantitative approach is utilised to validate the results. Both approaches enable the researcher to find "problem triggers or "recurrent problems" that interpreters encounter during the process of SI. The analysis follows the following procedure:

1- The **Speaker's Authentic Speech** (SL) in question is cited in its Arabic form, which is the source Language.

2- Next, the **Interpreter's Actual Utterance, which is problematic (TL) or output in question,** is also cited in its English utterance. When more than one interpreter presents the same type of error, both utterances are presented to be further analyzed. As for phonological errors, words are phonemically transcribed.

3- Then, the **Interpreter's Intended Utterance** is provided to help the reader compare the authentic speech and the interpreter's actual utterance while the **Suggested Interpretation,** if necessary, is incorporated for the need for a better understanding of the errors in question.

4- The problematic sounds, lexemes, and phrases in question are viewed in light of the dictionaries to show their semantic and phonemic significations.

5- Analysis of each error (TL) is presented in light of the theoretical framework: Levelt's speech production models, Gile's Effort Model and any relevant linguistic error types and placed according to error analysis taxonomies.

6- Statistical results- after counting errors- are also presented and discussed. The aim is to objectively rate the output and to keep any subjective or mistaken analysis at a minimum. Results from the data analysis are presented in tables to infer the further conclusion. They are meant to provide an individual evaluation of the interpreting.

4.2. Data Collection

The corpus consists of four authentic inaugural speeches delivered by President Hosni Mubarak, President Adly Mansour, President Mohamad Morsi, and President Abdel Fattah El-Sisi, spanning the period from 1981 to 2014. These speeches are chronologically chosen because they mark the end of political regimes and the beginning of new ones, and they provide insights into the leaders' visions, goals, and challenges for the nation. The speeches are also significant due to their association with important events such as the 25th January and 30th June revolutions and the death of President Al-Sadat.

Abdelhameed (2022) also states that these speeches reveal a discrepancy in employing the rhetoric of time. She mentions that the focus of Al-Sisi's speech was on his future, trying to ignore the past, while Morsi's speech is hinting at the role of Ideology and what the Muslim Brotherhood martyrs have

done to plant the tree of freedom. President Adly Mansour's speech is full of appreciation for different sectors in Egypt, referring to the importance of Tahrir Square in the 25th revolution. President Mubarak's speech is painful as he expresses his condolences for losing President Al-Sadat. Another reason for selecting these political speeches is that the political discourse, itself, is one of the most popular genres that learners and professional trainees have been trained in and practiced.

In addition, the study takes into account the speech rate of the presidents, which varies from faster to slower. For example, President Morsi's speech contains more pauses between phrases, allowing interpreters to conceptualize, process and deliver their interpretation more effectively. The duration of the presidential speeches ranges from approximately 4 (i.e., President Abdel Fattah El-Sisi) to 9 minutes (i.e., President Mohamad Morsi), and each participant's total interpretation time does not exceed 30 minutes to avoid overwhelming their cognitive capabilities. According to Gile (2018), teams, which consist of at least two interpreters, take turns to interpret a speech around every thirty minutes or so, because the pressure is too high to be performed by just one person. The following table1 represents the speeches and timings used in this study.

Table 1

Overview of Speeches and Duration

Speaker/ Speech	Time
President Abdel Fattah El-Sisi	Around 4:22 min.
President Adly Mansour	Around 6:46 min.
President Mohamad Morsi	Around 9:00 min.
The first part of President Mubarak's speech	Around 8:53 min.
	Total Time: 29:07 minutes

The corpus is conducted with some electronic types of equipment: headsets, and speech audio played on a computer. However, no computer-assisted tools (such as terminology management tools, note-taking applications, and voice-text devices) are accessed and interpreters are not allowed to listen to the source speech before recording or even request pauses to reduce time pressure. Each recording is played only once, and interpreters are given a 5-minute break after each speech.

5. A Cognitive Psycholinguistic Analysis of the Sample

This section presents the proposed analysis of the selected SI errors found in the output of interpreters and trainees. It is divided into two major parts: the first part follows a cognitive psycholinguistic model presented by Levelt and the

second part deals with Gile analysis. Moreover, the selected errors are analysed according to the linguistic levels including lexical, semantic, grammatical, and morphonological levels.

5.1. Lexical Errors

The lexical error is defined as "the wrong word use of a lexical item in a particular context by comparison with what a native speaker of similar characteristics as the L2 learner … would have produced in the same circumstances" (Llach, 2005, p. 49). Lexical errors are observed in word choice; therefore, the suggested linguistic summary is viewed as follows: problems in retrieving the TL and 'Formal Errors of Lexis' or problems in the lexical choice.

5.1.1. Problems in Lemma Retrieval

Problems with lemma retrieval is a sign of encoding failure with memory recall. The ability to recall TL when needed is affected by different factors such as stress, time pressure, and available processing resources. The following example shows how it is cognitively processed.

Example	1
Type	**Lexical Retrieval**
Speaker's Authentic Speech (SL)	*" نحتفل اليوم بنتائجها ونحترم هذه النتائج "*
Interpreter's Actual Utterance (1)	We…err...and respect its results.
Interpreter's Intended Utterance (1)	Today, we celebrate its results and respect these results.
Suggested Interpretation	Today, we celebrate the results of the election and we respect these results.

In the previously mentioned example (1), there are two main verbs "celebrate" and "respect". Only the second lemma, "respect", is activated as a target lemma in the mental lexicon, while the first lemma "celebrate" is not. As the interpreter is not able to retrieve the verb "celebrate", it is left omitted. Evidence suggests that if the lexical concept is activated, then retrieved based on an abstract representation of "respect" (x, y), the probability of other lemma retrieval is strongly enhanced. For instance, "respect its results" where the complement "its result" is strongly enhanced. Levelt et al. (1999) mention that the retrieval process starts by enhancing the level of activation of the node of the target lexical concept. Activation then spreads through the mental network, with each node sending a proportion of its activation to its direct neighbours. To verbalize "respect," the activation level of the lexical concept node respect (x, y) is enhanced. Then, the activation spreads through the conceptual network and down to the lemma stratum. As a result, the nodes of the lemma "respect" are activated. It can be seen that the highly activated node is the "respect" node because it receives a full proportion of respect (x, y)'s activation, whereas other

lemma nodes receive only a proportion of a proportion. Upon verification of the link between the lemma node of respect and respect (x, y), this lemma node will be selected. In addition, the use of the filler "err" indicates that the interpreter is in the process of retrieving something that is temporarily forgotten from STM. The following diagram shows how a lemma is activated.

Figure 3

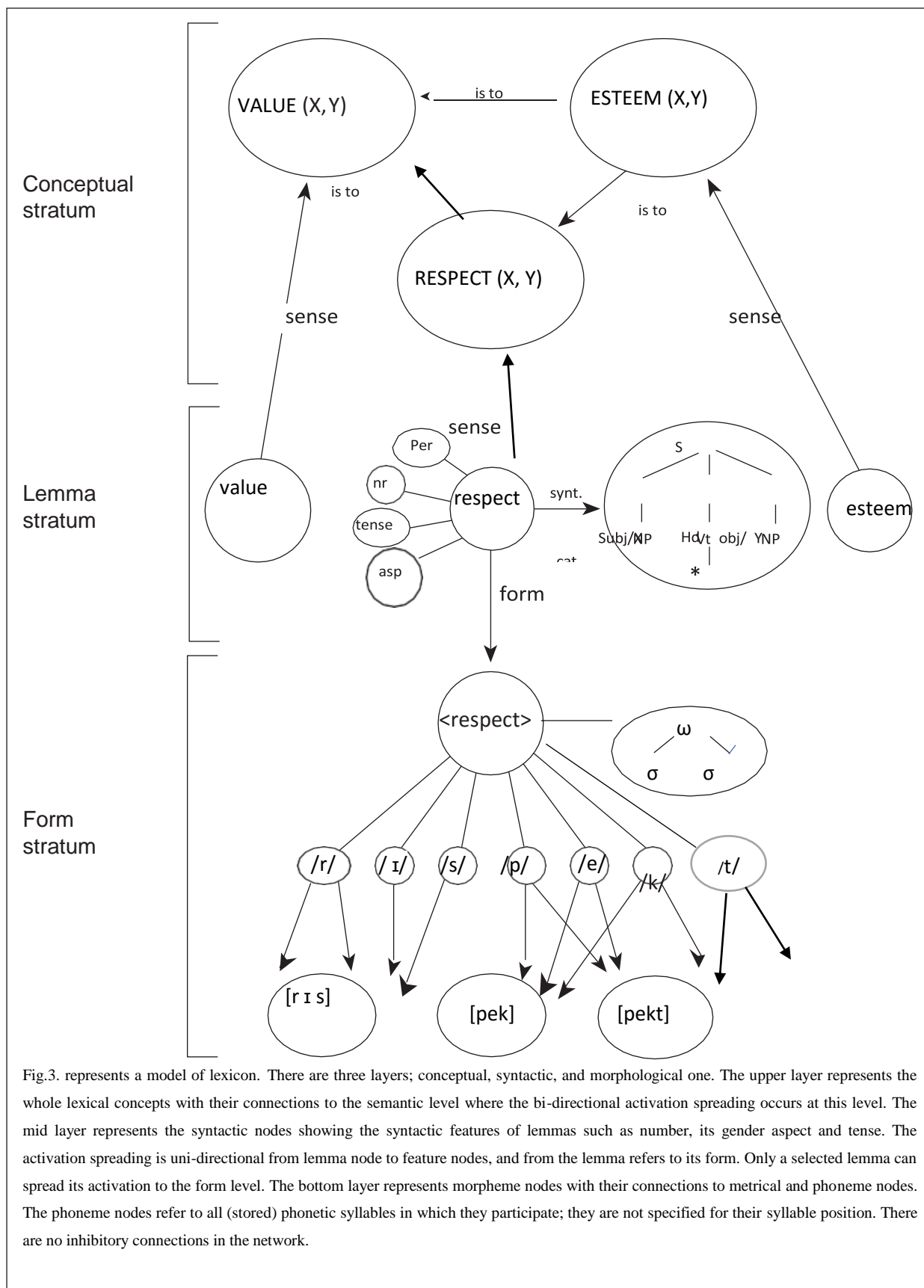*A Representation of 'Respect' in the Mental Lexicon*

Fig.3. represents a model of lexicon. There are three layers; conceptual, syntactic, and morphological one. The upper layer represents the whole lexical concepts with their connections to the semantic level where the bi-directional activation spreading occurs at this level. The mid layer represents the syntactic nodes showing the syntactic features of lemmas such as number, its gender aspect and tense. The activation spreading is uni-directional from lemma node to feature nodes, and from the lemma refers to its form. Only a selected lemma can spread its activation to the form level. The bottom layer represents morpheme nodes with their connections to metrical and phoneme nodes. The phoneme nodes refer to all (stored) phonetic syllables in which they participate; they are not specified for their syllable position. There are no inhibitory connections in the network.

Noteworthy, the mechanism of spreading activation theory explains how errors occur. Selecting the target lemma from the mental lexicon allows for the activation of other lemmas. This happens because there is competition between semantically related lemmas. Only active alternatives in the interpreter's mental lexicon are the ones that are selected and then articulated. Spreading activation occurs within semantic networking. In the mental lexicon, if two or more semantically related words are competitive, the probability of semantic errors increases as these words are highly competitive with each other. The semantic error occurs when more than one semantically related word is activated. Semantically unrelated words might not be highly activated, so they do not receive any additional boost in this case.

5.1.2. Formal Errors of Lexis

According to James (1998), lexical errors are subdivided into formal misselction, misformation and distortion errors. Therefore, the following examples sheds light on different types.

5.1.2.1. Formal Misselection

A misselection error, classified as a type of malapropism, is referred to as "synforms" by Laufer (1988) and "confusibles" by Room (1979). Within this category, James (1998) distinguishes four subtypes of lexical misselection: suffix, prefix, vowel-based, and consonant-based.

Example	(2)	(3)	(4)	(5)
Type	The suffix Type	The prefix Type	The vowel-based Type	The consonant-based Type
Speaker's Authentic Speech (SL)	"أبناء مصر الكرام"vs "المصرين الشرفاء "	" وحفظ شعبها "	" روح الميدان "	" أرض مصر الواسعه "
Interpreter's Actual Utterance (1) (2)	1-Honoured people of Egypt 2-Honoured men in Egypt	Deserve its people	the separate of the square	Our fast land of Egypt
Interpreter's Intended Utterance (1) (2)	1-Honourable people of Egypt 2- Honorable Egyptians	Preserve its people	The spirit of the square	Our vast land of Egypt
Suggested Interpretation	Dignified Egyptian people **vs** Noble Egyptians	May God save (or protect) its people	The spirit of the square	Our vast (or spacious) land

In the above-mentioned example (2, 3, 4, 5), each interpreter prepares the lemmas conceptually, and the lexical concepts have been activated and spread its activation in the mental lexicon. Lemmas such as "people" and "Egypt"; "people"; "square"; "land' and Egypt" are also retrieved, respectively, and

enhance the level of activation of the node of other target lexical concepts such as "الكرام", "حفظ "," روح "," أرض " and " واسعه " respectively. However, the interpreter confuses the usage of the two lexemes and misselcts the T lexemes and uses "honoured" instead of" honourable"; "deserve"[1] instead of "preserve"[2]; "separate"[3] instead of "spirit"[4]; "fast"[5] instead of "vast"[6] respectively.

Lexicographically, in (2), these two lexemes: "honoured"[7] and "honourable"[8] might be listed very close to each other, due to similarities in morphological structure and phonological structure. Indeed, there is a lexical difference between honourable and honoured; someone is honourable in himself/ herself, but someone is honoured by someone else. So, interpreters confuse both lexemes. The lexemes "honoured" means regarded with great respect, while" honourable" is used as a title indicating eminence or distinction, given especially to high-ranking officials.[9]

Linguistically, in (2), this pair ("honourable" & "honoured") of words look and sound similar: they (i) have the same stress pattern which is located on the first syllable /ˈɑnərəb(ə)l/ and /ˈɑnərd/; (ii) they are of the same word class which is adjective; (iii) have the same initial part which is "honour"; (iv) have some phonemes in common/ˈɑ/, /n/, /ə/ and /r/; and (vi) have phonemes with shared features. However, the noticeable difference arises from the suffix and the number of syllables -the matter that confuses the interpreter. The lexeme "honourable" /ˈänərəb(ə)l/ has four syllables but "honoured" has two syllables.[10] The same analysis applies to other examples.

5.1.2.2. Misformations

According to James (1998), lexical misformations are those lexical errors produced by the learner from TL or come from MT and are intended to convey

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[1] https://dictionary.cambridge.org/dictionary/english-arabic/deserve

[2] https://dictionary.cambridge.org/dictionary/english-arabic/preserve

[3] https://dictionary.cambridge.org/dictionary/english-arabic/separate?q=separate+

[4] https://dictionary.cambridge.org/dictionary/english-arabic/spirit

[5] https://dictionary.cambridge.org/dictionary/english-arabic/fast

[6] https://dictionary.cambridge.org/dictionary/english-arabic/vast

[7] https://www.almaany.com/ar/dict/ar-en/honoured/
[8] https://context.reverso.net/translation/english-arabic/honourable
https://www.almaany.com/ar/dict/ar-en/honourable/

[9] https://dictionary.cambridge.org/dictionary/english/honourable and https://dictionary.cambridge.org/dictionary/english/honoured

[10] https://www.howmanysyllables.com/syllables/honoured

the target language. They are known as interlingual misformation errors when referring to MT.

i) Borrowing. When the MT word is used in the TL, the interpreter is not able to tailor it to its new "host" code.

Example	6
Type	**Borrowing from Arabic**
Speaker's Authentic Speech (SL)	"أهلى جميعا المصريون جميعا المسلمين والمسيحين الرجال والنساء الكبار والشيوخ والشباب اللآباء واللأمهات"
Interpreter's Actual Utterance (1)	You are … my family all Egypt … all Egyptian the Muslims and Christians, elderly and sheikhs and, young men, father and mothers… fathers and mothers.
Interpreter's Intended Utterance (1)	You are my family all Egyptian the Muslims and Christians, elderly and sheikhs, and young men, father and mothers.
Suggested Interpretation	All Egyptians are my family: Muslims and Christians, old men and women, senior and junior citizens, fathers and mothers.

In the aforementioned example (6), the interpreter prepares the message conceptually, and then the lexical concepts have been activated. Activation has been spread to include all lexical items. However, there is a misformtion error when this interpreter uses the word "sheikhs" to mean *"الشيوخ"* which originates in Arabic. In this context, it is suggested that "elders", "elder citizens", "seniors" or "senior citizens" could be used to transfer the meaning of *"الشيوخ".* The reason for such suggestion is that it is likely to maintain the linguistic parallelism while collocating lexemes. Although this interpreter uses the adjective form of "elder", it is enough to use the noun form, instead of borrowing the lexical word from L1. The lexical issue occurs when the interpreter does not realize that the speaker means "senior citizens" or "elder people". Therefore, it is required for her to use these words to convey the meaning. Hence, the interpreter needs to be aware that these lexemes are borrowed.

ii)   Literal Translation from L1. This type of error results from the direct or literal translation of a word, phrase and/or sentence and the influence of the interpreter's native language. James (1998) uses the term "Calque" to mean literal translation. However, this lexical error is known in translation studies as a literal translation.

Example	7	8	9	10
Type	Literal Translation	Literal Translation	Literal Translation	Literal Translation
Speaker's Authentic Speech (SL)	*" حكمته العميقة "*	في هذا اليوم المشهود	بإرادتكم	بفضل الله

Interpreter's Actual Utterance (1)	His deep wise	in this witness day	After your desire	After Allah's granting us
Interpreter's Intended Utterance (1)	His deep wisdom	in this witness day	After your desire	After Allah's granted us
Suggested Interpretation: https://context.reverso.net/	His perfect wisdom or His profound wisdom	On this momentous day	with (of) your own free will	Grace of God/ God's favour

The above examples (7, 8, 9,10) show a case of misformation resulting from literal translation at the word, phrase, and sentence level. The phrase "deep wise, as a collocation, is misunderstood by the interpreter. In example (7), due to linguistic incompetence, the interpreter fails to formulate the lexeme " عميقه " into "profound" to describe "wisdom". Instead, the literal translation of the word "عميقه", which is "deep", is wrongly used. Literally, "deep" does not convey the intended meaning of TL. Also, a morphological error occurs in "wise". The interpreter should formulate the noun "wisdom." The same applies to examples (8,9,10). It is worth noting that literal translation found in different interpretations for selected lexical chunks in President Morsi's speech.

5.1.2.3. Distortions

Distortion errors are identified as intralingual errors whose forms do not exist in the TL. Even though distortions include omission, overinclusion, mis-selection, misordering, and blending, only blending is noticed in the corpus.

i)   Blending. Blending occurs as a performance slip and descriptively consists of a blend of the intended and unintended lexemes. Blending, on the other hand, is more typical of syntactic deviance and lexical deviance.

Example	11	12	13
Type	**Blending**	**Blending**	**Blending**
	Generation + relation	President + candidate	Intuition + initiative
Speaker's Authentic Speech (SL)	يظل المصريون هناك يتناقلون الراية جيلا بعد جيل	"المرشح الرئاسي"	"وكان للشباب فضل للمبادره والرياده والقياده"
Interpreter's Actual Utterance (1)	As Egyptians take the least ... generation after *relationeration	*Presididate	And the young people have the greeting to be *intuitiative and leadership
Interpreter's	Generation after	Presidential	And the young people

Intended Utterance (1)	generation	candidate	have the greeting to be initiative and leadership
Suggested Interpretation	Egyptians kept there passing the flag on generation after generation	Presidential candidate	Thanks to the youth who had taken the initiative, and leadership

Considering the above-mentioned example (11), the uttered or blended lexeme "*relationeration" does not exist either in L1 or L2. It is the composition of relation + generation. From a psycholinguistic view, there is a mixture of what the interpreter intentionally and unintentionally would like to utter. Although the first lexeme "relation" does not relate to the context, on the phonological level, it has the same suffix of "generation", which is the required equivalent for the context. As a result, it sounds like the interpreter blended the two words based on phonology. This error is more of a performance error as the interpreter is fully aware of both lexemes. Similar analysis applies to other examples.

The second part of the qualitative analysis follows Gile's (2009) Effort Model. According to Gile's Model, the analysis of lexical gaps or omission can be explained in terms of the efforts embodied in output. Omission can be related to either Listening and Analysis (Comprehension) Effort or Memory Effort. In the previous example (1), the lexical omission corresponds to the latter; Memory and Coordination as processing capacity of the interpreter is limited and therefore, not enough attentional resources were able to be adequately allocated. Pym (2008) suggests that lexical omissions have made the communicative aim less attainable. Based on that, it seems that the omitted lexical segment "celebrate" tends to be a low risk as the interpreter uses "and" which indicates his awareness of omission. Omission in example (1) impairs the message minimally, as the context would presumably have made it clear to the Target audience. The reason for the omission is the difficulty in processing the term coined by the speaker. It can be evidenced by audible hesitations and fillers that show that the interpreter's attention has been distracted and caused her to skip over it. Hence, the interpreter is more likely to focus on the added processing capacity (Memory) and stretch it to the limit to be able to solve the omission problem to reduce the cognitive load.

In lexical misselection errors, (ex. 2-5), the effect of increased processing requirements in the Production Effort eventually leads to the unconscious production of lexical output. The interpreter decides to focus on the production of this segment without taking into consideration selecting the accurate lexical item – the matter that takes attentional resources away from the production of the target speech. Therefore, the result of a lack of attention is the deterioration of the linguistic quality of the target speech. However, it is unlikely to say that short-term memory may be affected immediately after the dense production of

TL since more processing capacity forces the interpreter to accelerate the TL production.

As for Misformation errors, (ex. 6-10) the total processing capacity of the interpreter is less than what is required from the task. In other words, the lexical capacity of the interpreter is not equal to or more than the task requirement- the matter that causes different types of errors such as borrowing, and literal translation. Data reveals other errors such as code-switching, and derivation. Therefore, interpreters may understand a concept but struggle to reformulate the lemma into proper lexemes in the target language. For example, in (6), the interpreter finds it difficult to interpret the S lexeme either because the specific lexical unit is unknown to the interpreter or not available in his/ her mental lexicon during the processing time. Thus, excessive time and effort have been spared in the processing capacity of Listening and Analysis Effort as well as Memory Effort. Moreover, the challenge arises in the production effort when the task requires less accessible or unavailable lexical units. In such instances, the complexity of the issue becomes further compounded.

As for distortion errors (ex. 11,12,13), the processing capacity is responsible for distortion errors such as blending. Both lexemes compete and therefore are uttered at the same time. One of the typical reasons stems from the informationally dense Source speech. Another one is related to the speaker's pace; if the speaker is so fast, it requires more cognitive processing capacity. Due to the limited processing capacity, there is an overload on the interpreter's short-term memory (working memory). Therefore, the inability to remember the previously uttered language and self-correct it is the end result.

5.2. Semantic Errors in Lexis

James (1998) divides semantic errors in lexis into sense and collocation. First, errors in sense relations include confusion about using near-synonyms, co-hyponyms and opposite relations. Second, collocation errors involve one word wrongly collocating with another word and two or more wrong words that never collocate together. The explanation of how lexical semantic errors may result in sense relation confusion is provided in the section that follows.

5.2.1. Confusion of Sense Relations

Since lexical relations are the relationships of meaning between words, words are semantically related to one another in a variety of ways, such as synonyms, antonyms, etc. This means that errors in the lexical relations include the misuse of sense relations.

i)   **Assumed Synonymity.** Fromkin et al. (2010) state that "synonyms are words or expressions that have the same meaning in some or all contexts" (p. 156). Technically, "total sameness", where two words have identical meanings, is thought to be problematic as there are many occasions when one

word is more appropriate for the context than the other. On some occasions, the synonym would sound unnatural as it gave rise to different word associations. In that case, if the interpreter uses an inappropriate synonym, it is considered an error. Therefore, "Assumed synonymity" is the substitution of the target lemma by using a near-synonym lexeme.

Example	14
Type	Using a wrong lexeme from the set of a near-synonym
Speaker's Authentic Speech (SL)	"إن أعظم ما تم في التلاتين من يونيه أنه جمع الشعب كله"
Interpreter's Actual Utterance (1) (2)	1-The best of this revolution is that it compose all the people. 2-The greatest thing happened in the revolution of June that combine all the people.
Interpreter's Intended Utterance (1) (2)	1- The best of this revolution is that it units all the people. 2-The greatest thing happened in the revolution of 30th of June is that it unites all the people.
Suggested Interpretation	the great thing that happened on 30th June is that it brought the whole people together

Looking at both interpretations, the lexemes 'combine' and 'compose' share part of the meaning, which is to bring together. However, 'combine' is much more commonly used with chemicals. In this context, it is preferred that words like "gather", or 'unite' are to be used. Also, the words "best" and "greatest" share part of the meaning. However, 'greatest' is one that is nearly equivalent to the Arabic word "أعظم" and " best" to "أفضل " Even though there are some grammatical errors in the interpretation such as subject-verb agreement, semantic errors are clear, with special reference to the usage of synonyms like "collect" and "compose" instead of "unite" or "gather".

In an attempt to analyze such inaccuracies, the choice of the most accurate lexical items depends on the stored number of lexemes in the mental lexicon as well as which highly competitive lexeme(s) are activated to express the meaning accurately. It is hard to make a kind distinction between two synonyms during the interpretation process. Hence, the interpreter thinks that he/she can use synonyms interchangeably as a way to fill in the lexical gap of TL. However, the produced utterances are semantically deviant as presented above. The following example shows how a slight difference in meaning could affect the quality of interpretation.

5.2.2. Collocation Errors

According to Baker (1992), the difference between the source and target depicted in the collocational patterning leads to potential pitfalls and various problems in translation. Levelt (1992) also states that the problem of collocation lies in the selection of one word which can depend on the selection of other

words, and there are no conceptual reasons for this selection. In addition to that, processing collocation in L1, whether holistic or partial, differs from that of L2. Garibyan (2022) states that it is significant to take into account that the mental lexicon of native speakers has stronger associative bonds, whereas that of L2 learners is more loosely organised. This could indicate that these two groups process collocations differently. A semantically deviant collocation can be classified into two subtypes: one word that wrongly collocates with another one, and two wrong words that never collocate together.

Example	15	16
Type	i) One word wrongly collocates with another word	ii) Two or more wrong words that never collocate together
Speaker's Authentic Speech (SL)	" إنه إحساس بالمسؤولية "	"سأبذل كل جهدي للوفاء بالإلتزامات والتعهدات التي قطعتها علي نفسي عليكم أمامكم جميعا"
Interpreter's Actual Utterance (1) (2)	1-It is a feeling of responsibility 2-It is also feel of responsibility	1-I will exert all of efforts to commit and perform what I promised you in front of you all 2-I will exert all my efforts to fulfill all the promises that I made in myself in front of you on Egypt.
Interpreter's Intended Utterance (1) (2)	It is a sense of responsibility	1-I will exert all of efforts to fulfil all commitments that I promised to do in front of you all 2-I will exert all my efforts to fulfill all the promises that I made in myself in front of you on Egypt.
Suggested Interpretation	It is a sense of responsibility	I shall spare no effort to fulfil the commitments and pledges I have made to you all

Looking at the abovementioned examples (15), the interpreter prepares the message conceptually to be conveyed into the TL. The lexical concepts have been activated in the mental lexicon. Lemma, such as "responsibility", is also retrieved and enhances the level of activation of the node of other target lexical concepts. Activation then spreads through the network to its direct neighbouring lexemes that frequently collocate together. However, errors occur in selecting the first word that collocates with the noun "responsibility" to form a meaningful phrase. Instead of selecting "sense", the incorrect lexeme "feeling" is selected resulting in a semantically deviant collocation. These errors can be attributed to L1 transfer, wherein the interpreters transfer the Arabic words " " إحساس from their first language.

It is worth mentioning that some collocation errors are caused by the effect of the SL (source language). In this case, some interpreters confuse the SL and TL. Baker (1992) warns of this problem and suggests that paying attention to the potential influence of the collocational patterning of the source

text can help avoid such errors. Therefore, interpreters need to consider the collocation patterns of both the SL and TL to ensure accurate interpretation.

The Arabic phrase "الوفاء بالالتزامات والتعهدات" is a collocation pattern that has an equivalent in English. The equivalent collocation in English is to "fulfil commitments[1] and obligations"[2] or "fulfil the commitments and pledges"[3]. Interpreter (1) uses the words "commit and perform" to express the Arabic meaning of the speech, while Interpreter (2) attempts to use TL collocation "fulfil my promises" to express the whole meaning. Consulting dictionaries, the verb "fulfil" collocates with "commitments", "obligations", and "pledges". The above example (16) shows that the interpreter has no conceptual problems, as the collocation pattern exists in both TL and SL. However, the error occurs in selecting the most appropriate collocation in TL. Hence, the meaning has not been accurately communicated in TL.

The second part of the qualitative analysis follows Gile's (2009) Effort Model. Concerning semantic errors, whether sense or collocation errors, it seems clear that the two requirements were not met: (1) the total cognitive capacity of the interpreter is not either equal or greater than the total processing requirement of the task, and (2) some of the four separate cognitive efforts requirements exceed the corresponding available processing capacity (Gile, 1995). Moreover, interpreters have to invest more cognitive effort in Memory, which has unlimited storage of information, and Production Efforts to be able to produce accurate and convenient TL. If the production effort is not at or up to the level of expectation, the interpreter might not produce the required lexical item, as it is not available with high information density.

What is previously stored in the long-term memory has to be recalled during the task, otherwise, the interpreter struggles to produce the required lexemes. The confusion of sense relations originates from competitors; therefore, the interpreter's linguistic incompetence, i.e., the insufficient knowledge of synonyms, co-hyponyms, multi-word names, abbreviations, and acronyms is demonstrated in errors affecting the quality of T output. Therefore, the storage memory, in case of sense errors, is of the highest importance as it enables the interpreter to retrieve the lexemes quicker and able to produce them unconsciously, naturally and spontaneously.

When the correct collocation is accessible, it does not require processing effort from the interpreter; however, if it is not accessible, or even familiar, the interpreter takes longer to proceed to the Production Effort. Additional processing is given if the interpreter recognizes or realizes the falsity of the

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[1] https://www.freecollocation.com/search?word=commitment

[2] https://www.freecollocation.com/search?word=obligation

[3] https://www.freecollocation.com/search?word=pledge

output. Therefore, the total cognitive capacity of the interpreter must be either equal to or greater than the total processing requirement of interpreting TL lexemes such as collocation.

As observed, the mental saturation of this linguistic level in the TL must exceed what is required to avoid any linguistic problems happening through the cognitively demanding task. Based on that, insufficient semantic competence of sense and collocation is one of the internal factors that further hinder the performance of producing a semantically-equivalent T lexeme.

5.3. Grammatical Encoding Errors

Errors in the surface structure taxonomy can manifest as omissions, additions, misformations, or misorderings of linguistic items. These errors can occur in five syntactic classes of error: noun phrases (NPs), verb phrases (VPs), adjective phrases (Aj Ps), adverb phrases (AdvPs), and prepositional phrases (PPs).

5.3.1. Omission

Dulay et al. (1982) define omission as "the absence of an item that must appear in a well-formed utterance" (p. 154). During the process, certain linguistic items may be omitted to varying degrees.

Example	17	18	19	20	21	22
Type	Omission of Articles	Omission of the subject pronoun	Omission of dummy pronoun it /there	Omission of the main verb	Omission of to be	Omission of adverb
Speaker's Authentic Speech (SL)	" في التلاتين من يونيه "	" فإذا افترقنا نكون قدأخطائنا "	" نحن في ألآم عظيمة بل هو أعظم الألم في حياتنا المعاصرة "	" وعان من المرض والجوع ومن الظلم "	"تحية لرجال الشرطة الذين أدركوا بيقين أن مكانهم الحقيقي إلي جوار الجماهير"	أنور السادات يردد بحقق " كما كان زعيمنا الراحل محمد "
Interpreter's Actual Utterance (1)	in thirties of June	1-If we, if you wouldn't help each other, wouldn't succeed. 2-If we're differentiate, could wrong with ourselves.	We are in a hard suffering but is the greatest in our contemporary life.	People from oppression, so far from oppression.	I would like also to greet the policemen who realised that their real place beside the people and among their lines	As our formal was saying…
Interpreter's	in the	1- If we would	We are in a	People	I also would like	As our

Intended Utterance (1)	thirties of June	not help each other, we would not succeed.

2-If we're differentiated, we will have made mistakes | hard suffering but it is the greatest in our contemporary life. | suffered from oppression and injustice. | to greet the policemen who realised that their real place was beside the people and among their lines. | formal president was truly saying… |
| **Suggested Interpretation** | In the thirties of June | If we were separated, we would have made a mistake | We are in great pain. It is the greatest pain of our contemporary life. | People suffered from oppression, hunger, and injustice. | Tributes to the cops who have realized with certainty that their real place is next to the masses. | As our formal president was truly saying |

The aforementioned examples show that interpreters omit an article, a preposition, a pronoun in noun phrases or a main verb, dummy pronoun it /there, 'be' in the verb phrase Omission of adverb. One of the most frequent omission errors is subject pronouns. This particular error occurs due to processing complex structures such as "if". As depicted ex.18, the omission of the pronoun "we" occurs in the second clause of the conditional. The corpus provides a comprehensive overview of omissions encountered during the interpretation process. It elucidates various types of errors, encompassing the omission of articles, as exemplified by the absence of the definite article "the" as observed in data.

5.3.2. Addition

Ellis (1994) defines addition as the presence of an item that must not appear in a well-formed utterance. This means that the interpreter first prepares the message conceptually to be formulated into the target language. Then, appropriate lexical concepts are activated and converted into a kind of linguistic format. However, errors occur in the syntactic formulation of a clause by adding an element in L2 in the flow of interpretation. Addition errors are observed in double marking, regularisation and other simple additions such as prepositions.

i) Double marking. Errors in double marking are observed when there are two items rather than one marked for the same feature (e.g., tense). The addition in double marking in L2 is observed when the interpreter adds two tense markers fails that are not required in particular linguistic constructions.

Example	23
Type	**Double Marking Errors: Addition of Past Tense**
Speaker's Authentic Speech (SL)	"ست سنوات لم أفارقه فيها عملا ولقائنا واتصالا في كل ساعات الليل والنهار"
Interpreter's Actual Utterance	1-About 6 years I did not got away from him work and close at

(1) (2) (3)	night and morning.
	2-I did not *left him during this work and we worked together night and midday.
	3-I did not *separated from him during these 6 years day and night.
Interpreter's Intended Utterance (1) (2) (3)	1- About 6 years I did not get away from him work and close at night and morning.
	2-I did not leave him during this work and we worked together night and midday.
	3-I did not separate from him during these 6 years day and night.
Suggested Interpretation	For six years, I did not leave him at work, we met and communicated at every hour day and night

Considering the three interpretations (1, 2, and 3) in example (23), it is seen that the past tense is marked in the auxiliary and the verb. The English rule for tense formation, where the auxiliary is required, states that it is the auxiliary, not the main verb, which takes the tense marker. However, errors occur, hereby, when the interpreters place the marker on both. The above-mentioned case reflects the addition of the past tense marking element with negation, however; in the following examples, past tense is marked in the auxiliary and the verb.

ii) Regularization. Regularization errors are identified by those errors in which a marker is typically added to a linguistic item which is erroneously added to exceptional items of a given class that do not take a marker (Dulay et al., 1982). It is commonly known as over-generalisation.

Example	24
Type	Regularization of irregular plural nouns
Speaker's Authentic Speech (SL)	" ألم يعتصر كل القلوب قلوب الآباء والامهات والأبناء "
Interpreter's Actual Utterance (1)	It is really *touch all hearts, fathers mothers childrens, all *mens and womens
Interpreter's Intended Utterance (1)	This pain touches and squeezes the hearts of fathers, mothers, children, all men and women.
Suggested Interpretation	Fathers, mothers, and sons, all have tears of pain.

In the above-mentioned example (24), the interpreter prepares the message conceptually and the lexemes have been activated and selected. However, while formulating the structure of the sentence, the interpreter uses

the regular plural (-s) marker and adds it to items that do not take markers. This may be the result of over-generalisation because the interpreter overextends the grammar rule (-s) marker (e.g., fathers and mothers) to cover instances to which that rule does not apply (e.g., childrens, mens and womens).

iii)Simple Additions. Simple additions are those errors other than double marking and regularization. Simple additions are recognised when there is a use of an item that should not appear in a well-formed utterance.

Example	25	26
Addition Type	**Addition of article**	**Addition of preposition**
Speaker's Authentic Speech (SL)	"أن تنتهي إلي غير رجعة عبادة الحاكم التي تخلق منه نصف إله وأن تسقط كل أنواع القدسية والحماية والحصانة التي يضفيها الضعفاء علي الحكام والرؤساء وأن نتوقف عن إنتاجنا في صناعة الطغاة فلا نعود نعبد من دون الله ﷻ صنما ولا وثنا"	" أنور السادات الرجل الوديع الثقة يدعونا جميعا الي الرحمة والحب والتسامح"
Interpreter's Actual Utterance (1)	So, to make from a president a god where a people can just worship and where the weak can suffer from and stop from worship any other idol or president rather that Allah because this is not good thing.	Anwar El-Sadat or the person who call us all for to be merciful towards each other.
Interpreter's Intended Utterance (1)	So, to make from a president a god where people just worship and where the weak suffer from and to stop from worshipping any other idol or president rather than Allah because this is not a good thing.	Anwar El-Sadat, the trustworthy and kind man, who calls us all to be merciful towards each other.
Suggested Interpretation	That it ends, without the return, the worship of a ruler that creates from him half a god, that all kinds of sanctity, protection and immunity that the weak give to rulers and presidents will cease, and that we stop our production of creating more tyrants, so that we no longer worship without God, the Majesty, or idol.	Anwar El-Sadat, the gentle and the trustworthy man, who call us all to mercy, love and tolerance.

5.3.3. *Misformation*

Misformation is "the use of the wrong form of the morpheme or structure," Dulay et al., 1982, p. 158), while producing the TL. The interpreter

supplies something incorrect in the formation of the TL. The categorised as misformation errors are three: regularization errors, archi-forms and alternating forms.

i)Regularisation Errors. According to Dulay et al. (1982), a regularization error under misformation is the use of a regular marker in the place of irregular one. Dulay et al. (1982) summarize the sentence pairs which have similar structure but their deep meaning is different (e.g., ask vs tell, permit vs allow, etc). Interpreters commonly make regularisation errors while processing TL. It also reflects the comprehension of grammar while putting it into practice. For instance, some interpreters still find the use of "wish" and "hope" problematic in the formulation stage.

Example	27
Type	**Regularisation error: wish/ hope / want**
Speaker's Authentic Speech (SL)	**" إنني أرجو الا يرحل الثوار عن الميدان "**
Interpreter's Actual Utterance (1) (2) (3)	1-*I hope that the revolutionaries not to leave the square. 2-*I wish the revolutionaries will not leave the square. 3-*I want the rebels not leave the field.
Interpreter's Intended Utterance (1) (2) (3)	1-I hope that the revolutionaries will not leave the square. 2-I wish the revolutionaries would not leave the square. 3-I do not want the rebels to leave the field.
Suggested Interpretation	I hope that the revolutionaries do not leave the square.

In the above-mentioned example (27), There is a syntactic difference between "wish," "hope," and "want" as predicates. First, "wish" is typically followed by a subordinate clause introduced by "that" to express a desire or longing for a situation that is contrary to reality or unlikely to happen. For instance: "I wish that I could travel around the world." Second, "hope" is also followed by a subordinate clause introduced by "that" but is used to express a desire or expectation for a future event or situation that is considered possible or likely. Example: "I hope that it will stop raining soon." Third, "want" is a verb that expresses a strong desire or a specific intention to possess or obtain something. It is typically followed by a direct object or an infinitive verb phrase. For instance: "I want a new car" or "I want to go on vacation." In summary, "wish" is used to express desires or longings for situations contrary to

reality, "hope" is used to express desires or expectations for future events, and "want" expresses strong desires or intentions to possess or obtain something.

ii)Archi-forms. What is meant by archi-forms is the selection of one member of a class of forms to represent others in the class. Since archi-forms give way to the free alternation of various numbers of a class to be altered with each other. For instance, the interpreter may temporarily choose one of the demonstrative adjectives as a replacement for others.

Example	28
Type	**Archi-form**
Speaker's Authentic Utterance (SL)	*"في هذه اللحظات القاسية بآلامها والقاسية أيضا بمسؤوليتها"*
Interpreter's Actual Utterance (1)	In *this such hard moments as well as *its responsibilities
Interpreter's Intended Utterance (1)	In these hard moments as well as their responsibilities
Suggested Interpretation	in these hard moments with their pain and also their responsibility

Considering the aforementioned example (28), the interpreter misuses the demonstrative that linguistically refers to the plural noun "moments". Instead of producing the plural form of the demonstrative "these", the singular form "this" is uttered and used to modify the noun 'moments' with "such". The interpreter temporarily selects to do the work of several others. Dulay et al. describe it as "archi-demonstartive" adjectives representing the entire class of demonstrative adjectives. It is worth mentioning that this particular interpreter has also used the wrong possessive; "its" instead of "their".

iii)Alternating Forms. The use of Archi-forms gives way to free alternations of various members of a class with each other.

Example	29
Type	**Alternating Forms**
Speaker's Authentic Utterance (SL)	**"وجاءت اللحظة التي يسترد فيها هذا الشعب إرادته وحرياته"**
Interpreter's Actual Utterance (1)	And now it's time to *this people to recapture *its wealth and freedom and find the good life without any sufferings.
Interpreter's Intended Utterance (1)	And now it's time for these people to recapture their wealth and freedom and find the good life without any sufferings

Suggested Interpretation	It is the due moment that Egyptian people regain their will and freedom		

It is noted that trainees as a result of L2 acquisition uses "this" which is a demonstrative pronoun to modify to "people" that has already mentioned before. It is worth mentioning that archi-forms and alternating forms reflect the deficits on L2 acquisition. Archi-form errors is a characteristic of a particular interpreter, it is seen that alternating forms are reflected among most participants, but it occurred frequently among trainees.

5.3.4. *Misordering*

Misordering occurs when there is an incorrect placement of a morpheme or group of morphemes in an utterance. Misordering errors are frequently found in the formation of questions, complex sentences and questions. Throughout the collection of data, it was discovered that some trainees and even interpreters sometimes misuse the rules of grammar in the flow of delivering the Target utterance in practice, even though they are aware of theorizing them.

Example	30	31	32
Misordering Error Type	**Question Formation**	**Adjectival modifiers placed after the noun**	**Passive formation**
Speaker's Authentic Speech (SL)	*"كيف إذا تكون الآمي في قائدي وزعيمي وأبي وأخي محمد أنور السادات"*	"خلال الفترة الانتقالية القادمة"	"إن المستقبل صفحة بيضاء وفي أيدينا أن نملئها بما شئنا عيشا وحرية وكرامة إنسانيه وعدالة إجتماعية فإذا افترقنا نكون قد أخطائنا في حق الوطن وأنفسنا وأبناننا وأن تعاونا علي العمل والبناء سنملئها بما نتمنا من وطننا من رفاهية من وازدهار"
Interpreter's Actual Utterance (1)	* How was err, was I could express my pains of the loss of my father and my brother	*During the coming period, transitional one.	The future is a blank page. (pause) and we are able to fill it of what we, what we will we want, *it will filled with social justice.
Interpreter's Intended Utterance (1)	How could I express my pains of losing my leader, my dad, and my brother, Mohammad Anwar Al-Sadat?	During the coming transitional period	The future is a blank page and we are able to fill it with what we want … it will be filled with social justice.
Suggested Interpretation	How can I express my pains of losing my leader, my president, my father, my brother, Mohammed Anwar Sadat?	During the next transitional period .	The future is a blank page and it is in our hands. We can fill it with what we want: livelihood, freedom, dignity, and social justice.

Example (30) shows that the interpreter fails to form the right question. The interpreter uses two auxiliaries: 'was' and the model verb "could". This means that there is a misordering error in the formulation of this question. In

example (31), the interpreter fails to put the adjectival phrase into the right order. Instead of placing the adjective "transitional" before the noun, the opposite occurs which violates the linguistic order of the English language. One of the critical views why this error, in particular, frequently occurs is that the interpreter follows the sequence of the input. In the above-mentioned example (32), the interpreter fails to formulate the passive. There is evidence that the interpreter has a general knowledge of passive formation (e.g., "filled" in the past participle); however, the interpreter must master producing it spontaneously and/ or unconsciously devoid of the traditional grammatical tasks. To conclude, the above-mentioned misordering errors reflect that the correct lexemes have been activated and selected but misplaced in the utterance.

Based on the above-mentioned extracts, it can be revealed that when the interpreter strictly adheres to the sequence of the speaker's input, several issues can arise: message incompleteness, misinterpretation, insufficient communication and difficulty in handling complex structure such as passive, question formation, etc.

The second part of the qualitative analysis follows Gile's Effort Model (2009). Gile's Effort model provides a compressive explanation for omissions where the two requirements are not met: (1) the total cognitive capacity of the interpreter is less than the total processing requirement of the task, and (2) some of the four separate cognitive effort requirements exceed the corresponding available processing capacity (Gile, 1995). For instance, interpreters retrieve what is stored in the mental lexicon to formulate an accurate and convenient TL using the production Effort. However, the production effort required to replace TL is less than that of SL. Therefore, interpreters omit certain linguistic items, producing not well-formed utterances. In addition, the omission may be the result of engaging in producing the TL, and it seems that the speed of the speaker affects processing the TL. The interpreter might not produce the required lexical item, as it is not available with high information density.

Pym (2008) explores omissions, utilising the framework of Gile's (2009) Effort Model to investigate how memory and production processes work. Pym's research focuses on simultaneous interpretation during both the first and second attempts, using risk analysis to develop three hypotheses. According to Pym's

findings, the segments that are most frequently omitted tend to be low-risk due to time constraints. Moreover, omissions during the second translation are more likely to be of high-risk, whereas new omissions during the second translation tend to be of low-risk.

In the case of an addition, it is seen that the total cognitive capacity of the interpreter is greater than the total processing requirement of the task at hand,

and (2) some of the four separate cognitive effort requirements exceed the corresponding available processing capacity (Gile, 1995). For instance, interpreters retrieve what is stored in the mental lexicon to formulate an accurate and convenient TL using the production Effort. However, the production effort required to produce the TL is more than that of SL. That is why interpreters add certain linguistic items producing non-well-formed utterances.

The output of Egyptian interpreters contains some grammatical errors. The reasons why interpreters produce such errors in TI may have different explanations. First, the simultaneity of the process poses a great burden on the production of TL. Since the interpreters are producing English and listening to Arabic at the same time, the interference of L1 (Arabic) on L2 (English) is taken into consideration as the two have different linguistic features. de Bot (2000) explains that the interpreter may choose the syntactic structure in the source text just because it was most recently activated under such pressure. Second, an attentional resource for production in SI is less adequate than what is required from the task. Daro and Fabbro (1994) suggest that syntactic and phonological processes also require attention in SI. Therefore, when there are more requirements of the task (e.g., the challenge of competing for the limited attentional resource), grammatical performance deteriorates.

Moreover, when the total requirements (TR) for the interpretation task exceed the total available capacity of the TL grammatical rules of the interpreter, the linguistic performance does deteriorate and she will not be able to produce a well-formed English output.

i. TR > TA (where TA is the total available capacity)

To carry out the interpretation smoothly, the interpreter needs to have a mental saturation of TL, and in particular, grammatical rules which have an obvious negative effect on the interpreting performance. Listening and Analysis, memory, production and coordination effort have to be in harmony to reduce errors. As interpreters are working between two different languages (English and Arabic), and there are fewer shared syntactic procedures, the total requirements (TR) can be met when the following condition is satisfied as follows:

ii. TR = LR + MR + PR + CR

The challenge facing interpreters is particularly seen in Production and Coordination Efforts. The production requirement stems from the interpreter's desire to produce TI, which requires fewer available lexical units in the mental

lexicon, or a complex sentence as opposed to a simple one. Furthermore, when there is a lack of coordination between efforts due to the great demand for a mental resource, errors (e.g., additions, deletions, etc.) occur. As a result, interpreters may unconsciously pause, restart, or lengthen a sound in a way to keep pace with the demand and supply. At that time, it is very easy for interpreters to forget the TL rules, that they are not competent at, and simply put items of the same grammatical function together without any coordination. As a result, other ordering problems signal the malfunction of articulatory planning.

5.4. Errors in Morphophonological Encoding

The lexicalization process involves two main stages: finding the word and building the word. Finding the word is the lexical selection while building the word is the morphophonological encoding at which both morphological and phonological errors occur at the same local level of word-internal structure.

Since omission is one of the most frequent errors that arise unconsciously in the output, the following example represents how this error is processed phonologically. The omission of the consonant /θ / in the word-final position that occurs in the phonological decoding and phonetic representation of the lexemes is shown as follows:

Example	33
Type	Omission of word-final sound
Speaker's Authentic Speech (SL)	"الثلاثين من يونيو "
Interpreter's Actual Utterance (1)	The great thing happened in* thirty julu was gathering the people without distinction or discrimination.
Phonological Error	*/'θɜː(r)ti ʌ f /
Interpreter's Intended Utterance (1) & Transcription	Thirtieth of June /'θɜː(r)tiəθʌv /
Longman Dictionary Transcription	/'θɜː(r)tiəθ ʌv /

Initially, the interpreter attempts to retrieve the lexeme "thirtieth"; however, she fails and instead, she recalls and utters "thirty" unconsciously. There is no self-repair provided. In addition, this error shows that the interpreter suffers from weakness in maintaining the coda while formulating the phrase "thirtieth of June". This may be -for some interpreters- an unconscious fossilized error that is commonly happening at the lexeme level, while articulation due to intralingua reasons.

In the conceptualization stage, the interpreter generates the T phrase, prepares the intended lemma 'thirteenth' conceptually, and spreads its activation to other related lemmas such as "July". The outcome of this stage is the pre-verbal preparation of conceptual structure, or the message that consists of lexical concepts in TL. Once the interpreter listens to the Arabic phrase, الثلاثين

"من يونيو", the interpreter initiates the first step of the conceptual preparation by accessing the content words "يونيو" and "الثلاثين" .

    As the interpreter passes through the formulation stage, it is seen that the error mainly occurs in the Morpho-phonological Encoding. Once a lemma is selected, its grammatical and morphophonological code becomes activated. The available code is stored in articulatory memory. The interpreter generates an articulatory program for the selected lexical item *thirty* not *thirtieth* based on its stored morphological shape and phonological code and the developing phonological context of the utterance as a whole. Retrieving the lexeme follows its *a*ctivation. Therefore, the interpreter retrieves the lexeme "thirty" and encodes its morphophonological shape.

Step 1. The target lemma is "thirtieth". Two codes are successively accessed, first the code for the head morpheme thirt- and then the code for -ith. For each code, the speed of access is dependent on its frequency of usage.

Step 2: Each morphemic code should be spelt out. Each morpheme's segments (th, i, r…) and (t, i, e,th) have to be simultaneously selected. However, what is spelt out is the metrical code of <thirti> omitting <eth>.

*Step 3: The interpreter proceeds syllabification and chunks the phonemes to form */ˈθɜːti ʌ f/, not /ˈθɜː(r)tiəθ ʌ v/.*

    In the articulation stage, the interpreter is the motor execution of the articulatory score by the respiratory, laryngeal and supra-laryngeal apparatus that ultimately produces the product: overt speech. The phonological score is the output of phonological encoding; therefore, each syllable in the phonological score triggers an articulatory gesture. For instance, the first segment /θ/ in thirty activates all syllables in the syllabary that contain this segment. These spelled-out segments /θ/ , /ɜː/ and /t/ will accumulate till they create the phonological syllable [ˈθɜː(r)tiəθ] in the incremental syllabification process.

    Therefore, the interpreter finally articulates T lexemes but has a phonetic error where she omits /əθ/ at the word-final position of the lexeme. Instead of adding the sound / əθ / while formulating the phrase " الثلاثين من يونيو" she sticks to /ˈθɜːti/ without showing any problems in the respiratory, the laryngeal, or the supralaryngeal systems. In addition to that, there is no self-monitoring to correct the error.

6. Findings and Conclusion
6.1. The Percentage of Formulation Errors by Trainees and Interpreters

The following table (3) represents the overall calculation of all statistics representing the four levels: lexical- semantics, syntax, morphology and phonology. Throughout the four speeches

Table 3

The Total Errors at the Formulation Stage by Trainees and Interpreters

	Lexical-Semantic	Syntactic	Morphological	Phonological	Total
Interpreters	125	111	93	87	416
Trainees	112	91	69	70	342

Based on the results presented above, lexical-sematic and syntactic errors are at the top of the list of challenges facing the processing capacity of the interpreters as well as trainees. This is followed by morphological and phonological levels for interpreters, while trainees find that morphological and phonological levels are nearly the same degree of difficulty.

Based on the results presented above, it can be concluded that these challenges arise when the total processing capacity requirements of the task exceed the available processing capacity (saturation) of the interpreter or trainee. In other words, errors occur when the processing capacity available for a given Effort is not sufficient for the execution of the task due to individual deficits. Such problems are frequent because interpreters tend to operate near their saturation levels.

As explained, saturation can occur through an increase in processing capacity requirements in the Short-term Memory Effort when the source language and target language are semantically and syntactically very different and force the interpreter to store a large amount of information for some time before being able to reformulate it in the target language. The reasons why the total processing capacity requirements of the task sometimes exceed the cognitive ability of interpreters can be summarized as follows:

The lexical-semantic challenge encountered by interpreters and trainees may be due to lexical choice and the difficulty of finding the most adequate equivalent word or expression in the TL. Some expressions are culture-bound and do not exist in TL. Furthermore, idiomatic expressions, figurative language, and collocations in the target language pose challenges for interpretation. Additionally, finding complete synonyms in the target language presents another obstacle.

Egyptian interpreters have also faced many grammatical challenges regarding the word order as English is SVO while Arabic is VSO. Issues, such

as subject-verb agreement, prepositions, tenses, and verb forms, have posed difficulties. Hence, the lack of focus and attention on the part of the interpreters resulted in creating syntactic-related problems.

6.2 Conclusion

In light of the research questions of the study, the present study has answered its three questions. The first question is: "What are the main cognitive psycholinguistic levels responsible for conceptually generating, encoding or formulating, and articulating SI errors?" The first part of the qualitative analysis reveals that Levelt's(1999) speech production model does not only account for SI as a process, but also as a product. As a process, interpreters pass through conceptualisation, formulation, articulation, and self-monitoring stages. Conceptualization is responsible for generating the target output and monitoring the whole speech production system. Formulation is responsible for structuring the preverbal plan into a linguistic form and organizing the preverbal plan to correspond to the intended message to the TL. The output of the formulator is a phonetic plan or articulatory plan, to be ready for articulation. The self-monitoring stage provides an in-depth understanding of self-correction of the T output and recorrects any errors produced earlier. As a product, formulation errors that are pinpointed according to their linguistic levels: lexical-semantic, grammatical and morphophological, mostly occurred in the formulation stage. This can be indicative of the mapping process that occurs in the mental lexicon where only active lexical concepts spread their activation to their lemma node.

The second question is: "Which linguistic level triggers more processing problems or contains the highest frequency of errors?" The findings of the study have shown that lexical and syntactic errors pose the greatest difficulties for interpreters and trainees in terms of processing capacity. These challenges arise when the total processing capacity requirements exceed the available processing capacity and when the processing capacity available for a given effort is inadequate for the execution of the task due to individual deficits. Such problems are common as interpreters often operate near their saturation levels.

The lexical-semantic challenge arises due to lexical choice, the non-availability of lexemes at the time of formulation, and the difficulty of finding the most adequate equivalent word or expression in the TL. Furthermore, idiomatic expressions, figurative language, and collocations in the target language pose challenges for interpretation. Additionally, finding complete synonyms in the target language presents another obstacle. Therefore, interpreters omit, pause, hesitate or use fillers.

Egyptian interpreters have encountered numerous grammatical challenges, particularly related to word order as English is SVO while Arabic is

VSO. Issues such as subject-verb agreement, prepositions, tenses, and verb forms have posed difficulties. Consequently, inadequate focus and inattention on the part of interpreters have resulted in syntactic-related problems.

It is astonishing to notice that both interpreters and trainees exhibit nearly the same percentage of phonological errors. It is expected that trainees would find the phonological level a bit challenging as they are still in the process of acquiring their second language and on their journey towards mastering the target language (L2).

The third question is: "To what extent would Gile's Effort Model account for simultaneous interpretation errors?" Gile's Effort model is the most comprehensive among other information-processing Models used in processing SI. Its efforts account for most, if not all, of the required cognitive processing capacity involved in the task. To illustrate, two more conditions must be satisfied or even saturated. First, L + P + M + C must be less than the Total Available Processing Capacity (TAPC). Second, the processing capacity management condition must be satisfied, which means that "the capacity available for each effort (LA, MA, PA, and CA) must be equal to or larger than its requirements for the task at hand.

Formulation errors occur due to the fact that the two main requirements were not met: (1) the total cognitive capacity of the interpreter is not either equal or greater than the total processing requirement of the task at hand, and (2) some of the four separate cognitive effort requirements exceed the corresponding available processing capacity (Gile, 1995). Based on Gile's Effort model, formulation problems are triggered in the following cases:

1. Speed delivery of Source language speeches, dense speeches and speech segments led the interpreter to analyse the information over a short period. Hence, the heavy load is under the Reception Effort, which by nature affects the Production Effort due to the fact that the interpreter tries to cope with the speaker's speed to formulate the TL rapidly.
2. In the embedded structures, the interpreter has to store much information in memory as the target speech unfolds before they can reformulate it. Hence, the problem arises mainly due to the need to reorganize the components in the target language.

Therefore, it is necessary to invest more cognitive effort in Listening and Analysis to be able to comprehend the authentic SL and formulate it accurately. Moreover, interpreters have to increase the capacity of cognitive control in the formulation stage. This occurs consciously through attentional management during the process, which is vital to efficiently make instant decisions such as selecting and prioritizing important information to interpret from SL to TL. The

capacity can be increased unconsciously by working on language acquisition through exposure to more specialised T input and by intensive interpreting training until the mental lexicon reaches the saturation level. This inevitably increases the limited capacity of the mental lexicon and helps interpreters overcome many cognitive challenges.

7. Recommendation

Based on the analysis and findings from Levelt's (1999) model and Gile's (2009) Effort Model the researcher would like to make the following recommendations for effective results.

1-Interpreters should recognize the limitation of their processing capacity during the task. Therefore, it is advisable, for interpreters, to expand their knowledge and vocabulary across various fields. By acquiring translation and linguistic competence as well as balancing the processing Effort, interpreters can communicate the TL accurately. By doing so, interpreters can minimize errors by managing their processing capacity and avoiding excessive cognitive load on WM.

2-It is recommended that interpreters undergo assessment by experts and professors of interpretation and /or relevant institutions to anchor their area of weakness. Based on the assessment, interpreters can focus on specific action points, such as improving lexical, syntactic, morphological or phonological levels. By understanding and addressing these identified problems through targeted training, interpreters can mitigate errors. Furthermore, they should practice interpreting strategies to help them overcome some linguistic challenges. Interpreters are more inclined to omit lexemes or expressions that lack a direct counterpart in TL or require more processing time. The linguistic differences between Arabic and English contribute to increased cognitive load, particularly when word order changes, imposing a higher demand on working memory and consuming more time during subsequent production.

3-The adoption of Gile's (2009) Effort model is recommended for assessing interpreters due to its comprehensiveness and emphasis on the saturation level needed to accomplish the task smoothly. By incorporating Gile's (2009) model alongside Levelt's (1999) model, interpreters can gain a deeper understanding of TL formulation and effectively avoid errors through cognitive processing.

4-Error Analysis proves to be rule-governed. However, it has limited implications for SI. Focusing excessively on identifying errors may detract from the communicative goals of the context, as the primary attention is directed towards error detection rather than comprehension and the production of

meaningful messages. In addition, error analysis typologies often neglect conceptualization and comprehension errors. Errors are inevitable and competence is not the only barrier. Affective factors such as anxiety can also contribute to error production by interpreters. Therefore, constructive feedback provided to interpreters would lead to better performance. Moreover, remedial teaching that addresses their errors can cater to their needs and offer strategies for learning and improvement. In this sense, error analysis, along with other models, has enriched the study and contributed to a comprehensive understanding of the challenges faced in simultaneous interpretation.

8. Suggestions for Further Research

The present study, in turn, suggests the following:

1-Conduct a comparative study on slips of the tongue in both simultaneous and consecutive interpretation settings, aiming to develop practical strategies to alleviate cognitive load caused by time pressure.

2-Choose a particular problem, such as preservation, anticipation, code-switching, or self-monitoring, and examine its impact on the communication of the target language (TL) in interpretation.

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تحليل معرفي لغوي نفسي لأخطاء الصياغة في الترجمة الفورية

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المستخلص:

في محاولة لتحقيق متعدد التخصصات، تعتمد هذه الدراسة علي تحليل ما أنتجه المترجمون الفوريون والمتدربون المصريون الذين قاموا بترجمة أربع خطابات افتتاحية سياسية من العربية إلى الإنجليزية ؛ والتي تتضمن خطاب الرئيس السيسي (٣ يونيو، ٢٠١٤)، والرئيس عدلي (٤ يوليو، ٢٠١٣)، والرئيس مرسي (٢٤ يوليو، ٢٠١٢)، والرئيس مبارك (٩ نوفمبر، ١٩٨١). ويحاول البحث دمج ثلاثة مكونات في الإطار النظري: نموذج الجهود، كما صنفه جيل (٢٠٠٩)، ونموذج إنتاج الكلام، كما اقترحه ليفيلت (١٩٩٩) مع تصنيفات تحليل الخطأ، كما صنفها دولاي، وبيرت، و كراشن (١٩٨٢)، جيمس (١٩٩٨)، وإليس (1994). ويهدف البحث إلى توضيح كيف إن مراحل إنتاج الكلام، و التي تتمثل التصور والصياغة والتعبير والمراقبة الذاتية ،جنبًا إلى جنب مع متطلبات قدرة المعالجة المعرفية للمترجم ،والتي تتمثل في الاستماع والتحليل والذاكرة والإنتاج والقدرة على التنسيق، تفسر ظاهرة تحديد الأخطاء في المخرجات التي أنتجها المترجمون الفوريون ، وبالتالي تشخص المستوى اللغوي الأكثر استدعاءا للأخطاء المترجمين الفوريين المصريين (على سبيل المثال، المستوى المعجمي الدلالي، النحوي، الصرفي والصوتي). ولتحقيق هذا الهدف، يتم جمع الأخطاء وتصنيفها وتحليلها وصفيا.كما تفترض الدراسة أن المترجمين الفوريين ذوي الخبرة، بسبب خبرتهم الكبيرة، لديهم أداء أفضل للمهة الترجمة الفورية مما يؤدي إلى و جود أخطاء لغوية أقل. ومع ذلك، أظهرت هذه الدراسة نتائج متناقضة. على الرغم من خبرة المترجمين الفوريين، أظهر المتدربون إنخفاضًا في معدل تكرار الأخطاء اللغوية. والجدير بالذكر أن الصياغة المعجمية الدلالية أثبتت أنها هي التي تسببت في هذا العبء المعرفي. كما أكدت النتائج أن الأخطاء تعزى إلى قدرة المعالجة ومستوى التشبع. لذلك، يجب أن تكون القدرة المعرفية القصوى للمترجم الفوري مساوية أو تتجاوز إجمالي المتطلبات الازمه المعرفية للمهمة؛ ،وإلا فمن المحتمل أن تنشأ الأخطاء .

الكلمات المفتاحية: الترجمة الفورية ـ الصياغة ـ نموذج الجهود ـ تصنيفات تحليل الخطأ