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ABSTRACT

This study explored the effect of "Economization and Disambiguation" paradigms on English language production in order to seek psychological validity for the cognitive accounts of language processing involving Iranian learners of English. The participants consisted of 41 junior students of English Translation at Shiraz Azad University. Two groups of structures served as a recall task in the form of 20 pairs of sentences with each of two clauses designed in the reverse order. One group had the pronoun *he* at the beginning of the subordinate clause and the other *you*.

Upon exposure to these pairs, participants were instructed on how to combine the two clauses using the complementizer *that* when deemed necessary and report the result to an interlocutor.

Analysis of the results revealed that those pairs of sentences having the pronoun *he* took fewer *thats* than those having *you*. Results of a series of t-tests showed significant difference between the reconstruction of sentences in the two groups. The paradigms of disambiguation and economization came to surface through the above-mentioned task.

The said paradigms proved themselves as useful strategies resorted to in foreign language production.

CHAPTER ONE

INTRODUCTION

1-0. Preliminaries

The inclusion or omission of certain optional words by speakers has provided the forum for the juxtaposition of two distinct views in psycholinguistics, namely: i-economization and ii-disambiguation.

To clarify the point, let us consider the following structure:

1. The teacher knew (that) you had missed classes.

The common view shared by many psycholinguists including (Ferreira & Dell, 2000), and in line with common sense, is that the speaker may omit the optional complementizer *that* so that the utterance is spoken with minimal effort (i.e. economization of the number of words produced).

In those instances, however, when the speaker opts not to omit an optional constituent, it is generally assumed that an attempt is made on the part of the speaker to facilitate comprehension of the utterance by the listener (i.e. disambiguation). This view is of course perpetuated when the structure is partially ambiguous and as a result difficult to understand.

1-1. Definition of Key Concepts:

In this part the definition of some of the key concepts used during this study will be provided by the researcher.

1-1-1. Disambiguation:

As it was mentioned before one important paradigm in the speaker's utterance in order to facilitate comprehension of the listener is "disambiguation". This case arises when an ambiguous structure evokes different meanings to different people. Disambiguation sometimes refers to other concepts. Richards, Platt and Platt (1992: 110) defined disambiguation as: "the use of linguistic analysis to show the different structures of an ambiguous sentence."

Linguistic analysis is just one of the ways to clarify what an ambiguous sentence means. In any event, the speaker can have the same analysis in mind spontaneously and try to utter a sentence which is maximally comprehensible.

Disambiguation may have several manifestations, one of which is to use certain optional words like *that* in between two clauses of a complex sentence. At times, adding more words to an utterance may further disambiguate the sentence.

1-1-2. Economization:

Another significant element on the part of the speaker in order to save time and apply minimal effort to the utterance is "economization". Mousavi (1999: 110) in his *Dictionary of Language Testing* defined "economy" as:

Economy (i.e. cost) refers to the possibility of obtaining a relatively large amount of information in a short period of time and without an inordinate amount of energy expended by the instructor and students.

However through the present study a nonacademic sense is considered, so a great amount of authenticity is taken care of in this regard. In real life situations speakers try to save time and energy by economization of the number of words produced; nevertheless, a maximally comprehensible utterance is also required.

1-1-3. Authenticity:

Utterances produced by English speakers in real life situations are highly "authentic", since the two paradigms of disambiguation and economization are only applied to one's speech within meaningful and highly authentic settings. Richard, Platt and Platt (1992: 27) defined *authenticity* as: "the degree to which language teaching materials have the qualities of natural speech or writing."

According to the above definition an utterance, even in nonacademic settings, may be authentic if it contains qualities of natural speech. This researcher tried to gather data in authentic-like situations. This was done by having *interlocutors* take part in data collection.

1-2. Conceptual Framework

In uttering a linguistic structure, two forces are conceived to act on the speaker's cognitive system. First, the speaker must choose the appropriate constituents; and then, he has to order them in such a fashion as to best fulfill his goal of communicating the intended message (Ferreira and Dell, 2000). For these

processing tasks to be operationalized, the following points seem to be a given. As the creator of the utterance, the speaker must use all resources at his disposal to be timely and efficient in locating and selecting the constituents of the utterance. Consequently, the speaker faces somewhat of a dilemma--being timely and efficient on the one hand, and trying to be maximally comprehensible on the other.

Thus, in uttering an expression, the speaker's linguistic system is subject to the pressures of two opposing forces:

i- being timely and efficient, and ii- being optimally comprehensible. This line of reasoning has provided psycholinguists with the opportunity to evaluate the nature and the extent of the interaction between the mentioned pressures on the speaker's cognitive system. In this light, certain structures in English have provided the platform for the evaluation of the said forces on the speaker's language mechanism. The structures of this nature permit the psycholinguist to assess the intensity of these pressures as well as illuminating the influence of such pressures on the choices the speaker makes in producing utterances. This class of linguistic structures are composed of those that present the speaker with the choice of including an optional constituent for the sake of disambiguating his utterance or to forgo the use of such words for being economical.

Perhaps of all such structures, the ones made up of the optional complementizer *that* provides the most suitable type for this line of enquiry. This claim is based on the assertion that with such utterances, the speaker is more likely to be challenged with the task of disambiguating the utterance.

In so far as the above-mentioned pressures could empirically be verified as having a bearing on the speaker's utterances, further evidence for the psychological validity of the cognitive accounts of language processing would be provided. Such evidence has already been obtained in the domain of L1 processing (Ferreira and Dell, 2000); however, no full-fledged study has of yet addressed the issue in the context of L2 processing. Hence, this study is concerned with evaluating the claims made about the operation of the pressures on the L2 speaker's cognitive system when faced with structures containing the optional *that*, and the ensuing choices made by the speaker in forming this utterances.

1-3. Objective of the Study

This study seeks to determine whether the same forces are at play in L2 processing, namely economization and disambiguation. This would be accomplished through a task composed of certain structures devised to evaluate the strength of the forces on the cognitive system of L2 speakers in processing and producing language.

1-4. Significance of the Study

From the theoretical point of view, the findings of the conceived study will be tremendously valuable in shedding light on the intricacies of inner processing of L2 by foreign language speakers. More specifically, one might be able to ascertain the effect(s), if any, of the mentioned forces on the choices the foreign language speaker makes in production of L2.

Furthermore, in pinpointing the influence of the forces that operate on the cognitive system of the L2 speaker, and considering the nature of the task that will be discussed hereafter, it is believed that some insight could be gained on the order of presentation of certain L2 structures for the benefit of both the syllabus designer and the L2 teacher.

1-5. Hypotheses of the Study

This study seeks to determine whether the following strategies are resorted to in producing utterances:

- 1) The strategy of economization when uttering disambiguous structures; and
- 2) The strategy of disambiguation in producing partially disambiguous structures.

Hence, the following hypotheses were considered for this study:

In producing disambiguous utterances, the speaker would be more inclined to employ the economization strategy (i.e. omitting the optional constituent *that*). Thus,

$$H_1: X_e > X_d$$

However, with partially ambiguous structures the disambiguation strategy is more likely to be utilized:

$$H_2: X_d > X_e$$

For both types of structure, the null hypothesis would be:

$$H_0: X_e = X_d$$

Key:

X_e → mean instances of utilizing economization

$X_d \rightarrow$ mean instances of utilizing disambiguation

CHAPTER TWO

REVIEW OF LITERATURE

2-0. Introduction

In this chapter the related studies previously carried out on the Effect of Disambiguation and Economization on Language Production are reviewed.

2-1. Theoretical Considerations

It is axiomatic that in conveying an intended meaning the speaker of a language faces a variety of options. These options are mostly language specific (i.e. different languages permit different configurations of words to convey meaning). To cite an example of such alternations in syntax, one may consider the active vis-à-vis passive structures in English. A more subtle alternation is the speaker's option to use optional words (Ferreira and Dell, 2000).

2-1-1. Syntactic Flexibility

It has been argued that the reasons underlying the speaker's choice in the use or omission of optional words are three fold. The first is the subtle difference in meaning as maintained by Thompson and Mulac (1991). It has been asserted that the structure:

I noticed that mistakes were made.

is semantically, even though slightly, different than:

I noticed mistakes were made.

Since the omission of *that* serves to weaken the distinction between the embedded and main clause. In other words the topicality of the subordinate clause becomes less robust through the omission of *that* (Thompson and Mulac, 1991).

Besides, this semantically-motivated flexibility in syntax, two other factors seem to have a strong bearing on syntactic alternations. These factors are more cognitively oriented, and thus the main focus of the present study. This thesis hence proceeds with an introductory section on these factors.

2-1-1-1. Lemma-driven Motives for Syntactic Flexibility

At the heart of language production lies grammatical encoding. The process of grammatical encoding begins with a message and ends with the selection of word forms by the speaker (Ferreira, et al., 2000). Between these two points, the speaker accesses lemmas: "representation of syntactic properties of the to-be-produced words" (Ferreira, 2000: 298).

During lemma processing, the speaker may not gain immediate or even delayed access to the called for lemma. In such a case, he abandons his original syntactic representation for meaning of the message for one which is more

compatible with his lemma-driven capacities (Ferreira, et al., 2000). Thus for instance, if the lemma needed for the production of a passive structure is not readily available, the speaker may opt for the active form.

This type of syntactic flexibility is what was earlier referred to as being timely and efficient or perhaps more appropriately economical in relaying the message. Under this branch of psycholinguistics the topic is referred to as "the principle of first mention". The title is reflective of the incremental nature of a lemma-driven processing (i.e. recalling a lemma gives rise to a compatible lemma that comes next and the chain continues until the structure is syntactically complete. To clarify the concept of a lemma-driven system, let us consider the case of a structure whose first lemma unit is the *coach* followed by *knew*; now if the speaker's linguistic system predicts the next lemma unit to be *you* then according to the principle of immediate mention, the speaker would produce a sentence complement structure without *that* for only such type of a structure permits the immediate mention of *you* in:

The coach knew *you* missed practice.

On the other hand, if the speaker does not select *you* immediately, in all likelihood, a sentence complement structure including *that* would be uttered:

The coach knew *that you* missed practice.

In spite of its decisive influence in its demarcation of the type of utterance syntactically chosen, it should be mentioned at the outset that the concept of immediate mention will have minimal effects, if any, on the design of the present study for it will be neutralized as it will be treated not too much unlike a control variable. This point will be elaborated in future sections.

2-1-2. Cognitive Effects on Type of Structure

The second of the cognitively-based factors that influence syntactic flexibility is more robust not only in nature, but also in being implemented in the design of the present study entitled "ambiguity sensitive sentence production" it rests on the notion that in producing a structure, the speaker is both sub-consciously and practically concerned in getting his message across by taking steps to minimize the listeners effort in comprehension of the message. (i.e. disambiguating the utterance) (Ferreira, 2000); thus, one reason for syntactic flexibility is to use a configuration of words that exert minimal conceptual pressure on the listener's cognitive system. Of all structure domains that strive to minimize ambiguity, the notion of "Garden Path" has been extensively employed in psycholinguistic studies. Hence, the following section is devoted to Garden Path structures and the role they play in the present study.

2-1-3. Garden Path Phenomenon

Certain structures in English entitled "Garden Path" structures provide the background for the task of the present study.

Garden path structures are characterized by the following two notions: (a) they contain temporary syntactic ambiguities and (b) they are at first glance biased toward a syntactic analysis that proves false in the end (Ferreira, 2000). To exemplify the concept consider the structure:

The man selected for the task made history.

In the above structure, the temporary syntactic ambiguity occurs when the parsers reach *selected* in their analysis. The ambiguity results because *selected* can be taken as the main verb of the sentence and as such ends with an NP. Such an analysis is more highly involved in the parser's perceptual channel due to the higher frequency of type of exposure in the past. Hence, a bias towards following *selected* by an NP is built in.

However, upon reading the remainder of the structure, the status conferred upon *selected* as the main verb changes to one of the passive verbs with *made* being analyzed as the main verb of the structure.

For the purposes of this study, a particular category of Garden path structures that allow the ambiguity take place at the sentence complement part of the structure, are envisaged. As an example consider the structure:

The coach knew *you* missed practice.

In analyzing this structure, the parser is more likely to anticipate an *adverb* once he gets to *you*, again, based on the higher frequency of these structures. Thus, the ambiguity occurs the moment the comprehender reaches *you*; and the bias is for the structure to proceed with an *adverb*. However, the listener's expectations prove counterintuitive for the structure ends with a complementizer.

It is a given that no garden path phenomenon would result if *you* were replaced with any other personal NPs, nor if the optional *that* complementizer was not omitted.

In a research study investigating the tendency for disambiguating such structures by including the complementizer *that*; Elsness (1984) compared written texts against spoken ones. The results indicated that no compelling evidence differentiated written and spoken texts in their use of the complementizer *that* for disambiguating purposes. In another study (Rayner & Frazier, 1987) found that the time taken for reading disambiguated (i.e. structures with no omission) was less than the text that had structures with omissions.

2-2. Empirical Literature

A fair amount of work on a similar issue – lexical availability in relation with syntactic and lexical production – was advanced by Ferreira and Dell (2000). The study was held at the universities of California, San Diego and Illinois at Urbana-Champaign. Six experiments conducted through the study along with several tasks designed showed remarkable results about *native* speakers of

English. These experiments tested the predictions concerning optional word mention of two general approaches to language production as speakers only sometimes include the *that* in sentence complement structures like *The coach knew (that) you missed practice*. One approach claims that language production processes choose syntactic structures that ease the task of creating sentences, so that words are spoken opportunistically, as they are selected for production. The second approach claims that a syntactic structure is chosen that is easiest to comprehend, so that optional words like *that* are used to avoid temporarily ambiguous, difficult-to-comprehend sentences. In all experiments, speakers did not consistently include optional words to circumvent a temporary ambiguity, but they did omit optional words (the complementizer *that*) when subsequent material was either repeated (within a sentence) or prompted with a recall cue. The results suggest that speakers choose syntactic structures to permit early mention of available material and not to circumvent disruptive temporary ambiguities.

With each use of a linguistic expression, two acts are accomplished. First, the creator of the linguistic expression – the speaker – must find the right words and order them in accordance with an intended thought. Second, the recipient of the linguistic expression – the listener – must understand those words to recover the original thought that the speaker intended to convey. To be timely, speakers must create their utterances as efficiently as possible. But an utterance is only effective if it is understood at least as rapidly as it is created. Thus, the system that creates linguistic expressions is subject to two simultaneous pressures: It

must produce well-formed linguistic expressions as efficiently as possible, but it also must produce utterances that can be easily comprehended.

One way to evaluate the impact of these pressures is to examine the decisions that are made when the language production system builds a sentence and to determine whether those decisions aid the efficiency of production or of subsequent comprehension. One specific decision that the language production system must take is whether to include optional function words in certain sentences such as:

Complementizers like *that* in sentence complement structures, as in *I suspected (that) you learned the whole thing*, and relative complementizers and auxiliary verbs like *who were* in sentences with passive relative clauses, as in *the astronauts (who were) selected for the mission made history*.

The six experiments presented by Ferreira and Dell tested the degree to which such optional word mention is influenced by two separate mechanisms, one of which leads production to operate more efficiently, while the other leads production to create utterances that are more easily understood. A couple of considerations used in the study of Ferreira and Dell, (2000) will proceed to further clarify what the experiments sought to prove.

2-2-1. Lexico-syntactic Flexibility and Optional Word Mention

A language's *syntax* is a description of the allowable configurations of words in that language in terms of categories like *noun*, *verb* and so forth. Languages offer some flexibility within their syntactic systems, so that a particular idea can be communicated with distinct configurations of words. In English, such

flexibility commonly occurs with the alternations that occurs with the active (*The tortoise defeated the hare*) versus the passive (*the hare was defeated by the tortoise*) form of a sentence. However, a more subtle form of flexibility occurs with *optional word mention*, where a speaker can grammatically include or omit certain function words.

From the perspective of the information processing system that underlies language, such flexibility is a valuable resource that can be exploited to achieve different goals. Ferreira and Dell mentioned three of those goals, and their experiments addressed *two* of them.

One possibility is that syntactic flexibility is used to communicate subtle nuances of meaning, so that actives and passives are meaningfully different ("Mistakes were made"), as are sentence complement structures with or without the *that* (Thompson & Mulac, 1991). Most language users have the intuition that the syntactic variation that comes with syntactic flexibility primarily caters to such communicative needs, and research has shown that syntactic alternatives are not fully interchangeable (McKoon & Ratcliff, 1997) and communicate subtle differences in meaning (e.g., Thompson & Mulac, 1991, argue that omission of *that* involves weakening the distinctions between the main and embedded clauses, so that high epistemicity of the main clause or topicality of the complement clause lead to *that* being dropped).

However, psycholinguistic research has revealed that syntactic flexibility can also be exploited to address processing-related challenges faced by language users. Next, two ways that syntactic decisions can alleviate processing difficulties that arise during language use are discussed. With the first strategy,

the production system uses syntactic flexibility to more easily create fluent utterances. With the second strategy, the production system uses syntactic flexibility to present utterances that are easier for a potential listener to comprehend. These two processing functions of flexibility —easing the burden of the speaker and that of the listener — are not mutually exclusive; both could be at work, even at the same time. However, as Ferreira and Dell showed through their study, there are circumstances under which the two approaches make different predictions and hence the experiments presented by them allowed for an investigation not only of whether the strategies apply but also of their relative influence in affecting speaker choices.

2-2-2. Availability-Based Sentence Production

As was previously mentioned the concept of *lemma* and *lemma driven sentence production* as appeared in the works of Levelt, 1989, and Garrett, 1975, are important for language production. The same theory guided Ferreira and Dell's study as well.

Most models of language production assume that the information processing heart of sentence production occurs with *grammatical encoding*. Grammatical encoding begins with a *message* —the representation of the concepts and their interrelations that a speaker wishes to express — and ends with the selection of *word forms* — representation of the phonological content of the words of a sentence. It is between these two stages that the production system accesses *lemmas*: representations of the syntactic properties of the to-be-produced words. *Lemmas* are important for many reasons, one of which is that

sentence production is often characterized as *lemma driven*; that is, lemmas are taken to encode the information that is used to construct the syntactic structure of a sentence. (This emphasis on the role of lexically specific information has a long history in linguistics, as in Bresnan, 1978, 1982, and is now becoming important in psycholinguistic theory as well; MacDonald, Pearlmutter, & Seidenberg, 1994).

Lemma-driven production has desirable properties, especially that it supports *incremental* production (Ferreira, 1996; Levelt, 1989) — the construction of a sentence piecemeal, from beginning to end. This approach permits selected words to be produced in compatible sentences, so that "Wh-words" such as *what* and *who* can trigger the use of interrogative structures or so particular verbs can call on appropriate intransitive, transitive, or ditransitive structures.

However, not only do the syntactic privileges of the to-be-produced lemmas affect syntactic structure, but so too can the *timing* of lemma selection have important effects on the syntactic structure of a sentence. This point can be illustrated with passive versus active production as mentioned before.

As their study showed production proceeds more efficiently if syntactic structures are used that permit quickly selected lemmas to be mentioned as soon as possible. We call this *the principle of immediate mention*. The principle of immediate mention makes a straightforward prediction for sentence complement structures with optional complementizers, like *The coach knew (that) you missed practice*.

In general, such *availability-based effects* on sentence production link the availability of the to-be-produced lemmas to the processes responsible for selecting the sentence structures to be used. The operation of availability-based effects has been demonstrated in a wide range of structures involving order-of-mention effects here (e.g., the choice between using an active or passive; like Bock, 1986a, 1987).

Bock (1986a, 1987) has developed a fair amount of work on a relevant issue as well.

2-2-3. Ambiguity-Sensitive Sentence Production

Along with syntactic flexibility that can be exploited not only to make production processing proceed more efficiently, but also to make a potential listener's comprehension processing proceed more efficiently, Ferreira and Dell made use of another concept of ambiguity in sentence production.

Given a choice among sentence alternatives, the most straightforward way to increase comprehension efficiency is to avoid sentences that are more difficult to comprehend. A kind of difficulty arises especially with the *sentence complement structures* and *passive relative clause structures* in English.

As mentioned before, the notion of *garden path* has been well studied in the psycholinguistic literature examining sentence comprehension. Garden paths occur when sentences (a) contain temporary syntactic ambiguities and (b) are biased at the point of temporary ambiguity toward a syntactic analysis that is eventually inappropriate. A sentence is said to contain a temporary syntactic ambiguity when it momentarily permits more than one syntactic interpretation.

However, a temporary ambiguity is not sufficient to cause notable difficulties in comprehension (indeed, every sentence contains an indefinite number of temporary ambiguities as it unfolds).

Difficulties specifically occur when biases lead comprehension processes to commit to a syntactic analysis for the temporarily ambiguous fragment that is incompatible with the analysis that the entire sentence will eventually require. For example, given *The coach knew you . . .*, comprehension processes are unable to determine whether *you* is a direct object or an embedded subject. However, processing biases (which can include syntactic simplicity, Frazier & Fodor, 1978, and frequency of occurrence, MacDonald et al., 1994), cause comprehenders to take the post verbal noun phrase in such structures to be a direct object; here, they take *you* to be the direct object of the verb *know*. Nevertheless, by definition, sentence complement structures continue with *you* as an embedded subject, as in *the coach knew you missed practice* (Ferreira and Dell, 2000). Thus, when a comprehender receives the second verb (*missed*), the misanalysis is discovered (i.e., *you* must be an embedded subject) and the initial direct object interpretation is discarded in favor of the correct embedded subject interpretation. The same psycholinguistic process is true with passive relative clause structures.

Thus, when sentences with sentence complements or passive relative clauses are produced in their *reduced* form (without the optional function words), they may constitute garden path sentences. However, if the same sentences are produced in *full* form (with optional function words), the garden paths can be avoided. This implies that syntactic flexibility can be exploited by

production to increase comprehension efficiency in a straightforward way: If the reduced form of a sentence includes a garden path, then produce that sentence in its full form. Any such tendency would have the effect of reducing the number of ambiguous sentences seen in spoken language, though it is unlikely that any such pressure would be so powerful as to eliminate temporary ambiguities completely.

One study (Elsness, 1984) examined whether there is any tendency in natural spoken and written text for writers to produce the full forms of sentences that include garden paths in their reduced forms.

The study did not find compelling evidence for such a tendency, despite the fact that it has been shown that readers read full forms of sentences more easily than reduced ones (Rayner & Frazier, 1987). However, it is possible that a strong tendency to avoid ambiguity was not discovered for two reasons: First, the specific sentence choices made during writing may respond to a variety of demands which may have little to do with temporary ambiguity. Ferreria and Dell's experiments, by contrasting ambiguous and unambiguous under controlled circumstances, were more sensitive to any effect. Second, writing is likely to be a more deliberative process than speaking, so that if a tendency to avoid ambiguity is implicit, it may be more apparent in a spoken task.

Ferreira and Dell's six experiments tested the ambiguity-avoidance and availability-based claims using variants of a *sentence recall task*. This work on native speakers of English showed compelling processing results.

2-2-4. Results

The results of experiments might be taken to indicate that speakers are selfish, exploiting the flexibility of language to ease only the task of creating sentences. Such a conclusion, however, overlooks two considerations. First, communicative pressure, indeed affects optional word mention. That is, speakers can change their overall level of *that*-mention when understandability is important. Second, a range of challenges face language users when communicating. As noted by Clark (1996), one pressure that language users experience in a communicative setting is the need to "hold the floor" in a timely manner. The results of their experiments were testament to the importance of this pressure.

The need for language users to communicate in a timely fashion implies that specific strategies, like the availability-based one, are necessary so that speakers can manage the complexities that are involved in producing language.

CHAPTER THREE

METHODOLOGY

3-0. Introduction

This chapter includes the description of research methodology. It deals with the participants, instruments, data collection procedure, and statistical analysis procedure.

3-1. Participants

The participants in this study consisted of 41 junior students of English at Shiraz Azad University. Each of the participants was chosen randomly from among male and female students. The justification for choosing these participants – particular target population – is that during their three years of study they had been exposed to a sufficient corpus of both formal and informal L2 English. Thus their exposure to the type of structures is somewhat similar to the built in bias for one kind over another.

Moreover to offset the effect of age-related variations the participants were all above 18 years of age, as happens in all upper academic—university – situations. They also came from almost the same socio-economic backgrounds.

As for the variable of intelligence, the present study sides with Lenneberg (1968) and Steinberg (1982) in rendering it a non-factor due to the minimum levels claimed to be required for language acquisition and processing.

3-2. The Task

A sentence recall task consisting of 20 pairs of structures was designed for the study. All the structures had *I* as the pronoun preceding the complementizer *that*. However, Half of the structures had the complementizer preceded by *he* and the other half by *you*. The task was designed in two pairs of structures each of ten sentences. Structures in the two pairs were the same except for the pronoun preceding the complementizer. Through the first pair *odd* numbers had *you* and *even ones* had *he* as the pronoun, the reverse happened in pair (II). An example is given in Table 3.1. The whole task is also included in the appendix.

Table 3.1. Position of task structures

	Second Clause	First Clause
Pair I	<i>You</i> overheard the military secrets	I concealed
Pair II	<i>He</i> overheard the military secrets	I concealed

In constructing the structures, the second clause appeared first followed by the first clause. This reversed order of presentation is deemed necessary to make the participants resort to an actual processing procedure rather than merely repeating the structures while performing on the recall task. The prediction motivating the design of the recall task was that with the first group of structures the participants were faced with the opportunity to employ the disambiguation strategy; while with the latter type the economization strategy was more likely to be utilized.

As for memory considerations, the literature reveals that memory for entire sentences is often quite accurate, at least for short retention intervals (Potter and Lombardi, 1990, 1998).

As examples in table 3.1. reveal, in reconstructing the first type of structures, the participants were faced with a partially ambiguous mood that is the pronoun *you* leads to a garden path situation as it may be followed by either an adverb or a verb phrase. Thus, in order to avoid this partial ambiguity, the participant was more likely to not omit the complementizer *that* for the sake of clarity. With the second type of structures; however, the participants are not faced with a partially ambiguous situation since the pronoun that follows the first verb within the first clause doesn't permit any other constituent to follow it but a verb phrase. Hence, the parsers in most likelihood omit the optional *that* in conjoining the two clauses.

3-3. Administration Procedure

The 20 pairs of the structures of the task were tape recorded and played back through head phones to the participants, on an individual basis. The participants were instructed to put the two clauses of each structure in correct order (i.e. to change the order of their presentation), and to orally report the reconstructed sentences to the interviewer sitting in front of them. This scheme (i.e. the use of headphones and an interlocutor – the interviewer) provides for an air of authenticity for the task. This claim is substantiated on the grounds that a real

communicational setting will be constructed when the participant reports the reconstructed sentences to an actual interlocutor.

Furthermore, a 10 second time span for the onset of production of each sentence is incorporated into the administration of the task. By limiting the interval allowed for production, in effect, a real life communication encounter would be simulated for the participants. Hence, the utilization of the economization and disambiguation strategies is more likely to surface in the participants' production.

3-4. Data Analysis Procedure

Since two pairs of structures each of ten sentences which were the same except for the subordinate clause pronouns were used, the difference between the means for the inclusion and omission of the complementizer *that* in two streams of input (i.e. structure types 1 and 2) can be the answer to the research questions.

Therefore, in order to obtain the results a series of matched t-tests were administered on both the within type and between type means of the structures for the inclusion or omission of the complementizer.

The results of analysis are summarized in the following chapter.

CHAPTER FOUR

RESULTS AND DATA ANALYSIS

4-0. Introduction

Having gained the findings and results from the raw data, statistical analysis was carried out within the framework of "within type" and "between type" effects. In the following sections, these forums are elaborated on in detail.

4-1. Within Type Effects

Given that the primary objective of this study was to investigate whether there existed any meaningful differences between the use of *that* within each group of structures having *you* or *he* at the beginning of the subordinate clause. It was deemed that a series of matched t-tests would be beneficial in reaching a conclusion in this regard.

What follows, are the results of this battery of t-tests presented for each of the two groups involved through the present study.

4-1-1. Complement Structures with Ambiguous Pronoun *You*

The result of a matched t-test carried out on this type of structures with the ambiguous pronoun *you* indicates that the difference between the *you* structures with *that* and those without it was significant. As the following table indicates:

Table 4.1. Within type analysis of you structures containing the complementizer *that* vs. those lacking it

Variable	No of Pairs	Mean	SD	t-value	df	Level of Sig.
T.I.Y.	41	6.4634	1.485	6.14	40	.01
T.L.Y.		3.5854	1.533			

Significance level of T.I.Y/T.L.Y (matched T-test) *P<.01

T.I.Y. = That Inserted You Structures

T.L.Y. = That Less You Structures

4-1-2. Complement Structures With Unambiguous Pronoun *He*

The result of a matched t-test carried out on this type of structures with the unambiguous pronoun *he* indicates a significant difference between *he* structures with *that* vs. those without it. As the following table indicates:

Table 4.2. Within type analysis of *he* structures containing the complementizer *that* vs. those lacking it

Variable	No of Pairs	Mean	SD	t-value	df	Level of Sig.
T.I.H.	41	4.6341	1.475	6.65	40	.01
T.L.H.		3.6341	1.655			

Significance level of T.I.H/T.L.H (matched T-test) *P<.01

T.I.H. = That Inserted He Structures

T.L.Y. = That Less He Structures

4-2. Between Type Effects

The design conceived for the analysis of between type effects was another matched t-test. In this part the means obtained from the two different groups of *he* and *you* were compared. The result of this matched t-test, too, indicates a significant difference between *he* and *you* structures with *that*.

**Table 4.3. Between type analysis of the use of that in structures containing
*you and he***

Variable	No of Pairs	Mean	SD	t-value	df	Level of Sig.
T.I.Y.	41	6.4634	1.485	6.55	40	.01
T.I.H.		4.6341	1.655			

Significance level of T.I.Y/T.I.H (matched T-test) *P<.01

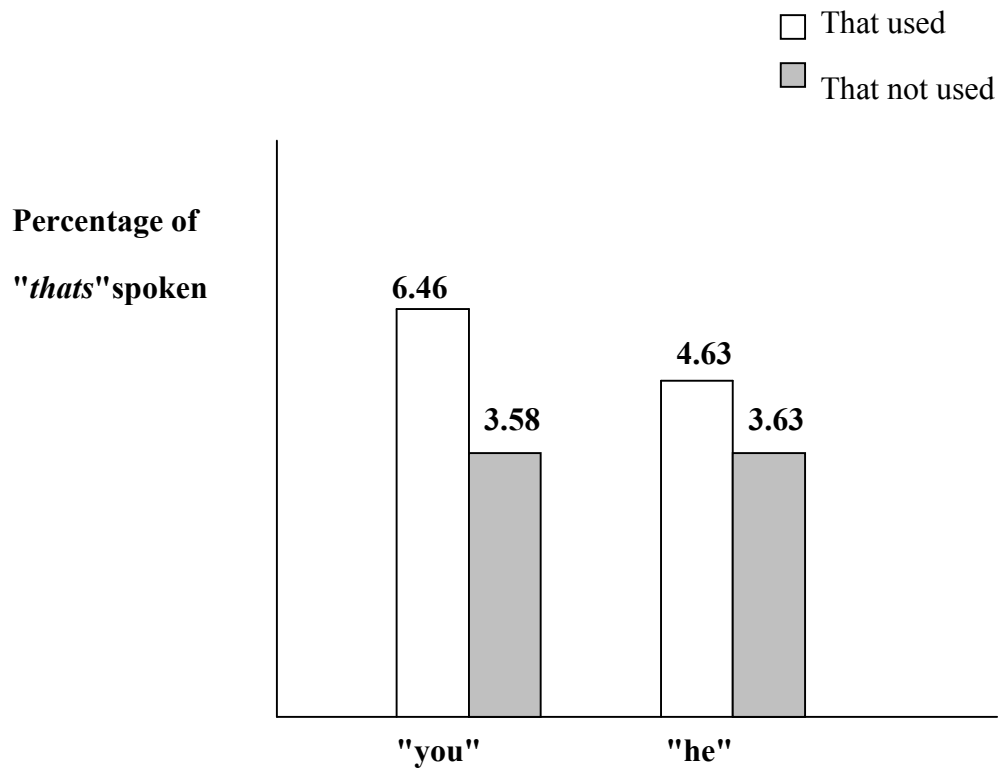
T.I.Y. = That Inserted You Structures

T.I.H. = That inserted He Structures

4.3. Results Summarized in Figures

As mentioned before the number of *thats* in structures with the unambiguous pronoun *he* was more limited compared to those having *you*. The following figure on the next page summarizes the "between" and "within type" effects. The figure was designed according to the means acquired through statistical analysis of the results. It makes a fair comparison of the number of *thats* used through the experiment.

Figure 4.1. Summary of between and within type effects in accordance with the percentage of thats used



CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION,

IMPLICATIONS,

AND SUGGESTIONS FOR FURTHER

RESEARCH

5-0. Introduction

This chapter provides the study's summary, discussions, conclusions, implications, and suggestions for further research.

5-1. Summary

This research aimed at examining the effects of disambiguation and economization paradigms on English language production used by Iranian EFL learners. The participants in this study were 41 junior students of English Translation at the Azad University of Shiraz. The participants were randomly selected from among male and female EFL learners at the above mentioned university. Two groups of complement structures served as a recall task were designed. There were 10 pairs of sentences with clauses put in the reverse order. All structures had *I* as the main clause pronoun; while, half of them had the ambiguous pronoun *you* and the other had the unambiguous pronoun *he* at the

beginning of the subordinate clauses proceeding the possible use of complementizer *that*.

Participants were then asked to put the two clauses of each pair in the correct order and use the complementizer *that* when deemed necessary.

The research question addressed by this study was:

Q: Do disambiguation and economization forces affect Iranian EFL Learners' utterances?

In order to answer this question, three matched T-tests were carried out to obtain the relationship within and between the intended groups.

5-2. Discussion

This study was performed to examine whether disambiguation and economization paradigms had any significant effect on the language production (i.e. utterances) of the participants.

The answer was affirmative for both paradigms. The said forces were both influential in the production of utterances by Iranian EFL learners.

Disambiguation and economization forces were found to have a significant effect on the choice of optional words (e.g. *that*) used by EFL learners.

It was also found that disambiguation and economization paradigms usually came to surface under special circumstances. Through the present study the use of ambiguous and unambiguous pronouns were the effective stimuli.

Results of a series of matched t-tests carried out on within and between type relationships showed meaningful differences, too.

Finally, given the efforts expended on eliminating the artificiality of the experiment, disambiguation and economization as the forces working through one's speech were more likely to be used in real life situations or other native-like ones as used with the intended participants in this study.

With respect to the null hypothesis of the study, the results provided a fair amount of evidence for its rejection. Namely, that the two groups of structures exhibited significant differences in so far as the use of *that* was concerned.

5-3. Conclusion

The results of this study indicated that disambiguation and economization paradigms come to surface as forces acting on individuals' speech every time one makes an utterance. It means that:

- 1) D.E. paradigms are the result of a series of complex psychological processes which happen while speaking that may deal with STM, as well.
- 2) Certain words through real-life situations may trigger the use of D.E. paradigms. The said forces may happen in productive skills as speaking, in particular.

5-4. Implications

The present study has yielded the following implications for the development of skills, meaningful drills and comprehension activities.

Having paid attention to *disambiguation and economization* paradigms in speaking and listening skills, one may communicate more effectively in more native-like situations as may happen with EFL learners of English.

More Authenticity can be seen through the use of *disambiguation and economization* forces in EFL situations. Teachers may also benefit by making the students aware of the optional word use, syntactic flexibility and other related items; therefore, more meaningful activities may also be applied to classroom situations.

EFL learners who gained mastery over *disambiguation and economization* use in communicative classrooms may have fewer problems in comprehension skills, understanding spoken English, and dealing with foreigners.

5-5. Suggestions for Further Research

1. This study was carried out on the effects of D.E. paradigms on *speaking* in particular. Similar study can be conducted on these effects on other language skills especially *writing* as another productive skill.
2. This research was conducted with EFL university students in Shiraz Islamic Azad University, a similar research can be carried out in other universities

with students of different proficiency levels to confirm or disconfirm the findings.

3. The sample in this study, as is true with all university situations, was chosen from among students over 21 years of age. Further studies may address other age groups.
4. This study was carried out at the university level with students of fairly good command of English. It can be also replicated at institute level with students of other language command levels.
5. Finally, the present study dealt with pronouns and different types of them as far as ambiguity is concerned. Other similar studies may work on other entries of English grammar.

REFERENCES

- 1- Carrol, D. (1999). *Psychology of Language*.
- 2- Chastain, K. (1988). *Developing Second Language Skills*. Orlando, FL: Harcourt Brace Jovanovich Publishers.
- 2- Cook, V. (1991). *Second Language Learning and Language Teaching*. London: British Library Cataloguing in Publication Data.
- 3- Elsness, J. (1984). *That or zero? A look at the choice of object clause connective in a corpus of American English*. *English Studies*, 65, 519-533.
- 4- Ferreira, F., & Clifton, C. (1986). *The independence of syntactic processing*. *Journal of Memory and Language*, 25, 348-368.
- 5- Ferreira, F., & Hendeysen, J.M. (1990). *Use of verb information in syntactic parsing: Evidence from eye movements and word by word self-paced reading*. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 16, 555-568.
- 6- Ferreira, V.S., & Dell, G.S. (2000) *Effect of ambiguity and lexical availability on Syntactic and Lexical Production*. *Cognitive Psychology*, 40, 296-340.
- 7- Ferreira, V.S. (1996). *Is it better to give than to donate? Syntactic flexibility in language production*. *Journal of Memory and Language*, 35, 724-755.
- 8- Francis, W.N., & Kucera, H. (1982). *Frequency analysis of English Usage: Lexicon and Grammar*. Boston: Houghton-Mifflin.

- 9- Frazier, L., & Fodor, J.D. (1978). *The sausage machine: A new two-stage model of the parser*. *Cognition*, 6, 291-325.
- 10- Gardner, H. (1993). *Multiple intelligence: The Theory of Practice Basic Books*.
- 11- Garrett, M.F. (1975). *The analysis of sentence production*. In G.H. Bower (Ed.), *The psychology of learning and motivation* (PP. 133-177). New York: Academic Press.
- 12- Gierse, C. (1993). *Ideas on how to motivate learner independence*. *Modern English Teacher* 2/4.
- 13- Goleman, D. (1996). *Emotional Intelligence. Why can it matter more than IQ?* Bloomsbury.
- 14- Hadfield, J. (1992). *Classroom Dynamics*. Oxford: Oxford University Press.
- 15- Lenneberg, E. (1967). *Biological foundations of language*. New York: Wiley.
- 16- Lombardi, L., & Potter, M.C. (1992). The regeneration of syntax in short term memory. *Journal of Memory and language*, 31, 713-733.
- 17- Mousavi, S.A. (1999). 2nd ed. *A Dictionary of Language Testing*. Tehran: Rahnama Publications.
- 18- Richards, J.C., Platt, J., & Platt, H. (1992). *Longman Dictionary of Language Teaching and Applied Linguistics*. London: Longman.
- 19- Riverse, V.O. (1968). *Teaching Language Skills*.
- 20- Seliger, H.W. & Shohamy, E. (1989). *Second language research methods*. Oxford: Oxford University Press.
- 21- Steinberg, D. (1981). *Psycholinguistics: Language, Mind, and World*.

APPENDIX A

Two Groups of Sentence Complement Structures Served as a Recall Task

The unambiguous (*he*) or ambiguous (*you*) pronoun was positioned at the asterisk in each of the two groups. Each group had 10 pairs of complex sentences differing in only the pronoun at the beginning of the subordinate clauses. The two clauses were played back to listeners in the reverse order individually.

Main Clause	Subordinate Clause
I heard	* warned the president about the economy
I concealed	* over heard the military secrets
I worried	* trusted too many people.
I dreamed	* forgot to go to the big concert
I guessed	* remembered the questions on the TOEFL
I observed	* confirmed the hotel reservation
I revealed	* protested against government
I replied	* charged too much for the computer
I thought	* learned 5 languages
I suspected	* felt uncomfortable

APPENDIX B

The Questionnaire Used to Investigate the Impact of Disambiguation and Economization

The present questionnaire was used by every interlocutors while participants were reporting the reconstructed structures to them. This was respectively done on an individual basis. The 10 second interval simply let the interlocutors mark the intended spaces.

Student Name: -----

Sex: M F

Age: -----

University Year

1

2

3

4

	1	2	3	4	5	6	7	8	9	10
Sec I										
Sec II										