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Research Paper

Effect of Frequency on the Directionality of Conversion in Persian: A Psycholinguistic Approach

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Abstract

This study examined a crucial factor in determining the directionality of conversion: frequency of occurrence. The primary objective was to assess the psycholinguistic methodologies, which contributed to identifying the direction of conversion in Persian: What happens cognitively during listening comprehension of converted item? Specifically, it investigated whether the well-established principle that higher frequency facilitates faster processing can help resolve this issue (directionality of conversion). Furthermore, it explored whether theoretical predictions align with empirical evidence obtained through psycholinguistic experimentation (psycholinguistic reality). The study adopted the theoretical framework of Shapiro and Levine (1990), which employs cross-modal lexical decision tasks measured by using the DMDX software, which records processing times in milliseconds during listening comprehension of sentences containing various types of conversion (e.g., adjective to noun/adverb, verb to noun, and noun to adjective). The independent variable was the type of conversion within the sentences, while the dependent variable was the reaction time of participants to visual stimuli. A total of 25 female university students aged 18–30 years, who were matched according to specific criteria, such as academic performance and grades, participated in the study. The findings suggested that frequency of occurrence as documented in corpus data (Bijankhan & Mohseni, 2018), along with processing time, serves as a reliable indicator of conversion directionality.

Keywords: Conversion, Directionality, Noun, Adjective, Persian, Processing.

1. Introduction

One of the most intriguing topics in morphological studies is conversion, which is also known as "zero derivation". The pioneering work of linguists, such as Kiparsky (1982) and more recent research by scholars like Bauer and Valera (2005) and Balterio (2007), make our understanding of this morphological process significantly advanced. Conversion has been defined in various ways by different linguists and is alternatively referred to as "zero derivation", "zero affixation", "functional shift", or "null adjunction" (Cannon, 1985, p. 412). This process involves the formation of new words solely through a shift in grammatical function within the speaker's cognitive framework without any significant phonetic modification or addition of an affix. Despite the absence of overt morphological changes, the word undergoes derivation and is employed in different syntactic and semantic contexts (Quirk & Greenbaum, 1987, p. 441). For instance, in English, adjectives, such as *slow*, *thin*, *warm*, and *clean*, as well as nouns like *referee*, *sand*, *butter*, *knife*, and *comb*,

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can function as verbs without undergoing any formal alteration. Similarly, [Balterio](#) (2007, p. 203) defines conversion as the transition of a lexical item from one part of speech to another accompanied by a corresponding shift in meaning but without any phonological or morphological modification, apart from necessary inflectional adjustments.

The importance of studying conversion lies in its dual role: not only does it provide valuable empirical data that support, refine, or challenge various linguistic theories, but it has also established itself as a central concept in morphological studies. Today, most morphologists acknowledge that, compared to other relatively recent word-formation processes—such as acronyms, shortening, and blending—conversion is more productive. Due to its simplicity and efficiency, it is expected to contribute substantially to the expansion of the English lexicon in the future ([Cannon, 1985](#), p. 415). Another factor that makes conversion a compelling subject of study is its broad applicability. Theoretically, it can encompass all parts of speech and its output can serve as input for other morphological processes, such as derivation and compounding. Additionally, since conversion is based on existing lexical items, it is easily understood in terms of meaning. By filling semantic gaps and promoting linguistic economy, it facilitates more efficient language use ([Bauer, 1983](#), p. 226; [Atchison, 1989](#), p. 161). Given its widespread influence and functional versatility, it is reasonable to consider conversion as one of the most significant morphological mechanisms for word formation in both contemporary and future linguistic landscapes.

There are at least two reasons why it is crucial to research the conversion process. Firstly, the considerable productivity of this process in widely spoken languages like English cannot be ignored. Secondly, certain linguistic approaches have had to be revised as a result of the focus on conversion. For example, in "contaminative morphology", words are formed from accumulation of morphemes with a kind of "lexical syntax" governing their arrangement. The lack of morphemes or obvious changes in this process is a disadvantage of this model. Despite this, some linguists (such as [Bloomfield 1933](#), [Marchand 1960](#), and [Kiparsky 1982](#)) believe that the converted forms are obtained by adding an affix to the base, which has no phonetic content and is called "zero affix". The reason for these linguists' insistence on accepting the mentioned idea is that accepting this type of derivation will preserve the theoretical integrity of the lexical processes and prevent the divergence of ideas in this area. This attitude, which is known as "Neutral Affixation" or "Zero affixation", is shown in the form [...A Ø]V, which, of course, is not shared by all linguists and against which arguments have also been made. The most important approach against this view belongs to [Lieber](#), in whose writings it is reflected as well ([Lieber 1981, 1992, 2004, 2005](#)). According to [Lieber](#), in conversion, the word does not undergo an invisible process; rather, the speakers of the language add a new word with the same form as the previous word to their vocabulary, which naturally has new and separate categorical information. This is why [Lieber](#) does not consider conversion as a morphological or even a grammatical process, but considers it to belong to the category of coinage and deals with it in the field of "use" of language, not its "structure". So, despite what it seems at first, there is still no complete consensus among morphological theorists about the true nature of conversion. This is probably the reason why according to [Bauer](#) (1983, P. 32), it is not yet clear whether we should consider conversion as a kind of the derivation process or establish a distinct field for it based on its special function.

Regardless of all the definitions, what is important in defining the conversion is the change of the lexical category as a necessary condition for conversion. It is for this reason that [Bauer](#) (ibid.) considers it as "a change in the category of the word", which has nothing to do with its appearance. [Katamba](#) (1994, P. 70) and [Coates](#) (1999, P. 30) have also provided a similar definition. From the results of these linguists' opinions, it can be concluded that:

1. Conversion is a relation between different forms of a word (lexeme), in which one lexical item is obtained/derived from another lexical item.

2. Conversion is a relation that occurs between homonymous words in the sense that the words that are related by conversion belong to separate lexical categories. Therefore, with this account, even the words that appear as a result of the change of stress in another word cannot be considered as the product of the conversion process, such as *combine* / *còmbine*, *implànt* / *implant*, *trànsport* / *transpòrt*, in which the change of noun to verb occurs through the change of stress position. Of course, [Marchand](#) (1972, P. 225) correctly mentions that the conversion process does not necessarily occur in all homophonic lexical units and historical linguistic criteria are also effective in creating forms of conversion (ibid., P. 243). It must be noted that various reasons will be found for homonymy. A language like English, which does not have a complex grammar, has a greater tendency to homonymy, rather than a language that has a more complicated morphological system. Basically, a language like English, in which the basic forms of the noun and the verb are similar in most cases, has a greater tendency to produce converted words ([Atchison, 1989](#), P. 160) and it is obvious that conversion in languages containing grammatical gender or nominative and verb inflection may seem as an impossible or limited phenomenon ([Cannon, 1985](#), P. 430).

The present study investigated the processing of sentences containing different types of conversion in Persian by using the cross-modal lexical decision method. Originally introduced by [Shapiro and Levine](#) (1990), this psycholinguistic approach has been widely used to assess cognitive load in verb processing. The primary objective of this research was to examine the psycholinguistic reality of conversion and its role in determining directionality in Persian. The theoretical framework was based on episodic processing, which suggested that mental representations of linguistic items are not entirely abstract but are shaped by sensory input during their formation. This study sought to address a key question: How can psycholinguistic methodologies contribute to determining the directionality of conversion in Persian? More specifically, it explored a fundamental issue in conversion studies—how to establish the direction of conversion and identify the base form. For instance, how could it be demonstrated that the Persian word

tond ("fast") has been originally an adjective that has later undergone conversion into an adverb, rather than the reverse? Determining the direction of conversion is essential as it confirms its role as a word-formation process.

This research employed the cross-modal lexical decision method, which was examined in detail due to its methodological significance. The study was grounded in the theoretical framework of Shapiro and Levine (1990) within cognitive psycholinguistics. The independent variable was the type of conversion present in the sentences, while the dependent variable was the reaction time of participants. A total of 25 female university students aged 18–30 years participated in the study.

The theoretical framework adopted in this study followed Shapiro and Levine (1990) within a psycholinguistic framework, utilizing cross-modal lexical decision tasks measured by the DMDX software. This program recorded processing times in milliseconds during the listening comprehension of sentences containing specific types of conversion (e.g., adjective to noun/adverb, verb to noun, and noun to adjective). The central hypothesis was that the base lexical item undergoing conversion exhibits a higher frequency of occurrence in the corpus and requires less processing time during listening comprehension. Thus, the directionality of conversion could be determined by analyzing both corpus frequency and processing time. When considered together, these two factors would provide valuable insight into identifying the grammatical category of the original lexical item before conversion. The independent variable in this study was the type of conversion used in the sentences, while the dependent variable was the reaction time of participants to visual stimuli.

The results of the experiment indicated that, in all instances, the two factors of corpus frequency (as documented in Bijankhan & Mohseni, 2018) and processing time contributed to determining the directionality of conversion. However, they were not the sole determining factors. The study identified cases in which certain lexical items exhibited high frequency within the Persian corpus, yet not demonstrating fast processing times. Empirical findings confirmed that frequency was a significant factor in determining the directionality of conversion in Persian. The overall results suggested that conversion as a lexical process in Persian served the semantic function of marking lexical elements. Consequently, this process was predominantly applied to lexical items in marked forms. Psychologically, this was reflected in delayed processing times. An additional noteworthy finding of this study was that the metaphorical use of certain lexical attributes, such as *Sir* ("leader"), *Mother*, and *Commander*, amplified semantic distinctions to their highest level, resulting in significantly slower processing times compared to other instances. The study thus proposed a hierarchical model of cognitive load in processing converted lexical elements. At the lowest level were unmarked, high-frequency elements with minimal reaction times. The next level consisted of lexical items that had undergone conversion, while the highest level comprised converted lexical items that had also acquired metaphorical extensions, leading to the greatest cognitive load. The findings further suggested that the representation requiring less processing time could be identified as the primary, unmarked form or base representation, whereas the representation requiring greater processing time corresponded to the derived form resulting from conversion. In this regard, the Persian word *tond* ("fast") functioned primarily as an adjective. However, through conversion, it also exhibited adverbial properties.

2. Literature Review

Employment of one form in a different distributional context, together with other pertinent modifications like meaning alternation and word class or category shift, is a process that will be recognized and labeled as conversion. Sweet first used the name "conversion" in 1891. Since then, the topic has been continuously addressed in sporadic publications and references found in grammars and word-formation guides with the exception of Biese's (1941) significant study. Some of them have become classics in the study of conversion, such as Lieber's (1981), Pennanen's (1971, 1984), and Clark and Clark's (1979). However, the field saw significant growth in the 1960s as a result of research by authors like Dokulil (1968a, 1968b, 1968c), Kastovsky (1968), and Marchand (1960, 1963, 1964, 1966). The subject has now reappeared after a 3-decade hiatus through research by Don (1993), Vogel (1996), Stekauer (1996), and Twardzisz (1997), and Cetnarowska (1993).

Conversion has been described in various ways throughout the history of linguistics. We can mention two somewhat opposing viewpoints: those that consider conversion to be a derivational process that includes word formation or even morphology and those that identify it as a primarily syntactic phenomenon, in which an element is used in different syntactic contexts that also involve other alternations. Two somewhat opposing points of view are those that identify conversion as a primarily syntactic phenomenon, where an element is used in various syntactic contexts that also involve other alternations and those that view it as a derivational process that involves word formation or even morphology. One can distinguish between two primary trends: the zero-derivation or zero-affixation approach to the basic form (Adams 1973, Kastovsky 1968). Conversely, there is a trend to reject the existence of a zero morpheme and support the idea that conversion is the cause of both functional and categorical change (Bauer, 1983). The third position, which is in the middle of the two methods, is well exemplified by Don (1993). According to him, conversion is a technique for word production when the morphosyntactic and semantic processes are left phonologically unexpressed.

In the review of literature for the topic of conversion, one may encounter this question: How is the "direction of conversion" determined? In other words, how can we prove which word is the basis of the derivation? How can it be proven that, for example, the word *tond* (fast) has been originally an adjective and has turned into an adverb by the conversion process and not the other way around? This question is very important because by knowing the direction of conversion, we can talk about conversion as a morphological process. However, there must be a lexical element or

elements in order to be subjected to a process and become(s) other lexical elements. This basic question does not have a simple answer, but one of the existing methods that can partially clarify the direction of our research is the use of the concept of "markedness" in the sense that we use high-frequent and unmarked elements as a criterion for the determination of conversion. Thus, if we accept that the unmarked element—in comparison with the marked elements—usually has a simple structure with no derivation occurring in it, then a word like "tond (fast)" (which also has the adverb form of "be- tond-i" (with-quick-nominalizer: fast as an adverb) is a base form and is basically an adjective because we do not know any other adjectival forms for it).

Bauer and Valera (2005) believe that: "There are basically two approaches to the way of assessing directionality in conversion, three if we count the view that directionality cannot be ascertained. One is based on historical evidence and uses etymological information to tell the base from derived (as in Biese 1941). The other rejects diachronic data as relevant for analysis of present-day material and rests primarily on the semantic relation between the terms linked by conversion (Marchand 1963, 1964). Others also appeal to native intuition (Adams 1973). As it is now, we seem to have reached an impasse, with neither of these two main approaches being capable of proving its correctness across the board. Where the two contradict each other (which happens not infrequently), we have no way to choose between them—which means, in effect, that the question of directionality is currently unresolved and irresolvable." (Bauer and Valera, 2005, P. 11)

The following are remarkable researches done as some of the most important writings to discuss Persian conversion in a more technical way.

Regarding the conversion of adjectives into adverbs, Homayoonfarokh (1955, P. 196) considers the words "fa:ʃ (vivid), ra:z (mystry), a:ʃka:r (clear), a:ʃka:ra: (clear), naha:n (hidden), penha:n (hidden), pa:k (tidy/ overall, totally), and saxt (hard/ harsh)" as *common* adjectives or adverbs. Some of his examples (pp. 296-301) are listed among our examples of conversion through the research. On the other hand, Mashkoor (1961, P. 108) calls adverbs that are also adjectives, "*common* adverbs" and creates the impression that the main base of zero derivation in such words is the adverb and not the adjective. But regarding the conversion of nouns to adjectives, probably nothing has been written, except for that of Sedighian (1977). According to him (ibid, 1048), the boundary of a noun and an adjective in Persian is blur because any noun that is located in the predicate position can actually be an adjective as well (like *mother* and *beautiful* in these sentences: *This woman is a mother* and *This woman is beautiful*). Therefore, all the words that appear to be nouns can also be adjectives due to their descriptors. That's why in old and contemporary texts, we sometimes come across words that cannot be determined whether they are nouns or adjectives. Another point is that the Arabic ternary infinitives used in Persian have the function of both an adjective and a noun (ibid., 1049), such as "adl (justice), naqz (violation), ju:d (generosity), xatar (danger), haq (hustice)", and others like them (ibid. P. 1052). Sadeghi (2001) deals with the conversion of the subject noun to the infinitive noun while discussing the historical background. He says, "In Pahlavi, the affix -ta:r / da:r has been added to the past participle of the verbs to form a subjective adjective, such as "gofta:r (speech) and rafta:r (behavior)". He states that "changing the meaning of the subject noun to the infinitive noun is surprising" (ibid., P. 119).

However, there is an article whose author (Haqhbini 2007) specifically knows about the category of conversion in Persian, in which the title "category change" is used for the conversion process. In this work, Haqhbini believes that zero derivation is one of the types of category change. Change of category is more widespread and fertile in Farsi and what seems like a change of category may sometimes be a deletion or a dead metaphor. Zaker (2013) has also examined conversion from a functional perspective and believes that the speaker tries to help the audience to analyze the meaning of the conversion word by placing the clues in the context. If the audience cannot understand this meaning, the process remains incomplete. Audience using the context and their universal knowledge about schemas decode the converted word. So far, there have not been many studies about this lexical process in Persian from a psycholinguistic viewpoint.

3. Theoretical Framework

The theoretical framework of the current research in the psychology of language is based on the experimental method of Shapiro and Levine (1990). These researches have been mainly based on online processing and presentation of primary and secondary tasks, as well as using the multi-sensory lexical selection model. The method of data analysis has been also based on the calculation of the subjects' reaction times. The underlying assumption of this empirical methodology is based on Cognitive Load theory (CLT).

The term *cognitive load* has been used to describe the amount of mental effort required by a task. Raney (1993) uses the term *cognitive load* to reflect demands on attentional resources, storage and retrieval processes, and integrative strategies to name a few (e.g., Britton & Tesser, 1982; Kahneman, 1973; Navon & Gopher, 1979). Cognitive Load refers to the total amount of mental activity performed by working memory at any point in time (Cooper, 1998). There are three kinds of cognitive load: intrinsic, extraneous, and germane (Paas et al., 2003; Sweller, 2007). Intrinsic cognitive load arises from the nature of an incoming stimulus. In other words, it cannot be altered by instructional interventions because the element interactivity is intrinsic. It is imposed by the basic structure of the information that the learner needs to acquire for achieving learning goals irrespective of the instructional procedures used. Extraneous cognitive load is, on the other hand, generated by instructional interventions and the manner of their presentation. An inappropriate instructional design that requires a considerable amount of working memory resources may impose a heavy cognitive load and thus interferes with learning. Extraneous cognitive load must be controlled by the instructor. The third type of cognitive load

is germane cognitive load, which occurs when working memory resources are engaged in learning and the construction of schema automation. Unlike intrinsic and extraneous cognitive load that are imposed by the nature and structure of the learning materials, germane cognitive load is not imposed by the learning materials. Rather, it belongs to a different category that can be better understood as working memory resources that are devoted to information relevant or germane to learning. Effective learning therefore can be achieved by reducing extraneous cognitive load as far as possible and allowing the freed working memory resources to be devoted to germane cognitive load (Sweller, 2007). Over the past two decades, CLT has been used as a framework for designing instructional procedures and materials for complex learning with the intention of reducing extraneous cognitive load and increasing germane cognitive load.

Understanding can be largely described by additional changes in long-term memory (along with the effect of those changes on working memory). Without changes in long-term memory, nothing can be understood. Information is 'understood' when we are able to process multiple, interacting elements simultaneously in working memory. What is the nature of changes in long-term memory when a material is learned? The process probably can best be described in terms of abstraction, schema construction, and automation.

The rationale behind the use of CMLD methodology here was that the more complex a heard sentence was, the subject's reaction time to the visual stimulus would be as if there was a kind of trade-off between the two tasks. The cognitive load of a sentence auditory presented would be calculated through the reaction time to the visual stimulus.

4. Research Methodology

One of the key methods for studying online language processing is the multi-sensory decision-making approach commonly known as the Cross-Modal Lexical Decision (CMLD) method. This method provides a precise representation of sentence processing in real time as its tasks are highly sensitive to moment-by-moment cognitive activity.

The research methodology employed in this research was multi-sensory lexical decision-making, which simultaneously engaged both auditory and visual modalities through two interrelated tasks. The objective was to examine sentence comprehension and lexical decision-making in parallel. This method was characterized by the following key features:

1. Auditory Sentence Presentation: The target sentences were presented to participants auditorily. They were instructed that their primary task was to attentively listen to the sentences being played.

2. Simultaneous Lexical Decision Task: While listening, participants were also required to perform a secondary task—determining whether a sequence of letters appearing on a computer screen formed a valid word or a non-word. The rationale behind this task was that the reaction time for lexical decisions reflected the cognitive load imposed by sentence processing. Since there was a trade-off in cognitive resources between listening and decision-making, fluctuations in reaction time provided insights into the processing demands of the auditory input.

3. Uninterrupted Sentence Processing: The presence of the visual stimulus (word/non-word) did not disrupt sentence processing, ensuring a continuous assessment of cognitive engagement.

4. Reaction Time as an Indicator of Sentence Processing: The reaction time to visual stimuli served as an indirect measure of sentence processing speed. Data analysis was based on the participants' response times to the visual stimuli recorded with millisecond precision.

This experiment was conducted by using DMDX software, which measured reaction times, as well as the accuracy of responses at a fine-grained level (thousandths of a second). The collected data were then analyzed by using appropriate statistical methods and presented in tabular form through Word and Excel for further interpretation.

4-1 Used Tool

This test was performed using the DMDX software program, which measured the reaction time of the subjects and their correct and incorrect answers in thousandths of a second. This program is mostly used by cognitive and language psychologists to analyze and evaluate different aspects of cognitive and language abilities.

4-2 Variables

Throughout this research, the type of conversion used in the sentence was included as an independent variable and the reaction time of the subjects to the stimuli as a dependent variable.

4-3 Test

In this experiment, the subjects first listened to a sentence while simultaneously viewing a visual stimulus on the screen at a specific point—precisely when encountering a target word related to conversion. They had to then decide whether the displayed sequence of letters constituted a valid Persian word. The reaction times to visual stimuli were recorded with millisecond precision.

The test consisted of 36 sentences with every three sentences corresponding to a specific conversion category. For example, sentences 1 to 3 were associated with one particular conversion type. The rationale behind categorizing sentences in this manner was that each category involved a distinct type of conversion. By analyzing these categories, the study aimed to investigate the processing mechanisms and cognitive load imposed by different types of conversion.

The primary objective of the test was to compare the participants' reaction times to the stimuli that followed each conversion category. In the second phase, the subjects completed a lexical decision task, further contributing to the analysis of conversion processing.

4-4 Subjects

The subjects included 25 female undergraduate students aged 18 to 25 years. They were matched in terms of academic average. The basis of data analysis was their correct responses to the visual stimuli. Therefore, some subjects were sometimes removed from the analytical tables due to excessive errors, the number of which was less than 25 in the registration tables.

4-5 Test Materials

The language materials in this test included 34 sentences and 34 visual stimuli (among which there were some Persian words and non-words). The words were extracted and selected from the Persian language database, [Bijankhan & Mohseni \(2018\)](#) naming *Frequency Dictionary Based on Contemporary Persian Corpus*. The visual stimuli, which were not words (non-words), were also made by replacing the first letter of the 5- to 7-letter words of the same Persian words. Test program was installed on the same laptop to prevent the interference of different processor speeds in the test results.

5. Data analysis

Below is the first test sentence in each category. The asterisk indicates the presentation location of the visual stimulus. The string of letters marked with a plus sign is a word in Persian and the non-word stimuli are marked with a minus sign presented to the subject in the form of a lexical decision task. The grammatical category of each target word is specified and finally the frequency of the target word in the corpus is mentioned (here based on [Bijankhan & Mohseni's, 2018](#)). In each category, the first table contains the descriptive statistics of the subjects' reaction times and the next three tables contain inferential statistics that show the significance of the difference between the reaction times.

A. Conversion of adjective to noun / adverb in the word bad (bad)

1. hame bad*¹ nistand. zangin-/ adjective/ frequency: 465 ²

All bad* aren't.

It is not the case that all (of them) are bad.

2. be u: bad* hamle kardand. tozi?+/ adverb/ frequency:37

to he bad attack did.

They attacked him badly.

3. az bad*-e hādese injā-?im tamite-/ noun/ frequency: 10

from bad-EZ event here- personal ending for 1sing.

We are here as a result of (our) misfortune.

Table 1- Descriptive statistics for the conversion of the word bad

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	1020.9256	498.26265
2	18	1077.1885	1179.94380
3	21	1392.9256	1053.37167

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.05:

Test Statistics^a

N	18
Chi-Square	8.111
df	2
Asymp. Sig.	.017
a. Friedman Test	

Ranks

	Mean Rank
VAR00022	2.06
VAR00023	1.50
VAR00024	2.44

¹ Asterisk shows the exact location of the presentation of the visual stimuli

² The first item shows the exact visual stimuli, plus shows that it is a word, and minus shows that it is a non-word. The second item separated by slash shows the part of speech and the third item shows the frequency of occurrence of the item in the corpus.



We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 3 and those of Questions 2 and 1 at a significance level of 0.05. That is, the word *bad* was processed as a noun later than an adjective or adverb.

Test Statistics^a

	VAR00023	- VAR00024	- VAR00024	-
	VAR00022	VAR00022	VAR00023	
Z	-.414 ^b	-2.555 ^c	-1.851 ^c	
Asymp. Sig. (2-tailed)	.679	.011	.064	

a. Wilcoxon's Signed Ranks Test

b. Based on positive ranks

c. Based on negative ranks

B. Conversion of adjective to noun / adverb in the word *pāk* (pure/totally)

1. ešq-i *pāk** bejn-e ān-hā vojod dāšt.. mašqul+/ adjective/ frequency: 428
love-INDF pure between they exist had.
There was a pure love between them.
2. *pāk** giš šode budam teslām- / adverb/ frequency:10
totally puzzled had been-1sing.
I had been totally puzzled.
3. mahsul-āt-e labani-ye *Pāk** gerān šode ast. mahsul +/ noun/ frequency: 4
Product-s-EZ dairy-EZ *Pāk** expensive have become.
The dairy products of *Pāk**have been expensive.

Table 2- Descriptive statistics for the conversion of the word *pa:k*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	929.0258	671/91859
2	21	1210.5497	833.32561
3	19	1059.6188	1052.07759

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.01:

Ranks

	Mean Rank
VAR00031	1.58
VAR00032	2.63
VAR00033	1.79

Test Statistics^a

N	19
Chi-Square	11.789
Df	2
Asymp. Sig.	.003

a. Friedman Test

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 2 and those of Questions 1 and 3 at the significance level of 0.01 and 0.05, respectively. It meant that *pa:k* was processed as an adverb later than as an adjective.

Test Statistics^a

	VAR00032	- VAR00033	- VAR00033	-
	VAR00031	VAR00031	VAR00032	
Z	-2.694 ^b	-.443 ^b	-1.932 ^c	
Asymp. Sig. (2-tailed)	.007	.658	.053	

a. Wilcoxon's Signed Ranks Test

b. Based on negative ranks

c. Based on positive ranks



C. Conversion of adjective to noun / adverb in the word sa:bet (stable)

1. mahal-e sābet* va dā?emi dar nazar gereft. vazifeh +/- adjective/ frequency: 963
location-EZ stable and permanent considered.
They considered a stable and permanent location.
2. āqā-ye Sābet* az pelle-hā pā?in āmad. ehtemāl + / noun/ frequency:7
Mr. Sābet from stair- pl. down came.
Mr. Sabet came down the stairs.
3. in raqam sābet* mānde bud-0. rastād -/ adverb/ frequency: 1
this number stable remained was-3Sg.
This digit / number had been remained stable.

Table 3- Descriptive statistics for the conversion of the word sābet

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	3589.845.	97343.743.
2	20	962.2325	1252.79517
3	19	1208.6569	942.46385

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.01:

Ranks		Test Statistics ^a	
	Mean Rank	N	18
VAR00037	1.56	Chi-Square	18.778
VAR00038	1.61	df	2
VAR00039	2.83	Asymp. Sig.	.000

a. Friedman Test

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 3 and those of Questions 2 and 1 at the significance level of 0.01. That is, *sa:bet* in the role of adverb was processed later than adjective.

Test Statistics ^a			
	VAR00038 - VAR00037	VAR00039 - VAR00037	VAR00039 - VAR00038
Z	-.523 ^b	-3.340 ^b	-2.984 ^b
Asymp. Sig. (2-tailed)	.601	.001	.003

a. Wilcoxon's Signed Ranks Test

b. Based on negative ranks

D. Conversion of adjective to noun / adverb in the word xub (good)

1. šarāyet-e xub* va monāsebi dāšt-0 adabiyyāt +/- adjective/ frequency: 1623
conditions-EZ good and suitable-IND had-3Sg.
He has good and suitable conditions.
2. bezan ke xub* mizan-i. faqsim- / adverb / frequency:674
Play-IMP for well play-2Sing.
Play as you play (the instrument) well.
3. in xub*-hā va bad-hā dar moqe?iyyat-hā bā ham farq dārand. ma?ruf +/- noun/ frequency:20
this good-pl. and bad-pl. in situation-pl. with each other are different.
These good and bad items are different in different situations.

Table 4- descriptive statistics for the conversion of the word *xub*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	20	1110.6449	1065.84928
2	21	955.8641	397.22910
3	21	1087.6488	1157.32366

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.05:

Test Statistics^a

N	20
Chi-Square	9.100
df	2
Asymp. Sig.	.011

a. Friedman Test

Ranks

	Mean Rank
VAR00064	1.70
VAR00065	2.55
VAR00066	1.75

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the mean of Question 2 and that of Question 3 at the significance level of 0.05. That is, *xub* was processed as a noun later than the adjective.

Test Statistics^a

	VAR00065	-	VAR00066	-	VAR00066	-
	VAR00064		VAR00064		VAR00065	
Z	-.896 ^b		-.224 ^b		-2.312 ^c	
Asymp. Sig. (2-tailed)	.370		.823		.021	

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on positive ranks.

E. Conversion of adjective to noun / adverb in the word *došvār* (hard/difficult)

1. in *kār-i došvār** ast. *movafaqiyat +/- adjective/ frequency: 374*

this work-IND difficult is

This work is difficult.

2. in *matlab xeyli došvār** *enteqāl miyāb-ad. zarurat + / adverb / frequency:2*

this content very difficult/hard convey find-3Sg.

This content is conveyed very hard.

3. *došvār*-e zendegi bā hamkāri āsān mišav-ad. kerbit- /noun/ frequency: 1*

difficulty-Ez life with collaboration easy get-3Sg.

The difficulty of life gets easy with collaboration.

Table 5- Descriptive statistics for the conversion of the word *došvār*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	20	876.0307	559.76163
2	21	972.1200	581.93455
3	21	1057.0817	554.45601

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.05:

Ranks		Test Statistics ^a	
	Mean Rank	N	20
VAR00067	1.75	Chi-Square	9.100
VAR00068	1.70	df	2
VAR00069	2.55	Asymp. Sig.	.011
a. Friedman Test			

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 1 and that of Question 3 at the significance level of 0.05. That is, *došvār* in the role of adjective was processed earlier than in the role of noun.

Test Statistics ^a				
	VAR00068	-	VAR00069	-
	VAR00067		VAR00067	VAR00068
Z	-.224 ^b		-2.502 ^c	-1.547 ^c
Asymp. Sig. (2-tailed)	.823		.012	.122
a. Wilcoxon's Signed Ranks Test				
b. Based on positive ranks				
c. Based on negative ranks				

F. Conversion of verb to noun in the word *bargašt* (returned)

1. pul be hesāb *bargašt*-0*. *eslām*+ / verb/ frequency: 131
money to account returned-3Sg.
The money returned to the account.
2. *bargašt**-e ček bāʔes-e bi-eʔtebāri-ye to mišavad. *tondān*- / noun / frequency:9
return-EZ cheque cause-EZ disgracefulness you become-3Sg.
Bounced checks will make you disgraceful.

Table 6.1- Descriptive statistics for the conversion of the word *bargašt*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	17	1287.5298	723.05681
2	21	953.0737	468.35358

Table 6.2- Inferential statistics for the conversion of the word *bargašt*

Test Statistics ^a										
	q2 – q1	q4 – q3	q6 – q5	q8 – q7	q10 – q9	q12 – q11	q14 – q13	q16 – q15	q18 – q17	q20 – q19
Z	-1.493 ^b	-2.798 ^b	-3.099 ^b	-2.242 ^b	-2.154 ^c	-.966 ^b	-1.823 ^c	-2.214 ^c	-1.610 ^c	-1.167 ^c
Asymp. Sig. (2-tailed)	.135	.005	.002	.025	.031	.334	.068	.027	.107	.243

- a. Wilcoxon's Signed Ranks Test
- b. Based on negative ranks
- c. Based on positive ranks

According to the table of results, the average of Question 1 has a significant difference with that of Question 2 at the significance level of 0.01. That is, *bargašt* in the role of verb has been processed earlier than in the role of noun.

G. Conversion of verb to noun in the word *nešast* (sat)

1. *u ru-ye zamin nešast*-0 *. *hāšiye*+ / verb/ frequency: 266
he on-EZ floor sat-3Sg
He sat on the floor.
2. *nešast**-e *zamin dar in mantaqe qābel-e roʔyat ast. fulād*- / noun / frequency:1130
this region notable is. subsidence-EZ earth in
Land subsidence is notable in this region.

Table 7.1- Inferential statistics for the conversion of the word *nešast* (sat)

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	17	1287.5298	723.05681
2	21	953.0737	468.35358

Table 7.2- Inferential statistics for the conversion of the word *nešast***Test Statistics^a**

	q2 – q1	q4 – q3	q6 – q5	q8 – q7	q10 – q9	q12 – q11	q14 – q13	q16 – q15	q18 – q17	q20 – q19
Z	-1.493 ^b	-2.798 ^b	-3.099 ^b	-2.242 ^b	-2.154 ^c	-.966 ^b	-1.823 ^c	-2.214 ^c	-1.610 ^c	-1.167 ^c
Asymp. Sig. (2-tailed)	.135	.005	.002	.025	.031	.334	.068	.027	.107	.243

a. Wilcoxon's Signed Ranks Test

b. Based on negative ranks

c. Based on positive ranks

According to the table of results, there is a significant difference between the average of Question 1 and that of Question 2 at the significance level of 0.05. That is, *nešast* in the verb role has been processed later than its noun role.

H. Conversion of noun to adjective in the word *āqā* (sir)

1. az *āqā** emām rezā komak xāst-0 mosiqi+/ noun/ frequency: 453

From Sir Imam Rezā help wanted-3Sg.

He asked his Excellency Imam Reza for help.

2. ham āzād, ham *āqā**, ham aziz va ham moraffah, dor-e ham jam? šodand. mazkur+ / adjective with metaphoric meaning / frequency:3

Both āzād, both *āqā*, both dear and prosperous, around each other gathered.

Both Āzād and Āqā, both dear and prosperous gathered together.

3. u xeyli *āqā** va bāšaxsiyat ast. jabazeh- / adjective with metaphoric meaning/ frequency: 1

he very sir and personable is

He is very gentleman and personable.

Table 8- Descriptive statistics for the conversion of the word *a:qa:*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	890.4556	555.16245
2	18	1222.5770	666.49973
3	21	1048.3331	661.38340

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.05:

Test Statistics^a

N	18
Chi-Square	8.778
df	2
Asymp. Sig.	.012

a. Friedman Test

Ranks

	Mean Rank
VAR00004	1.44
VAR00005	2.39
VAR00006	2.17

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 1 and those of Questions 2 and 3 at the significance level of 0.05 and 0.1, respectively. That is, *a:qa:* in the role of a noun was processed earlier than its adjective metaphorical roles shown in 2 and 3 and the metaphorical meaning of *a:qa:* shown in examples of 2 and 3 was processed later than the noun.

Test Statistics^a

	VAR00005	- VAR00006	- VAR00006	-
	VAR00004	VAR00004	VAR00005	
Z	-2.592 ^b	-1.929 ^b	-.719 ^c	
Asymp. Sig. (2-tailed)	.010	.054	.472	

a. Wilcoxon's Signed Ranks Test

b. Based on negative ranks

c. Based on positive ranks



I. Conversion of noun to adjective in the word mādar (mother)

1. mādar* va xāhar=aš āmad-and. *daqsīyat+ / noun/ frequency: 854*
mother and sister=his (possessive pro.) came-3Pl.
His mother and sister came.
2. qavānin-e esterātežik va mādar* rā vaz? kard-and. *tahqiq+ / adjective / frequency:37*
laws-EZ strategic and mother DO legislated-3Pl
They legislated strategic and major laws.
3. dar tul-e safar Ali mādar* xarj bud. *roqa:yase- / adjective with metaphoric meaning/ frequency: 1*
During-EZ journey Ali cost-holder was.
Ali was the one who held the costs of the journey.

Table 9- Descriptive statistics for the conversion of the word mādar

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	20	958.8356	555.53034
2	21	872.0904	2266.57469
3	21	1059.7670	653.15239

The results of Friedman Test showed that there are significant differences between the mean sums at the significance level of 0.05:

Ranks		Test Statistics ^a	
	Mean Rank	N	20
VAR00013	1.95	Chi-Square	7.300
VAR00014	1.60	df	2
VAR00015	2.45	Asymp. Sig.	.026
		a. Friedman Test	

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 1 and those of Questions 2 and 3 at the significance level of 0.1 and 0.05, respectively. Also, there was a significant difference between the average of Question 2 and that of Question 3 at the significance level of 0.01. That is, *ma:dar* in the role of a noun was processed earlier than its adjective and metaphorical role and the metaphorical meaning of mother was processed the last of all.

Test Statistics^a

	VAR00014	- VAR00015	- VAR00015	-
	VAR00013	VAR00013	VAR00014	
Z	-1.867 ^b	-2.053 ^c	-2.659 ^c	
Asymp. Sig. (2-tailed)	.062	.040	.008	
a. Wilcoxon's Signed Ranks Test				
b. Based on positive ranks				
c. Based on negative ranks				

J. Conversion of noun to adjective in the word farmāndeh (leader/ commander)

1. har farmāndeh* bāyad avval tasmim-e dorost begirad. *fasla:h- / noun/ frequency: 776*
every commander must first decision-EZ correct make.
Each commander must first make the right decision.
2. naqš-e yek kešvar-e farmāndeh* rā bāzi mikard-0. *komiteh+ / adjective / frequency:2*
role-EZ a country-EZ played commander DO played-3Sg
It played the role of a commanding country.
3. salām farmāndeh*! *meqda:m- / adjective with a metaphoric meaning/ frequency: 1*
Hello Commander!

Table 10- Descriptive statistics for the conversion of the word farma:ndeh

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	990.2888	571.92470
2	18	891.9003	524.81074
3	18	1501.8974	483.92642

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.05:

Ranks		Test Statistics ^a	
	Mean Rank	N	16
VAR00025	1.81	Chi-Square	7.875
VAR00026	1.63	df	2
VAR00027	2.56	Asymp. Sig.	.019

a. Friedman Test

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the average of Question 3 and those of Questions 2 and 1 at the significance level of 0.01 and 0.05, respectively. That is, *farmāndeh* in the role of a noun was processed earlier than its adjective and metaphorical role and the metaphorical meaning of the commander was processed latest.

Test Statistics ^a			
	VAR00026 - VAR00025	VAR00027 - VAR00025	VAR00027 - VAR00026
Z	-.806 ^b	-2.722 ^c	-2.482 ^c
Asymp. Sig. (2-tailed)	.420	.006	.013

a. Wilcoxon's Signed Ranks Test

b. Based on positive ranks

c. Based on negative ranks

7. Discussion of Results

The main idea was that the frequency of occurrence of a linguistic element is often used to determine the direction of conversion. The assumption was that the higher the frequency of occurrence of a word in a specific grammatical category is, the greater the likelihood that the conversion process has derived from that base. The data of the present study confirmed the hypothesis that the following words in their roles can be the basis for conversion (bad in adjective role, *pāk* in adjective role, *sābet* in adjective role, *xub* in adjective role, *došvār* in adjective role, *bargašt* in verb role, and *āqā*, *mādar*, and *farmāndeh* in noun role because they both have a higher frequency of occurrence in the corpus and are processed earlier. Yet, while conducting this experiment, we also encountered examples that either did not create significant differences in processing despite different frequencies, such as *ārām* below or proved the opposite of the assumption like *bozorg* and *nešast*. Examples like these showed that we can only consider frequency as a determining factor in the direction of convergence when higher frequency is associated with ease of processing; otherwise, we must resort to other factors, such as diachronic information to determine the directionality of conversion.

K. Conversion of adverb into adjective in the word *ārām* (slow/slowly)

1. u *a:ra:m* forou be xordan kard. *ejaze*+/ adverb/ frequency: 130

He slowly began to eat.

He began eating slowly.

2. *rafta:r-e a:ra:m-e u ziba: bud bima:r*+/ adjective/frequency: 42

manner-EZ slow-EZ he nice was.

His slow manner was nice.

3. u dar inja: *a:ra:m nada:jt. mova:jeh*+/ noun/ frequency: 6

He in here peace/ease did not have.

He was not at peace here.

Table 11- Descriptive statistics for the conversion of the word *a:ra:m*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	21	1449.9478	1113.61353
2	21	925.2563	858.5230
3	19	1059.3417	779.80369

The results of the Friedman test for comparing the means of Questions 1 to 3 showed that there was no significant difference between the means of the three groups.

Ranks	
	Mean Rank
VAR00001	2.19
VAR00002	1.81
VAR00003	2.00

Test Statistics ^a	
N	21
Chi-Square	1.524
df	2
Asymp. Sig.	.467
a. Friedman Test	

L. Conversion of adverb into adjective in the word *bozorg* (old, big)

1. doxtar-e bozorg*-0 soʔāl porsid. girās - / adjective/ frequency: 409
daughter-EZ old-comparative marker question asked.
The older daughter asked a question.

2. in masʔale rā bozorg* jelve dād dastur+/ adverb/ frequency:9
This problem object marker bigger showed.
He made the issue appear big.

3. ānhā be bozorg-e* fāmil ehtera:m gozāštand . beʔtemād -/ noun / frequency: 2
They to old-EZ family respect put-3Pl.
They respected the older person of the family.

Table 12- Descriptive statistics for the conversion of the word *bozorg*

	Number of subjects with correct answers	Mean reaction time	Standard deviation
1	20	1193.8702	621.90261
2	21	932.9260	680.10757
3	21	1145.7799	732.79054

The results of Friedman Test showed that there were significant differences between the mean sums at the significance level of 0.1:

Test Statistics ^a	
N	20
Chi-Square	10.300
df	2
Asymp. Sig.	.006
a. Friedman Test	

Ranks	
	Mean Rank
VAR00025	2.45
VAR00026	1.45
VAR00027	2.10

We used Wilcoxon's non-parametric test to compare the questions. The results of Wilcoxon test showed that there was a significant difference between the mean of Question 1 and that of Question 2 at the significance level of 0.05. The word *bozorg* in the role of adjective was processed later than adverb and noun. This was the opposition to the presupposed assumption that the more frequent word will be processed sooner, too.

Test Statistics ^a			
	VAR00011 - VAR00010	VAR00012 - VAR00010	VAR00012 - VAR00011
Z	-.403 ^b	-1.198 ^c	-2.016 ^c
Asymp. Sig. (2-tailed)	.687	.231	.044

a. Wilcoxon's Signed Ranks Test

b. Based on positive ranks

c. Based on negative ranks

The analysis of the informative content of the above tables showed that frequency might not be considered as an ultimate and sole estimate measure for processing time for other factors might affect it. It seemed that Frequency estimates were not sufficient. Part of this related to the fact that the word frequency as depicted in frequency dictionaries is to be affected by other factors (like the kind of sources used in data compilation) and the other part relates to the effects of other variables, which correlates with word knowledge (like word prevalence, word length, age of the word acquisition, similarity to other words, and concreteness of the word content). Using lexical decision tasks in the present article showed that some other psychological factors like the recency effect (the effect which a recent item has), prominence, and prevalence correlates with word knowledge, which these dictionaries miss to show or ignore.

8. Conclusion

The present study investigated the psycholinguistic mechanisms underlying the listening comprehension of converted lexical items as a lexical process. The central research question explored how this process unfolds cognitively. The initial hypothesis posited that the base form of a word, prior to undergoing conversion, exists in an unmarked, high-frequency state and is processed more rapidly than its converted counterparts. This suggested that during comprehension, the lexical item was first processed in its original unmarked semantic and grammatical role. Subsequently, a second stage of processing occurred, during which the word was reanalyzed based on contextual linguistic cues, leading to the assignment of a new semantic and grammatically marked function. This dual-stage processing accounted for the increased reaction time observed in converted instances.

The data confirmed the hypothesis. As previously stated, the primary assumption was that the base lexical form undergoing conversion is the one with the highest frequency in the corpus and is processed more quickly due to its unmarked status. Additionally, this study addressed one of the most critical questions in the discussion of conversion: how is the *directionality* of conversion determined in terms of cognitive mechanisms? More specifically, how can we establish which word serves as the base for derivation? For instance, how can it be demonstrated that the Persian word *tond* ("fast") originally functions as an adjective and is subsequently converted into an adverb rather than the reverse? This question was of considerable importance because determining the direction of conversion allowed us to analyze conversion as a morphological process. Morphological processes necessarily operate on existing lexical elements, transforming them into new forms. The findings of this study indicated that the representation requiring less processing time could be identified as the primary, unmarked form, while the representation with a longer processing time was the secondary form, resulting from the conversion process. In this sense, *tond* ("fast") functioned primarily as an adjective and through conversion, it acquired an adverbial function. An additional noteworthy finding emerged from the analysis of inferential statistics related to Categories 10, 11, and 12. The results indicated that the metaphorical extension of certain lexical attributes, such as *Sir*, *Mother*, and *Commander*, intensified semantic distinction and significantly increased processing time. Consequently, a hierarchy of lexical elements based on processing time could be proposed: at the lowest level were unmarked, high-frequency elements with minimal reaction times; the next level consisted of lexical forms that had undergone conversion; and at the highest level were converted lexical forms that had additionally acquired metaphorical meanings, which exhibited the greatest processing delays.

Overall, the findings of this study suggested that conversion as a lexical process serves the semantic function of marking lexical elements, thereby making it more likely to apply to unmarked forms. Psychologically, this phenomenon manifests as an increase in processing time, reflecting the additional cognitive load associated with reanalyzing converted forms.

This study explored conversion as a lexical process, focusing on one of the key arguments regarding the factors that influence the directionality of conversion—namely, frequency of occurrence. The primary aim of this research was to investigate, for the first time in Persian, how words affected by conversion are processed by using experimental methodologies derived from psycholinguistics. The significance of this study was primarily theoretical as it demonstrated that a word frequency in a linguistic corpus serves as a crucial determinant of conversion directionality. The research sought to address the central question: How can psycholinguistic methodologies contribute to determining the directionality of conversion in Persian? This study employed an experimental approach commonly used in psycholinguistics and the psychology of language. In this framework, frequency of occurrence was treated as the independent variable, while processing time served as the dependent variable. Consequently, conversion directionality could be determined by analyzing both corpus frequency and processing time during auditory comprehension. The interplay of these two factors provides valuable insight into identifying the grammatical category of the base lexical item undergoing conversion. Empirical findings confirmed that frequency plays a decisive role in establishing the directionality of conversion in Persian. This was where psycholinguistic tests and tasks reinforced the theoretical foundations of morphological theory, offering deeper insights into the cognitive mechanisms underlying lexical processing.

Conversion is more common than first thought. It is considered as typical of English and is now a common resource of word formation processes in many languages, including Persian. The article tried to elaborate on conversion in Persian theoretically and psycholinguistically.

In view of the above discussion, it can safely be claimed that there are some clear cases of productive conversion in Persian. These include the conversion of adjectives into adverbs and adjectives into nouns or vice versa. Both are very common and by no means marginal. The existence of specular cases of conversion in Persian seems to be uncontroversial (conversion of adverbs into nouns, particles into nouns, particles into adverbs, and adjectives into prepositions). These are less productive and sometimes even marginal excluded from the body of the present research. The current study only investigated the listening comprehension of the conversion. Its production aspect needs to be investigated too.

The article doubted the previously accepted idea that a word will necessarily be considered as the base form of the conversion process if it enjoys high frequency of occurrence within a corpus. Thus, directionality of conversion can be determined through the frequency of occurrence in corpus and processing time during listening comprehension as well. Here, it is believed that a word can be determined as the basis of the conversion process if it bears both high frequency and less processing time. These two factors, when going together, will be illuminating in the determination of the

grammatical category of the basic lexical item, which undergoes conversion. Overall, this study suggests that during comprehension, the lexical item is first processed in its original semantic and grammatical role. Subsequently, a second stage of processing occurs, during which the word is reanalyzed based on contextual linguistic cues, leading to the assignment of a new semantic and grammatical function. This dual-stage processing accounts for the increased reaction time observed in converted instances.

References

- Adams, V. (1973). *An introduction to modern English word-formation*. Longman.
- Aitchison, J. (1989). *Words in the Mind—An Introduction to the Mental Lexicon*, Oxford: Basil Blackwell.
- Balteiro, I. (2007). *The directionality of conversion in English: A dia-synchronic study*. Peter Lang.
- Bauer, L. (1983). *English word-formation*. Cambridge University Press.
- Bauer, L., & Valera, S. (2005). Conversion or zero derivation: An introduction. In L. Bauer & S. Valera (Eds.), *Approaches to conversion/zero derivation* (pp.). Waxmann.
- Biese, Y. M. (1941). *Origin and development of conversions in English*. *Annales Academiae Scientiarum Fennicae*, B XLV (2).
- Bijankhan, M., & Mohseni, M. (2018). *Frequency dictionary based on contemporary Persian corpus*. University of Tehran Press.
- Bloomfield, L. (1933). *Language*. Holt.
- Britton, B. K., & Tesser, A. (1982). Effects of prior knowledge on use of cognitive capacity in three complex cognitive tasks. *Journal of Verbal Learning and Verbal Behavior*, 21, 421–436.
- Cannon, G. (1985). Functional shift in English. *Linguistics*, 23, 411–431.
- Cetnarowska, B. (1993). *The syntax, semantics and derivation of bare nominalisations in English*. Uniwersytet Śląski.
- Clark, E. V., & Clark, H. H. (1979). When nouns surface as verbs. *Language*, 55, 767–811.
- Coates, R. (1999). *Word structure*. Routledge.
- Cooper, G. (1998). Research into cognitive load theory and instructional design at UNSW. Retrieved July 18, 2008, from <http://paedpsych.jku.at:4711/LEHRTEXTE/Cooper98>
- Dokulil, M. (1968a). Zur Frage der Konversion und verwandter Wortbildungsvorgänge und -beziehungen. *Travaux linguistiques de Prague*, 3, 215–239.
- Dokulil, M. (1968b). Zur Frage der sog. Nullableitung. In H. E. Brekle & L. Lipka (Eds.), *Wortbildung, Syntax und Morphologie* (pp. 55–64). Mouton.
- Dokulil, M. (1968c). Zur Theorie der Wortbildungslehre. *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschafts- und sprachwissenschaftliche Reihe*, 17, 203–211.
- Don, J. (1993). *Morphological conversion* (OTS Dissertation Series). Research Institute for Language and Speech.
- Haghibin, F. (2007). Category change and zero derivation in Persian. In M. Dabirmoghaddam et al. (Eds.), *A collection of papers of the 7th symposium of linguistics* (pp.). Allameh Tabatabai University.
- Homayoonfarokh, A. (1955). *A complete grammar of Persian*. Bina.
- Kahneman, D. (1973). *Attention and effort*. Prentice-Hall.
- Kastovsky, D. (1968). *Old English deverbal substantives derived by means of a zero morpheme*. B. Langer.
- Katamba, F. (1994). *English words*. Routledge.
- Kiparsky, P. (1982). From cyclic phonology to lexical phonology. In H. van der Hulst & N. Smith (Eds.), *The structure of phonological representations* (Vol. 1, pp. 131–175). Foris.
- Lieber, R. (1981). *On the organization of the lexicon* (Doctoral dissertation, University of New Hampshire). Indiana University Linguistics Club.
- Lieber, R. (1992). *Deconstructing morphology*. University of Chicago Press.
- Lieber, R. (2004). *Morphology and lexical semantics*. Cambridge University Press.
- Lieber, R. (2005). Word formation processes in English. In P. Štekauer & R. Lieber (Eds.), *Handbook of word-formation* (pp. 375–427). Springer. https://link.springer.com/chapter/10.1007/1-4020-3596-9_16
- Marchand, H. (1960). *The categories and types of present-day English word-formation*. Beck.
- Marchand, H. (1963). On a question of contrary analysis with derivationally connected but morphologically uncharacterized words. *English Studies*, 44, 176–187.
- Marchand, H. (1964). A set of criteria for the establishing of derivational relationships between words unmarked by derivational morphemes. *Indogermanische Forschungen*, 69, 10–19.
- Marchand, H. (1966). On attributive and predicative derived adjectives and some problems related to the distinction. *Anglia* 84, 131–149.
- Marchand, H. (1972). *Studies in syntax and word-formation*. Wilhelm Fink.
- Mashkoor, M. J. (1961). *A manual on the syntax of the Persian language*. Shargh Press.
- Navon, D., & Gopher, D. (1979). On the economy of the human processing system. *Psychological Review* 86, 214–255.
- Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist* 38(1), 1–4. https://doi.org/10.1207/S15326985EP3801_1
- Pennanen, E. V. (1971). *Conversion and zero derivation in English*. Tampere Yliopisto.



- Pennanen, E. V. (1984). What happens in conversion? In H. Ringbom & M. Rissanen (Eds.), *Proceedings from the Second Nordic Conference for English Studies, Hanasaari/Hanaholmen, 19th–21st May 1983* (pp. 79–93). Meddelanden Från Stiftelsen för Åbo Akademi Forskningsinstitut.
- Quirk, R., & Greenbaum, S. (1987). *A university grammar of English*. Longman.
- Raney, G. E. (1993). Monitoring changes in cognitive load during reading: An event related brain potential and reaction time analysis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19.
- Sadeghi, A. (2001). The change of subject-noun suffix in Persian. In *Historical issues of Persian*. Sokhan.
- Sedighian, M. (1977). The use of noun for adjective. *Sokhan*, (10).
- Shapiro, L. P., & Levine, B. (1990). Verb processing during sentence comprehension in aphasia. *Brain and Language*, 38, 21–47.
- Σtekauer, P. (1996). *A theory of conversion in English*. Peter Lang.
- Sweller, J. (2007). *Keynote address: Cognitive load*. Paper presented at the Symposium on Cognitive Load: Theory and Applications, Fo Guang University, Yilan, Taiwan.
- Twardzisz, P. (1997). *Zero derivation in English: A cognitive grammar approach*. Wydawnictwo Uniwersytetu Marii Curie-Skłodowskiej.
- Vogel, P. M. (1996). *Wortarten und wortartenwechsel: Zu konversion und verwandten erscheinungen im Deutschen und in anderen sprachen* (Studia Linguistica Germanica 39). de Gruyter.
- Zaker, A. (2013). *Conversion in Persian: A functional approach* (Doctoral dissertation), Allameh Tabatabai University.

