In the Name of God

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In-text citation (paraphrase):
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Bednarik, R. G. (2001). Rock art science: The scientific study of palaeoart. Brepols Publishers.
Bednarik, R. G. (2003a). Concerns in rock art science. Aura Newsletter, 20(1), 1-4.
Bednarik, R. G. (2003b). A figurine from the African Acheulian. Current Anthropology, 44(3), 405-413.
Bednarik, R. G. (2003c). Seafaring in the Pleistocene. Cambridge Archaeological Journal, 13(1), 41-66.

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Chapters:

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Websites:

Marshall, M., Carter, B., Rose, K., & Brotherton, A. (2009). Living with type 1 diabetes: Perceptions of children and their parents. Journal of Clinical Nursing,18(12), 1703-1710. Retrieved from http://www.wiley.com/bw/journal.asp?ref=0962-1067

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Gabbett, T., Jenkins, D., & Abernethy, B. (2010). Physical collisions and injury during professional rugby league skills training. Journal of Science and Medicine in Sport, 13 (6), 578-583. doi:10.1016/j.jsams.2010.03.007

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Contents

Journal of Language Research
ZABANPAZHUHI
Quarterly Scientific Journal of Language Research, Vol. 15, No. 49, Winter 2024
Alzahra University, http://jlr.alzahra.ac.ir
Article Type: Research
pp.9-29

Modality- and Task-Specific Impairments in Speaking and Reading: A Case Report From Persian[1]

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Abstract

The question of whether specific patterns of impairment across different language modalities are isolated, associated, or doubly dissociated has been a major theoretical issue in aphasiology. In this paper, we describe modality- and task-specific language impairments in a Persian-speaking patient (AG) with ischemic stroke. AG's overall language impairments were evaluated using the bedside version of Persian Western Aphasia Battery (P-WAB-1), which indicated an Aphasia Quotient (AQ) index of 86. Moreover, his performance on the Reading subtests of the Persian Diagnostic Aphasia Battery (P-DAB-3) indicated a Language Quotient (LQ) index of 60. We also evaluated his word reading, sentence reading, and sentence repetition using the subtests of the Persian version of the Bilingual Aphasia Test (BAT). Based on his performance on these assessment tools during the chronic post-onset time, AG was diagnosed with transcortical motor aphasia. Notably, he exhibited two striking characteristics, namely, (a) a modality-specific dissociation, with severely impaired reading comprehension in

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the face of relatively spared auditory comprehension; and (b) a set of task-specific agrammatic symptoms in verbal expression and out-loud sentence reading in the context of relatively well-preserved sentence repetition. The general characteristics of our patient's grammatical violations also highlight certain universal and language-specific agrammatic impairments. The present clinical linguistic data argue against the existence of monolithic speech-related regions in the brain.
Keywords: aphasia, modality-specific dissociation, task-specific agrammatism, Persian

1. Introduction

It is generally recommended that acquired language disorders should be described in relation to the locus, extent, and etiology of the lesion as well as other premorbid abilities. This approach largely follows from Poeppel and Hickok's (2004) argument about the anatomical shortcomings and functional underspecification of the classical narrow localization brain–language model. For example, there are case reports demonstrating that patients with the same lesion site and etiology behave differently with respect to aphasic deficits (Nilipour et al., 2010). In the present paper, we provide tentative evidence for a dissociation of impairments between two language modalities, that is, reading and auditory comprehension, in a Persian-speaking patient with aphasia. Further inspection of the current clinical linguistic data also reveals task-restricted deficit profiles and some language-particular agrammatic impairments.

2. Associated and Isolated Modality Impairments Revisited

A longstanding controversy in aphasiology revolves around the question of whether the relative degrees of impairment across the four language modalities (i.e., verbal comprehension, speech, reading, and writing) are isolated, associated, or doubly dissociated. Classical aphasiological studies were mostly concerned with the location of independent language processing centers in the brain (Geschwind, 1970). In this localizationist view, they sought distinct aphasia syndromes based on postmortem studies. This finally led to the idea of *isolated modality impairments*, according to which some modalities may be impaired, while others may remain partially or completely intact. Others,

however, have argued that all language modalities may become impaired to approximately the same extent (Duffy & Ulrich, 1976; Smith, 1971). For instance, people with Broca's aphasia who have agrammatic speech would also exhibit impairments in reading and writing grammatical words.

Given that linguistic domains have rich internal structure with numerous subcomponents, Poeppel and Hickok (2004) have argued against the existence of anatomically or functionally monolithic speech-related regions. In this case, we cannot determine with certainty any one-to-one relationship between lesion sites and aphasia syndromes. To provide a more comprehensive account, Pulvermüller (2002) proposed the notion of *neuropsychological double dissociation*. He argues that following associative learning, discrete distributed functional webs are established. However, subsequent to lesions in specific parts of the networks, the strong links among distant neuron ensembles may become functionally separate again. Therefore, it is not too farfetched to expect that one or two modalities may be selectively impaired, while others may remain spared to varying degrees, depending on the lesion site and size.

Evidence accumulated so far demonstrates varying degrees of impairment across different language modalities and linguistic tasks (Assal & Buttet, 1981; Nilipour, 1989; see also Hier & Mohr, 1977). Assal and Buttet (1981) reported a native French speaker (JFM) with a large zone of hypodensity in the left middle cerebral artery following a vascular accident. A striking feature of JFM's language performance was a dissociation between his oral and written disorders. He had expressive and receptive difficulties in both oral and written modalities. His verbal expression was slow and poor in vocabulary, but with no signs of agrammatism. As opposed to his verbal modality, JFM showed typical agrammatic features in the written modality. At reception, his reading comprehension of short commands was superior to that of his severely impaired auditory comprehension. Close inspection of JFM's linguistic profile implied that he was characterized with Wernicke's aphasia in the oral modality and Broca's aphasia in the written modality.

In addition to studies supporting modality-specific language deficits, one aphasic patient (PA) has been extensively reported as reflecting task-

specific agrammatic symptoms (Nilipour, 1989). She was a Persian–English bilingual with a left side cerebrovascular accident (CVA) in the frontotemporal area. Whereas her oral production and comprehension were almost preserved, PA manifested major grammatical violations in Sentence Oral Reading and Sentence Repetition tasks of the BAT (English and Persian versions; Paradis et al., 1987; Paradis et al., 1987). Interestingly, these violations were compatible with the structural properties of each language. For example, whereas her performance in Persian involved omission of grammatical particles, substitution of bound morphemes, and reconstruction of verb inflection, all of the violations in English were omission of grammatical morphemes. This study demonstrated that syntactic processing impairments can be not only restricted to certain linguistic tasks, but also specific to structural properties of languages. Given the site, extent, and etiology of the lesion in the present case, we aimed to examine whether impairments of verbal expression and comprehension parallel patterns of expressive and receptive disorders in the reading modality. To anticipate, the patient exhibits not only modality-based degrees of vulnerability, but also task-based sets of deficit profiles that are in part specific to the structural properties of Persian.

3. Case Description

AG is a 60-year-old right-handed native speaker of Persian, with five years of elementary education. He worked as a company manager and had no history of difficulties with spoken and written language in Persian prior to his illness. He reported to have been previously suffering from high blood lipid levels, however. A few days after experiencing a mild heart attack, he lost his consciousness consequent to an ischemic CVA on the way back home from a journey on February 4, 2018. He was hospitalized in Shahid Beheshti hospital in Qom and fell into a one-month coma. Upon regaining consciousness, he reported to have lost his speech production, repeating only meaningless syllables for the first 30 days. AG was referred to speech therapy and physiotherapy on April 21, 2018 (2.5 months post-onset). By the time of this examination, he has undergone speech therapy once a week for almost 14 months.

His brain scans, taken on February 5, 2018 (Figure 1) and July 29, 2018 (Figure 2), indicate that there is evidence of cerebral edema extending superiorly from the left medial temporal lobe affecting severely the temporoparietal areas. Specifically, it includes the temporoparietal junction, the angular and supramarginal gyri as well as small portions of the superior temporal gyrus. In the left medial frontal lobe, particularly in the Anterior Cingulate Cortex (ACC) of the left cerebral hemisphere, edema is also evident. It should be noted that the extent of edema in the superior temporal and angular gyri decreased by almost one-half over 6 months between scan time points.

Figure 1

AG's CT scan taken on February 5, 2018. Affected regions are plotted onto axial slices.

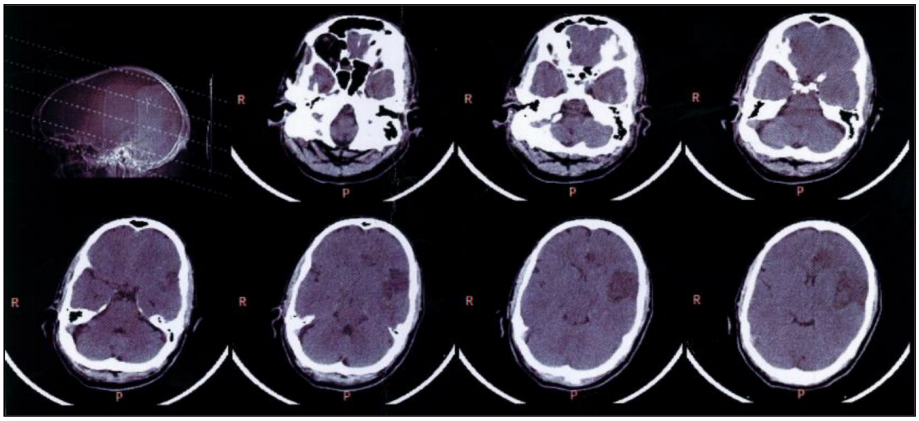
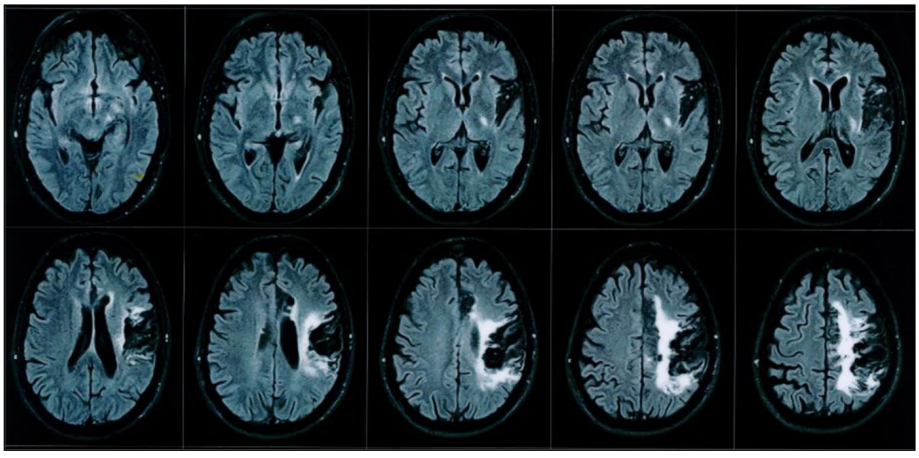


Figure 2

AG's MRI scan taken on July 29, 2018. Affected regions are plotted onto axial slices.



His language impairments were assessed during the chronic phase of aphasia (15 months post-onset). He was alert, well-oriented, and cooperative, with no gross cognitive damage preventing him from concentrating during the three test sessions. No major hearing problems or visual field defects were observed. He suffered from right hemiparesis but had no left-sided sensory-motor deficits. AG could not use his right hand for fine motor activities, but he was able to use his left hand for a very rough sketch of simple words. In addition, we observed acalculia in performing simple mathematical operations. Acalculia is one of the symptoms of Gerstmann's syndrome, which is associated with lesions in the left angular gyrus (Gerstmann, 1940). AG's short-digit span memory was 4.

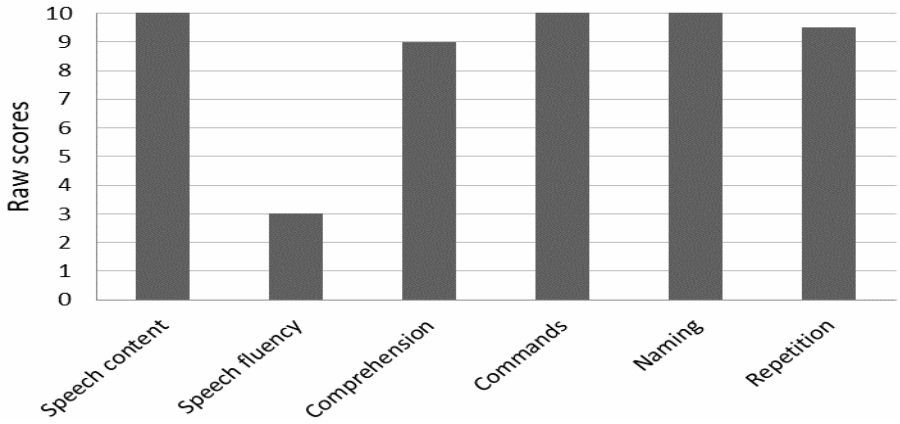
4. Language Assessment Tools

4.1 Evaluation of Oral Skills

In the first session, AG was assessed using the bedside version of P-WAB-1 (Nilipour et al., 2014). Based on AG's AQ index (86 out of 100), his overall severity of aphasia is classified as mild. The clinical picture of his performance on the P-WAB-1 can be summarized as good auditory comprehension, good repetition, good confrontation naming, but nonfluent speech (Figure 3). The subtest of sequential commands was also performed without the least difficulty. Based on the obtained operational index and classical classification criteria (Paradis & Libben, 1987), these symptoms are compatible with a diagnosis of transcortical motor aphasia.

Figure 3

AG's raw scores on the subtests of the P-WAB-1.



The evaluation of AG's spontaneous speech indicated that his verbal comprehension was markedly superior to his effortful and nonfluent expression. It comprised a total of 50 words (43 content words and 7 function words), with an overall mean length of utterance (MLU) of 3.15. His descriptive speech on the Bird Nest Story resulted in 15 utterances comprising 42 words (37 content words and 5 function words), with an overall MLU of 2.8. The fluency rate was 18 words per minute; his type–token ratio was 0.88.

The analysis of AG's connected speech confirmed that it was characterized by laborious articulation, distorted pronunciation of certain words, and imprecise consonant production. These dysarthric speech problems seem to have arisen from the presence of cerebral edema in the ACC of the left hemisphere, which is assumed to have a modulatory influence on some aspects of higher-order motor control such as vocal production (Jürgens & von Cramon, 1982; Paus et al., 1993). He also exhibited instances of omission (e.g., /lune/ "nest" was replaced by [une]), substitution (e.g., /gonješk/ "sparrow" was replaced by [gondet]), and one case of neologism (i.e., /gonješk-hā/ "sparrows" was replaced by [gott-ā]). A description of AG's performance from the elicited speech sample is provided in what follows.

Postposition direct object marker. The post-posed direct object marker /-rā/ was omitted in two instances out of three required contexts; it was used only in one instance (3).

1. *bi-ār-id* *tado-punda* (*s*ado-punzda*h*)[1] *[-rā]*
   V-(IMP: 2PL) N [postp]
   bring sado-punzdah[2] [OBJ]
   bring sado-punzdah
2. *barānkārd* *[-rā]* *āvard-and*
   N [postp] V-(PAST: 3PL)
   stretch [OBJ] brought-they
   they brought (the) stretch
3. *une* (*l*une) *-rā* *bardāt-a-Ø* (bardāšt-*e-Ø*)

[1] The correct pronunciations of words are provided in parentheses.
[2] /Sado-punzdah/ "115" is the emergency telephone number for the ambulance service in Iran.

N [postp] V-(PAST: 3SG)
nest [OBJ] picked up-he
(he) has picked up (the) nest

Possessive morpheme. Possessive morphemes were correctly used in four required contexts.

4. *del-at* (del-a*š*) *[dārad-Ø] be āle-tun* (*h*āle-*š*un) *mi-tud-ad-Ø* (mi-*s*uz-ad-*Ø*)
N-POSS [AUX] prep N-POSS PROG-V: 3SG
heart-her [has-she] for status-their breaking
her heart is broken for their status

Plural morpheme. Grammatical morpheme errors were rare in his speech. However, only in one instance (5) a plural noun was not marked with the regular plural morpheme /-hā/.

5. *[zan] negāh be atte*[1]*-goje[-hā]* (*l*atte-go*n*je*šk*[-hā]) *dārad-Ø*
[N] N prep N[-h*ā*] V-(PRES: 3SG)
[woman] looks at chick-sparrow[s] has-she
[the woman] is looking at (the) hatchling[s]
6. *atte-e gott-ā* (*l*atte-*gonješk-hā) badbax* (badbax*t*) *tod-and* (*š*od-and)
N-LINK N: PL ADJ V-(PAST: 3PL)
chick-of sparrows miserable became-they
(the) hatchling[s] became miserable

Past tense morpheme. AG used past tense morphemes in five required contexts correctly.

7. *doctor mo'ālej-aš kard-Ø*
N N CLITIC V-(PAST: 3SG)
doctor treatment him did
(the) doctor treated him
8. *tu āmbulānt-et* (āmbulān*s-aš*) *godāt-and* (gozāš*t*-and)
prep N CLITIC V-(PAST: 3PL)
in ambulance-him put-they
they put him in (the) ambulance

[1] In AG's local accent, /bačče/ "child" is pronounced /latte/ whose first phoneme /l/ is omitted in his speech.

Conjunctions. The coordinate conjunction /va/ "and" was missing from almost four required contexts; the missing conjunctions were replaced by a long pause.

9. *deraxt vāžegun tod-Ø* (šod-*Ø*) *[va] [mard] pate* (part) *tod-Ø* (šod-*Ø*)
   N ADJ V-(PAST: 3SG) [conj] N N V-(PAST: 3SG)
   tree capsized became [and] [man] fell became
   (the) tree was downed [and] [the man] fell
10. *barānkārd [-rā] āvard-and [va] tu brānkārd-et* (brānkārd-*aš*) *kard-and*
    N [postp] V-(PAST: 3PL) [conj] prep N pro V-(PAST: 3PL)
    stretch [OBJ] brought-they [and] on stretch-him did-they
    they brought (the) stretch [and] laid him on (the) stretch

Nouns. In AG's speech, most of the sentences lacked an agent or experiencer in the subject position. Overall, he used 13 nouns in the elicited speech sample.

11. *[zan] [dārad-Ø] doton-e* (*nešā*n-e) *towar-eš* (šow*h*ar-*a*š) *mi-de-Ø*
    [N] [AUX] N N POSS PROG-V: 3SG
    [woman] [has-he] show spouse-her giving-she
    [the woman] is showing her spouse
12. *[zan] negāh be atte-goje[-hā]* (*l*atte-gon*j*e*šk*[-hā]) *dare-Ø*
    [N] N prep N[-h*ā*] V-(PRES: 3SG)
    [woman] looks at chick-sparrow[s] has-she
    [the woman] is looking at (the) hatchling[s]

Verbs. The verb, which is conjugated for person, number, and tense, was properly used in all required contexts. However, he preferred to use the past tense form of the verbs in four contexts where it was more appropriate to use the present continuous tense form (see sentences 7 and 10). Overall, there was only one case of verb omission.

13. *[zan] telefon [mi-zan-ad-Ø]*
    [N] N [PROG-V: 3SG]
    [woman] telephone
    [the woman] is telephoning

Progressive verb prefix. The obligatory prefix /mi-/, which indicates progressive aspect on the simple present of content verbs, was correctly used in two required contexts (sentences 4 and 11).

Imperative. /be-, bi-/ as an obligatory prefix on imperative verbs appeared once on a morphologically correct form (sentence 1).

Auxiliary. There were two cases of auxiliary verb deletion in two required contexts (sentences 4 and 11).

Pronouns. AG never used independent personal pronouns in his speech. This might be because Persian is a pro-drop language in which personal pronouns are optional. However, he used the clitic pronoun /-aš/ "him" resumptively at the end of nouns (sentences 7 and 8).

4.2 Evaluation of Written Skills

In the second session, AG's written language skills were examined using the Reading subtests of the P-DAB-3 (Nilipour et al., 2015). This battery provides an LQ score as a severity index of oral, written, and reading skills. He obtained a score of 8.5 (out of 20) for his performance on the Reading subtests. Since he was not able to use his right hand for the Writing section, AG exhibited a moderate LQ index (i.e., 60 out of 100).

4.2.1 Reading Comprehension

In this task, Reading stimuli were in a multiple-choice format, and the patient had to choose an appropriate word from among four options to fill in the blanks. At reception, his reading comprehension was markedly inferior to his auditory comprehension. He could answer only the first items that included short simple sentences (score = 12 out of 40). At expression, he showed frequent agrammatism by constantly omitting function words and using morphologically simpler content words. At one point in reading a simple word /barf/ "snow," he repeated /bar-/ a few times, but was not able to identify the last phoneme and replaced it with /g/; this resulted in another word /barg/ "leaf." Nevertheless, he immediately hesitated that this might not be the right word and after several trials in seemingly groping for the right sound, he could finally read the word correctly. A sample of AG's reading performance is presented in the Appendix.

4.2.2 Semicomplex Commands

In reading a number of sentences aloud and then executing the required actions in the correct sequence, AG had a very poor performance. He could understand and execute only one out of a total of six sentences.

4.2.3 Matching Tasks

To evaluate semantic processing, matching tasks were administered by using the same words (six items) in each task. AG's reading of written words and matching them to their corresponding objects and pictures were perfectly performed. He failed to identify two words on matching pictures to words seen. On matching words heard to words seen (four items), he could not respond to two items. He selected either words that were minimal pairs (e.g., /tiz/ "sharp" instead of /miz/ "chair") or words that were phonologically similar (e.g., /polow/ "rice" instead of /pāltow/ "coat").

4.2.4 Recognition Tasks

In the Recognition of Letters (six items), AG failed to identify two letters (score = 4). In the Recognition of Syllabized Words (six items), he was not able to recompose individually presented letters into their corresponding words, particularly in words with more than four letters (score = 3). In the Syllabification task (six items), he had difficulty decomposing words heard into their corresponding individual letters, especially with di- and trisyllabic words. He correctly responded to only two monosyllabic words (i.e., /mār/ "snake" and /āb/ "water").

4.3 Complementary Tests

In the third session, we administered additional tasks, including Word Reading, Sentence Reading, Sentence Repetition, and Matching Sentences to Pictures by using the subtests of the Persian version of the BAT (Paradis et al., 1987) and the P-DAB-3 (Nilipour et al., 2015). AG was successful in reading more than half of the regular and irregular words, but his ability to read nonwords was severely impaired. Although AG was able to repeat almost all the sentences, his sentence reading was characterized by paraphasias, omission of grammatical particles, and structural simplification that resulted in poor sentence-to-picture matching performance.

4.3.1 Reading Regular Words

In this task, the patient read a list of 10 Persian regular words, including eight nouns and two adjectives. The list included seven monosyllabic and three disyllabic words in the Persian version of the BAT (Paradis et al., 1987). He was able to read two words correctly (/barde/ "slave" and /bār/ "burden"), yet four words were characterized by phonemic paraphasia (e.g., [tar] was substituted for /sar/ "head"). He also misread either the initial or the final syllables/sounds of four other words (e.g., [čāne] "chin" was substituted for /dāne/ "seed," [čāy] "tea" for /čāq/ "fat," [xormā] "date" for /xol/ "clumsy," and [panir] "cheese" for /tir/ "arrow"). Overall, he obtained a score of 6 out of 10.

4.3.2 Reading Irregular Words

In this task, AG read 10 Persian irregular words, including concrete, abstract, and proper nouns in the P-DAB-3 (Nilipour et al., 2015). He could read two proper nouns correctly (/kobrā/ and /'isā/) as well as one concrete noun (/roqan/ "oil"). However, four words were characterized by phonemic paraphasia (e.g., [ortid] was substituted for /xoršid/ "sun" and [tiār] was substituted for /xiār/ "cucumber"). He also skipped the initial phoneme in the word /xāb/ and failed to read one word /nok/ "beak." Overall, he obtained a score of 8 out of 10.

4.3.3 Reading Nonwords

The phonological processing of written words was assessed by reading nonwords. This task consisted of 10 nonwords which included two monosyllabic and eight disyllabic items in the P-DAB-3 (Nilipour et al., 2015). AG could not read any of the items correctly. For example, /tarjam/ was replaced by [motardem] (i.e., /motarjem/ "translator"), /xarād/ was replaced by [dordād] (i.e., /xordad/ "the name of a month in Persian calendar"), and /dāxem/ was replaced by [tānom] (i.e., /xānom/ "lady").

4.3.4 Reading Sentences Aloud

This task consisted of 10 sentences of various syntactic constructions and complexities based on the Sentence Reading subtest of the BAT (items 377–386). These sentences were presented to the patient one by one, and he

was asked to read them aloud. AG's performance on this task is presented in Table 1.

Table 1

AG's Performance on the Out-Loud Sentence Reading Task of the BAT

Syntactic structures	Persian sentences	English translation
377. Standard word order, noun as subject or object	/doxtar pesar-rā hol mi-deh-ad-Ø/ pe*t*ar *motkelātun*-rā h*a*l mi-*kon-and*	The girl pushes the boy.
378. Standard word order, pronominal reference	/pedar be xod-aš negāh mi-kon-ad-Ø/ pe*t*ar Ø xod-a*t*	The father looks at himself.
379. Nonstandard word order, OSV for SOV	/sag-rā gorbe gāz mi-gir-ad-Ø/ ag gorbe-rā	The dog is bitten by the cat.
380. Topicalized subject	/in kāmiyun ast ke savāri-rā mi-keš-ad-Ø/ Ø at Ø *t*avāri mi-ke*t*-ad-Ø	It is the truck that pulls the car.
381. Standard word order, negative	/zan ān mard-rā ne-mi-bus-ad-Ø/ Ø mi-bu*t*-ad-Ø	The woman does not kiss the man.
382. Nonstandard word order, negative OSV	/kāmiyun-rā savāri ne-mi-keš-ad-Ø/ *t*avāri-rā mi-ke*t*-ad-Ø	The truck is not pulled by the car.
383. Topicalized object	/in sag ast ke gorbe gāz-aš mi-gir-ad-Ø/ Ø *d*ag Ø Ø gorbe-rā gāz	It is the dog that the cat bites.
384. Standard word order, pronominal reference	/ān-hā donbāl-e u mi-dav-and/ ān-ā-*i ke* donbāl Ø	They are running after him.
385. Nonstandard word order, OSV	/xod-aš-rā ān zan mi-zan-ad-Ø/ *mard* xo*d*-a*t*-ā Ø Ø	The woman hits herself.
386. Nonstandard word order, negative OSV	/savāri-rā kāmiyun ne-mi-keš-ad-Ø/ *t*avāri kāmiyun-rā mi-ke*t*-ad-Ø	The car is not pulled by the truck.

Note. Substitutions are indicated below each word and omissions are marked by Ø.

As in his speech, AG exhibited phonemic paraphasias and one case of semantic paraphasia. The major grammatical violation in his reading was the omission of grammatical particles, including three bound negative morphemes and 10 function words (out of 16 cases) such as the relative clause marker /ke/, the post-posed direct object marker /-rā/, and demonstrative pronouns /in/ "this" and /ān/ "that." There was one case of verb omission in (385) and

one substitution in (377; i.e., /hal mi-kon-and/ "solve" was substituted for the verb /hol mi-deh-ad-Ø/ "push"). AG had a tendency to structurally simplify sentences with nonstandard (noncanonical) word orders (382 and 386) into canonical structures by attaching /-rā/ to the subject constituent in the object position. For example, the sentence *Savāri-rā kāmiyun ne-mi-keš-ad-Ø* "The car is not pulled by the truck" was restructured to *Savāri kāmiyun-rā mi-keš-ad-Ø* "The car pulls the truck."

4.3.5 Repeating Sentences Aloud

In this task, AG was asked to repeat sentences one by one right after the examiner (first author). The items were based on the stimuli in the Sentence Repetition task of the BAT (items 253–259). Apart from constant phonemic paraphasias, AG's ability to repeat sentences was almost perfectly preserved (see Table 2).

Table 2

AG's Performance on the Sentence Repetition Task of the BAT

Persian sentences	English translation
253. /doxtar pesar-rā hol mi-deh-ad-Ø/ pe*t*ar ol	The girl pushes the boy.
254. /u donbāl-e ān-hā mi-dav-ad-Ø/ ān-ā	He is running after them.
255. /in sag ast ke gorbe-rā gāz mi-gir-ad-Ø/ *d*ag at Ø	It is the dog that bites the cat.
256. /in pesar ast ke doxtar hol-aš mi-deh-ad-Ø/ pe*t*ar at	It is the boy that the girl pushes.
257. /savāri-rā kāmiyun ne-mi-keš-ad-Ø/ *t*avāri ne-mi-ke*t*-ad-Ø	The car is not pulled by the truck.
258. /pedar u-rā negāh mi-kon-ad-Ø/	The father watches him.
259. /mādar pesar-aš-rā bidār ne-mi-kon-ad-Ø/ pe*t*ar-a*t*	The mother does not awaken his son.

Note. Substitutions are indicated below each word and omissions are marked by Ø.

4.3.6 Matching Sentences to Pictures

To further assess reading comprehension, we asked AG to read the sentences in the Sentence Reading subtest and then to touch the pictures illustrating them. He had a very poor performance with a score of 2 (out of 10). This failure can be explained by the constant omission of function words and the structural simplification of sentences that utterly reversed their meanings.

5. Discussion

AG's brain scans indicated evidence of cerebral edema in the left temporoparietal language areas during acute and subacute stages. Based on AG's clinical linguistic profile manifested 15 months post-onset, he was diagnosed as having transcortical motor aphasia. This clinical impression was corroborated by his profile on the P-WAB-1 (Nilipour et al., 2014), the P-DAB-3 (Nilipour et al., 2015), and the subtests of the BAT (Paradis et al., 1987). The patient had therapy-induced aphasia recovery as indicated by his language improvements over almost 14 months of speech therapy treatment.

Regarding the extent to which impairments in verbal expression and comprehension may coexist with deficits in the reading modality, the data seem to suggest a different picture in the severity of disorders. That is, the patient's grammatical violations in both reading comprehension and expression were greater and more varied than those in speaking. At verbal expression, his connected speech samples indicated symptoms of an agrammatic patient, yet it was less severe than the grammatical violations in the reading modality. His utterances consisted of short single clauses and his grammar was simple and restricted. Nevertheless, he performed well in the oral naming of objects as well as repeating the dictated words and sentences. AG's impaired oral reading in the context of normal naming and repetition may indicate a perceptual disturbance. Specifically, the omission and substitution errors in identifying the initial or final portions of regular words and nonwords along with the failure to recognize some letters suggest an attentional disorder in the early stages of analysis of visual inputs (Glosser & Friedman, 1995).

In addition to structurally simplifying sentences with nonstandard word orders, AG showed typical agrammatic features by frequent omissions of free grammatical particles and bound morphemes in the Reading tasks. Evidence of morphological regression in verbs included omitting negative morphemes and using the singular form of the verbs. Morphological simplification of nouns manifested in substituting singular nouns for their plural forms. Some of these agrammatic symptoms are reminiscent of patients with *phonological alexia* whose reading of morphemes that serve primarily

syntactic functions is compromised (Patterson, 1982). Furthermore, AG exhibited semantic paralexic errors by substituting semantically-related words for target words, such as /mi-gir-and/ "take" in place of /mi-deh-and/ "give."
At reception, whereas AG's auditory comprehension was almost preserved, his reading comprehension was severely impaired. This suggests that the process by which visual inputs gain access to lexical–semantic processing components may be impaired (Glosser & Friedman, 1995). AG's profile differs from Assal and Buttet's (1981) patient (JFM) whose reading comprehension was superior to his severely impaired auditory comprehension. Thus, unlike cross-modal deficits (e.g., impaired repetition, oral reading, and naming tasks) which suggest an impairment *within* the processing component, the modality-specific dissociation of impairment in the present case (i.e., defective reading comprehension but relatively spared auditory comprehension) may implicate a disorder in *accessing* certain processing components (Glosser & Friedman, 1995).

These observations bring us to the question of whether the pattern of disorders might be task-specific. Indeed, AG exhibited agrammatic symptoms in verbal expression, particularly in oral reading, but his ability to repeat sentences was almost perfectly preserved. The clinical picture of our patient can be compared with that of a previously reported case (PA) by Nilipour (1989). Whereas her oral production and comprehension were preserved, PA exhibited task-restricted syntactic processing impairments in both repetition and out-loud reading. A comparison of PA's lesion site in the left frontotemporal areas with AG's in the left temporoparietal areas as well as their respective clinical classifications as conduction aphasia and transcortical motor aphasia indicates that deficits consequent to different brain regions and corresponding to different types of aphasia are likely to manifest relatively similar sets of performance profiles. Broadly speaking, this is evident in the patients' residual modality-specific capacities with intact oral comprehension, but impaired sentence reading.

We also observed certain universal and language-specific agrammatic impairments that manifested mainly in out-loud sentence reading. Among

universal features, the data show syntactic simplification, lesser accessibility of verbs, and more reliance on canonical forms that are consistent with the data reported from other languages (Menn & Obler, 1990). As for language-specific features, the general characteristics of our patient's grammatical violations are in part consistent with the structural properties of Persian. In accordance with the existing Persian patholinguistic data (e.g., Nilipour, 1989, 2000), these violations can be classified into the following agrammatic deficits, namely, (a) omission of free grammatical morphemes, (b) morphological simplification of nouns, and (c) verb deletion and morphological regression.

The present data are suggestive of nonunitary models of aphasia as a symptom complex phenomenon, such that the classical speech-related regions are not monolithic and aphasic patients' linguistic impairments are likely to manifest varying types and degrees of deficits as a function of site, size, and etiology of the lesion, among other factors (Poeppel & Hickok, 2004).

6. Conclusion

The overall clinical characteristics of our patient's residual linguistic capacities conform to the syndrome of transcortical motor aphasia. The present case is remarkable in two respects. First, he exhibits a modality-specific dissociation of impairment, with relatively spared auditory comprehension but severely impaired reading comprehension. Second, he shows task-specific agrammatic symptoms in verbal expression and out-loud sentence reading in the face of relatively well-preserved sentence repetition. The patient's agrammatic features are also partly consistent with the structural properties of Persian. It is worth noting that since the patient's pathologic condition presented the existence of edema in the absence of more focal cerebral lesions such as traumatic brain damage, these conclusions will have to be verified by future reports from Persian-speaking patients with different clinical histories using the same assessment tools.

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Appendix

A sample of AG's Performance on the Reading (Comprehension) Task of the P-DAB-3

In (5a) and (5b), the singular nouns /mo'allem/ "teacher" and /dānešāmuz/ "student" are substituted for their plural forms /mo'allem-ān/ and /dānešāmuz-ān/, respectively. AG also exhibited cases of semantic paraphasia; for example, in (5a) the verb /mi-rav-ad-Ø/ "goes" is substituted for the verb /bar-mi-gard-and/ "return" (see also sentence 4c). Sentence (6a) includes one case of morphological regression in which the third person plural /hast-and/ "are" is replaced by /ast/ "is" (the third singular of the copula /budan/ "to be") (see also sentence 3a).

Persian sentences	English translation
1. /sarbāz (tofang) dārad-Ø/ *t*arbā*t* *d*ofang	The soldier has a gun.
2. /āqā-ye Karimi māšin va otubus ta'mir mi-kon-ad-Ø. u yek Ø Ø amir (ta'mirkār) ast-Ø/ *mekānik* Ø	Mr. Karimi repairs car and bus. He is a mechanic.
3a. /kešāvarz-ān aqlab gandom, zorrat va sāyer-e qallāt ke*t*āvarz-*i* Ø Ø Ø Ø towlid mi-kon-and/ Ø mi-kon-*ad*-Ø	Farmers often produce wheat, corn, and other cereals.
3b. /ān-hā hamčenin mi-tavan-and (sabzi-jāt) be-kār-and/ Ø hamčen*ā*n Ø Ø *kar mi-kon*-and	They can also plant vegetables.
4a. /bā šoru'-e fasl-e bahār, eyd-e Nowruz āqāz mi-šav-ad-Ø/ Ø Ø Ø Ø Ø	At the beginning of Autumn, Nowruz eve starts.
4b. /mardom dar ta'tilāt-e Nowruz-i be didan-e ham-digar Ø Ø Ø Ø mi-rav-and/ mi-ran	People visit each other in the Nowruz holidays
4c. /va be ham (eydi) mi-deh-and/ Ø Ø Ø mi-*gir*-and	And give Eydi to one another.

5a. /mo'allem-ān dar pāyiz be madrese bar-mi-gard-and/	Teachers return to school in autumn.
mo'allem Ø pāyi*t* Ø madre*t*e mi-*rav*-*ad*-Ø	
5b. /ān-hā be (dānešāmuz-ān) dars mi-deh-and/	They teach students.
Ø Ø dānešāmuz mi-dan	
6a. /qāšoq va čangāl az vasāyel-e qazāxori hast-and/	Spoon and fork are eating utensils.
āšoq Ø Ø vas*ile-ye dad*āxori *ast*-Ø	
6b. /ān-hā az (felez) sāxt-e mi-šav-and/	They are made up of metal.
Ø Ø *d*āxt-e *šod-e ast*-Ø	

Note. Substitutions are indicated below each word and omissions are marked by Ø; the words in parentheses are the correct choice in the Reading Comprehension task.

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Contextualized Text Representation Using Latent Topics for Classifying Scientific Papers[1]

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Abstract

Annually, researchers in various scientific fields publish their research results as technical reports or articles in proceedings or journals. The collocation of this type of data is used by search engines and digital libraries to search and access research publications, which usually retrieve related articles based on the query keywords instead of the article's subjects. Consequently, accurate classification of scientific articles can increase the quality of users' searches when seeking a scientific document in databases. The primary purpose of this paper is to provide a classification model to determine the scope of scientific articles. To this end, we proposed a model which uses the enriched contextualized knowledge of Persian articles through distributional semantics. Accordingly, identifying the specific field of each document and defining its domain by prominent enriched knowledge enhances the accuracy of scientific articles' classification. To reach the goal, we enriched the contextualized embedding models, either ParsBERT or XLM-RoBERTa, with the latent topics to train a multilayer perceptron model. According to the experimental results, overall performance of the ParsBERT-NMF-1HT was 72.37% (macro) and 75.21% (micro) according to F-measure, with a statistical significance compared to the baseline (p<0.05).

Keywords: Article Content Analysis, Contextualized Representation, Distributional Semantics, Neural Network, Scientific Article Classification, Topic Modeling

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1. Introduction

Nowadays, a large volume of scientific papers are published in print and in the electronic format in different countries. This highlights the need to pursue using information science for a pervasive effect on policy making organizations in science. Information science "investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, collection, organization, storage, retrieval, interpretation, transmission, transformation, and utilization of information" (Borko, 1968). One of the tasks in information science is the classification of sciences to make it possible to draw the road map in the field. Since there are different fields of science, accurate classification will be a tough task, especially when dealing with interdisciplinary or multidisciplinary scientific papers. Classification of documents is one of the old tasks of librarians, but due to fast dissemination of research-based articles, this task cannot be done manually any longer. This fact will be severe when a repository of article archives, such as Scopus, contains a huge number of articles. To this end, machine learning methods can be beneficial and pave the ground to reach the goal.

This paper aims at proposing a content-based classification model that takes the advantage of contextualized text representation in a deep neural network model to classify Persian articles.

2. Research Background

Although the classification of scientific articles is, in general, a text classification task, not much research has been done in this domain, specifically to classify scientific papers.

Kim & Gil (2019) used the Term-Frequency and Inverse of the Document-Frequency (TF-IDF) vectorization method (Salton, 1971) and Latent Dirichlet Allocation (LDA) (Blei et al., 2003) for clustering scientific articles. Their proposed method benefited from three kinds of information: users' input, abstracts' keywords, and keywords of the topics extracted by LDA. The

extracted keywords were used to vectorize each paper with TF-IDF and to cluster the papers by the K-means clustering algorithm (MacQueen, 1967), where optimal value of K obtained by the Elbow scheme. The K-means clustering algorithm used in this paper calculates the center of the cluster that represents a group of papers with a specific topic and allocates a paper to a cluster with high similarity, based on the Euclidean distance between the TF-IDF value of the paper and the center value of each cluster. In this research, they utilized 3264 papers published in Future Generation Computer System journal from 1984 to 2017.

To classify scientific papers, Chowdhury & Schoen (2020) evaluated the performance of common machine learning classification algorithms, such as Support Vector Machine (SVM), Naive Bayes, decision tree, and K-Nearest Neighbor (KNN). Their dataset contained 107 abstracts, collected from the abstracts of the articles in science, business, and social sciences. The SVM algorithm performed the best with the 89.5% F1-score.

Rivest et al. (2021) classified 40 million scientific articles using character-based convolutional deep neural networks. They used additional features, such as title, keywords, and authors' affiliation, in the model. Based on the results, simple features, such as direct reference and bibliographic information, had the most significant impact on common classification algorithms and neural networks, respectively.

Mustafa et al. (2021) evaluated the proposed framework using two diversified datasets. One of them is based on research publications from the Journal of Universal Computer Science and another one contains research publications from the Association of Computing Machinery. In their proposed method, metadata, like title and keywords, was extracted from the documents. The metadata's Word2Vec representation (Mikolov et al., 2013) and similarity calculation were the base of their proposed model. Their research experiments resulted in the best average accuracy by 86%.

The above reviewed papers used English documents to build the models and to classify. There are a number of researches accomplished for classification of scientific articles in other languages, such as Persian. The

Persian language, which is mostly considered as a low-resource language, is not much considered in research in comparison to high resource languages, such as English. In the rest of this section, the articles focused on Persian scientific papers are reviewed.

EmamiAzadi & AlmasGanj (2006) used the Probabilistic Latent Semantic Analysis (PLSA) method (Hofmann, 1999) and evaluated the Persian scientific article classification by Farsdat dataset (Bijankhan et al., 1994), including 6 different subjects. They used the authors' specifications to improve the model. The proposed method has enhanced the PLSA model by eliminating inappropriate hidden variables during training.

Teymoorpoor et al. (2009) performed the classification of the indexed articles in International Scientific Indexing in the field of nanotechnology by using an unsupervised model based on information retrieval. The evaluation dataset consisted of 1990 articles from 2003 to 2009. In this research, the hierarchical classification of the nano tree was used. Each article was an observation and each node at a specific level of the nano tree was a label. First, the articles were initially assigned to their class using the nano tree. Then, articles, which were not classified in the initial classification, were categorized using the TF-IDF vector space model and the cosine similarity metric.

Karami et al. (2018) introduced a fuzzy model, named Fuzzy Latent Semantic Analysis, as an approach in topic modeling to estimate the number of topics. They used five different datasets on health and medical research in their experiments, namely MuchMore Springer Bilingual Corpus, nursing notes, Ohsumed collection, Twitter health news, and subsets of the Wall Street Journal dataset. In their experimental results, 69% to 75% of F-measure were obtained.

Rabiei et al. (2019) classified environmental research articles using the SVM algorithm. In this research, they introduced a new method for weighting when constructing vectors that can be used for discovering the representative terms of scientific domains. The data used in this research was 16,626 documents related to the environment field, which have been received from doctoral and master theses archived in Irandoc, the organization of managing scientific articles in Iran.

Shokouhian et al. (2020) presented a hybrid supervised and unsupervised learning model to classify scientific articles thematically in the field of health. To conduct this research, they prepared scientific papers in health from the PubMed database, from 2009 to 2019. They clustered and labeled documents using LDA. Eventually, they utilized vectors obtained from the LDA model to train the SVM classifier.

Ghayoomi & Mousavian (2022) performed research on classifying Persian scientific papers. In addition to the basic classification machine learning algorithms, they proposed using perceptron and convolutional neural networks as well as static representation, Word2Vec (Mikolov et al., 2013), and dynamic representation, ParsBERT (Farahani et al., 2021), for classifying the scientific articles in humanities. The ParsBERT representation with the perceptron model obtained the best result.

3. Contextualized Text Representation

According to the distributional hypothesis, meaning is determined by context, and words that appear in a similar context tend to have similar meanings (Harris, 1954). Hence, contexts of a word have been introduced as an intermediate way to represent semantic meanings. Examples (1) to (4) show that similar contexts imply that the meaning of the words 'auto', 'automobile', 'car', and 'vehicle' are similar.

1. John drives an auto.
2. John drives an automobile.
3. John drives a car.
4. John drives a vehicle.
5. John has a car.
6. John fixed his car.

Vector representation is a semantic representation method (Jurafsky & Martin, 2000). In this method, the semantic properties of words are represented numerically in a vector space which has magnitude and direction. In addition, a vector space is characterized by dimension, and it is possible to use mathematical operations in linear algebra, such as addition or

multiplication, to add or multiply vectors.

The recent attempt by Mikolov et al. (2013) explored contextualized semantic properties proposed by Harris (1954) in a vector space, called word embedding. The result of this method was proposing a single, static vector representation of a word appeared in different contexts. Similar contexts in examples (1) to (4) cause to have similar vectors for the words 'auto', 'automobile', 'car', and 'vehicle'. Since contexts in examples (3), (5) and (6) are different, only one vector will be created.

In addition to this static word embedding method, contextualized word embeddings was proposed by Devlin et al. (2019) to represent different vectors for a polysemous word in a given local context; as a result, the word's meaning and the local context of the target word are reflected in the contextualized vector representation. In examples (7) and (8), we have two vectors for the 'bank'.

7. John walked in the bank.
8. John walked by the bank of the river.

This allows downstream tasks to model a natural language more realistically. Based on Harris theory, the languages of special domains have structures and regularities that can be observed by analyzing the corpora of these domains.

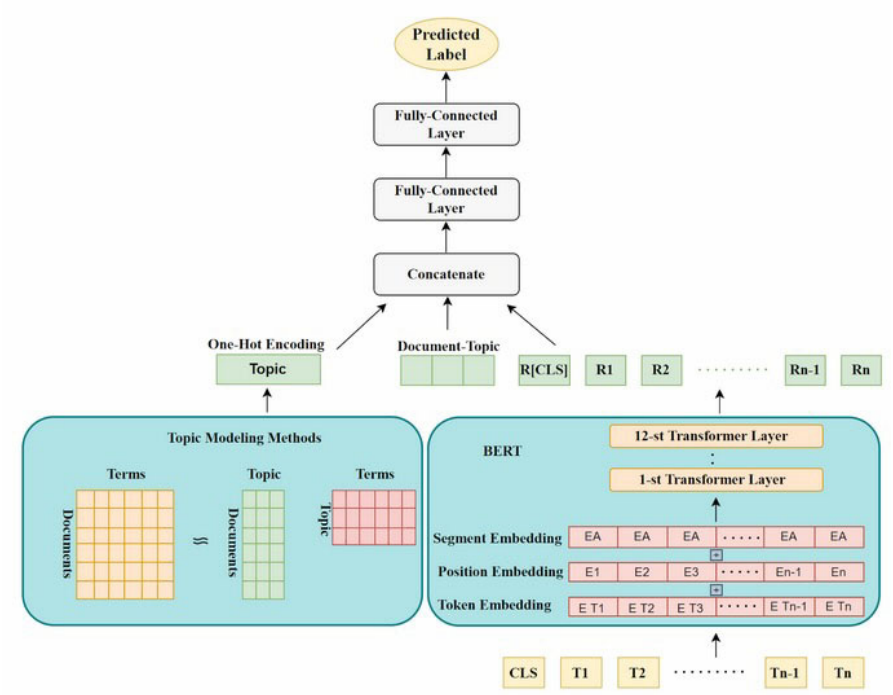
In the current research, we used contextualized representation to learn the structures and word meanings of articles in Humanities, and boosted the performance of the model with the semantic representation of topic modeling methods.

4. Proposed Model

This paper aims at assigning a label to the articles to identify their fields of study. The architecture of our proposed model is described in Figure 1. As it is shown in the figure, the model contains two main modules, namely the representation module and the classification module described in the following sections.

Figure 1

The architecture of the model



4.1. Representation Module

The purpose of developing and implementing this module is to access specific and hidden knowledge in each distinctive domain. The representation of each article in the proposed model contains three different types of representations: 1) contextualized representation of transformer-based language models; 2) probabilistic semantic distribution of articles using topic modeling methods; and 3) one-hot encoding vector of each article's subject. To determine which articles are more thematically similar, we use the topic number of each article as a one-hot vector, which is acquired from the topic modeling algorithms. Each of these three representations contains valuable and diverse information in the dataset. The integration of the concatenated information provides deeper knowledge for each article.

4.1.1. ParsBERT

Transformer-based language models are prevalent among the pre-trained language models since the models obtained the state-of-the-art results.

One of these models is the Bidirectional Encoder Representations from Transformers (BERT) model proposed by Devlin et al. (2019). This model, which is created based on the bidirectional transfer model, supports non-English languages in its multilingual model. Unfortunately, the multilingual BERT has been trained on a limited amount of data for each non-English language. For this reason, the ParsBERT model was proposed by Farahani et al. (2021) to overcome this limitation for the low-resource languages, including the Persian language. As Farahani et al. (2021) reported, the extended model achieved state-of-the-art results compared to other architectures and multilingual models for this language.

The ParsBERT model is based on the BERT model architecture, including a multi-layer bidirectional transformer. Farahani et al. (2021) used the original BERT BASE configuration (12 hidden layers, 12 attention heads, 768 hidden sizes), and trained it with a massive amount of crawled Persian documents.

4.1.2. XLM-RoBERTa

The RoBERTa model (Liu et al., 2019), a multi-layer bidirectional transformer described in Vaswani et al. (2017), was proposed to improve the BERT model (Devlin et al., 2019). The differences between RoBERTa and BERT are the volume of the training data, the batch size, the length of train sequences, the masking pattern, and the Next Sentence Prediction (NSP) task during the pre-training step. They trained the model with a more extensive data set, batch size, and longer sequences. They modified the masking pattern, i.e., using dynamic masking versus static masking in the BERT model, and removed the NSP loss function during the pre-training step. The XLM-RoBERTa model was proposed by Conneau et al. (2020). Its structure was inspired by Cross-lingual MLM (XLM) and RoBERTa models (Liu et al., 2019). Using cross-lingual representation was yielded in XLM-RoBERTa to supply the possibility of transferring knowledge across languages to enhance the model performance.

4.1.3. Topic Modeling

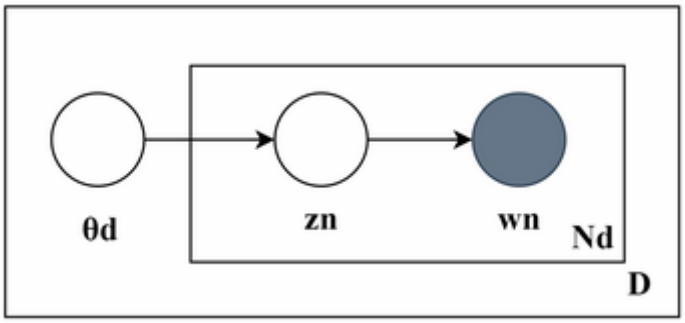
Statistical topic modeling is used in natural language processing to identify the abstract topics that exist in a collection of documents. Topic

modeling is often utilized in text mining to uncover hidden semantic structures. Utilizing topic modeling methods can provide a useful overview of a large collection, individual documents, and the relationship between them. We benefit from two methods for topic modeling, described in the following sections.

4.1.3.1. Latent Dirichlet allocation. Latent Dirichlet Allocation (LDA) proposed by Papadimitriou et al., (2000) is an unsupervised generative probabilistic model for the content analysis of texts. The documents are assumed to be random mixtures of latent topics, where a distribution of words defines a topic. LDA (Blei et al., 2003) is a popular method for topic modeling to illustrate topics by word probabilities.

Figure 2

Graphical model representation of LDA



As shown in Figure 2, given a corpus D consisting of M documents, with document d having N_d words ($d \in 1,..., M$), LDA models D, according to the following generative process (Jelodar et al., 2019):

- Choose a multinomial distribution $\phi(t)$ for topic t ($t \in \{1,..., T\}$) from a Dirichlet distribution with parameter β;
- Choose a multinomial distribution $\theta(d)$ for document d ($d \in \{1,...,M\}$) from a Dirichlet distribution with parameter α.
- For a word w_n ($n \in \{1,..., N_d\}$) in document d;
    - Select a topic z_n from $\theta(d)$.
    - Select a word w_n from $\phi(z_n)$.

The words in documents are the only observed variables in the above generative process, while other variables are latent variables (ϕ and θ) and hyperparameters (α and β). In order to infer the latent variables and hyperparameters, the probability of observed data D is computed and maximized as follows:

$$P(D|\alpha,\beta) = \prod_{0=1}^{M} \int p(\theta_d|\alpha)\left(\prod_{d_n=1}^{N} \sum_{z_{d_n}} p(Z_{d_n} \mid \theta_d)\ p(w_{d_n} \mid z_d,\beta)\right) d\theta_d$$

where α is the parameter of topic Dirichlet prior and the distribution of words over topics, drawn from the Dirichlet distribution given β; T is the number of topics; M is the number of documents; and N is the size of the vocabulary. (α, θ) is defined as the Dirichlet multinomial pair for the corpus-level topic distributions; and (β, ϕ) is defined as the Dirichlet-multinomial pair for topic-word distributions. The variable $\theta(d)$ is a document-level variable for sampling in a document; Z_{d_n} and w_{d_n} are the word-level variables to sample each word in each document.

4.1.3.2. Non-negative Matrix Factorization. Non-negative Matrix Factorization (NMF) was introduced by Févotte and Idier (2011) for text topic learning. According to the experimental results, Chen et al. (2019) proved that NMF performs much better than LDA for short text topic modeling, and NMF learns much higher-quality representative terms for the coherent topics than LDA. NMF was suggested for problems that, given a non-negative matrix V, find non-negative matrix factors W and H such that:

$$V \approx WH$$

The matrix factorization process is done in two steps such that in the first step a set of multivariate n-dimensional data vectors are placed in the columns of an $n \times m$ matrix V, where m is the number of examples in the data set. In the second step, this matrix is approximately factored into an $n \times m$ matrix W and an $r \times m$ matrix H. The factorization process results in a compact version of the original data matrix and locates a structure that is latent in the data. In other words, each data vector v is approximated by a linear combination of the columns of W, weighted by the components of h, where v

and *h* are the corresponding columns of *V* and *H*. In each iteration of the NMF algorithm, the new value of *W* or *H* is calculated by multiplying the current value by some factors that learn the approximation quality. They described cost functions that quantify the quality of the approximation. The cost function can be created using distance measures between two non-negative matrices, such as Euclidean distance. The algorithm's performance shows that the quality of the approximation improves monotonically by using these multiplicative update rules; and these update rules ensure covering the approximation to a locally optimal matrix factorization.

4.2. Classification Module

The MultiLayer Perceptron (MLP) neural network model is employed in our proposed model to classify scientific articles. MLP contains an input layer, one or more hidden layers, and an output layer of fully-connected neurons. This connection is between each neuron in one layer, with each neuron on the next layer. The input signals are guided forward from the inputs to the outputs through the hidden neurons. The number of neurons in the input layer is equal to the number of input variables of the dataset after the data preparation procedure. Equally the number of neurons in the output layer is similar to the number of classes in the dataset.

Feed-forward neural network often has one or more hidden layers followed by an output layer of linear neurons. The hidden layer with a non-linear activation function allows the network to learn non-linear and linear relations between input and output vectors. After fine-tuning the proposed model, the best result will be attained using two hidden layers with the rectified linear unit activation function, and 128 and 16 neurons. The output layer is constructed by 16 neurons and the softmax activation function.

5. Experiments

Our proposed model, shown in Figure 1, is motivated by BERT and the recent advances in transformers architecture, where the BERT pooler output is combined with document-topic distribution of topic modeling methods and

one-hot encoding of the topic number. The merged and enhanced vector feeds into MLP to discover each scientific article subject.

5.1. Dataset

A large number of scientific articles are published annually by researchers in Persian and they are archived either by governmental organizations, such as IranDoc, or institutes, such as the General Humanities Portal[1]. To conduct this research, we used the data prepared by Ghayoomi and Mousavian (2022). This dataset that is crawled from the General Humanities Portal contains 114,170 abstracts of Persian articles belonging to 16 fields of study in Humanities. In our experiments, the corpus is divided into training, validation, and test datasets. The statistical information of each dataset is reported in Table 1.

Table 1

Statistical information of the datasets used in the experiments

Set	Document
training	82202
validation	9134
test	22834

On the portal, the category of each article is defined. We put the effort into providing a uniform distribution of articles while dividing the data. Table 2 presents the statistical information of the dataset in detail.

[1] www.ensani.ir

Table 2

Statistical information of the documents in Humanities

Subject	Train	Validation	Test
Physical Education	3149	381	924
Literature	6357	698	1771
Library Science	1906	206	488
Philosophy and Logic	3514	420	929
Law	3781	430	1029
Art Science	2310	266	623
Geography	7481	824	2065
Social and Communication Sciences	6349	705	1818
History	3551	431	1022
Political Sciences and International Relations	4679	551	1366
Islamic Sciences	8219	914	2268
Economics	7134	839	1992
Women Studies	1498	173	406
Accounting and Management	10545	1104	2920
Psychology	9846	1018	2679
Linguistic	1883	174	534

5.2. Results

We evaluated our proposed model in different scenarios. First, we used the output of LDA as a vector representation to train normal machine learning classifiers, namely random forest, SVM, logistic regression, naive bayes, KNN, decision tree, and MLP. In the set of experiments, the contextualized representations, both ParsBERT and XLM-RoBERTa, were used.

5.2.1. Topic Modeling

We first ran the first set of experiments to find out which classifier with which number of topics can perform the best to do the further experiments. To begin our research, we used NMF and the common LDA topic modeling approaches. The document topic probabilistic distribution is fed to basic machine learning algorithms and SLP and MLP to predict the documents' topic.

The results of training the classifiers with 50, 100, and 200 topics are reported in Table 3. The results indicated that number of 200 topics with the KNN and decision tree, among the basic machine learning algorithms, performed the best and the worst respectively; and this number of topics with MLP performed the best among the entire series of experiments. According to the experimental results, the performance of MLP in comparison to KNN improved by over 3% on the micro F1 measure and over 4% on the macro F1 measure. It needs to be added that using MLP rather than SLP increases the performance by 1.5%. The NMF model rather than LDA has over 2.28% and 3.2% further improvement using SLP and MLP, respectively.

Table 3

Performance of classifiers trained with topic modeling approaches

Model	F1-Measure (micro)			F1-Measure (macro)		
	50	100	200	50	100	200
LDA-RandomForest	59.3	59.77	60.06	52.46	51.49	50.21
LDA-SVM	57.72	58.92	59.78	51.1	51.6	51.55
LDA-LogisticRegression	57.26	58.26	58.87	50.1	50.08	49.74
LDA-NaiveBayes	53.31	54.18	54.72	49.3	50.24	50.92
LDA-KNN	59.14	60.46	61.50	53.15	54.43	55.72
LDA-DecisionTree	40.11	38.14	38	35.53	33.58	33.49
LDA-SLP	58.01	60.34	63.15	51.85	54.44	58.13
NMF- SLP	60.44	62.49	62.78	52.39	55.34	54.48
LDA-MLP	59.52	61.81	64.56	54.78	57.58	60.72
NMF-MLP	62.72	64.57	65.62	56.14	59.16	59.89

5.2.2. Evaluating the Proposed Model

To perform further experiments and demonstrate the proposed model, we set up 8 learning scenarios described in the rest of this section -:

(a) XLM-RoBERTa-MLP (baseline): As a first experiment, the XLM-RoBERTa cross-lingual representation model is enriched with the MLP input. This model is comparable with the LDA-MLP model in

Table 5 since the classifier is the same and only the vectorization method is changed. According to the experimental results, the XLM-RoBERTa-MLP model obtained at least 10% better performance than the LDA-MLP model. We selected this model as the first baseline.

(b) XLM-RoBERTa-LDA-MLP: In this learning scenario, the LDA document topic distribution is concatenated with the XLM-RoBERTa model. The integrated vector feeds directly into fully-connected layers.

(c) XLM-RoBERTa-NMF-MLP: In this learning scenario, the XLM-RoBERTa model is enriched with the NMF document topic distribution. The results indicate that adding semantic distribution features using LDA did not improve the model's performance. Due to the fact that we classify articles based on their abstracts, it is expected to achieve better results with the NMF method than LDA.

(d) XLM-RoBERTa-NMF-1HT-MLP: In this learning scenario, the XLM-RoBERTa cross-lingual representation model is concatenated with the NMF document-topic distribution and one-hot encoding of document topics, thereafter called 1HT, as a feature. The NMF topic modeling method places articles into different clusters according to their subject fields. We add the topic number of each article as a one-hot vector to the model's features to determine which articles are more thematically similar.

As mentioned in the section about ParsBERT, transformer-based language models either do not support low-resource languages, such as Persian, or are limited to a small amount of data if a multilingual model is supplied. Accordingly, we arrange to replace the XLM-RoBERTa cross-lingual representation model with the ParsBERT contextualized representation model and repeat the experiments according to the four previous learning scenarios described as follows:

(e) ParsBERT-MLP: In this learning scenario, the ParsBERT contextualized representation model is enriched with the MLP input. The results of this model are comparable with XLM-RoBERTa-MLP

and LDA-MLP models. Since the classifier of the model is the same and the difference of the models is the vectorization type, we consider this model as the second baseline.

(f) ParsBERT-LDA-MLP: In this learning scenario, the ParsBERT contextualized representation model is concatenated with the LDA topic modeling distribution to evaluate the advantage of using LDA as a feature vector.

(g) ParsBERT-NMF-MLP: In this learning scenario, the ParsBERT model is enriched with the NMF document topic distribution.

(h) ParsBERT-NMF-1HT-MLP: This learning scenario is similar to scenario (d), except that the XLM-RoBERTa model is replaced with the ParsBERT model to utilize the large volume of Persian data used in the pre-training step of ParsBERT.

During the training phase of the model, the parameters of different models were set. Our proposed models with different settings in terms of the semantic representation mode as well as topic modeling are reported in Table 4.

Table 4

The parameters for training models

Parameter	Value
Maximum Sequence Length	128
Learning Rate	2e-6-2e-5
Epoch	3-100
Batch Size	100-500
Optimizer	Adam
Loss	Cross Entropy
MLP(Number of Layers)	5
LDA, NMF(Number of Topics)	200

According to the experimental results reported in Table 5, the BERT-based contextualized representation model performed better than the transformer-based cross-lingual representation model in general. This

improvement determines that the raw data volume used in the pre-training step has a positive impact on the performance of the classifier. Moreover, augmenting the BERT-based contextualized representation model with document topic distributions and 1HT vector performed better than the transformer model.

Table 5

Performance of the proposed learning models

Scenario	Representation Model	Topic	Classifier	F1-Measure (micro)	F1-Measure (macro)
(a)	XLM-RoBERTa	-	MLP	74.02	71.51
(b)		LDA		73.91	70.81
(c)		NMF		73.84	70.68
(d)		NMF-1HT		74.11	71.59
(e)	ParsBERT	-	MLP	74.92	72.41
(f)		LDA		75.02	72.43
(g)		NMF		75.09	72.4
(h)		NMF-1HT		75.21	72.37

Enriching the BERT-based models with topic modeling obtained two different results. The transformer-based cross-lingual representation model was not able to make use of the LDA knowledge; while the contextualized representation model made use of it and it had a slight improvement compared to the baseline. Replacement of the LDA topic modeling model with the NMF model had an improvement on the transformer-based cross-lingual representation model; and it had a positive impact on the contextualized representation model based on the macro F1-measure. The results determined that the acquisition of distributional semantic information via topic modeling eases the challenge of identifying the article's category. Consequently, we put the effort into enriching the semantic information about the article by adding the 1HT feature to the model. According to the experimental results, a slight improvement on the contextualized representation model augmented with the NMF features was achieved. The result still highlights the importance of usability of semantic information to improve the classification task of scientific

articles. The differences in the results of the best model (ParsBERT-NMF-1HT) and baseline (XLM-RoBERTa-MLP) are statistically significant according to the two-tailed t-test ($p < 0.05$).

In Table 5, the best performance of the model was achieved with the ParsBERT-NMF-1HT learning scenario. We used this model to calculate the performance of the model for each topic separately. The results are reported in Table 6. As it can be seen, the Physical Education field obtained the highest and the Women Studies field obtained the lowest performance of the model. The content of the articles in Physical Education field is technical; therefore, it is expected to achieve a better performance. The articles on Women Studies are mostly interdisciplinary and this property of the articles misleads the classifier. Three fields, namely Geography, Psychology, Economics and Literature, obtained the performance between 80 to 90% according to F-measure which we can consider the result relatively high. Moreover, three fields, namely Accounting and Management, Library Science, and Law, obtained a performance between 70 to 80% according to F-measure. Six fields, namely Art Science, Linguistic, Political Sciences and International Relations, Islamic Sciences, Philosophy and Logic, and History, achieved a performance between 60 to 70% according to F-measure which is good enough; and the field of Social and Communication Sciences performs between 50 to 60% according to F-measure.

Table 6

Performance of the ParsBERT-NMF-1HT model in different subject fields

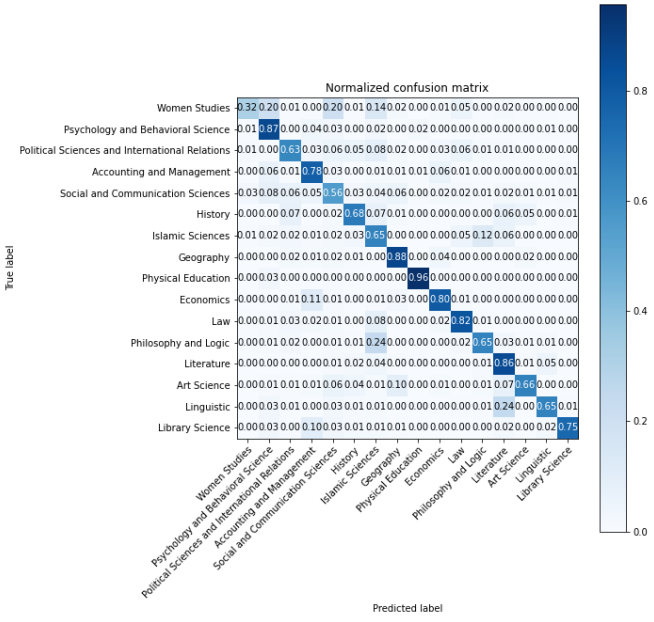
Subject	Range	Precision (per class)	Recall (per class)	F1-Measure (per class)
Physical Education	90<=x	91.37	95.12	93.21
Geography	80<x<90	81.52	89.53	85.34
Psychology and Behavioral Science		81.27	85.06	83.12
Economics		80.95	81.27	81.11
Literature		75.61	83.85	79.51
Accounting and Management	70<x<80	79.51	79.1	79.31
Library Science		77.86	79.3	78.57
Law		69.3	83.38	75.69
History	60<x<70	70.48	71.03	70.76

Subject	Range	Precision (per class)	Recall (per class)	F1-Measure (per class)
Art Science		70.39	68.69	69.53
Linguistic		69.18	66.85	67.99
Political Sciences and International Relations		71.71	62.37	66.71
Islamic Sciences		65.66	65.6	65.63
Philosophy and Logic		67.1	55.11	60.52
Social and Communication Sciences	50<x<60	65.15	55.22	59.77
Women Studies	30<x<40	46.83	32.75	38.55

The confusion matrix of the best performance of the model is represented in Figure 3. As can be seen, articles related to Women Studies are labeled with the lowest result, such as Psychology and Behavioral Science, Social Studies and Communication.

Figure 3

Normalized confusion matrix of ParsBERT-NMF-1HT model results



The articles in the field of Philosophy and Logic are labeled Islamic Science. One reason for misleading the classifier is the interdisciplinary feature of these two fields and content relatedness. The articles in the field of Linguistics are also misled by the classifier, and the wrong label of Literature is assigned.

6. Error Analysis and Discussion

In this section, several incorrectly classified data by the best model, i.e. the ParsBERT-NMF-1HT-MLP model, are examined from the test dataset and analyzed. The error analysis will help to improve future models by solving the deficiencies.

By analyzing and studying the samples in the mentioned table, we discovered that the main subject of interdisciplinary articles is not easily recognizable even by human resources. This issue has led to a reduction in the model's performance in predicting the subject of articles. The keywords in the articles' abstract are related to several topics; consequently, the model has trouble recognizing a single category for the article. Although the distributional semantics of documents and contextualized representation have facilitated this problem, its impact on model's performance is still apparent.

In Example (1), the relatedness of words, such as behavioral disorder, communication, socialization, and distraction to psychology, is undeniable. The bigram 'behavioral disorder' with nine repetitions creates more weight for Psychology rather than Social and Communication Sciences. Therefore, the model's misunderstanding to identify the correct label is not very surprising.

(1)

بازی‌های رایانه‌ای اختلالات رفتاری آموزان پسر دبستانی

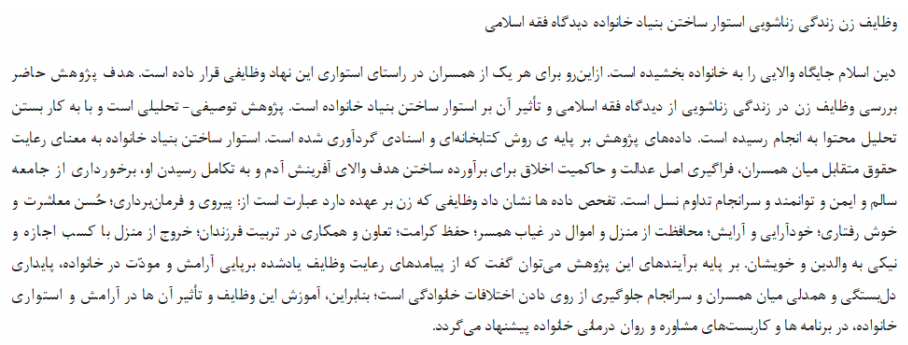
اختلالات رفتاری، اختلالات بسیار شایع و ناتوان‌کننده‌ای هستند که بر تنوعی از عملکردها، به ویژه بر عملکرد مدرسه کودکان اثر می‌گذارند و مشکلات بسیاری را برای معلمان، والدین و خود کودکان و نوجوانان ایجاد می‌کنند و آثار منفی بر یادگیری، ارتباط و کارآیی اجتماعی آنان می‌گذارند. پژوهش ها نشان می‌دهند که شیوع اختلالات رفتاری در کودکان رو به افزایش است و این احتمال داده می‌شود که گسترش روزافزون بازی‌های رایانه‌ای یکی از دلایل عمده آن است. مطالعه حاضر با هدف تعیین رابطه بین میزان استفاده از بازی‌های رایانه‌ای و بروز اختلالات رفتاری دانش آموزان پسر مقطع ابتدایی صورت گرفته است. این پژوهش با روش توصیفی و در قالب یک طرح پیمایشی و مقطعی انجام شد. داده‌های تحقیق، از ۳۱۴ نفر از دانش آموزان پسر که در سال تحصیلی ۱۳۹۲-۱۳۹۱، در پایه‌های سوم تا ششم ابتدایی شهر یزد به تحصیل اشتغال داشتند، جمع آوری شد. این افراد با استفاده از روش نمونه گیری خوشه‌ای چندمرحله ای، از بین ۱۰ مدرسه منطقه یک و دو یزد انتخاب شدند. ابزار سنجش تحقیق آزمون ارزیابی اختلالات رفتاری و پرسشنامه انجام بازی‌های رایانه‌ای بود. داده ها با استفاده از تحلیل واریانس چند متغیری تحلیل شدند. تفاوت معناداری بین دانش آموزان با سطوح متفاوت انجام بازی‌های رایانه ای، از نظر اختلال‌های رفتاری به طور کلی و نیز از نظر سه شکل از اختلال‌های رفتاری؛ یعنی اختلال سلوک، بی قراری و حواس پرتی وجود داشت. استفاده از بازی‌های رایانه ای، عاملی مهم و موثر در ابتلای دانش آموزان به اختلالات رفتاری است و خطر ابتلا به اختلالات رفتاری چون اختلالات سلوک، بی قراری و اختلال حواس پرتی را در بین دانش‌آموزان پسر دبستانی افزایش می‌دهد؛ بنابراین برای کاهش اثرات منفی استفاده بیش از حد از بازی‌های رایانه‌ای و ابتلا به اختلالات رفتاری دانش آموزان دبستانی لازم است تا نظارت بیشتری از سوی والدین بر فرزندانشان در زمینه میزان استفاده از بازی‌های رایانه‌ای صورت پذیرد.

Gold Label: Social and Communication Sciences

Predicted Label: Psychology

The content of the article in Example (2) can be attributed to two topics: Women Studies and Psychology because, on the one hand, the article negotiates with the position and duties of women in the family and, on the other hand, it deals with the relationship between spouses, especially the woman's relationship with her husband. Consequently, true label prediction for the model is problematic.

(2)



وظایف زن زندگی زناشویی استوار ساختن بنیاد خانواده دیدگاه فقه اسلامی

دین اسلام جایگاه والایی را به خانواده بخشیده است. ازاین‌رو برای هر یک از همسران در راستای استواری این نهاد وظایفی قرار داده است. هدف پژوهش حاضر بررسی وظایف زن در زندگی زناشویی از دیدگاه فقه اسلامی و تأثیر آن بر استوار ساختن بنیاد خانواده است. پژوهش توصیفی- تحلیلی است و با به کار بستن تحلیل محتوا به انجام رسیده است. داده‌های پژوهش بر پایه ی روش کتابخانه‌ای و اسنادی گردآوری شده است. استوار ساختن بنیاد خانواده به معنای رعایت حقوق متقابل میان همسران، فراگیری اصل عدالت و حاکمیت اخلاق برای برآورده ساختن هدف والای آفرینش آدم و به تکامل رسیدن او، برخورداری از جامعه سالم و ایمن و توانمند و سرانجام تداوم نسل است. تفحص داده ها نشان داد وظایفی که زن بر عهده دارد عبارت است از: پیروی و فرمان‌برداری؛ حُسن معاشرت و خوش رفتاری؛ خودآرایی و آرایش؛ محافظت از منزل و اموال در غیاب همسر؛ حفظ کرامت؛ تعاون و همکاری در تربیت فرزندان؛ خروج از منزل با کسب اجازه و نیکی به والدین و خویشان. بر پایه برآیندهای این پژوهش می‌توان گفت که از پیامدهای رعایت وظایف یادشده برپایی آرامش و مودّت در خانواده، پایداری دل‌بستگی و همدلی میان همسران و سرانجام جلوگیری از روی دادن اختلافات خانوادگی است؛ بنابراین، آموزش این وظایف و تأثیر آن ها در آرامش و استواری خانواده، در برنامه ها و کاربست‌های مشاوره و روان درمانی خانواده پیشنهاد می‌گردد.

Gold Label: Psychology

Predicted Label: Women Studies

Example (3) discusses women's employment, and contains words from both Economics and Women Studies fields, such as /?ešteqāl=e zanān/ 'women's job'. Such an interdisciplinary topic is challenging to identify the category not only for the human but also for the machine.

(3)

رشد اثر درآمد جنسیتی نیروی ایران ماتریس حسابداری اجتماعی

با توجه به طبیعت متفاوت ساختار تولید در بخش‌های مختلف اقتصاد، رشد این بخش ها اثر متفاوتی بر اشتغال دارد. از سوی دیگر با توجه به تجزیه بازار کار بر حسب جنسیت، اثر رشد بخش‌های مختلف اقتصاد بر اشتغال زنان و مردان نیز متفاوت است. در این پژوهش ساختار شغلی اشتغال زنان در بخش‌های مختلف اقتصادی در ایران و اثر رشد بخشی بر درآمد جنسیتی نیروی کار (مردان و زنان) در چارچوب مدل ماتریس حسابداری اجتماعی بررسی شد. از آنجایی که در ماتریس‌های حسابداری اجتماعی موجود در ایران حساب عوامل تولید خصوصاً نیروی کار بر حسب جنسیتی تفکیک نشده است، در همین راستا هدف اولیه در این پژوهش ارائه روشی به منظور تهیه ماتریس حسابداری اجتماعی که در آن درآمد نیروی کار بر حسب جنسیت تفکیک شده است. سپس بر اساس آن مدل ماتریس حسابداری اجتماعی ارائه و اثر رشد بخشی بر کل درآمد نیروی کار، درآمد نیروی کار زنان، و درآمد مردان به تفکیک مورد بررسی قرار گرفته است. نتایج نشان می‌دهند با رشد بخشی اثرات یکسانی بر درآمد شاغلین زن و مرد ندارد و درآمد نیروی کار مردان با اختلاف زیادی بیش از درآمد نیروی کار زنان افزایش می‌یابد.

Gold Label: Women Studies
Predicted Label: Economics

In the last example, Example (4), words, such as /še?ri/ 'poetic', /šā?erān/ 'poets', /sabk/ 'style', /še?r/ 'poem', and /pārādoks/ 'paradox', represent a literary article. The share of words that are particularly associated with linguistics in this abstract is very diminutive; therefore, the error of the model in this instance is predictable.

(4)

دلایل افزونی بسامد پارادوکس سبک هندی

سبک هندی متمایزترین سبک شعری کلاسیک فارسی است که با سبک‌های قبل و بعد خود تمایزی آشکار دارد و اصول و موازین خاص خود را داراست؛ از جمله این عنصر تمایز بخش بسامد فراوان تصاویر پارادوکسی در کنار صنایعی چون: حسامیزی، تجرید، اسلوب معادله و... است. توجه ویژه شاعران این سبک به پارادوکس و نقشی که این شگرد ادبی در ساختار شعر آن ها دارد، سبب گردید تا نگارندگان این جستار، به بررسی دلایل افزونی بسامد پارادوکس در شعر آن ها بپردازند.بر اساس یافته‌های این تحقیق، تصاویر پارادوکسی دارای کارکردهایی چون: ابهام انگیزی و دشواری، هنجارگریزی، ایجاز، دو بعدی بودن، تازگی و ایجاد شگفتی و لذت هستند که با معیارهای شعری و زیبایی شناختی سبک هندی تناسب و همخوانی فراوانی دارد و همین امر سبب استقبال و استفاده فراوان شاعران این سبک، از این شگرد ادبی شده است.

Gold Label: Linguistics
Predicted Label: Literature

In Tables 7 and 8, we report the F-measures results of all experiments for each class separately. According to the results, the latent topics in most of the subjects are useful for the classifier. This table shows that although the NMF topic modeling performed better than the LDA topic modeling, in general, according to the results in Table 5, the augmented LDA model performed better than the NMF model in the same field with the ParsBERT representation. Four subjects, including Accounting and Management, Linguistic, Political Sciences and International Relations and Women Studies, obtained the best performance with NMF; while in seven subjects, including Physical Education, Geography, Psychology and Behavioral Science, Library Science, Law, Art Science, and Islamic Sciences, obtained the best performance with LDA. Two subjects, namely Literature and Philosophy and Logic, obtained the best performance when no augmented topic modeling is used. However, the augmented NMF and 1HT obtained the best performance for the subjects Economics and Social and Communication Sciences. For History, using either the NMF model solely or the augmented NMF and 1HT model achieved equal results.

Table 7

Experimental results of XLM-RoBERTa for F1-Measure (per class)

Subject	XLM-RoBERTa			
	-	LDA	NMF	NMF–1HT
Physical Education	91.5	93.71	93.52	93.45
Geography	85.19	84.53	84.98	83.81
Psychology and Behavioral Science	82.28	82.81	82.85	83.28
Economics	80.05	78.7	79.22	79.34
Literature	78.87	78.94	78.08	79.74
Accounting and Management	77.93	77.58	78.48	78.45
Library Science	77.94	77.56	77.63	77.32
Law	75.53	75.04	74.42	74.6
History	69.3	68.97	70.2	68.38

Art Science	67.3	65.32	67.16	65.75
Linguistic	66.34	66.85	65.59	63.54
Political Sciences and International Relations	65.32	65.46	66.74	66.08
Islamic Sciences	63.4	62.48	64.64	62.06
Philosophy and Logic	58.86	62.5	62.1	62.73
Social and Communication Sciences	59.73	55.93	58.89	58.56
Women Studies	41.87	41.62	44.06	45.24

Table 8

Experimental results of ParsBERT for F1-Measure (per class)

Subject	ParsBERT			
	-	LDA	NMF	NMF–1HT
Physical Education	93.38	93.68	93.07	93.21
Geography	84.87	86.23	85.92	85.35
Psychology and Behavioral Science	83.2	83.49	82.69	83.13
Economics	80.9	81.04	80.56	81.11
Literature	80.06	80.03	79.98	79.52
Accounting and Management	79.32	78.92	79.35	79.31
Library Science	78.41	79.59	78.17	78.58
Law	75.28	76.67	75.56	75.69
History	69.15	70.61	70.76	70.76
Art Science	69.77	70.55	69.13	69.54
Linguistic	65.93	65.98	68.16	68.00
Political Sciences and International Relations	66.83	66.5	67.12	66.72
Islamic Sciences	63.44	66.69	65.34	65.64
Philosophy and Logic	64.06	58.34	60.64	60.52
Social and Communication Sciences	58.68	59.08	59.54	59.78
Women Studies	41.78	39.58	42.89	38.55

The performance of our presented models is compared with the model proposed by Ghayoomi & Mousavian (2022). To this end, we used the same training and test data as used in the experiments of Ghayoomi & Mousavian (2022). According to the experimental results in Table 9, the ParsBERT-NMF-1HT model as our proposed model improved the previous work by 0.5% according to F1-measure(micro). This determines that enriching the contextualized representation with semantic information about the article, using both LDA and NMF, and adding the 1HT feature have positive impact in comparison to the previous research.

Table 9

Comparing the performance of the proposed learning models with the previous work

Model	Topic	Classifier	F1-Measure (micro)	F1-Measure (macro)
Ghayoomi & Mousavian (2022)	-	SLP	74.71	72.55
Our Experiments	-	MLP	74.92	72.41
	LDA		75.02	72.43
	NMF		75.09	72.4
	NMF-1HT		75.21	72.37

7. Conclusion

This paper implemented the augmented BERT-based models with topic modeling for classifying Persian scientific articles in Humanities. We used the LDA topic modeling method, machine learning algorithms, and multilayer perceptron neural network for the initial experiments. In the initial scenarios, the LDA semantic distribution was fed to MLP neural networks and machine learning algorithms as a representation of abstracts. It became apparent that the MLP neural network model had remarkably better performance than machine learning algorithms. In the second step, knowledge from topic modeling methods, namely LDA and NMF, and transformer-based language models, including ParsBERT and XLM-RoBERTa, were combined and fed into the MLP neural networks to make the model more robust. In this series of

experiments, the NMF topic modeling method and ParsBERT language model had better performance than LDA and XLM-RoBERTa, respectively. Based on the better results from NMF on articles' abstracts as short texts, we designed a new scenario and developed the proposed model. We enriched semantic knowledge of articles by using 1HT feature to determine which articles were more thematically similar. The paper concludes that the contextual information is important and effective in the models to find the relations between the words. Moreover, we found that enriching the models with the topics, extracted from texts, determines that latent semantic properties in texts have a positive impact on the article classification task.

In this paper, we used the data to train the models which had 16 labels for 16 subject fields in Humanities. One direction of this research for the future work is using zero-shot or few-shot machine learning method to extend the number of the fields and the labels as well. The advantage of these machine learning methods is that they require no or very few samples in the training data.

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Comparative Analysis of Speech Rhythm Measures for Persian Speaker Identification: Duration vs. Intensity[1]

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Abstract:

Previous studies have demonstrated the efficacy of speech rhythm measures in speaker identification across various languages with different phonotactic structures. In Persian language, in particular, two categories of speech rhythm metrics were examined: duration-based and intensity-based metrics. Building upon these prior works, the current study delves deeper into the discrimination capabilities of the mentioned measurement types—duration-based versus intensity-based—in the context of Persian speakers. To achieve this, a multinomial logistic regression model was employed on a dataset comprising 20 male Persian speakers, each reciting 100 sentences at a normal speaking pace. Findings revealed that, when distinguishing between Persian speakers, duration-based measures outperform intensity-based ones, however, this excellence is very slight. This observation is significant, as it sheds light on the suitability of specific rhythm metrics for Persian speaker identification. I postulate that this discrepancy in performance may be attributed to the simple syllable structure of Persian and the lesser reliance on intensity as a primary indicator of lexical stress. This research contributes valuable insights into the choice of rhythm metrics for optimal Persian speaker identification and underscores the importance of considering linguistic features when developing speaker recognition systems.

Keywords: forensic phonetics, speaker identification, speech rhythm measures, Persian language

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1. Introduction

Acoustic parameters of speech rhythm, computed over the temporal characteristics of vocalic and consonantal intervals (hereafter referred to as C- and V-intervals), as well as syllabic intensity characteristics have consistently revealed noticeable between-speaker variability in multiple studies (Asadi et al, 2018; Dellwo et al., 2015; He & Dellwo, 2016; Leemann et al., 2014; Moez et al., 2018; Taghva et al., 2023; Weingartova, 2014). These investigations have collectively provided substantial empirical evidence supporting the idea that rhythmic parameters can be influential in distinguishing speakers across different languages, even when these languages are characterized by different phonotactic structures. The initial inquiries into this area primarily emerged from German and Swiss-German speech corpora, the two languages which are traditionally classified as stress-timed. Stress-timed languages are known for their intricate syllable structures and complex consonant clusters, setting them apart from syllable-timed languages, which generally exhibit less complex syllable structures and simpler consonant cluster patterns (Dellwo, 2010). Moreover, stress-timed languages exhibit relatively less variability in the temporal features of both consonantal and vocalic intervals (Dellwo, 2010). Studies focusing on stress-timed languages have consistently demonstrated the capability of speech rhythm metrics to distinguish speakers based on both temporal and intensity-related characteristics of speech (Dellwo et al., 2012; Dellwo et al., 2015; He & Dellwo, 2016).

Subsequent investigations ventured into the realm of syllable-timed languages, typified by Persian, where vocalic intervals tend to be prolonged while consonantal intervals favor brevity. This exploratory line of inquiry was underpinned by the hypothesis that, given the simple syllable structure of Persian and the absence of vowel reduction, there might exist variations in the release of consonant clusters, and consequently, speakers would have less freedom for differentiation (Asadi et al., 2018). However, contrary to initial expectations, these studies yielded consistent results, confirming the effectiveness of both duration-based and intensity-based metrics on discriminating speakers, regardless of the linguistic medium employed (Asadi

et al., 2018; Asadi & Alinezhad, 2022).

Nevertheless, it is important to note that the efficacy of rhythmic speech metrics for speaker identification is not uniform across languages. Comparative analyses of speech rhythm metrics in stress-timed languages, such as German and Swiss German, have demonstrated that intensity measures outperform duration-based metrics (He & Dellwo, 2016). This discrepancy is postulated to arise from the stronger association of intensity measures with underlying anatomical factors. Previous research has indicated that parameters such as the extent of oral aperture and intensity oscillations over time are closely linked to speech production (Chandrasekaran et al., 2009). Consequently, it is plausible that metrics assessing time-integrated intensity variability encompass a richer source of information regarding the idiosyncratic articulatory patterns of individual speakers than interval durations alone. Therefore, intensity-based rhythm metrics may expand the feature space, providing additional orthogonal dimensions for distinguishing different speakers (He & Dellwo, 2014; He & Dellwo, 2016).

Building upon these insights, the question arises as to whether similar outcomes can be expected in a linguistic context that substantially differs from the stress-timed languages of German and Swiss German, such as Persian. Persian exhibits distinct temporal attributes, characterized by longer vocalic intervals and shorter consonantal intervals. These different phonotactic features of Persian compared to the stressed-timed languages might lead one to question whether the efficacy of intensity-based metrics, closely linked to articulatory movements of speech organs, would still hold in this linguistic context. To address this conjecture and to further our understanding of the applicability of rhythm metrics across languages, I propose a comprehensive comparative analysis of both duration-based and intensity-based metrics within the context of Persian. This research endeavor aims to answer the two following research questions:

1) Which set of rhythm metrics, namely intensity-based or duration-based, exhibits superior performance in delineating between-speaker variability in Persian?

2) Which domain of metrics (intensity measures, duration measures, or a composite thereof) yields elevated recognition outcomes?

These questions are of paramount importance as they have the potential to shed light on the generalizability of speech rhythm metrics across diverse linguistic backgrounds and offer valuable insights into the intricate relationship between speech production and rhythm metrics in different languages. Consequently, this comparative analysis contributes significantly to the broader understanding of the role of acoustic metrics in the realm of linguistics and speaker identification.

2. Past research on between-speaker variability in speech rhythm measures

Speech rhythm metrics can be categorized into two distinct domains (Tilsen & Arvaniti, 2013). These domains encompass metrics which are rooted in the temporal duration of speech intervals and metrics which are reliant on the temporal characteristics of the amplitude envelope. These metrics are typically derived from various phonetic units, including CV-intervals (Grabe & Low, 2002; Ramus et al. 2009), syllables or foot (Nolan & Asu, 2009), consecutive CV-intervals (Grabe & Low, 2002), voiced and unvoiced intervals (Dellwo & Fourcin, 2013), and amplitude peak intervals (Marcus, 1981). Earlier studies on speech rhythm measures mainly focused on cross-linguistic rhythmic attributes, revealing that the durational features of C- and V-intervals serve as correlates of language-specific auditory rhythmic characteristics (Dellwo, 2006; Grabe & Low, 2002; Ramus et al., 1999; White & Mattys, 2007). Following this line of research, phoneticians proposed that speech rhythm measurements based on different phonetic regions like CV intervals and syllable units, may also hold the potential to capture between-speaker rhythmic variation within a given language. However, the explanation for the variability inherent in acoustic correlates of speech rhythms has been a subject of debate.

Yoon (2010) conducted one of the earliest studies on between-speaker rhythmic variability, applying rhythm metrics to a group of 10 native English speakers. His findings revealed significant differences in %V and VarcoV among

these speakers. In a similar vein, Wiget et al. (2010) investigated the reliability of various rhythm metrics in a dataset comprising 6 British English speakers. While their results indicated considerable variability across speakers, they emphasized that the sentence structure had the most essential impact on rhythm scores. With a similar goal in mind, Dellwo et al. (2012) examined the acoustic characteristics of speech rhythm in a dataset consisting of spontaneous speech from 8 German speakers. Their findings revealed that despite the variable nature of spontaneous speech, rhythmic measures effectively captured the variations between speakers. Furthermore, their study demonstrated that vocalic durations were more effective than consonantal intervals in showing between-speaker variability. In another study, Leemann et al. (2014) explored between-speaker variability in suprasegmental temporal features using a corpus containing 16 speakers of Zurich German. Their research uncovered a high degree of variability between speakers in both read and spontaneous speech. Additionally, they found that suprasegmental temporal features remained consistent across different speaking styles and channel variations, which enhanced their applicability in forensic casework. In another study, Dellwo et al. (2015) identified strong and consistent between-speaker variability in durational metrics, such as %V, ΔC(ln), ΔV(ln), and ΔPeak(ln), across two German speech corpora with different sources of within-speaker acoustic variability. This study underscored the stability of the investigated rhythmic measures in the presence of within-speaker variability stemming from articulation rate and linguistic structural characteristics.

Following extensive investigations into stressed-timed languages, Asadi et al. (2018) employed specific acoustic metrics primarily derived from CV intervals and syllables in two sets of Persian speech corpora. Their research postulated that the phonotactic structure of Persian, characterized by a simple syllable structure and reduced vowel reduction, may limit the degree of speaker differentiation. Nonetheless, findings in Persian supported earlier observations in stressed-timed languages, indicating that the temporal characteristics of speech rhythm measures effectively expose acoustic variations between speakers, regardless of the language spoken. A significant

outcome of this study was the recognition of %V as a highly influential factor, with the potential to serve as a universal acoustic parameter suitable for forensic voice comparison. Moez et al. (2018) conducted research on another syllable-timed language, namely French, and reported that durational parameters of voiced and unvoiced intervals are significantly influenced by the speaker. Subsequent studies in Persian further confirmed the results originally found by Asadi et al. (2018). Taghva et al. (2021) discovered that metrics like syllable rate VarcoC, %V, nPVI-V, nPVI-VC, ΔC(ln), and ΔPeak(ln) performed exceptionally well in Persian speaker identification. They also highlighted %V as the most crucial parameter for distinguishing between speakers. In the most recent study, Tahgva et al. (2023) applied the same metrics to Kalhori Kurdish, leading to similar findings. They identified %V and syllable rate as the most effective metrics for capturing between-speaker variability in both read and spontaneous speech corpora of Kalhori Kurdish. In general, research utilizing duration-based metrics has consistently demonstrated their ability to reveal substantial variance among speakers in diverse languages, such as English, German, Swiss German, Persian and French.

Following studies on between-speaker rhythmic variability, researchers explored an alternative dimension of speech rhythm measures, suggesting that the aspect related to intensity might also exhibit speaker-related variability. This quantification of speech rhythm in terms of intensity variability was prompted by the well-established connection between mouth aperture size and signal intensity (Chandrasekaran et al., 2009; Garnier, 2008). For example, a wider mouth aperture results in higher amplitude, indicating that idiosyncratic variations in mouth and articulatory organ movements encode a wealth of speaker-specific characteristics related to intensity. He & Dellwo (2014, 2016) proposed the idea that the part of the signal capturing intensity contours may show more speaker individuality because the alternations in mouth opening and closing coincide with the intensity curve of the speech signal. To validate their hypothesis, they applied two sets of intensity variability measures to speech corpora containing speakers from Zurich German and Northern German. The results demonstrated a significant

amount of between-speaker variability across both datasets. Importantly, they found that intensity measures contained more speaker-specific information than measures based on the temporal characteristics of speech, attributing this superiority to their association with anatomical factors. Persian was also investigated in terms of intensity-based measures (Asadi & Alinezhad, 2023). Initially, it was anticipated that given Persian's emphasis on duration as the primary indicator of lexical stress (Sadeghi, 2011), between-speaker intensity variability might be less observable in Persian. However, the results emerging from the analysis of Persian corpora demonstrated that speech rhythm measures derived from the amplitude envelope of the signal still retain the capacity to capture between-speaker variability in Persian.

In summary, previous research underscores the efficacy of speech rhythmic metrics in delineating acoustic variations among speakers. These studies posit that speech rhythm measures are closely intertwined with anatomical factors that are less subject to conscious control by speakers. Nevertheless, they do not discount the relevance of language-specific attributes. Specifically, this study aims to juxtapose the efficacy of two categories of speech rhythm metrics - namely, duration-based and intensity-based metrics - with the dual objectives of determining which domain exhibits superior performance and extending prior findings to ascertain whether the contribution of speech rhythmic metrics is solely a product of biological predispositions or if linguistic elements also wield influence over these acoustic features, thereby broadening our understanding of the intricate dynamics underpinning speech variability.

3. Materials and Methods

3.1. Data collection and segmentation

A corpus of 20 native male Persian speakers, specifically of the Tehrani variety, with an age range spanning from 22 to 35 years, were instructed to articulate a set of 100 sentences at a normal speaking pace, punctuated by 3-second intervals between each sentence. Subsequently, the speech samples underwent detailed analysis using Praat software (version 5.2.34, Boersma & Weenink, 2013) and were annotated across three distinct tiers: segments,

syllables, and peak tiers. In the initial step, the onsets and offsets of speech segments were meticulously marked through manual annotation, utilizing Praat's built-in annotation function. The syllable tier, on the other hand, was carefully delineated through manual annotation performed by the author. A Praat script *DurtaionAnalyzer*[1] was used to calculate automatically all duration-based speech rhythm measures. Computational calculations for intensity-based measures were carried out within the Praat environment, facilitated by a script developed by Lei He from the University of Zurich.

3.2. Acoustic rhythmic parameters

Building upon the influential speech rhythm metrics that exhibited reasonable success in forensic voice comparison studies, two sets of speech rhythm metrics were devised. For this study, duration-based measures derived from CV intervals and syllable units of speech signals were selected. To mitigate potential distortions introduced by speech rate variations, rate-normalized measures were exclusively applied. Drawing upon established temporal measures within the realm of speech rhythm research (Asadi et al., 2018; Asadi & Alinezhad, 2023; Dellwo et al., 2012; Grabe & Low, 2002; Leeman et al., 2014; Ramus et al., 1999), I employed acoustic rhythmic metrics on the collected dataset. In total, I selected five duration-based measures as follows: one vocalic duration ratio (%V), two consonantal and vocalic duration variability measures (ΔV(ln), ΔC(ln)), one rate-normalized vocalic variability measure (n-PVI-V). Additionally, the articulation rate (the number of syllables per second) was calculated from the syllable tier and the following duration-based measures were obtained from the CV interval tier (Dellwo et al., 2015; Leemann et al., 2014):

- %V: proportion over which speech is vocalic;
- ΔV(ln): standard deviation of the neutral log normalized durations of vocalic intervals;
- ΔC(ln): standard deviation of the neutral log normalized durations of

[1] This script is available on http://www.pholab.uzh.ch/static/volker/software/plugin_durationAnalyzer.zip.

consonantal vocalic intervals;

- n-PVI-V: rate-normalized averaged durational differences between consecutive vocalic intervals.

From the intensity contour, I quantified both the mean (M) and peak (P) intensity corresponding to a speech syllable. To obtain the amplitude envelope of the signal, a full-wave rectification was performed on the signal, followed by low-pass filtering at 10 Hz. The mean syllable intensity was determined by summing the intensity values within the contour delineated by syllable onset and offset and then dividing this sum by the duration of the syllable. Likewise, the peak intensity was computed at the syllable peak point using cubic function interpolation. The following intensity measures (He & Dellwo, 2016) were calculated:

- stdevM: the standard deviation of average syllable intensity levels;
- stdevP: the standard deviation of syllable peak intensity levels;
- varcoM: the variation coefficient of average syllable intensity levels (normalized stdevM);
- varcoP: the variation coefficient of syllable peak intensity levels.

3.3. Statistical Analysis

The statistical analysis of the data was conducted using R (R Core Team, 2021) version 4.2.2,. Initially, a Pearson pairwise correlation was employed to examine the extent of correlation between the duration-based and intensity-based measures. This preliminary analysis aimed to ascertain whether these two distinct sets of metrics fall within different categories. Highly correlated measures indicate a substantial overlap in the information they convey, while measures with low or negligible correlations do not share similar information. Next, a multinominal logistic regression model using the assembled speech data was constructed to address the question of which type of rhythmic metrics better accounted for between-speaker variability. In this model, the speaker was designated as the nominal response variable, and the chosen acoustic parameters were treated as predictors. To quantify the extent to which each intensity-based and duration-based measure contributed to

explaining between-speaker variability, I computed the likelihood ratio χ^2 for each acoustic parameter. This value was then divided by the sum of likelihood ratio χ^2 values for all parameters, providing a measure of the proportion of between-speaker variability attributable to each specific acoustic parameter. To express the variability explained by each measure as a percentage, I calculated the percentage of χ^2 values for each measure over the sum of all χ^2 values for all measures. The χ^2 value of the final model was calculated by taking the difference between the -2 log-likelihood ratios (-2LL) of the null model and the final model. Likewise, the χ^2 value of each tested measure was computed by taking the difference between the -2LLs of the final model and each reduced model.

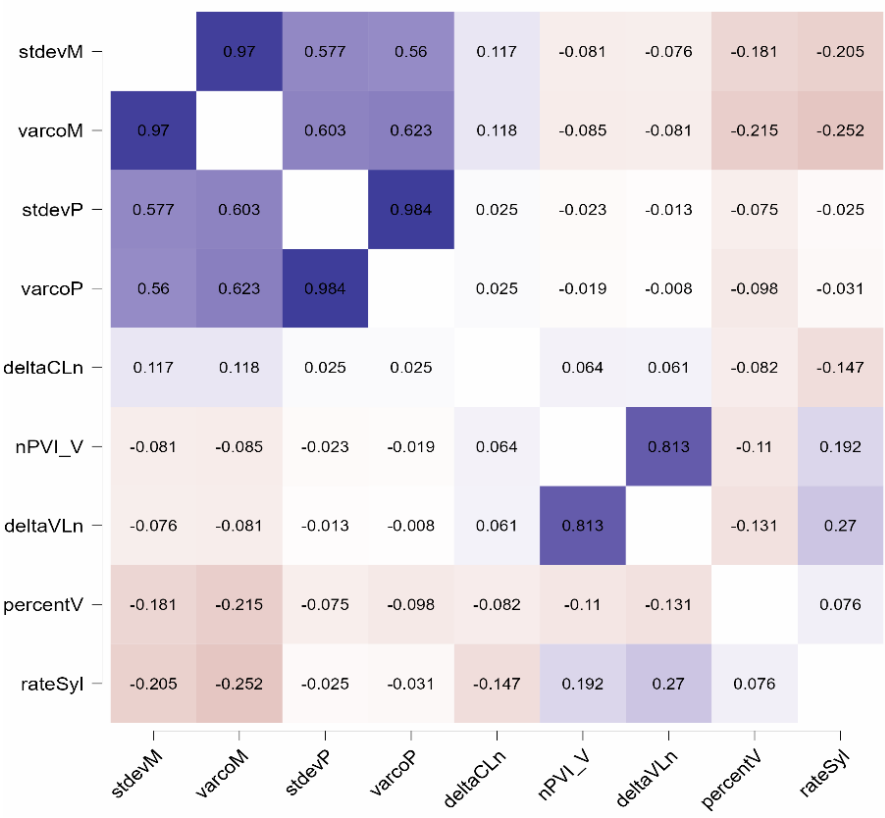
4. Results

4.1. Correlations between speech rhythm measures

I conducted pairwise correlation analyses among the speech rhythm measures to assess their predictive relationships with one another. Figure 1 illustrates the pairwise correlations between the duration-based and intensity-based measures in the collected dataset. The findings depicted in Figure 1 highlight a substantial interdependence among intensity-based measures. Furthermore, correlations among all duration-based measures, with the exception of %V and syllable rate, are substantially high. These results indicate that %V and rate of syllable form distinct categories that exhibit minimal correlation with both other duration-based measures and intensity-based measures. The robust correlations within each measurement type, whether duration-based or intensity-based, suggest that these metrics convey unique information and belong to separate categories. As indicated by Figure 1, these two sets of measures encapsulate distinct insights into speech rhythm variability, and, therefore, a combined analysis of both sets can provide a more comprehensive understanding of the speaker-specific characteristics within speech signals.

Figure 1

Correlation matrices showing Pearson's correlation coefficient r of the intensity and durational speech rhythm measures in our corpus. All correlations were highly significant (p < 0.005).



4.2. Comparative analysis of speech rhythm measures using multinomial logistic regression

In order to ascertain which types of rhythmic measures most effectively explained between-speaker variability, a multinomial logistic regression model was developed using the collected dataset. Results demonstrated that the effect of the speaker was highly significant for all the tested rhythmic measures. As revealed in Table 1, the most substantial effects were observed for the measures %V and syllable rate, closely followed by varcoP and stdevP. This outcome suggests that the most salient parameters indicative of speaker individuality primarily fall within the domain of duration-

based metrics. Nevertheless, it is worth noting that intensity-based measures also demonstrated commendable performance. The metrics obtained from peak intensity contours collectively explained roughly 29% of the between-speaker variability, while intensity metrics derived from the mean intensity contours accounted for approximately 19% of the acoustic rhythmic variability among speakers. The individual impact of each of the 9 predictors in the regression model is visually depicted in the radar chart presented in Figure 2. The length of the radius associated with each measure correlates with its weight in the created model, signifying the relative importance of each intensity measure in explaining variability between speakers.

Findings concerning the most effective parameters for capturing between-speaker variability in Persian highlight %V and syllable rate as the top parameters within the duration-based category. %V and syllable rate accounted for approximately 23% and 21% of the acoustic rhythmic variability in Persian speakers, respectively. Among intensity-based measures, stdevP and varcoP emerged as the most robust parameters for characterizing speaker identity. StdevP and VarcoP, derived from peak syllable characteristics, collectively contributed to approximately 28% of the acoustic rhythmic variability among speakers. Figure 3 presents boxplots illustrating the between-speaker variability observed in %V and varcoP, respectively. Upon exaining the correlation heatmap (Figure 1), it is apparent that there is a relatively low correlation between these top parameters. Even though %V and syllable rate both fall within the same category, they exhibit minimal correlation. This is a significant finding, as it suggests that these parameters convey distinct information, thus making them suitable for combination in speaker identification.

Table 1

Summary of the results of multinomial logistic regression on speech rhythm measures

-2 Log Likelihood of Reduced Model		χ2 [df]		P	Variability explained
Model fitting information					
null model	12941.563				
full model	7287.641	5653.924[171]		<0.0001	
Likelihood ratio test of each speech rhythm measure					
stdevM	7582.546	294.906 [19]		<0.0001	9.50%
varcoM	7590.376	302.736 [19]		<0.0001	9.81%
stdevP	7742.691	455.051 [19]		<0.0001	14.66%
varcoP	7728.237	440.597 [19]	∑χ2 = 3076.677	<0.0001	14.19%
%V	8000.653	713.014 [19]		<0.0001	22.97%
ΔVln	7368.771	81.131 [19]		<0.0001	2.61%
ΔCln	7437.624	149.984 [19]		<0.0001	4.83%
n-PVI-V	7314.323	26.684 [19]		<0.0001	0.85%
Syllable rate	7926.898	639.258 [19]		<0.0001	20.59%

Figure 2

Radar chart depicting the relative contributions of each analyzed parameter within the multinomial logistic regression model for speaker variation

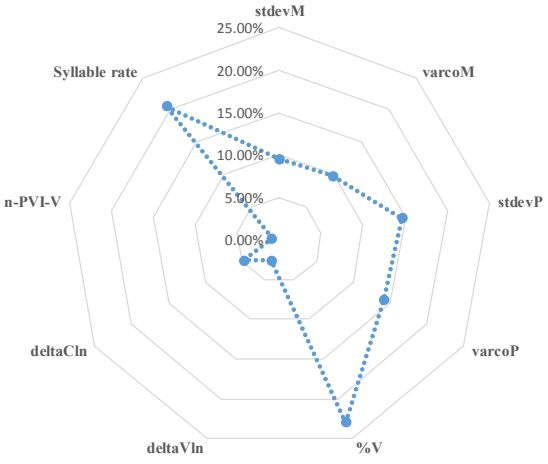
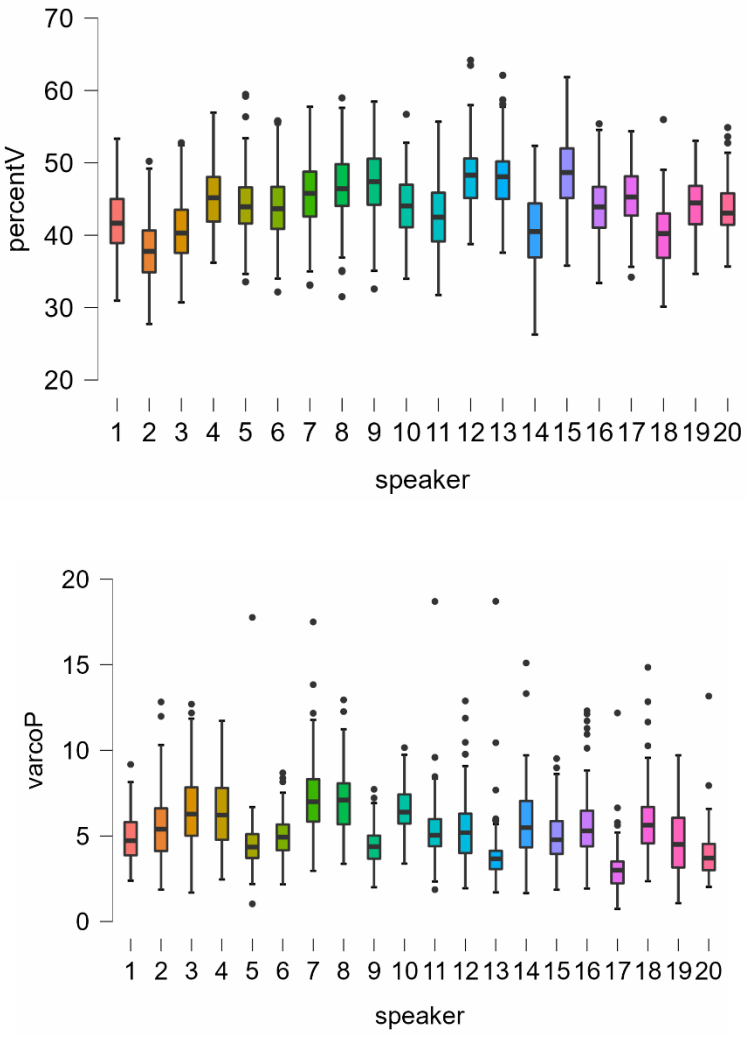


Figure 3

Boxplots showing speech rhythmic variability for %V (top) and VarcoP (bottom)



5. Discussion

In this study, I selected a diverse set of speech rhythm measures from different categories, encompassing both duration-based and intensity-based metrics. The primary objective was to assess which category of these metrics is better for capturing between-speaker variability in Persian. Initially, a pairwise Pearson correlations was performed to evaluate the predictive relationships among these parameters. This finding suggests that these two disparate

categories of speech rhythm measures offer distinct and complementary information about speech signals produced by individual speakers. Consequently, it becomes apparent that the fusion of these categories has the potential to yield more robust and comprehensive results in the realm of speaker identification. A closer examination of the correlation heatmap (see Figure 1) highlights that intensity-based measures display a strong interdependence among themselves, with a high level of correlation. In contrast, the duration-based measures exhibit more varied correlation patterns. As is shown in Figure 1, a high correlation was observed between ΔV(ln) and n-PVI-V, indicating that these two measures, both derived from vocalic intervals, convey similar information. However, the remaining duration-based parameters demonstrated relatively weak correlations.

Based on the data analysis, duration-based measures emerged as the more effective set of metrics when compared to their intensity-based counterparts, despite a relatively modest difference in their performance. This superior performance can be examined from two key perspectives. Firstly, the results of the multinomial logistic regression analysis unequivocally highlighted that duration-based measures, particularly %V and syllable rate, wielded the most significant influence in distinguishing between speakers when compared to the other duration-based parameters. %V and syllable rate, in combination, accounted for approximately 43% of the acoustic rhythmic variability among speakers. This finding underscores the significant influence of these two specific measures on excellence in duration-based metrics. A second perspective that significantly contributes to our understanding of the data stems from the examination of the pairwise correlation analysis. Intensity-based measures exhibited noticeable correlations among themselves, indicating redundancy in the information they extracted from the speech signal. In contrast, when we turn our attention to the duration-based measures, particularly highlighting the prominent parameters of %V and syllable rate, we observe weak correlations with the remaining metrics. This observation holds profound significance as it aligns with the insights of Rose (2002), who noted that an assemblage of acoustic parameters with low inter-correlations often

leads to enhanced discrimination performance. Hence, it can be reasonably inferred from the results that combining the most effective duration-based parameters, specifically %V and syllable rate, with intensity-based measures derived from the peak contours of intensity, such as varcoP and stdevP, may yield a better performance in the context of Persian speaker identification. This synthesis of parameters bridges the inherent strengths of both duration and intensity measures, culminating in a holistic approach that leverages the linguistic features of Persian and the subtleties of acoustic rhythm to advance the accuracy and reliability of speaker differentiation.

Upon scrutinizing the performance of the two domains of the analyzed rhythmic measures, these findings revealed that duration-based metrics exhibited a greater performance in discerning Persian speakers. However, it is noteworthy that intensity-based measures also yielded commendable results, albeit to a slightly lesser extent. One plausible rationale for these observed patterns can be traced back to the phonotactic structure of the Persian language. It is well-documented that syllable-timed languages, such as Persian, exhibit a higher percentage of vocalic intervals (%V) and shorter ΔC (the standard deviation of C-intervals), resulting in more compact and evenly distributed C-intervals (Dellwo & Wagner, 2003; Ramus et al., 1999). This phenomenon could provide speakers of syllable-timed languages with a greater degree of flexibility in modulating the vocalic aspects of their speech. The rich diversity of vocalic intervals in Persian allows for a more nuanced expression in speech, contributing to the effectiveness of duration-based measures, particularly %V, in capturing the rhythmic variability among speakers. Furthermore, this study highlights the significance of syllable rate as a crucial factor in showing variations among Persian speakers. At the syllable level, syllable-timed languages are often characterized by reduced complexity and typically lack vowel reduction. This linguistic feature affords their speakers increased flexibility in both syllable production and rate. In the case of Persian, the relatively simple syllable structure and the absence of vowel reduction may have been instrumental in generating variations in syllable rates among speakers.

Findings of this study, showcasing the superiority of duration-based measures over intensity-based ones, are in contrast with the conclusions drawn by He & Dellwo (2016), who found that intensity-based measures were more effective in distinguishing between German speakers. Their postulation centered on the notion that intensity-based measures were more closely linked to the idiosyncratic movements of speech articulatory organs, with a particular emphasis on those influencing the area of mouth opening. This contrast in findings underscores the importance of the relationship between speech rhythm measures and the linguistic and phonetic characteristics specific to each language. When comparing the results of this study to those of He and Dellwo (2016), it becomes clear that, although intensity-based measures perform adequately in the context of Persian, their performance still is not on par with %V and syllable rate, two key durational measures. The differences in intensity variability across languages can be attributed to a multitude of factors. One contributing factor is the complexity of syllables, which significantly impacts the systematic variability in speech rhythm measurements (Prieto et al., 2012). It is generally assumed that languages with more phonotactically complex structures exhibit higher levels of intensity variability than languages with simpler structures. Another important factor influencing the variability of intensity-based rhythmic measures is vowel reduction. Languages that allow vowel reduction tend to exhibit higher syllabic intensity because reduced or centralized vowels produce lower amplitude envelope levels, resulting in lower intensity levels in terms of mean intensity or peak intensity (He, 2017). Persian, categorized as a syllable-timed language (Lazard, 1992; Windfuhr, 1979), adheres to a simple syllable structure (CV(C)(C)), and it lacks the vowel reduction patterns found in stress-timed languages (Bijankhan, 2018; Lazard, 1992, 2010; Sadeghi, 2015; Windfuhr, 1979). Taking into account these considerations and exploring the multifaceted interplay between language-specific attributes and speaker variability, it becomes evident that the linguistic characteristics of Persian wield a substantial influence over the observed variations in intensity measures among speakers.

An alternative explanation for the superior performance of duration-based measures in Persian, as compared to the less effective performance of intensity-based measures, can be attributed to the way in which Persian signals lexical stress. The identification of lexical stress in languages is a complex process influenced by a multitude of interconnected perceptual factors (Fry, 1958). Languages that rely on intensity as a primary acoustic cue for indicating lexical stress or prominence typically exhibit higher levels of intensity variability when compared to languages that do not heavily rely on intensity to signal stress placement (Wang, 2008). In the case of Persian, duration is regarded as the most reliable indicator of stress, whereas intensity serves as a less reliable indicator of stress position in Persian (Sadeghi, 2011). Given this linguistic feature, it is reasonable to infer that the intensity levels of speech signals in Persian would be less affected by speaker individuality when compared to languages where intensity plays a more prominent role in stress placement. In Persian, the emphasis on duration as the primary marker of lexical stress may result in a relatively consistent intensity pattern across speakers, making intensity-based measures less effective for distinguishing among them.

In light of the various factors that have been discussed, it becomes increasingly evident that the linguistic characteristics of Persian play an important role in shaping the observed variations in speech rhythm measures among speakers. Our findings shed light on the fact that speech rhythm metrics are not solely a product of biological variability but are equally molded by linguistic factors. The intricate interplay between these biological and linguistic dimensions plays an integral role in defining the unique acoustic profiles of individual speakers. These insights underscore the importance of considering linguistic characteristics when delineating the most appropriate acoustic parameters for forensic voice comparison. Such considerations extend beyond the mere acoustic variability within speech and encompass the underlying linguistic structures and patterns that help shape these acoustic characteristics. Recognizing the profound impact of language-specific features on speaker differentiation is important in advancing the precision and reliability of voice

analysis, particularly in the realm of speaker identification and related applications.

In sum, this study emphasizes the multifaceted nature of speech rhythm measures, where both the biological attributes of the speakers and the linguistic traits of the language they speak converge to define the acoustic landscape of speech. Acknowledging the intricate relationship between these factors is fundamental to enhancing the accuracy and effectiveness of forensic voice analysis, ultimately contributing to the advancement of the forensic voice comparison field and its applications.

6. Conclusion

This study extends the previous works on Persian speaker identification using various speech rhythm measures. Previous works showed that speech rhythm measures extracted from CV intervals and syllable intensity have the capability to show speaker variability in Persian. In this study, I have taken a step further by conducting a comparative analysis of rhythmic metrics stemming from different categories of speech rhythm measures. Through this investigation, I sought to discern the most effective domain of rhythmic parameters for capturing between-speaker variability. This study has revealed that speech rhythm metrics computed from the durational aspects of speech, especially %V and syllable rate, exhibit slightly superior performance when compared to those derived from the amplitude envelope of the signal. However, it is essential to acknowledge that intensity-based measures, especially those extracted from syllable peaks, have also demonstrated commendable performance in capturing the variations among Persian speakers. The relatively low correlation observed between duration-based measures and intensity-based measures suggest that a combination of these two categories of measures might lead to more robust results in speaker identification tasks. Interestingly, these findings differ from previous studies in which intensity-based measures were found to perform better. I hypothesize that this discrepancy may be attributed to the phonotactic structure of Persian, which plays a significant role in shaping the between-speaker variability observed in this study. Findings

clearly showed that the importance of considering the linguistic characteristics of the target language in the interpretation of acoustic measures for speaker identification cannot be understated.

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The Impact of Gender, Age, and Education on Language Attitudes among Kurdish Speakers in Mahabad: A Matched-Guise Approach[1]

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Abstract

This article examines the impact of gender, age, and education on the attitudes of Kurdish speakers in Mahabad towards standard Persian and the Kurdish language. Since people's emotions towards their own or others' languages are related to their language attitudes, this important component plays a significant role in measuring success in language planning, learning speed, language selection and use, and predicting the extinction or sustainability of a language. The study's statistical population consisted of 80 Kurdish-Persian bilinguals in Mahabad who were randomly selected. This study is situated within the theoretical framework of sociocognitive linguistics, and the research perspective was measured through an indirect method (matched-guise test). After distributing the questionnaire and conducting the matched-guise test, the collected data were analyzed. The results of the statistical analysis showed that the variables of gender, age, and education in Mahabad had no significant impact on the attitudes of bilingual Kurdish speakers towards standard Persian and the Kurdish language. The Kurdish speakers of Mahabad exhibited numerically positive attitude towards the standard Persian language compared to Kurdish language, but no significant difference in terms of any of the mentioned variables was observed between the two languages under study.

Key words: Sociolinguistics, Language attitude, Bilingualism, Matched-guise test

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1. Introduction

Language is a social institution, which means that the people of a community have established it in the order to know each other's intentions and to communicate, so language should be examined in society because communication occurs in society. People think based on their own personal experiences, and this leads to their different attitudes. So, the study of the language attitude in the society is of great importance and by examining it, information can be provided to researchers, according to which they can predict the future state of that language. Attitudes can also play a decisive role in the choice of language and its use by speakers and language learners. In other words, a more positive attitude of people towards a language will increase their motivation in learning that language. Otherwise, having a positive or negative attitude towards language diversity not only profoundly affects the people who learn and use it but also plays a critical role in the field of language policy and planning. Therefore, knowledge of language attitudes is essential for formulating language planning policies, and without such knowledge, it is not possible to predict which policies will be successfully implemented and which policies will fail (Cargil et al., 1999). In sociology of language, two direct (questionnaire, interview, observation) and indirect (matched-guise-test) methods are used to measure the language attitude of bilinguals. Kurdish is one of the languages spoken in parts of Turkey, Iran, Iraq, Turkmenistan and Syria. Kurdish speakers of Iran mostly live in the province of West-Azerbaijan, Kurdistan, Kermanshah, Lorestan and Ilam. Kurdish is a group of Iranian-Aryan languages or the Iranian branch of the great Indo-European family.

Mahabad is one of the Kurdish cities in West-Azerbaijan province and it is the center of Mukry Kurdistan. People in Mahabad speak Sorani Kurdish with the Mukryani dialect of the Kurdish language and most of them are familiar with Persian language. The people's religion in this area is Islam (Sunni shafi'i). In this research, we investigate the attitude of Persian bilinguals in Mahabad towards standard Persian language and Kurdish language using matched-guise-test.

1.1. Research background

Following introducing the concept of attitude by Allport in 1935, the first studies concentrating on attitude in psychology and sociology were conducted in European countries, but the first researches on attitude in linguistics was conducted in Canada in 1960. First, (Lambert et al. (1960) measured and investigated people's language attitude using the matched guise test. They conducted their research in the English-French bilingual community of Quebec province in Canada. The results of their study showed that English speaking Canadians evaluated the voices that recorded in English as more positive and pleasant than the voices of French-speaking speakers and French-speaking Canadians considered the English-speaking voice more positive than the voice of their French-speaking counter parts.

Later on, a study by Anisfeld et al. (1962) considered whether subjects would exhibit differential reactions to the same speaker when speaking in "pure" English and in English with a Jewish accent; i.e. the matched-guise-test was used again in its original form, since there were the same speakers speaking with a different variety. The results indicate that when the same speakers use Jewish-accented English, they are rated much less positive and were labeled "immigrants" based on their accent.

Hapea (1999) examined the attitude of Finnish students towards varieties of English language and their speakers by using questionnaire and matched-guise-test and found out that female students evaluated a different varieties of English and their speakers more positive than the student of vocational college or the male student. Kercher, (2009), using matched-guise-test and questionnaire, examined the attitude of English-speaking and French-speaking students in Montreal towards three languages: English, Quebec French and European French. The findings showed that the attitudes towards French and English were positive, but the attitude towards French was more negative compared to English.

Pishghadam & Sabouri, (2011) investigated the attitude of English language learners towards different varieties of English language using the matched-guise-test. In this research, 165 English learners were asked to listen

to a text read by native speakers from the following accent groups: British, Persian, American and Arabic. Subjects, then, recorded their attitudes toward each of the readers using a semantic differential scale. Based on the results, the learners considered American accent to be quiet superior to the others.

Mozafari, (2014) investigated the attitude of the speakers of Fars province towards Shirazi variety and standard Persian by using three survey methods, matched-guise-test and interview. This research was conducted by 490 participants from cities near Shiraz. The findings of the research showed that the attitude of the surveyed people was positive towards the use of standard variety. They also had a positive sense of loyalty towards their native city and local varieties; and the local variety of each city was the dominant type in the environment of family and friends, while in other social areas the standard variety was dominant.

Pirouzfar & Elyasi, (2014) investigated the attitude of Kurdish speakers in Sanandaj towards standard Persian by using matched-guise-test. The result showed that the attitudes of Kurdish speakers of Sanandaj towards standard Persian were not positive and speakers' emotional attitude towards this language was different.

Fereidoni (2003) investigated multilingualism in Urmia, a city in West Azerbaijan Province of Iran. The population of Urmia consists of Turkish, Kurdish and Armenian people, where Turks are bilingual and Kurds and Armenians are trilingual. Parasher's model (1980) was used in this research and participants in different age groups and different education participated in this test. The results of the research showed that among the Turkish-speaking community Turkish was the dominant language in all domains except the domain of education, and the age variable had an important effect on the choice of language used among the three mentioned groups.

2. Methodology

2.1. Participants

The statistical population of this research was made up of 80 bilingual Kurdish-Persian people living in Mahabad, who were in two age group of 15-35

years and 45-75 years, in two levels of education, namely high school students or dropout ones as well as academic students. Each age and education group included 40 bilingual men and women from Mahabad. The number of participants in all three groups was the same and 10 people were also selected through random sampling. High school students and dropouts were selected from urban environment such as streets, markets, schools and mosques; and people with academic education were selected from academic and official environments. In addition to the participants in the test, 3 male speakers also collaborated to prepare the matched-guise-test, two of them were Kurdish-Persian bilinguals and one of them was Persian. Among the speakers, one person was chosen as the main speaker, who read the text in Kurdish and Persian, and his voice was recorded.

2.2. Variables

The independent variables in this research are gender, age and level of education, and the dependent variable is the language attitude of Kurdish-Persian bilinguals living in Mahabad towards standard Persian and Kurdish language.

2.3. Data collection tools

In this research, two instruments, a questionnaire and matched-guise-test, were used.

2.4. Questionnaire

The questionnaire of the research consists of three parts. The first part contains the subject's personal information such as gender, education, age, place of birth and place of residence. The second part of the questionnaire is the level of Persian and Kurdish languages used in daily conversations, and the last part of the questionnaire, based on Lamberts questionnaire (1960), consists of 14 sentences. One of the sentences wherein the word "ambitious" was used was removed since it is a positive adjective in English and a negative one in Persian. This questionnaire was designed based on Likert's 5-point scale of agreement,

ranging from completely agree to completely disagree, to indicate the cultural index of the region regarding subjects' attitude towards the standard Persian language.

2.5. Matched-Guise-Test

To perform the matched-guise-test, first a text with a general and topic was prepared and the prepared text was translated into Sorani dialect from Kurdish language. The text was given to several local male speakers and the correctness of the text was confirmed in terms of words, grammar and spelling. Then three men who were fluent in both languages were chosen as speakers. It should be noted that the voices of the spokespersons did not have special and exceptional characteristics and were also not similar to the voices of radio and television hosts. After selecting the spokespeople, they were asked to read the selected text in Persian and Kurdish languages. The characteristics of prosody, such as reading speed, leaning and pausing were controlled and normalized. The duration of each recorded sound was approximately two minutes and twenty-three seconds. In this experiment, three spokesmen were investigated, one person who was fluent in standard Persian and Kurdish read the text in both languages and his voice was recorded, and the two other spokesmen were used as fillers, one in Kurdish and the other in Persian. The recorded voice of this group did not play a role in the statistical analysis and research results. In this research, four recorded voices were actually prepared, while the voices of three spokesmen were recorded, one main voice and two fillers (two texts in Persian and two texts in Kurdish). The point that was very important in this research was that the subjects should not have realized that one of the spokesman read the text in both languages and his voice was recorded twice. For more certainty, after each spokesman voice, a soft and wordless song was played for thirty seconds. After providing all requirements for conducting the matched-guise-test, including determining the personality characteristics, choosing the text, recording the voices of the spokesmen, and designing the questionnaire, the test began. Before taking the test, each of the subjects was given a brief explanation about how to do the test and answer the questions,

and they were allowed to read the text. The purpose was to fully familiarize them with the topic of the text, so that while listening to the sounds, they focus only on the language and voice of the spokesmen. Questionnaires were also handed to the participants and they were asked to complete it while listening or after finishing each sound.

3. Discussion and conclusion

The gathered data in this study were coded, then entered into Excel software, and finally imported into SPSS software for statistical analysis. The reliability of the instrument used in the present study was tested using Cronbach's Alpha formula, which is used to determine the reliability of a questionnaire or test with an emphasis on its internal correlation. The results showed Alpha coefficient of 0.807 for the matched-guise-test questionnaire in this study. Therefore, the matched-guise-test questionnaire is reliable in this study and the results are completely reliable.

Table 1

One Sample t-Test results for the attitude of Mahabad Kurdish speakers towards Kurdish and standard Persian language compare to number 3.

Variable	n	M	T	P-value
Emotional attitude towards the Kurdish language	80	2.584	-6.017	0.000
Emotional attitude towards the standard Persian language	80	2.540	-8.077	0.000

To measure the attitude of Kurdish speakers of Mahabad towards the Kurdish language and standard Persian language, by using one sample T-test and comparing means with the number 3, it shows the attitude of Kurdish speakers of Mahabad city towards Kurdish and Persian language and how it is., and the significance level of the test will indicate the type of attitude towards that language. The test results of Kurdish language are shown in Table 1. As shown, the attitude means of Mahabad Kurdish speakers towards Kurdish language was 2.584, which is smaller than 3 and also the test significant level

was 0.000 that is smaller than 0.05. Therefore, this result showed that Mahabad Kurdish speakers have positive attitude towards Kurdish language. Moreover, the attitude means of Mahabad Kurdish speakers towards standard Persian language was 2.540 which is smaller than 3 and test significant level was 0.000 that is smaller than 0.05. These results showed that Mahabad Kurdish speakers have also positive attitude towards standard Persian language.

A paired T-test was used to evaluate the differences between the attitudes of Kurdish speakers of Mahabad towards the Kurdish language and standard Persian language. The results are shown in Table 2.

Table 2

Paired-Samples t-Test results to compare the attitude of Mahabad Kurdish speakers towards Kurdish and Persian speakers.

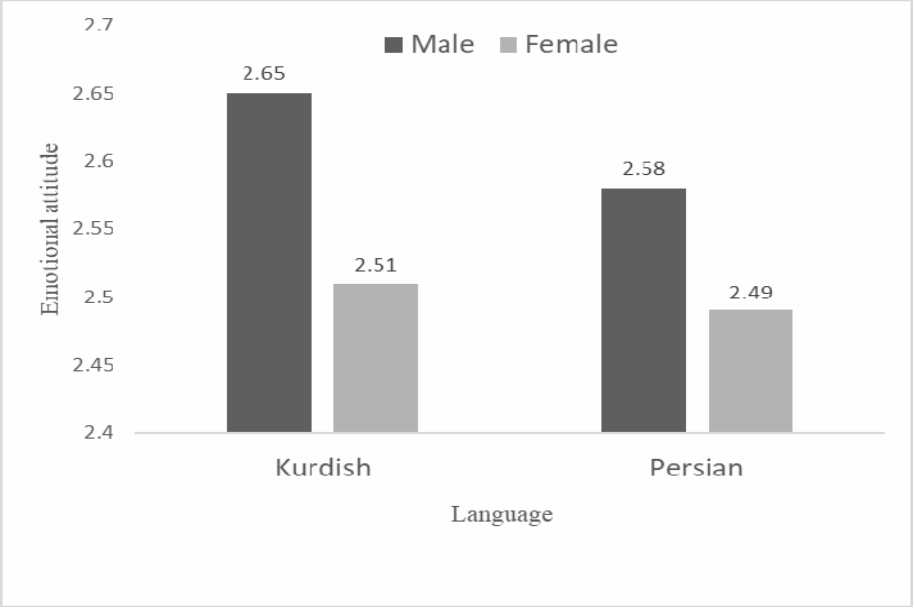
Variable	speakers	n	M	T	P-value
attitude	Kurdish	80	2.584	0.650	0.518
	Persian	80	2.540		

As it is seen in Table 2, the attitude means of Mahabad Kurdish speakers towards Kurdish speakers and Persian speakers was equal to 2.58 and 2.54, respectively; and the test significance level is greater than 0.05 (p=0.518). Therefore, it is clear that there is no significant difference between the attitude of Mahabad Kurdish speakers towards the Kurdish speaker and the Persian speaker. The results related to the impact of gender on the attitude of Mahabad Kurdish speakers towards a Kurdish language and the standard Persian language are shown in Figure 1. As shown, the attitude means of men and women towards the Kurdish language was equal to 2.654 and 2.514 respectively. Also significant level of one-way ANNOVA test was 0.315. Thus, this result showed that there were not significant differences between Mahabad Kurdish men and women speakers towards Kurdish language. What is more, attitude means of men and women of Mahabad Kurdish speakers towards standard Persian language was 2.585 and 2.495, respectively; and significant level of one way ANNOVA test was 0.429. Hence, these results showed that there were no significant difference between men and women of Mahabad

Kurdish speaker towards standard Persian language. Pirouzfar and Elyasi (2013) stated that there was no significant difference between the emotional attitude of Kurdish-speaking women and men living in Sanandaj towards the standard Persian language which is similar to the result of our research, but gender had an effect on the attitude of Mazandarani speakers towards the Persian language, and the attitude of girls towards the Persian language was more positive (Esmaieli et al, 2007).

Figure 1

The average emotional attitude of female and male Kurdish speakers living in Mahabad towards Kurdish and standard Persian languages

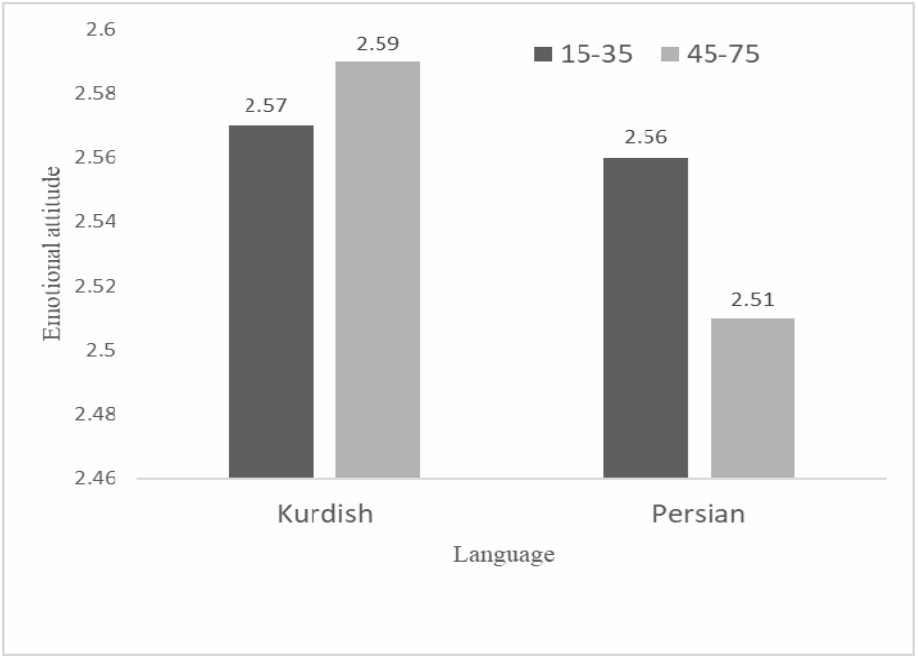


The result of age impact on Mahabad Kurdish speaker's attitude towards Kurdish language and standard Persian language are shown in Figure 2. As shown, the attitude means of 15-35 years old and 45-75 years old people towards Kurdish language were 2.571 and 2.597, respectively. Furthermore, the significance level of one way ANNOVA test was 0.854. This result showed that there was no significant difference between attitude of 15-35 years old and 45-75 years old towards Kurdish language. Besides, the attitude means of 15-

35 years old and 45-75 years old Kurdish speakers of Mahabad towards standard Persian language was 2.569 and 2.511, respectively; and the significant level of one way ANNOVA test was 0.609. Accordingly, this result showed that there was no significant difference between attitude of 15-35 years old and 45-75 years old group. In a research, Pirouzfar & Elyasi (2013) found that there is no significant difference between the emotional attitude of Sanandaj-speaking Kurdish teenagers and young people towards the standard Persian language, and the attitude of both groups towards the standard Persian language is positive. However, by examining the effect of age on Urmia's multilingualism, Fereidoni (2003) showed that the age variable was effective on the choice of the language used.

Figure 2

The Average emotional attitude of Kurdish speakers 15-35 years old and 45-75 years old living in Mahabad towards Kurdish and standard Persian language

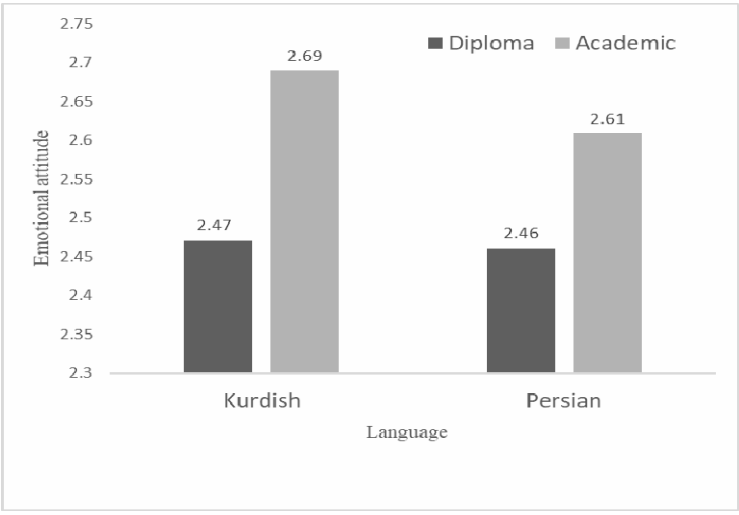


The impact of education level on Mahabad Kurdish speakers' attitude towards Kurdish language and standard Persian language is shown in Figure 3. As indicated, the attitude means of Mahabad Kurdish high school or dropout

speakers and academic ones towards Kurdish language was 2.475 and 2.692, respectively. Additionally, significant level of one-way ANNOVA test was 0.117. Therefore, the results showed that among the Kurdish speakers of Mahabad, there was no significant difference between the attitudes of people with low or high levels of education towards the Kurdish language. Also, the attitude means of Mahabad Kurdish speakers having low and high education levels towards standard Persian language was 2.61 and 2.46, respectively. Moreover, the significance level of one way ANNOVA test was 0.183. It showed that among the Kurdish speakers of Mahabad, there was no significant difference between the attitudes of people with high or low levels of education towards standard Persian language. After examining the effect of education level on the emotional attitude of Kurdish-Persian bilinguals living in Sanandaj, Pirouzfar and Elyasi (2013) concluded that education had no effect on peoples' attitude towards standard Persian language. But as Ahmadi and Zandi (2018) investigated the position and use of Persian and Kurdish language in Uramanat, it was found that illiterate people use Kurdish language the most, and on the other hand, the most use of the Persian language belonged to the group with academic education.

Figure 3

The average emotional attitude of Kurdish speakers with different levels of education living in Mahabad towards Kurdish and standard Persian language



The present study was conducted with the aim of investigating the emotional attitude of bilinguals in Mahabad towards standard Persian language. It also tried to evaluate the effect of gender, age and education variables on peoples' language attitude. Based on the results, the findings of the research can be summarized as follows: overall, there was no significant difference between men and women attitude towards Kurdish and standard Persian language. Furthermore, the age variable had no effect on emotional attitude of Mahabad Kurdish speakers toward Kurdish language. Also the education level had no effect on emotional attitude of Mahabad Kurdish speakers towards Kurdish and standard Persian language. Also, the results of the study showed that there was no significant difference between emotional attitude of Mahabad Kurdish speakers towards Kurdish and standard Persian language, so that their attitude towards Kurdish and Persian language was positive. However, their attitude towards standard Persian language was a bit more positive compared to that of Kurdish language. On the other hand, Mahabad Kurdish speakers had positive attitude towards both languages, which is probably because Mahabad is a mono-ethnic society and the inhabitants of this city do not make an effort to show themselves differently in linguistic societies. Although it is probably the case that Persian language has more linguistic validity from their point of view, no difference was observed in this research in this regard. The results of this research are similar to those of Lambert et al, (1960) who believed that the attitude of people towards the speakers of a language shows their attitude towards that language.

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A Semantic Analysis of Constructions Consisting of "ba" (WITH) in Persian Language[1]

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Abstract

This article investigates the comitative constructions in Persian. These constructions consist of three members named accompanion, accompanee and accompanying setting. Previously, studies considered 'bā' (WITH) as a preposition in traditional grammar. All traditional grammarians introduced 'bā' as a preposition except those who pointed to 'bā' (WITH) in accompanying situations. One of the aims of the present research is to answer this question: Is 'bā'(WITH) a preposition in all sentences or is it a conjunction or both? So, this study attempts to show its syntactic and functional features in Persian. Another goal is to compare coordinated and comitative constructions. The hypothesis is that 'bā'(WITH) can be considered as a conjunctor and a preposition as well. Thus comitative constructions are divided into two groups: 1) symmetrical constructions in which [with + DP2] is not an adjunct (an argument). The type of the verbs in this group are as follows: collectives, combining, relational predicates and similar comparison. 2) asymmetrical constructions in which [with + DP2] is an adjunct. The second type does not depend on the type of the verbs. It consists some members named non-collective verbs, instrumental, body organ, transportation. The instrumental type are of mediatory and facilitating. The findings of the present article can be used in the teaching of Persian grammar as well as syntactic analyses.

Key words: Comitative construction, Symmetrical comitative, asymmetrical comitative, conjunctive coordination, Persian Language

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1. Introduction

In Persian, comitative constructions are formed by using the preposition "bā" (with) and noun phrases that can be either animate or inanimate in similar conditions. Linguistic studies based on semantic-functional strategies, such as Stassen (2000) and Papero (2012) have indicated that these types of constructions share some similarities with coordinate constructions formed through the conjunction "and". After examining 270 languages, Stassen (2000) concludes that Indo-European languages employ two strategies in generating comitative constructions: the "AND" strategy and the "WITH" strategy. Following this analysis, linguistic typology can be divided into two types: the "AND" category (where both "and" and "with" are used as strategies for the accompanying setting) and the "WITH" category (where only the "WITH" strategy is used as a last resort). In other words, in the "WITH" category, there is no coordinate strategy using the conjunctor (and), and comitative strategy is solely expressed through the grammatical morpheme "bā". Haspelmath (2004) believes that in these languages, the comitative construction has undergone a shift from a comitative to a coordinated construction, leading to a corresponding change in the role of the grammatical morpheme "bā" from a morpheme which indicates or marks comitative case to a morpheme which indicates or marks coordination

According to Stassen (2000, p. 4), coordinate and comitative constructions are seen as having equal semantic value on the same scale. Coordination has been defined from both syntactic and semantic perspectives. From a syntactic viewpoint, the emphasis has been on the sameness of categories of noun phrases and their constituency (Chomsky 1957, 1965, p. 212). Semantically, coordination has been interpreted as making a larger unit from the parts, where units with similar semantic roles come together (Haspelmath, 2000, p. 1). Stassen (2000) also believes in his typological framework that nominal coordination occurs if:

a) Noun phrases refer to the occurrence of a single event.

b) The single event is occurred by the participants simultaneously (are conceived of as separate individuals) as in:

1- a. John and Mary are talking.

b. John is talking with Mary. (Paperno, 2012, p. 1)

2- a. John and Mary will arrive tomorrow.

b. John will arrive with Mary tomorrow.

Based on the definition provided above, both '*John'* and *'Mary'* share the same category (1a and 2a) and have similar semantic roles. In examples (1b) and (2b), although there is a very slight difference in meaning, both '*John'* and *'Mary'* are involved in the realization of the verb event. What they have in common is that the verb event is possible with the mutual interaction of both participants. Therefore, another surface structure can be considered for them:

3- a. John with Mary are talking.

b. John with Mary will arrive tomorrow.

As the examples demonstrate, we are dealing with both types of constructions, coordinate and comitative. Based on Stassen's (2000) perspective, conjunction and comitative markers have the same functions in these constructions, and it appears that they both play a unitary role. Kayne (1994) also categorizes both conjunction and comitative markers in the same category based on Stassen's viewpoint, placing them in a head of a phrase called XP. However, in the current discussion, the focus is not on their syntactic analysis, and their syntactic and typological analysis must be presented in another paper.

Based on Stassen's (2000) hypothesis, we are seeking an answer to the question of whether, similar to English, the grammatical morphemes "با" ("bā") in Persian functions similarly to the conjunction "و" (va) or not. If the answer is affirmative, under what conditions and with which verbs is this possibility feasible? The writers assume that in Persian, there is a similarity between the two, but these conditions are limited to some specific verbs. Therefore, in Persian, it is possible to assume two roles for the grammatical morpheme "با" ("bā"); based on these two hypotheses, two types of comitative constructions can be determined. Regarding the different perspectives on the grammatical morpheme "با" ("bā") in comitative constructions, the writers aim to illustrate the status of comitative constructions and their types in Persian. The

significance of such research lies in determining the dual behavior of "ب" ("bā") in this language. The outcome of this research can have an impact not only on linguistic modules, but also on teaching Persian at all levels of education. It can demonstrate that "ب" ("bā") is not merely a preposition and can have the other role as well. The main objective is to answer whether "ب" ("bā") is solely a preposition or not, performs both roles, or has a different function. This research can determine the different roles and the semantic/functional network of this particle in such constructions. Additionally, investigating the instrumental nature of these constructions and identifying their types are among the other objectives of this paper.

Upon examining the evidences and reviewing the previous literature, it becomes evident that such a linguistic research has not been conducted in Persian language yet. In traditional grammar and linguistic studies, this type of morpheme has solely been discussed as a preposition. However, the attention of non-Iranian linguists to this type of construction is noteworthy. For instance, in the Turku Seediq dialect (a Formosan language) spoken primarily in western Taiwan, '*deha'* (with) functions solely as a preposition. *Yetoq* (with) in Q'anjob'l (a Mayan language) in Guatemala, Capeverdean Creole (a Portuguese-based creole language), and Paiwan (in the investigation of Austronesian languages), *'Ka'* (with) serves both as a preposition and a conjunction. The scope and expansion of the topic to other languages led the writers to examine such constructions and determine their types through evaluating multiple linguistic tests. This research is based on the assumption that in Persian, "with" also has both functions and its comitative constructions also include other subcategories.

The present article consists of four parts. The first part deals with the critique and examination of Stassen's examples in English (Stassen, 2000). The second one focuses on the studies and backgrounds of Iranian grammarians and linguists regarding comitative and coordinate constructions. The third part is dedicated to data analysis, which is further divided into two subparts. The data analysis subsection involves various tests that evaluate the comitative constructions on a scale. By assessing these constructions in this section, it is

possible to classify the types of comitative constructions. Additionally, the differences and similarities between these two types of constructions, comitative and coordinate, are determined. Therefore, by defining the characteristics of comitative constructions, their types will be introduced along with their subcategories in Persian. The fourth part provides a summary and the overall conclusion.

2. Comparing Stassen's (2000) examples in English and Persian

As mentioned earlier, Stassen proposes two solutions for languages like English and all Indo-European languages, assuming that the grammatical morpheme "با" ("bā") and "و" ("va") function in the same way. Consider the following translation of his examples into Persian:

4- a- *John va Mary dārand sohbat mikonand*[1]

John and Mary are talking.

b- *John darad bā Mary sohbat mikonad*. (Paperno, 2012, p.1)

John is talking to Mary.

c- *John bā Mary darad sohbat mikonad*.

John talks to Mary.

5- a- *John va Mary fardā xāhand resid (mi-rasand).*

John and Mary will arrive tomorrow.

b- *John fardā bā Mary mi-resad.*

John will arrive with Mary tomorrow.

c- *John bā Mary fardā mi-resad*.

John arrives with Mary tomorrow.

The verbs used in the above examples (4-5), such as "speaking" and "arriving", are being discussed to determine their alignment with the provided definition in the introduction: "nominal phrases referring to a single event A single event should be jointly participated by two individuals simultaneously (with separate referents) by two participants". These constructions, coordinate and comitative constructions behave the same.

In sentence (4a) there is a possibility for John to speak with someone

[1][John & Mary are speaking together] is the main aim of the discussion in this context.

other than Mary, and the same applies to Mary. In sentence (5a), in the case of coordination, a single event occurs, but simultaneity is not necessary. It is possible for John to arrive at the destination at 12 o'clock and Mary to arrive at 5 o'clock. Therefore, these examples do not align with Stassen's definition.

In sentences (4b) and (5b), the occurrence of the event is observed simultaneously. Therefore, the comitative constructions with verbs like "speaking" and "arriving" in the coordinate and comitative constructions (4b and 5b) function differently in terms of meaning and syntactic structure. Additionally, in this analysis, the structure [bā + noun phrases $_2$] and its variations have not been taken into account. In these two examples, this structure is optional, and if omitted, the sentence remains grammatical. Another difference observed between English and Persian is the agreement in these sentences.

The grammatical agreement (singular or plural) is also different in these constructions. Therefore, based on the discussion above, we cannot observe comitative construction in these examples in Persian. The authors' hypothesis is that the semantic nature and type of the verb play a significant role in this analysis. In response to the question of whether "با" ("bā") linking or connecting role (linker) in such constructions, the answer can be positive, but in specific conditions and with specific verbs that will be introduced. These verbs are those in which the presence of two noun phrases is necessary, and the constituent [bā + noun phrase] is not optional. Unlike the English examples where they were optional constituents (adjuncts) in both examples (4b) and (5b), and they have not been regarded as the verb arguments. These verbs include collective verbs, compound verbs, relational predicates, and sameness comparison. In this type of comitative construction, the grammatical morpheme "با" ("bā") can have a linking or connecting role. To prove this claim, after reviewing the literature review, various comitative constructions will be introduced and analyzed using tests.

3. Background and Literature review

3.1. The grammarians

Natel Khanlari (2001, 246-252), Anvari and Ahmadi-Givi (2001, pp. 312-313) have referred to this type of sentences as "linking sentences." According to them, independent sentences in a speech or text can be connected to each other. This connection is divided into two categories: semantic linking and verbal/ literal linking. In semantic linking, two or more independent sentences are placed one after another without any intervening word or phrase connecting them directly (Anvari and Ahmadi-Givi, 2001, pp. 248). In verbal/ literal linking, two or more independent sentences with a common subject and tense are connected through an intervening word or phrase. They refer to this word as a conjunction. Sentences that are joined together by a conjunction have one of the following relationships: agreement, equality, alternation, opposition, sequence, confirmation and negation, participation in negation, expressing cause and result.

Traditional grammarians have solely provided a descriptive view of the phenomenon of coordination. In these descriptions, internal structure, syntax, and grammatical elements have been the focus of attention. Therefore, with an understanding of valuable previous achievements and a theoretical approach, such constructions are studied to achieve a comprehensive explanatory framework that addresses theoretical, semantic and practical challenges.

3.2. Linguists

Kalbasi (1997, pp. 137-140) has focused on the analysis of some Mazandarani and Gilaki dialects. Like traditional grammarians, she has primarily provided a descriptive account of these constructions. Therefore, her study aligns with and resembles the approaches of traditional grammarians.

Gholamali-zadeh (2007, pp. 139-144), Mahoutian (1999, pp. 78-86), and Lazar (1393, pp. 247-250) define coordination as follows: two independent clauses with the same element or similar syntactic roles are connected by coordinating conjunctions; these conjunctions can also appear between two words within a single clause (Lazar, 1393, p. 247).

Fayazi (2013, p. 117) addresses coordination in Persian from a cognitive perspective. In her study, she focuses on cognitive factors and their influence on coordination. Coordination is interpreted as follows: coordinating structures share a common element and have a similar structure. In response to two main questions: Are coordinating structures contingent upon specific semantic criteria? Is there a conceptual or thematic relationship between coordinating structures? She concludes that there is a semantic relationship between the two coordinating structures. On the other hand, cognitive factors such as size, animacy, temporal sequence, prominence, contrast, parallelism, and metaphorical relations play a role in coordination. In simpler terms, cognitive factors have an impact on coordination.

Shabani et al. (2010, pp. 131-156) discuss coordination in Persian. They introduce conjunctions and their types from a syntactic perspective and explore multi-core approaches and coordinating conjunctions. They then mention the insufficiency of the predicate-complement-adjunct assumption. According to their perspective, coordination is possible at any level, even lower than the word level. Finally, relying on the pure merging process, they find this approach effective in explaining Persian data. According to this approach, coordination is feasible at any level.

Lazard (2014, p. 89) introduces and describes prepositions, categorizing "با" ("bā") as expressing companionship and instrumentality. In his analysis, he refers to the complement of the preposition as the "prepositional complement" because it establishes a relationship between the direct object and the verb through the intermediary of the preposition (Lazard, 2014, p. 227). In his examination, he discusses the combination of adverbials of manner, instrument, and agent with the prepositions "با" ("bā") and "به"(be[to]). He considers the nouns that are used with the preposition "با" ("bā") as essential nouns. Additionally, he believes that this preposition can also be observed with adverbs.

The means and instruments of performing an action are often expressed with compound prepositions (with or without additional prepositions):

6- *čandeen taxte sang ke bā sarooj va gol mohkam šode boodand*. (Lazard, 2014, p. 234)

Several stone slabs that were secured with clay and mud.

Another role attributed to the preposition "bā" (with) is to indicate companionship, affiliation, or partnership.

7- *Bā zan o bačče be Uropaa rafte ast.*

He has gone to Europe with his wife and child.

8- *Bā xodeš goft.*

He said to himself.

According to his perspective, the complement that "bā" (with) attaches to is often related not to the verb, but to a noun.

9- *Mard-e mossen-i bā lebas-e farsude vāred šod.*

An old man entered with worn-out clothes.

At times, "bā" (with) in this complement is almost equivalent to the coordinating conjunction "va" (and) in terms of its function.

10- *Hassan bā barādaraš āmadand. [Hassan and his brother]* (Lazard, 2014, p.236).

Hassan came with his brother.

In this research, the connotation of companionship is also demonstrated with compound prepositions like "hamrah-e" and "behamrahi-e".

In Example (10), Lazard uses the preposition "bā" (with) to indicate its function as a conjunction "va" (and), despite having a singular subject. From a syntactic perspective, such concordance (singular subject with plural intransitive verb) in the verb is not grammatically acceptable. The verb "āmadand" (to come) as an intransitive verb does not require the constituent "[با+گروه اسمی]" (with + noun phrase). Lazard's viewpoint differs from the approach presented in the current research. However, it is highly commendable that he acknowledges the equivalence between "bā" (with) and the conjunctor "va"(and).

In support of the agreement of plural verb with a singular subject, we can refer to another characteristic of the Persian language. One of the features of this language is the concordance between the singular and plural form of the

subject. If the subject is countable and its quantity is plural, it agrees with a plural verb. The concordance and its marker appear on the verb in the singular or plural form. Therefore, if the subject is animate and plural, the verb should also be plural (Natel Khanlari, 2013, p. 52). In the Persian language, there is subject-verb agreement. In this language, a respectful style is also notable, where the verb is plural in all situations, even when the subject is singular.

11- *Išān bā xaharaš āmadand.*

He/She came with her sister.

12- *Jenabe āli farmoodid.*

You (honorable) said.

As a sign of respect and politeness, after a noun that refers to a single person, plural verbs are often used (Lazard, 2014, p. 213).

13- *āqa manzel nistand.*

Sir are not at home[1].

Sometimes in this language, a singular verb is used when the subject is a plural noun.

14- *Polis āmad*.

The police arrived.

Undoubtedly, each of the previous studies has had valuable achievements. Based on their findings, the concept of coordination has been limited to the conjunction "va" (and). Semantic and pragmatic investigations indicate that from the perspective of semantic and pragmatic approaches, it is possible to consider another type of با ("bā") that has not been addressed in previous studies; با ("bā") as a connector/linker. Therefore, با ("bā") as a preposition and a connector/linker deserves attention. The present research focuses solely on the examination of با ("bā") in the construction of "Coordination" ("ham-payegi") in the Persian language, based on semantic-pragmatic considerations. Such a theoretical analysis was not found in the previous literature.

After discussing the general features of agreement in the Persian language, we will analyze the data of comitative constructions in the following

[1] It is the literal translation into English

section to achieve a comprehensive classification of comitative types in this language.

4. Data analysis

In this section, by evaluating the comitative and instrumental constructions, the characteristics of these types of structures are determined. The main goal of data analysis is to demonstrate that comitative constructions can be classified into two types: symmetrical type, where the constituents [noun phrase 1] and [bā (with) + noun phrase 2] are the main arguments of the verb, therefore [ٮ+noun phrase 2] is not an optional or additional element. In this group, (bā =with) plays the role of a linker. The second group is the asymmetrical type, where the constituent [ٮ+noun phrase 2] is an optional and additional element (adjunct). In this group, (bā =with) functions as a preposition. In this type, there is no necessity for agreement in animacy or inanimacy. The Instrumental asymmetrical construction and its subclasses are also in this category, which are discussed in section 4-2.

4.1. Symmetrical comitative constructions

In this type of constructions, two noun phrases are arguments of the verb in the sentence and they are equivalent in terms of animacy/non-animacy. The verbs that form these structures include collective verbs (verbs that require two constituents, such as comparing, attacking, competing, etc.), relational predicates (relational verbs that represent the relationship between two constituents or linguistic elements, such as being friends, being contradictory, being similar, etc.), combining verbs (verbs that combine and mix two elements), and similarity comparison (where the similarity or equal size of two elements is indicated by a specific relational verb, such as being of the same age, being of the same height, etc.). These two noun phrases both participate in the realization of the verb event. Through the following tests, it can be concluded that in most cases, the comitative construction has the same function to the coordinate constructions, which is the evidence of the similarity of the coordinating conjunction “and” and the functional word “bā” (with) in

these structures. In the analysis of symmetrical comitatives in Persian, considering semantic and pragmatic considerations, the hypothesis is that in this type of commutative sentences, there is a similarity between conjunctive coordination and comitative constructions, meaning that ﺑ ("bā") functions as a linker.

4.1.1. Substitution Test

In this test, if two noun phrases have the same value, substituting them will not result in any change in the meaning of the sentence. For example:

15- a) *Ali bā Minā ham qad ast. = Ali va Minā ham qad hastand.*

Ali and Mina are the same height.

b) *Minā bā Ali ham qad ast. = Minā va Ali ham qad hastand.*

Mina and Ali are the same height.

16- a) *Ali namak rā bā āb maxloot kard. = Ali namak va āb rā maxloot kard*.

Ali mixed salt with water.

b) *Ali āb rā bā namak moxālat kard. = Ali āb va namak rā maxloot kard*.

Ali mixed water with salt.

17- a) *Ali bā Hassan dust ast. = Ali va Hassan dust hastand.*

Ali is friends with Hassan.

b) *Hassan bā Ali dust ast. = Hassan va Ali dust hastand.*

Hassan is friends with Ali.

It is worth mentioning that at this stage of analysis, the information structure and grammatical position are not considered as relevant elements because there are certainly fundamental differences in their information structure and the way information is placed in the sentence. In sentence (15a and b), which shows the similarity and analogy between "Ali" and "Maryam", the comitative construction is semantically like the coordinate constructions. In case of substituting the two noun phrases, the meaning remains unchanged in both. In example (16a and b), which includes a combining verb, once again, substituting the constituents maintains the same semantic meaning. In this sentence, "salt" as the direct object and "water" as the indirect object are both influenced by the action and function of "Ali" in the subject position. Their discourse context and information structure have been ignored. In example

(17a and b), "being friends" as a relational predicator establishes a reciprocal relationship between "Ali" and "Hassan", which is expressed similarly in its coordinate equivalents.

Therefore, in each of the examples, substituting the two noun phrases in the comitative constructions, similar to coordinating conjunctions, does not bring about a change in the accomplishment of the event; in all of them, both constituents participate in the realization of the verb event and the mode of analogy have remained the same.

4.1.2. Omission of the constituent [bā (with) + noun phrase$_2$]

18- a) *Maryam bā Minā xāhar ast.* ⟶ **Maryam -----xāhar ast .*

Maryam is Mina's sister.

19- a) *Maryam va Minā xāhar hastand.* ⟶ **Maryam------ xāhar hastand .*

Maryam and Mina are sisters.

20- a) *Maryam rā bā Minā moqāyese kard.* ⟶ ** Maryam rā ---- moqāyese kard. (Regardless of the speech context)*

He compared Maryam with Mina.

Sentences (18-20) indicate that the constituent [bā (with) + noun phrase$_2$] requires semantic and syntactic completion to be acceptable. The constituent [bā (with) + noun phrase$_2$] is not an adjunct and is similar to "and" phrase.

4.1.3. Unity of Semantic Role between [DP1] and [DP 2 + bā (with)]

21- *Ali bā Hassan u rā koštand. = Ali va Hassan u rā koštand*

Ali and Hassan killed him.

22- *Ali bā Hassan šahid šod. = Ali va Hassan šahid šodand.*

Ali and Hassan were killed.

23- *Talā bā noqre be rāhati tarakib šodand. = Talā va noqre be rāhati tarakib šodand*

Gold and silver easily combined.

As shown in examples (23-21), in sentence (21), both Ali and Hassan are agents in carrying out the event of the verb. Both Ali and Hassan are involved in causing the death of someone, both Ali and Hassan together or Ali along with Hassan. In example (22), both Ali and Hassan are affected by the action, and the same applies to example (23) where the non-animate noun

phrases "gold" and "silver" are affected by the event and combination action. Therefore, these examples illustrate the similarity between the constructions of comitative and coordinate. In each of them, both instances refer to a single event. This indicates the similarity between symmetrical comitative and coordinative conjunction.

4.1.4. VP ellipsis

In symmetrical comitative constructions, it is assumed that both [noun phrase$_1$] and [noun phrase$_2$ + bā (with)] are arguments of the verb. Therefore, they are not considered as an adjunct. With the acceptance of this assumption (non-adjunct), retaining them at the end of the sentence after permissible deletion is not allowed and would result in ungrammaticality.

24- a) *Ali takālif-e xod rā* ***ruz-e do šanbe*** *nevešt va Maryam (ham****) ruz-e panj šanbe****. (adjunct)*

Ali wrote his assignments on Tuesday and Maryam (also) on Friday.

b) * *Ali* ***ketāb rā*** *ruz-e do šanbe āvard va Maryam (ham)* ***majaleh rā****. (argument)*

Ali brought the book on Tuesday and Maryam (also) the magazine.

25- a) **/?? Ali* ***kif rā bā kelidaš*** *bardāšt va Hassan* ***bā eynakaš*** *.*

Ali compared Bita and Maryam together and Hassan with Mina.

b)* */?? Ali* ***Bitā rā bā Maryam*** *moqāyese kard va Hassan* ***bā Minā****.*

Ali compared Bita with Maryam and Hassan with Mina.

Retaining both the coordinating and symmetric comitative construction leads to ungrammaticality and is considered unacceptable (24b and 25a&b). However, retaining the adjunct does not pose a problem (24a). This test indicates that in this type of construction, [noun phrase$_2$ + bā (with)] is not an adjunct. According to native Persian speakers, the acceptable form of sentence (25b) would be "Ali Bita rā bā Maryam moghāyese kard va Hassan U rā bā Mina."

4.1.5. The optionality of the constituent [Noun Phrase2 + bā (with)]

The assumption is that in symmetrical comitative constructions, the structure [Noun Phrase$_2$ + bā (with)] is not optional. Examples of this are as follows:

26- a) *Ali bā Hasan barādar ast.* *b) * Ali barādar ast.*

Ali is Hassan's brother. Ali is a brother

27- a) *Ali bā Hossein qazā poxt* *b) Ali qazā poxt.*

Ali cooked food with Hossein. Ali cooked food

28- a) *Ali Minā rā bā barādraš moqayese kard.* *b) */؟؟ Ali Minā rā moqāyese kard.*

Ali compared Mina with his brother. Ali compared Mina

The omission of [noun phrase$_2$ + bā (with)] in the examples (26b and 28b) indicates that in some syntactic contexts, it is necessary, as shown in (26a and 28a), while in example (27a and 27b), it is optional. Therefore, depending on the type of the verb and the necessity of it in accomplishment of the verb event, it is evident that it is not an adjunct. As an argument, it has a specific role. In cases where it is optional (adjunct), it does not play a crucial role in the realization of the verb event.

4.1.6. Pronominal Substitution

29- a) *Ali bā Hossein barādar ast.* *b) ānha barādar hastand. c) * U barādar ast.*

Ali is Hossein's brother. They are brothers. He is a brother.

30- a) *Talā va noqre be rāhati tarkib šodand.* *b) ānha be rāhati tarkib šodand*.

Gold and silver were easily combined. They were easily combined.

Examples (29-30) demonstrate that symmetrical comitative constructions show the plurality concept. This relationship is bi-directional, such as being brothers, being friends, and the combination of two objects, are bi-directional events can convey the concept of plurality. Therefore, the substitution of the plural pronoun in place of both arguments, compared to the singular pronoun, is acceptable.

4.1.7. Binding

31- a) *Mādar, pedaraš xodašān rā dar āyene didand.*

The mother and her father saw themselves in the mirror.

b) *Tim-e A bā tim-e B dar zamin-hāye xodašān be reqābat pardāxtand.*

Team A competed against Team B on their own fields.

c) *Ali bā Maryam hardoo ham-qad hamdigar hastand.*

Ali and Maryam are both of the same height.

Regarding Government & Binding Theory, reflexive and reciprocal pronouns should be bound by an antecedent in their smallest governing domain. Evaluating these sentences, especially (31c) by Persian native speakers, poses ambiguity for the authors. The judgments on grammaticality and ungrammatically of Persian native speakers was different. The reason lies in the variation between formal and colloquial Persian. Some, based on their linguistic intuitions and considering the discourse context, deem sentence (31c) as grammatical and acceptable. However, others, adhering to prescriptive grammar rules and formal usage, consider the use of the grammatical morpheme "bā" (with) with the arguments "Ali and Maryam" as odd and unacceptable. Nevertheless, considering the predominance of judgments of sentence (31c), the authors regard it as grammatical.

Based on the examples, the plural pronoun "khodeshān" (themselves) has referred to the noun phrases "mother, her father", "team A with team B", and "Ali with Maryam". By referring the pronoun to the plural concept of the noun phrases and their agreement with the verb, it resembles the coordinate constructions.

4.1.8. Determining Constituency

In syntactic analysis, constituents can only be linked to each other by a conjunctor.

32- *(**Ali** bā **Maryam**) va (**Hassan** bā **Hossein**) be mehmāni raftand.*

Ali went to a party with Maryam, and Hassan went with Hossein.

The constituents (**Ali** bā **Maryam**), (**Hassan** bā **Hossein**) conjoined through AND. It shows they are in the same value.

4.1.9. Wh-questions and Focus

Focus is one of the tests that can demonstrate the function of a constituent [Noun Phrase$_2$ + bā (with)] as an argument, which can be done in two ways: Wh-questioning and Clefting.

33- a) *Mina bā Maryam xāhar ast/hastand.*

Mina is Maryam's sister.

b) *Minā hast ke bā Maryam xāhar ast.*

It was Mina who is/was Maryam's sister.

c) * *Bā Maryam hast ke Minā xāhar ast.*

It was with Maryam that Mina is/was a sister.

34- a) *Omar bā jam'ie be xāneh-aš hamle bordand. (Shariati, 2000, p.9)*

Omar attacked his house with a group.

b) *Omar bud ke bā jami'e be xāneh-aš hamle bordand.*

It was Omar who attacked his house with a group.

c) * *Bā jam'ie bud ke Omar be xāneh-aš hamle bordand.*

It was with a group that Omar attacked his house.

d) * *Bā ki Omar be xāneh-aš hamle bordand?*

With whom did Omar attack his house?

Considering the examples (33 and 34), it can be concluded that the two constituents [Noun Phrase$_1$] and [Noun Phrase$_2$ + bā (with)] are not similar in terms of their information structure. The constituent [Noun Phrase$_2$ + bā (with)] cannot be focused in symmetrical (non-adjunct) constructions. Focus implies containing new information. Therefore, considering the examples (33c and 34c,d), the constituent [Noun Phrase$_2$ + bā (with)] contains presupposed and background information.

The analysis of comitative constructions shows many similarities with coordinate constructions. After demonstrating the significant similarities between these two constructions, one of the distinguishing factors is the use of the adverb "jodāgāne" (separately), which is contrasted with the adverb "bā ham/bā hamdīgar" (together/with each other).

35- a) *Ali va Maryam bā ham raftand*.

Ali and Maryam went together.

b) *Ali bā Maryam bā ham qazayešān ra tamām kardand.*

Ali and Maryam together finished their meal.

36- a) *Ali va Maryam jodā az ham raftand. (Har yek be tanha'i / jodaganeh)*

Ali and Maryam went separately from each other. (Each one alone / separately)

b) * *Ali bā Maryam jodā az ham / jodā raftand.*

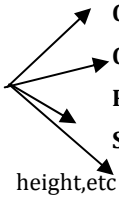
Ali went separately from Maryam.

As demonstrated by examples (35 and 36), in both comitative and coordinate constructions, the concept of simultaneous occurrence of events is observed in both constituents. However, the concept of separate occurrence is only possible in coordinate constructions.

The final outcome of this section on symmetrical comitative constructions in Persian can be summarized as follows: in this type of comitative constructions, which consist of collective verbs, relational predicates, combining verbs, and similarity comparisons, both constituents [Noun Phrase$_1$] and [Noun Phrase$_2$ + bā (with)] are arguments. So, the constituent [Noun Phrase$_2$ + bā (with)] is not optional and should not be considered as an adjunct. It functions as a linker. Contrary to English, this type of comitative construction can be represented in Figure 1:

Figure 1

Symmetrical comitative construction (non-adjunct)



Collective verbs; attacking, comparing, competing, confronting, etc.

Combining verbs; mixing, merging, etc.

Relational predicates; being friends, being familiar, being contradictory, etc

Similarity comparisons; being the same in something, such as being the same height,etc

4.2. Asymmetrical comitative Constructions

In this type of constructions, both constituents [Noun Phrase$_1$] and [Noun Phrase$_2$ + bā (with)] are present, with the difference that the second phrase, the [Noun Phrase$_2$ + bā (with)] is an adjunct. Therefore, "with" is located in the head of the prepositional phrase, and the prepositional phrase group is optional and does not play a role in the accomplishment of the verb event. Asymmetrical comitative constructions have various types, such as:

37- *Man goošt rā bā čāqoo boridam. (Alat/abzar)*

I cut the meat with a knife. (Tool/instrument)

38- *Ali bā māšin miāyad. (Vasileye hamlo naghl)*

Ali comes with a car. (Means of transportation)

39- *U bā pā-ye piāde āmad. (Aza-ye badan)*

He came on foot. (Body part)

40- *Ali bā Hassan qazā poxt. (Fe'al-e gheyr jame'i)*

Ali cooked food with Hasan. (Non-collective verb)

As illustrated in the examples, in this type of comitative construction, similarity of both constituents on animacy is not necessary. The optional phrase [Noun Phrase$_2$ + bā (with)] can have various interpretations depending on the specific meanings associated with it.

4.2.1. Instrumental Construction

In this type of constructions, the constituent [Noun Phrase$_2$ + bā (with)]] functions as an instrument or tool. Consider the following examples:

41-a) *Ali dar rā bā kelid-e zang zade bāz kard.*

Ali opened the door with the rusty key.

b)- *Kelid-e zang zade dar rā bāz kard.*

The rusty key opened the door.

42-a) *Pedar bozorg sup rā bā qāshoq-e čoobi xord.*

Grandfather ate the soup with a wooden spoon.

b) * *Qāshoq-e čoobi sup ra xord.*

* The wooden spoon ate the soup

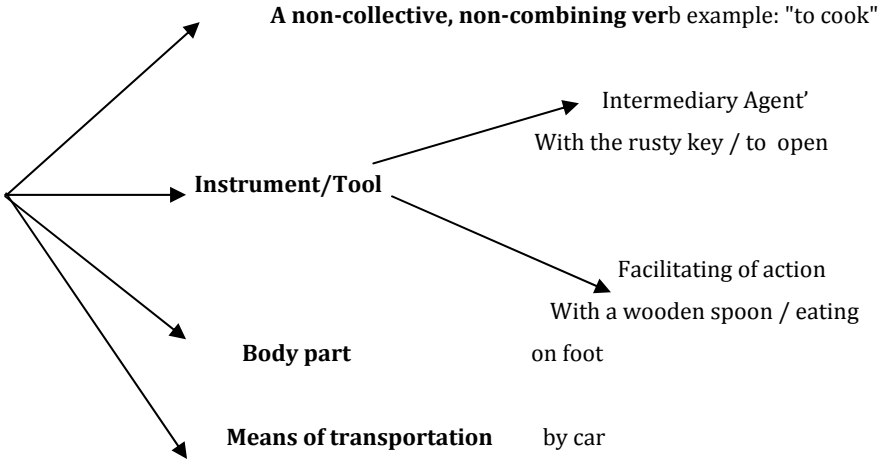
In both of the above examples (41a and 42a), the preposition "bā" (with) is used along with a tool. There is no difference between them in these examples. However, in examples (41b and 42b), they function differently as subjects. The presence of different complements in these two sentences leads to their distinct functions. Therefore, the different complements in the prepositional phrase (PP) are the cause of this distinction. In sentence (41), "Kelid-e zang zade" (the rusty key) is a phrase in which the tool ("Kelid", key) serves as an intermediary for the action of "baz šodan" (opening) and "dar" (door) ultimately resulting in the opening. Therefore, *Ali* performs an action on the rusty key, then the key, as an intermediary, makes the door open. Marantz (1984, p. 246) named this type of instrumental constituents as "Intermediary Agent".

However, in the examples (42a and b), *the wooden spoon* is also a tool that plays a role in the action of eating. This wooden spoon is different from the previous example of the key for opening the door. The wooden spoon cannot serve as an intermediary like the key, and the non-grammaticality of sentence (45b) is the evidence of that. Marantz (1984) refers to this type of tool as a "facilitating of action", while Pascal (1999) calls it as "means." In this sentence, the grandfather performs the action of eating using the spoon, but it is not the spoon that is eating the soup. The selection and operation of these instrumental phrases depend on the type of the verb and its arguments. In other words, the arguments behave on the base of the semantic nature of the verb which is permissible.

To sum up, the asymmetrical comitative construction exhibit different semantic networks. In this group, the constituent [noun phrase$_2$ + bā (with)] serves as an adjunct, and "bā" (with) functions as a preposition. The diagram below illustrates the types of asymmetrical comitative constructions:

Figure 2

types of asymmetrical comitative constructions



5. Conclusion

The analysis of comitative constructions in Persian language has shown that in this type of constructions, two constituents, accompanion and, accompanee are connected to each other through accompanying linker "b" (with). They are divided into two groups: 1) symmetrical constructions in which [with + DP2] is not an adjunct (an argument). The type of the verbs in this group are as follows: this type has been used with specific types of verbs, including collective verbs, relational predicates, combining verbs, and similar comparison. In this type, the constituent [Noun Phrase$_2$ + bā (with)] is not optional and cannot be considered as an adjunct. Therefore, in syntactic analyses, the grammatical morpheme "bā" (with) is not regarded as a head of prepositional phrase. Thus it behaves like a linker; 2) asymmetrical constructions in which [with 'bā'+ DP2] is located at the head of a prepositional phrase and is considered an adjunct and an optional constituent. The asymmetrical comitative constructions include non-collective verbs, body parts, means of transportation, and tools/instruments. The instrumental type itself consists of mediatory agent and facilitating action.

To sum up, the overall discussion reveals that the Persian language employs the grammatical morpheme "bā" (with) in two syntactic and semantic positions. One is as a linker (non-adjunct), and the other is as the head of a prepositional phrase (adjunct). Such an analysis is feasible considering syntactic-semantic considerations.

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Creating Lexical Phrases within Construction Grammar and their Application in Persian Dictionaries[1]

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Abstract

Idioms and collocations are part of lexical phrases which are of high importance in lexicography. One of the criteria for distinguishing these two types of phrases from each other is the inflexibility of their constituent elements. Idioms, unlike collocations, are not flexible in terms of word order and are always used in a fixed and specific form. The purpose of the present article was to show firstly whether all Persian idioms are inflexible against syntactic changes or some are flexible; secondly, to indicate how a new lexical phrase is created as a result of converting an idiom into a collocation. To illustrate this phenomenon, a new and practical definition for idioms and collocations, based on syntactic criteria not merely semantic, was provided. According to Construction Grammar, idioms were analyzed based on four syntactic tests: 'passivization', 'clefting', 'dislocation', and 'interrogation'. Two hundred idioms were collected from two of the most up-to-date and comprehensive sources, namely *Farsi Amiyaneh Dictionary* (Abolhassan Najafi, 2008*)* and the two-volume *Dictionary of Kenayat-e Sokhan* (Hassan Anvari, 2019). Some idioms were flexible to syntactic changes, and behaved similarly to collocations. The flexibility of idioms led to introducing a new definition of these phrases based on syntactic criteria. Thus, such

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phrases were considered a kind of collocation, not an idiom. The result showed that converting an idiom into a collocation always creates a lexical phrase or lexeme with a new meaning. Finally, a plan was introduced to represent such idioms practically in Persian dictionaries.

Keywords: idiom, collocation, Construction Grammar, lexical phrase, Persian lexicography

1. Introduction

A dictionary is a reference book that provides information about the meanings of words and how to pronounce them, often showing examples of how they are used in context, and is usually presented in alphabetical order (Landau, 2001, p. 6). Authoring and compiling a dictionary is called lexicography, which is a scientific field and a specialized activity. Lexicography is a very difficult, time-consuming and challenging task. According to Atkins and Rundell (2008, p. 2), no dictionary is perfect, and almost all of them can be called as 'work in progress'; moreover, since there is not any dictionary without defects, there is no unique method for dictionary-making. These endless challenges have always made the lexicographer subject to criticism.

In active lexicography, which is used for translation from native language to foreign language, the information provided in the sub-entry is more important than the entry itself. This information often includes lexical groups or phrases such as collocations, idioms, clichés, etc. It is obvious that their accurate knowledge plays a crucial role in lexicography. One of the important distinctions between idioms and collocations has often been its semantic aspect; idiom is considered as a lexical phrase whose meaning is not the sum of the meanings of its constituent elements (*Macmillan English Dictionary for Advanced Learners*, 2007). Collocations are also a group of words that have a high co-occurrence frequency.

Another important distinction between idioms and collocations is related to the lack of syntactic changes in idioms. Therefore, one of the main characteristics of idioms is the immutability of their constituent elements. In relation to the syntactic changes of idioms, Mel'čuk points to four syntactic

changes, including the constructions of passivization, clefting, dislocation, and interrogation, which can cause the displacement of the constituent elements in idioms (2014, p. 309). In standard written and spoken Persian, we, native Farsi speakers, discover idioms in which we witness these syntactic changes. The occurrence of each of these constructions in idioms alone is enough to claim that in some idioms, we witness a syntactic change. Therefore, the discussion of syntactic invariability of the constituent elements of idioms is practically ruled out. In fact, it seems that some phrases that we know as idioms and have an entry in dictionaries indicate a syntactic behavior similar to collocations. In this article, we investigated whether these syntactic changes occur in all Persian idioms or we see changes only in a limited set; and if we observe the occurrence of this event, will our definition of idioms remain the same as the previously known definitions or will a new categorization be required in phraseology? Is it possible to divide Persian idioms into two distinct groups, fixed and flexible, based on the four tests of passivization, clefting, dislocation, and interrogation? It seems that we are not faced with an idiom in its general sense, but we will have a new form of collocation where one lexical element will play the role of a core and the other lexical element will play the role of a function for the core. In addition, it seems that Persian idioms can be divided into two categories: fixed and flexible. Therefore, the two main questions of the current research are: 1) Considering the flexibility of some idioms, what distinction can be made between these two categories of idioms and collocations? 2) How should flexible idioms be presented in Persian dictionaries?

According to the authors, changing the role of a lexical combination from an idiom to a collocation always creates a lexical group or a word with a new meaning in the vocabulary of a language. Based on this, a plan was proposed to represent idioms in which there is a possibility of these four syntactic changes in monolingual and bilingual dictionaries practically. The proposed scheme is that if a phrase accepts syntactic changes, we are handling a collocation, not an idiom. This idiom, which syntactic changes do not empty it of its original meaning, should not be the main entry in the

dictionary, but the lexical group or the word created in a new meaning shall be the main entry, so that the other words that made up the idiom will play the role of collocators in the sub-entry.

The authors have extracted 200 idioms from the most up-to-date sources, namely *Farsi Amiyaneh Dictionary* (Abolhassan Najafi, 2008) and *Kenayat Sokhan Dictionary* (Hassan Anvari, 2019). The analysis tool was the use of authors' linguistic intuition as Persian native speakers to investigate the possibility of syntactic changes. To analyze the data, sixteen Persian speakers were asked to judge the well-structured data resulting from syntactic changes.

2. Theoretical framework

This section is presented in five main subsections. In section 2.1., first, the Construction Grammar and the most important purposes of this grammar, as the theoretical framework of the present research, are presented. Then, the four constructions used in this research (i.e. 'passivization', 'clefting', 'dislocation', and 'interrogation') are mentioned.

2.1. Construction Grammar

"Construction Grammar (CxG)" is a cover term for a number of grammatical theories and models in cognitive linguistics. The most basic unit of study in this model is "grammatical construction", not syntactic units or those rules that combine these syntactic units with each other. According to the CxG, the basis of establishing linguistic communication is a set of fixed expressions in the language speakers' minds, which are committed to the mind like a formula. From this point of view, linguistic expressions as pairs of form and meaning are considered as the main and formal unit of language (Goldberg, 1995, 2003; Sinclair, 2004).

In the CxG, each construction to some extent has a degree of conceptual and abstract content that has various stylistic representations. Constructions in this grammar, just like lexemes, are a combination of form and meaning. These constructions are basically considered symbolic units

(Croft, 2007, p. 72). These constructions are associated with syntactic, morphological, phonological, and pragmatic meaning. According to Goldberg, C is considered a construction if and only if C is a pair of form and meaning <F*i*, S*i*> in such a way that some aspects of F*i* or some aspects of S*i* cannot be completely predicted from the components of the C construction. (1995, p. 4). In this definition, F stands for the word form and S stands for the word semantics. Therefore, the pair <F, S> represents a symbolic unit. Indexes demonstrate the symbolic relationship between form and meaning. As a result, constructions can be considered the intersection of syntax and semantics. Goldberg believes constructions are "mental patterns and frames' that can be 'morpheme', 'word', 'idiom', 'verb phrase', 'noun phrase', 'ditransitive verb' and 'complex word'" (2003, p. 220).

Based on CxG, grammatical knowledge is uniformly represented in language speakers' mind, which are present as generalized constructions. All linguistic units, from words to general syntactic and semantic rules, can be explained in the form of construction. In fact, CxG generalized construction to all grammatical constructions comprising form and meaning. In addition, the examination of idiomatic constructions from another angle, within the framework of syntactic theory, led to the emergence of a uniform representation of all grammatical constructions.

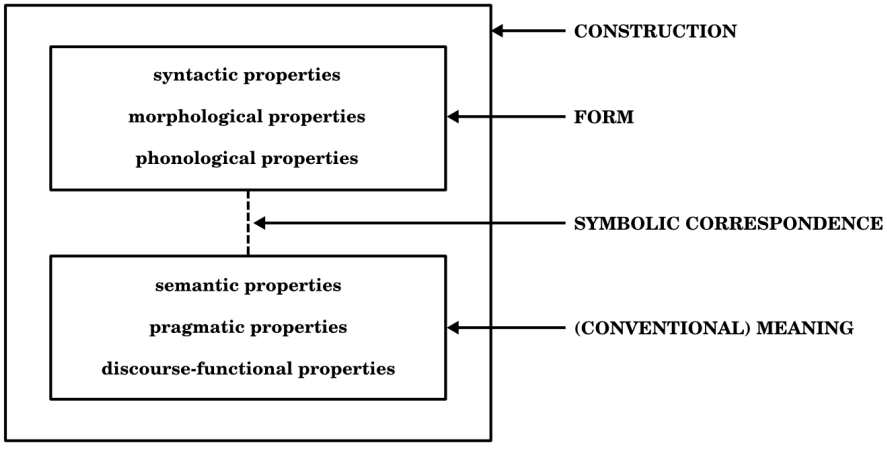
One of the most important features of "construction" is that all its meanings cannot be derived from the meanings of its constituent elements. These constituent elements can be words or morphemes or even phrases (Goldberg, 1995). It is worth reminding that constructions can appear in different sizes and levels of complexity, from a complete sentence to various phrases as well as word-formation patterns.

The main hypothesis in Goldberg's Construction Grammar is that the constructions themselves have meaning in the sentence, and this meaningfulness of the constructions is separate from the meaning of the words used in the sentence (Goldberg, 1995, p. 1). It seems necessary to mention that Goldberg never denies the fact that words play a major role in conveying meaning, but she believes that a "lexical grammatical model" alone

cannot fully and accurately represent the meaning of a sentence. As mentioned at the beginning of this section, a construction in CxG is a symbolic unit which can be represented as follows:

Figure 1

The symbolic structure of construction in Construction Grammar (Croft, 2001. p. 18)



For the first time, Newmeyer (1974) mentioned the possibility of applying four syntactic tests (proposed in the introduction section) to idioms. Then, Schenk (1995) applied the same four tests to the idiom "to kick the bucket". The main goal of the present research is to examine the Persian idioms within these four constructions. Before analyzing the idioms, it is necessary to briefly introduce these four syntactic tests to clearly determine the constructions in which the idioms will be examined.

2.2. Passivization

The conversion of active construction into passive construction is done based on three principles, which are actually three universal processes in the world's languages (Perlmutter & Postal, 1977):

1- The direct object of the active sentence replaces subject in the passive sentence (Perlmutter & Postal, 1977, p. 399). For example, in the active sentence "Abbas killed all the enemies", the phrase "all the enemies" is the direct object which plays the role of the subject in its passive sentence "All the

enemies were killed".

2- When the subject of an active sentence appears in the passive sentence, it is a *chômeur element* (Perlmutter & Postal, 1977). For example, in the passive sentence "All the enemies were killed by Abbas", the word "Abbas" is a *chômeur element*.

3- The passive sentence in surface structure is an intransitive sentence (Perlmutter & Postal, 1977). For example, the passive sentence "The tire was punctured" is an intransitive sentence.

According to Dabir-Moghaddam (2020, p. 43), after applying the passive transformation on the underlying structure of active sentences, passive sentences are obtained which are unambiguous and they only have a passive concept. He argues that the passive transformation cannot be applied to all Persian verbs. Therefore, the passive construction in Persian language is transformation-bound and is applied only in those verbs that have a special semantic feature (Dabir-Moghaddam, 2020). For example, sentence (1) is an active sentence and sentence (2) is its passive equivalent.

(1) Iranian football fans consider Ali Daei as the best football player in the history of their country.

(2) Ali Daei is considered the best football player in the history of his country.

2.3. Clefting

The term "cleft sentence" was used for the first time by Jespersen (1909). The equivalent of Jespersen's example can be seen in Persian language as a sentence like sentence (3).

(3) $[\text{It}]_{\text{pronoun}}$ was Mehran $[\text{who ate the food}]_{\text{relative clause}}$.

This sentence consists of the following parts:

1- Pronoun 'it' which is called cleft pronoun.

2- The noun after the pronoun, which is called focus or cleft constituent. In example (3), the proper noun Mehran is the focus or cleft constituent.

3- Copula

4- A type of relative clause. Some researchers, such as Quirk et al. (1985), Sornicola (1988), and Miller (1999) do not consider this type of clause as a relative clause.

2.4. Dislocation

One of the marked syntactic constructions in Persian language, in terms of word order, is dislocation (Moezzipoor, 2018, p. 46). A dislocation is a construction in which a constituent that can be an adjunct or an argument of a clause appears outside the clause, either on the right or on the left side (Sanchez & Ott, 2020). The dislocation on the left side is called left-dislocation. In this construction, the oblique object or possessor in an *ezafe* construction leaves its original position within the clause and gives its position to a pronominal clitic that carries the syntactic role of the left-dislocation constituent. In the Persian language, this dislocation is usually followed by the postposition 'rā' (Moezzipoor, 2018, p. 46). He gives example (4) for possessive left-dislocation in an *ezafe* construction, and example (5) for the left-dislocation of the oblique object[1]:

(4) *qazal-o*[2] *šomār-aš-o peydā kardam*
Qazal-DO number-her-DO apparent did-I
'As for Qazal's number, I found it'.

(5) *bačče-ro čāqu-ro az-aš begir*
child-DO knife-DO from-his or her take
'As for the child, take the knife from him or her'.

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[1] In this article, the following notations and abbreviations were used:
[a]: low front vowel
[ā]: low back vowel
pl: plural
part: participle
EZ: Ezafe (genitive) marker
DO: Direct Object
NEG: Negative
INF: Infinitive marker
HIATUS: a phoneme which prevents two vowels from appearing next to each other.
Ø: Zero morpheme which indicates verbal agreement with third person singular subject when the verb is used in the past tense.

[2] -o is a spoken form of the postposition rā (the direct object marker in Persian). Another spoken form of rā is ro.

In the dislocation construction on the right side, a noun phrase is moved to the right side of the clause, and the clause itself puts a coreferential pronoun instead of that moved noun phrase (Toma, 2018, p. 1). The dislocation on the right side is called *right-dislocation*. Ward & Birner (1996, p. 472) provide example (6) for the right-dislocation construction:

(6) She$_i$'s a smart cookie, that Diana$_i$.

2.5. Interrogation

In Chomsky's Universal Grammar, movement is one of the most important syntactic phenomena. One construction in which the phenomenon of movement is investigated is the interrogative construction. Movement consists of rules called transformation. In the movement process, the linguistic constituent moves from its position and occupies another position. Chomsky calls this event α movement. The movement of wh-expression is one of these movements that has attracted a lot of attention. According to Chomsky, wh-expression is moved from its original position to a position at the beginning of the sentence, which is a non-role position. In other words, there is a movement from subject to non-subject position. He calls this secondary position the *complementizer phrase specifier*. English is one of the languages in which the movement of the wh-expression is mandatory, but there are also examples where the wh-expression does not move, like (7) that Radford (2009, p. 183) brings as an echo-question:

(7) She was meeting who?

Regarding such examples, Chomsky considers movement in English to be of two types:

A) Overt syntactic movement. In this movement, the wh-expression is obviously transferred to the position of the complementizer phrase specifier and a grammatical sentence is obtained.

b) Non-overt syntactic movement. The wh-expression remains in its original position (logical level) and does not reach the phonetic level. In the above example, a non-overt syntactic movement is seen.

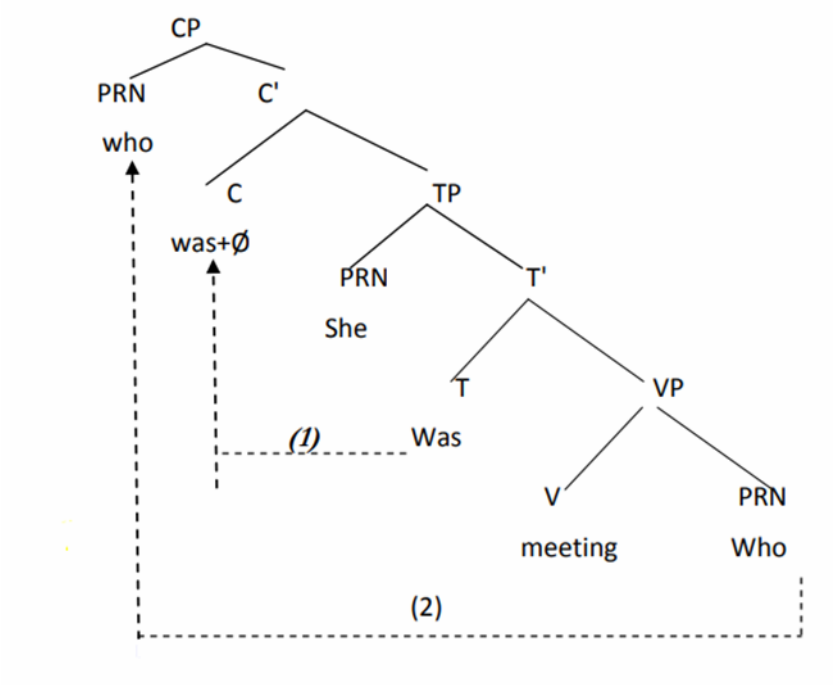
To illustrate the overt syntactic movement, Radford gives example (8)

as well as the following figure (2009, p. 183-185).

(8) Who was she meeting?

Figure 2

Obvious Syntactic Movement (Radford, 2009, p. 184)



As it is clear in figure 2, the wh-expression 'who' moves from the position of verb phrase to the position of the pronoun in the complementizer phrase. The verb 'was' moves from the position of the tense phrase head to the position of the complementizer phrase head, as well.

3. Method

In the current research, the authors have tried to give, based on the syntactic changes, a new definition of Persian idioms, and then explain how a lexical group is created, resulting from this phenomenon. For this purpose, it has been tried to use the most up-to-date sources available. Researchers have collected the idioms from two main sources, namely *Farsi Amiyaneh Dictionary* (Abolhassan Najafi, 2008) and *Kenayat Sokhan Dictionary* (Hassan Anvari, 2019).

The data were analyzed based on the authors' linguistic intuition as Persian speakers to investigate the possibility of syntactic changes. Then, the idioms were listed according to the previously mentioned definition. In the next step, the changes and displacements of the elements present in idioms were examined, then, sixteen Persian speakers were asked to judge the well-structured data resulting from syntactic changes. In addition, it was indicated how a lexical phrase resulting from the above-mentioned syntactic tests, i.e. passivization, clefting, dislocation, and interrogation, was created. Finally, its application in Persian lexicography was presented.

4. Discussion

Since the mentioned syntactic constructions are marked in Persian language, they have always been of great interests to researchers; however, limited research has been done on the syntactic constructions of idioms, and so far a comprehensive definition of idioms and collocations has not been proposed based on the probability of occurrence of these constructions in idiomatic expressions. In addition, the possibility of these constructions occurring in Persian idioms has been a question that has not been answered before this research.

In this section, it is tried, while analyzing 200 Persian idioms and applying the principles and concepts raised in the Goldberg's CxG framework, to provide an accurate and comprehensive definition of idioms based on the syntactic features of this type of expressions. By examining these data, it is determined which idioms accept some or all syntactic constructions (passivization, clefting, dislocation and interrogation) and which types of idioms do not show the flexibility. In addition, the question "what is the reason for the inflexibility of some idioms?" will be answered.

After performing these analyses, we will discuss how a lexical phrase or word in a new and limited meaning is created, and finally, the way of representing these phrases or words in Persian lexicography is shown.

4.1. Data analysis

In this section, 24 of the 200 selected idioms are presented as

examples in the following four subsections. Then, they are analyzed, and the flexible ones will be determined. The flexibility of each idiom is indicated by a tick mark (✓). Using this sign in front of the idiom means that the phrase in question does not lose its idiomatic meaning. For example, in the case of the expression *havās-e kasi-rā part kard-an* (=to distract somebody's attention), a sentence like *havās-am part šod* (=I was distracted) can be used in the passive construction. In this sentence, the same meaning as the original phrase is taken from it. As a result, the above idiom is flexible against the passive construction and is indicated by a tick mark. The inflexibility of an idiom is showed by an asterisk mark (*), which indicates that the sentence is meaningless, or at least has a less established meaning among Persian speakers. It is worth noting that all the sentences that are made by applying the four syntactic tests on idioms have a meaning, but that idiomatic meaning may not be taken. For example, in the idiom *hendevāne zir-e baqal-e kasi gozāšt-an* (=to flatter or praise somebody; literally: to put a watermelon under somebody's armpit), its passive construction is considered being asterisked and therefore meaningless. In the sentence *zir-e baqal-e ali (az su-y-e pedar-aš) hendevāne gozāšt-e šod* (literally: A watermelon was put under Ali's armpit (by his father)), which is the passive form of the above idiom, although the sentence has a meaning (for example, Ali's father has bought a watermelon and put it under his son's armpit to take it home), the idiomatic meaning (to flatter somebody) cannot be obtained. Some Persian idioms cannot be used in the passive or clefting constructions. For example, the idiom *morq-e kasi yek pā dāsht-an* (=to be persistent and not to go back on one's word), and also the idiom *rudarvāsi-rā kenār gozāšt-an* (= to express one's intention clearly) do not exist in the passive and clefting forms, respectively. In these cases, the flexibility of such constructions is indicated by a dash mark (-). The reason for this problem is explained in the subsections related to the passive and clefting.

4.2. Passive construction in idioms

The first construction examined in relation to idioms is the passive construction. Initially, we evaluate the flexibility of idioms in the passive

construction in the form of 6 idioms. Here, there are three categories of idioms in the passive constructions as follows:

(9) *jegar-e* *kasi-rā* *suzand-an*

liver-EZ somebody-DO burn-INF

literal meaning: to burn somebody's liver;

idiomatic meaning: to make somebody suffer deeply.

Passive construction:

jegar-e *mādar-aš* *suxt-Ø*

liver-EZ mother-his or her burnt-it

✓ 'His or her mother's liver burned'.

(10) *ātaš* *be* *pā* *kard-an*

fire to foot do-INF

literal meaning: to set fire;

idiomatic meaning: to cause chaos.

Passive construction:

ātaš *be* *pa* *šod-Ø*

fire to foot became-it

✓ 'The fire was set'.

The first category shows flexibility against the passive construction. In other words, the construction under consideration does not empty the idiom from its idiomatic meaning. In Persian, unlike in English, the passive construction does not significantly change the constituent elements of an idiom, and it is done simply by converting one light verb into another. According to Karimi (1997), more than 90% of Persian verbs are made with light verbs. A high percentage of Persian light verbs are also made with the light verb *kardan* (to do), to the extent that this verb is also often used with foreign words, such as *email kardan* (to send an email, to email), *kāt kardan* (to cut), *kansel kardan* (to cancel), etc. By all means, this does not mean that whenever an idiom contains the verb *kardan* or other light verbs, it can be converted into passive.

(11) *ārezu* *be* *del-e* *kasi* *mānd-an*

desire to heart-EZ somebody stay-INF

literal meaning: a desire to stay in somebody's heart;

idiomatic meaning: not to fulfill somebody's wish and always miss it.

Passive construction: - (An intransitive verb)

(12) *morq-e kasi yek pā dāsht-an*

hen-EZ somebody one foot have-INF

literal meaning: somebody's hen to have one leg;

idiomatic meaning: to be persistent and not to go back on one's word.

Passive construction: - (A transitive verb that cannot be passivized)

The second category is idioms which can't come in passive form. For example, idioms such as *ārezu be del-e kasi mānd-an* or *morq-e kasi yek pā dāsht-an*, can't be converted into passive, since an intransitive verb has been used in the structure of these expressions.

(13) *hendevāne zir-e baqal-e kasi gozāšt-an*

watermelon under-EZ armpit-EZ somebody put-INF

literal meaning: to put a watermelon under somebody's armpit;

idiomatic meaning: to flatter or praise somebody.

Passive construction:

zir-e baqal-e ali hendevāne gozāšt-e šod-Ø

under-EZ armpit-EZ Ali watermelon put-part became-it

* 'A watermelon was put under Ali's armpit'.

(14) *šotor-rā bā namad dāq kard-an*

camel-DO with felt hot do-INF

literal meaning: to heat the camel with felt;

idiomatic meaning: to make the work very difficult for a person.

Passive construction:

šotor bā namad dāq šod-Ø

camel with felt hot became-it

* 'The camel was heated with felt'.

The third category is idioms such as *šotor-rā bā namad dāq kard-an* which its passive form *šotor bā namad dāq šod-Ø* (=the camel was heated with felt) cannot be used in the same idiomatic sense. One of the reasons is that the expression 'the camel was heated with felt' is not used as an idiom among Persian speakers, and this has caused the expression *šotor-rā bā namad dāq*

kard-an to maintain its high level of inflexibility.

4.3. Clefting construction in idioms

The next construction in idioms is clefting construction. We examine the behavior of 6 idioms in the cleft construction and then provide a model of the idioms' flexibility or inflexibility in the construction under consideration. Here, we face two categories of idioms in clefting constructions as follows:

(15) *del-e* *kasi-rā* *šekast-an*

heart-EZ somebody-DO break-INF

literal meaning: to break somebody's heart;

idiomatic meaning: to turn somebody's hope into disappointment.

Clefting construction:

in *del-e* *ali* *bud* *ke* *šekast-i*

this heart-EZ Ali was that broke-you

✓ 'It was Ali's heart that you broke'.

(16) *havās-e* *kasi-rā* *part* *kard-an*

Senses-EZ somebody-DO outlying do-INF

literal meaning: to throw somebody's senses;

idiomatic meaning: to distract somebody's attention.

Clefting construction:

in *havās-e* *man* *bud* *ke* *part* *šod-Ø* *na* *to*

this senses-EZ I was that outlying became-it NEG you

✓ 'It was my attention that got distracted, not yours'.

(17) *ajal-e* *kasi* *resid-an*

life deadline-EZ somebody arrive-INF

literal meaning: to arrive somebody's life deadline;

idiomatic meaning: to be the time of somebody's death.

Clefting construction:

In *ajal* *bud* *ke* *āxar-eš* *az* *rāh* *resid-Ø*

this life deadline was that end-its from way arrived-it

✓ 'It was the life deadline that finally arrived'.

The first category shows flexibility against clefting construction. That

is, this construction does not empty the idiom from its idiomatic meaning. To be more precise, these idioms have a high frequency among Persian speakers in their clefting construction, and replacing their constituent elements does not make the idiom empty of its idiomatic meaning. In the following, after presenting the next three examples, we will discuss the reason for this phenomenon.

(18) *sar-e gāv tu-y-e xomre gir kard-an*
head-EZ cow inside-HIATUS-EZ vat trapped do-INF
literal meaning: to get the cow's head trapped in the vat;
idiomatic meaning: to face an unexpected problem that cannot be solved.

Clefting construction:

in sar-e gāv bud ke tu-y-e xomre gir kard-Ø
this head-EZ cow was that inside-HIATUS-EZ vat trapped did-it

* 'It was the cow's head that got trapped in the vat'.

(19) *riq az damāq-e kasi birun āmad-an*
thin stool from nose-EZ somebody outside came-INF
literal meaning: to come out thin stool of somebody's nose;
idiomatic meaning: to die.

Clefting construction:

in riq bud ke az damāq-e u birun āmad-Ø
this thin stool was that from nose-EZ he or she outside came-it

* 'It was the thin stool that came out of his nose'.

(20) *tasme az gorde-y-e kasi kašid-an*
belt from kidney-HIATUS-EZ somebody pull-INF
literal meaning: to pull a belt from somebody's kidney;
idiomatic meaning: to intimidate somebody and make them submit to their will.

Clefting construction:

in tasme bud ke az gorde-y-e mā kašid-and
this belt was that from kidney-HIATUS-EZ we pulled-they

* 'It was the belt that they pulled from our kidney'.

The second category is idioms in which it is not possible to have clefting constructions. The reason for the difference is their constituent elements and the role of these elements in assuming the semantic load of the idiom. In the first category, in which the cleft construction still preserves the idiomatic meaning, there are elements that contain all or a large part of the idiom's meaning. For example, in the first to third idioms, that is, *del-e kasi-rā šekast-an, havās-e kasi-rā part kard-an*, and *ajal-e kasi resid-an*, the lexemes *"del*", "*havās*" and *"ajal*" alone can be used in the meanings close to 'feeling or the center of feelings and emotions', 'mind' and 'time of death' respectively. This relative independence of words and their use (in the same meaning as mentioned) in other sentences, causes these words to free themselves from their absolute constraints in these idioms and gradually lower the idiom's inflexibility level. This will eventually lead to the transformation of an idiom into a collocation. In other words, when a word carries the main meaning of an idiom, it obtains the power to change its place within the structure of the idiom. When a word cannot freely change its place within the structure of the idiom, it is because it does not play a role in determining the idiom's meaning. The smaller the role of a word in determining the idiom's meaning, the less freedom of action it will have in freeing the constraints of the idiom. This applies to the second category. For example, in the expression *riq az damāq-e kasi birun āmad-an* (= to die), none of the constituent elements of the idiom have a role in determining the overall meaning of the idiom. Neither "*riq"*, nor *"damāq"* nor *"birun āmad-an*" have anything to do with the concept of 'dying'. One of the important factors in the transformation of an idiom into a collocation is the commonness of that idiom among people, and especially among young people. The wide spread of an idiom causes its constituent elements to find an independent identity over time; as a result, they carry the idiom's semantic load. For example, it seems that the idiom *gir dad-ān* (= to ask somebody for something with persistent insistence) became popular among people when the TV series *Zir-e Asemān-e Šahr* (literally. Under the City's Sky) started airing in 2003. After some time, the noun *"gir*" became free from its light verb and could

be used alone. More precisely, the light verb *dad-ān* (= to give) was reduced from the sentence level (Safavi, 2012) and the word *"gir"* was used alone in many sentences among people.

4.4. Dislocation construction in idioms

The third construction examined in the present study is called dislocation. In this section, we examine the behavior of idioms in this construction and after that, present a model of the idioms' flexibility or inflexibility in the construction under consideration. Here, we face three categories of idioms in the dislocation construction as follows:

(21) *jour-e* *čizi-rā* *kešid-an*
tyranny-EZ something-DO pull-INF
literal meaning: to pull the tyranny of something;
idiomatic meaning: to face the punishment of one's bad action.

Dislocation construction:

tanbali *jour-eš-o* *hālā* *xāh-ad* *kešid*[1]*-Ø*
laziness tyranny-its-DO now will-he or she pulled

✓ 'Laziness, he or she tolerates its punishment now'.

(22) *ārezu-y-e* *čizi-rā* *be* *gur* *bord-an*
desire-HIATUS-EZ something-DO to grave carry-INF
literal meaning: to carry the desire for something to the grave;
idiomatic meaning: not to reach one's desire and die.

Dislocation construction:

demokrāsi *ārezu-y-aš-rā* *be* *gur* *xāh-and* *bord*
democracy desire-HIATUS-its-DO to grave will-they carried

✓ 'Democracy, they will carry their wish to the grave'.

The first category demonstrates flexibility against this construction. That is, the construction does not empty the idiom from its idiomatic meaning. But the important point is that the dislocation construction works only on those idioms that have lexical units such as 'something' or 'somebody'. In fact, in such

[1] In Persian, the future tense auxiliary agrees with the subject, and the main verb appears in its past stem form without a subject agreement marker (Dabir-Moghaddam, 2020, p. 118).

idioms, we see the *ezafe* (genetive) combination of noun + noun (for example, *ārezu-y-e demokrāsi* in the second case) where the second element can be moved to the beginning of the sentence. The reason for this is that the second element can be any word, for example *ārezu-y-e piruzi* (a desire for victory), *ārezu-y-e āzādi* (a desire for freedom), *ārezu-y-e qabul šod-an dar konkur* (a desire to be accepted in university entrance exam), etc., and it is not a fixed element of the idiom. This lowers the inflexibility level of the idiom and makes it more like a collocation than an idiom. According to the authors, the existence of such lexical units such as 'somebody' or 'something' makes a phrase very close to a collocation.

(23) *āsemān rismān be ham bāft-an*
sky string to each other weave-INF
literal meaning: to weave the sky (and) string together;
idiomatic meaning: to speak scattered and irrelevant words.

Dislocatipn construction: -

(24) *band-rā āb dād-an*
Dam-DO water give-INF
literal meaning: to water the dam;
idiomatic meaning: to say what should not be said.

Dislocation construction: -

The second category is idioms in which it is not possible to make them dislocated. Dislocation can be seen only when there is an *ezafe* combination in the phrase. In this second category there is no *ezafe* combination of noun + noun. Therefore, the formation of dislocation construction cannot occur in them.

(25) *yek rude-y-e rāst tu-y-e čekam-e kasi na-bud-an*
one intestine-HIATUS-EZ right inside-HIATUS-EZ stomach-EZ somebody NEG-be-INF
literal meaning: not to be a right intestine in sb's stomach;
idiomatic meaning: to be a liar.

Dislocation construction:

*čekam-e farbod yek rude-y-e rāst tu-*š *na-bud-Ø*

stomach-EZ Farbod one intestine-HIATUS-EZ right inside-its NEG-was-it

* 'Farbod's stomach, there is not a right intestine in it'.

(26) *āb tu-y-e guš-e kasi kard-an*

water inside-HIATUS-EZ ear-EZ somebody do-INF

literal meaning: to pour water into somebody's ear;

idiomatic meaning: to deceive somebody.

Dislocation construction:

guš-e mehān tu-š āb rixt-and

ear-EZ Mehran into-its water poured-they

* 'Mehran's ear, they poured water into it'.

Finally, the third category consists idioms in which the presence of dislocation construction makes the phrase void of its idiomatic meaning and as a result, they are displayed with an asterisk. For example, in the expression *yek rude-y-e rāst tu-y-e čekam-e kasi na-bud-an* (= to be a liar), no lexical element (except for the word '*kasi*' (somebody)) can be moved to the beginning of the sentence or anywhere else. This is because in this idiom, the meaning of 'being a liar' is distributed among all the elements of the expression, and there is no element in the idiom that can alone carry all or most of the idiom's meaning. In other words, the semantic value of all elements is the same. On the opposite point, we have idioms like *jour-e čizi-rā kešid-an* where a single lexical unit (here, *"jour*") carries most of the semantic load of the idiom alone. In this idiom, "*jour*"can be considered equivalent to 'punishment of a bad deed'; while in an expression like *yek rude-y-e rāst tu-y-e čekam-e kasi na-bud-an*, there is no such a lexical unit that carries most of the semantic load of the idiom alone.

4.5. Interrogation construction in idioms

The last construction examined in the present study is the interrogation construction. First, we examine the behavior of six idioms in the construction under consideration. After that, a model of idiom's flexibility or inflexibility in this construction is provided. Here, we are faced with two categories of idioms in the interrogation construction as follows:

(27) *šāx-e qul-rā šekast-an*

horn-EZ monster-DO break-INF

literal meaning: to break the monster's horn;

idiomatic meaning: to do a superhuman task.

Interrogation construction:

fekr kard-i kodām šāx-e qul-rā šekast-i

thought did-you which horn-EZ monster-DO broke-you

✓ 'Which monster's horn did you think you broke'?

(28) *qāl-e qaziye kand-e šod-an*

din-EZ matter come off-part become-INF

literal meaning: to come off the din of a matter;

idiomatic meaning: to put an end to.

Interrogation construction:

qāl-e kodām qaziye kand-e šod-Ø

din-EZ which matter come off-part became-it

✓ 'Which din of the matter was come off'?

(29) *(kasi-rā) tu-y-e ātaš andāxt-an*

(somebody-DO) inside-HIATUS-EZ fire throw-INF

literal meaning: to throw (somebody) into the fire;

idiomatic meaning: to cause somebody's misfortune.

Interrogation construction:

to-rā tu-y-e kodām ātaš andāxt-am ke in qadr asabāni šod-i

you-DO inside-HIATUS-EZ which fire threw-I that this much angry became-you

✓ 'In which fire did I throw you that you got so angry'?

The first category shows flexibility against the interrogation construction. That is, this construction does not empty the idiom from its idiomatic meaning. In this category, that is the interrogative construction which still preserves the meaning of the idiom, the reason for that is the existence of elements that contain all or a large part of the idiom's meaning. For example, in the first three idioms, that are *šāx-e qul-rā šekast-an*, *qāl-e qaziye kand-e šod-an*,

and *kasi-rā tu-y-e ātaš andāxt-an*, the words or lexical phrases *šāx-e qul, qaziye,* and *ātaš* alone can be respectively used to the meanings close to "extraordinary work", "the flow of something" and "misfortune". This relative independence of words and their use (in the meanings as mentioned) in other sentences causes these words to free themselves from their absolute constraints in these idioms and gradually lower the level of idiom's inflexibility. This will lead to the transformation of an idiom into a collocation. In other words, when a word carries the main meaning of an idiom, it obtains the power to change its place within the idiom's structure. When the word cannot freely change its place within the idiom's structure, it is because it does not play a role in determining the meaning of the idiom.

(30) *šāx tu-y-e jib-e kasi gozāšt-an*
horn inside-HIATUS-EZ pocket-e somebody put-INF
literal meaning: to put a horn in somebody's pocket;
idiomatic meaning: to encourage somebody to do something by flattery and trickery.

Interrogation construction:

šāx-r ā tu-y-e kodām jib-e mehrān gozāšt-i
horn-DO inside-HIATUS-EZ which pocket-EZ Mehran put-you
* 'In which Mehran's pocket did you put the horn'?

(31) *fil-e kasi yād-e hendustān kard-an*
elephant-EZ somebody remembrance-EZ India do-INF
literal meaning: to make somebody's elephant remember India;
idiomatic meaning: to think of one' halcyon days.

Interrogation construction:

kodām fil-e ali yād-e hendustān kard-Ø
which elephant-EZ Ali remembrance-EZ India did-he
* 'Which Ali's elephant remembered India'?

(32) *qāti-y-e morq-hā šod-an*
blended-HIATUS-EZ hen-pl become-INF
literal meaning: to be blended in with hens;
idiomatic meaning: to marry.

Interrogation construction:

u	*qāti-y-e*	*kodām*	*morq-hā*	*šod-Ø*
he or she	blended-HIATUS-EZ	which	hen-pl	became-he or she

* 'Which hens was he blended in'?

The second category refers to the idioms in which it is not possible to make an idiom interrogative. The reason for the difference in the behavior of these two types of idioms is their constituent elements and the role of these elements in assuming the idiom's semantic load. The less the role of the word in determining the idiom's meaning, the less freedom of action it will have in freeing the constraints of the idiom. This applies to this second category. For example, in the idiom *qāti-y-e morq-hā šod-an* (= to marry), none of the constituent elements of the idiom plays a role in determining the overall meaning. Neither *"morq-hā"*, nor *"qāti šod-an*" have anything to do with the concept of "to marry". It is important to mention that in this section, only those idioms where examined which the question words such as *"če*" (what) or *"kodām"* (which) is used in the structure of the idiom, not those idioms where the question word appears at the beginning of the idiom. That's why the researchers were to investigate the formation change of the idioms. The question words used at the beginning of the idiom do not change the structure of idioms; therefore, they are not a suitable benchmark to evaluate the formation change of the idioms. Of course, in Persian language, question words can be used at the beginning of the sentence without changing the idiom's structure. For example, the idiom *āb az galu-y-e kasi payin na-raft-an* can be interrogated as *kodām āb az galu-y-e man payin na-raft?*, but this interrogative sentence does not specify exactly whether the idiom is flexible to the interrogation construction or not.

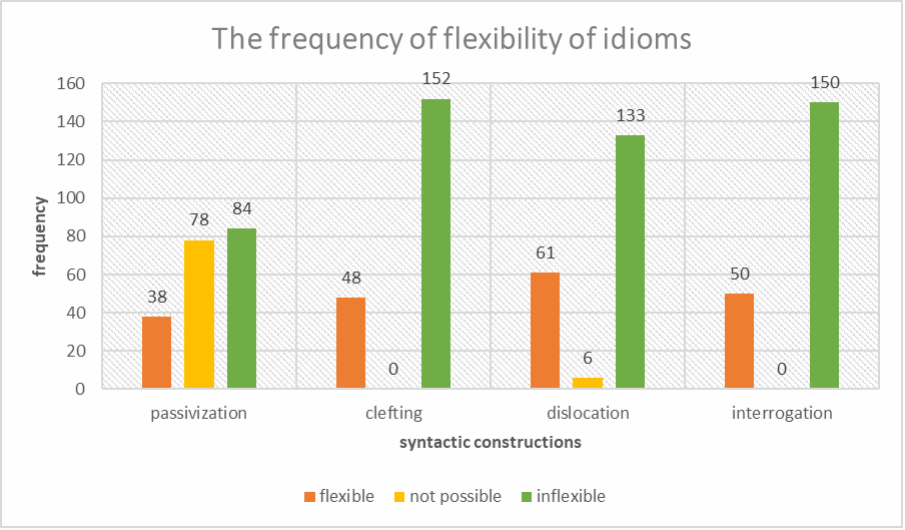
4.5. Data statistical analysis

Out of the total of 200 idioms that were examined, 38 idioms were used in the passive construction and produced sentences that had the same idiomatic meanings. 48, 61, and 50 idioms also produced meaningful sentences in clefting, dislocation, and interrogation constructions, respectively. The result of

the final analysis of these 200 idioms indicates that 24.62 percent of the idioms show flexibility against these four syntactic constructions. The above results prove that the constituent elements of some idioms can be moved and used in different constructions like collocations. Figure 1 shows the frequency of flexibility of idioms in four syntactic constructions.

Figure 1

Frequency of flexibility of idioms in four syntactic constructions



5. Conclusion

The main goal of the present research was to analyze idioms with a novel perspective and provide a new classification of these limited lexical phrases. In fact, by using the above four syntactic tests, we tried to identify two types of idioms in Persian. In addition to the main goal, another goal was followed, which is related to the presentation of idioms in dictionaries. Almost all monolingual and bilingual dictionaries present idioms as a main entry, which makes the user's hands tied when translating from his/her mother tongue to the foreign language, and he/she cannot use these idioms in different ways in his/her text as they want. If syntactic changes are possible in idioms, these apparently immutable lexical phrases will not be displayed as the main entry. In fact, they will be divided into a core and one or more functions. The

idiom should be considered as a sub-entry of the core so that the user can use that expression in a desired form, such as passive, dislocated, interrogative, etc. in his/her text.

It seems that with the increase of creativity in using language, especially among young people, we will see more and more idioms converting into collocations. Of course, the fewer the constituent elements of an idiom, the more likely it is to become a collocation. For example, the phrase *del-e kasi rā šekast-an* (= to turn somebody's hope into disappointment; literally: to break somebody's heart) consists of two lexical elements: 1. *"del*" (= heart), 2. *"šekast-an*" (= to break). However, the phrase *band-e del-e kasi pare šod-an* (= to become extremely distressed; literally: to be torn somebody's heartstrings) consists of three elements: 1. *"band"* (= string), 2. *"del*" (= heart), 3. *"pāre šod-an"* (= to be torn). This difference in the number of idiom elements makes the second idiom, unlike the first one, remain still an idiom. This is due to the fact that when the number of constituent elements is high (more than two elements), no elements can carry the main burden of meaning alone and weaken the rest of the elements in terms of meaning. For example, in the idiom *pust-e xarboze zir-e pā-y-e kasi andāxt-an* (= throw a melon skin under somebody's feet, literally: to deceive), the meaning of 'to deceive' is equally distributed over all constituent elements, and no element can assume the meaning of 'to deceive'. As a result, it is very unlikely that this idiom will be converted into a collocation in the future. But in a phrase such as *āh dar basāt na-dašt-an* (= to be clean and penniless), the lexeme *"āh*" can alone carry the meaning of the phrase (in a meaning such as lack of money). Or in a phrase like *ātaš be pā kard-an* (to cause chaos), since it has only two constituent elements (*"ātaš"* and *be "pā kard-an"*), *"ātaš"* assumes the meaning of the phrase (in a meaning like chaos) and the verb *"be pā kard-an"*, which has given up the main semantic load, becomes a light verb and plays the function role for the pivot (here *"ātaš*") in various syntactic constructions.

According to the authors, changing the role of a lexical combination from an idiom to a collocation always results in the addition of a lexical group or a word with a new meaning to the lexicon of a language. To make it clearer,

let us propose the famous idiom 'to kick the bucket' in English. If one day all four syntactic changes mentioned in section 1 were meaningful, then, according to the authors, the lexical group 'the bucket' with the meaning of 'death', 'passing' or similar words close to the concept of death would be added to the lexicon. As a result, 'the bucket' should be presented as the main entry in dictionaries, and the verb 'kick' will act as a collocate of the lexical group 'the bucket'. In this case, the verb 'kick' in the idiom 'to kick the bucket' is a light verb and has the same role as the light verb *"kardan"* (to do) in the collocations such as *"eštebāh kardan"* (= to make a mistake), *"ezdevāj kardan"* (= to marry) or *"guš kardan*" (= to listen) because all these three verbs imply doing something.

Now we will examine the same issue in Persian. As mentioned earlier, almost all monolingual and bilingual dictionaries display idioms as the main entry. For example, an idiom such as *pust-e xarboze zir-e pā-y-e kasi andāxt-an* (= throw a melon skin under somebod's feet, literally: to deceive), cannot be written under any of the constituent elements of that idiom, because the above idiom has no any semantic relation with the words *"pust", "xarboze", "pā",* etc. Therefore, it is obvious that idioms are always displayed as main entries. Some Persian and English dictionaries display idioms under one of the constituent elements of the idiom which helps the user find the idiom quickly. The reason for adopting that method by lexicographers is beyond the scope of this article and we will limit ourselves to this.

Based on the results of the present research, it can be concluded that there are two types of idioms in Persian. Some idioms are inflexible to syntactic constructions and still bear the name of idiom. These idioms will be the main entries in the dictionary as before. But the topic we are discussing is the second type of idioms, which are flexible against syntactic constructions. The authors consider these idioms to be a type of collocation and their representation in dictionaries is similar to collocations, but with two more limitations. Here, the flexible idiom *šāx-e qul-rā šekast-an* (= to break the monster's horn, literally: to do a superhuman task), which will be called a collocation from now on, is represented in the dictionary.

The authors believe that the above expression, which is flexible against syntactic constructions, should not be the main entry. The reason is that its constituent elements were not irreplaceable like idioms and behaved similarly to collocations. The above expression has been recorded in Persian dictionaries as an idiom, but the lexical phrase *"šāx-e qul*" (in *šāx-e qul-rā šekast-an*) has not been inserted in any dictionary as the main entry. This lexical phrase could freely change its place in the idiom construction. One of the reasons, as mentioned, was that it carried all or most of the semantic load of the idiom. This reason is enough to choose "šāx-e qul" as a newly-created lexical phrase as a main entry in the dictionary. The meaning of this new lexical phrase is something close to the concept of "extraordinary work". Since the user cannot freely choose such phrases and use them in his/her text, the definition of these phrases should not be displayed. This is the first limitation in the way these entries are represented. The reason for this is to tell the user that he/she cannot use these phrases alone, except with their collocators. Mandatory use of the collocators is the second limitation in the representation of these phrases. This can be seen in the entry *aback (adv)* in *Longman Dictionary of Contemporary English*, 5th Ed. It can be founded that the use of the adverb *aback* will always be accompanied by the use of the light verb *to take*.

Finally, the way to represent the expression *šāx-e qul-rā šekast-an* is suggested as follows:

šāx-e qul (noun)

~ rā šekast-an

In front of the main entry *"šāx-e qul"*, no definition or equivalent like "extraordinary work" has been given because it cannot be used freely in the above meaning. For example, *šāx-ha-y-e qul dastmozd-e bālā-tar-i mi-talab-ad* (= the monster's horns demand a higher salary!) is not possible. In the sub-entry, the sign ~ indicates the presence of the main entry in the sub-entry expression. Using the entry *šāx-e qul* is always accompanied by the use of the collocator *šekast-an*. In fact, by displaying the sub-entry in this way, we allow the user to use the phrase *šāx-e qul-rā šekast-an* in different syntactic constructions such as passivization.

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The Relationship between the Addressee's Social Dominance and Request Strategies Used by Iranian Teenage Students[1]

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Abstract

The study of request speech act has been considered by many researchers in various cultures and communities. In line with the goals of these studies, the cuurent article aims to extract and categorize the request speech act strategies used by Iranian teenager students (ITS) based on Cross Cultural Speech Act Realization Project (CCSARP) coding scheme proposed by Blum-Kulka, House and Kasper (1989) with regard to the relationship between the social dominance (power) of the addressees on the type and number of request strategies. The data were collected via Discourse Completion Test (DCT) and role-play filled and performed by 100 Birjandi high school students of Persian (50 girls and 50 boys). The results of the Chi-square test and also the two data collection methods employed showed that there was a significant relationship between the addressee's social dominance and the type and number of request strategies used by ITS. In addition,"Alerters", "preparatories" and "grounders" were the most employed strategies by the participants in both DCTs and role-plays. Besides, the lower social dominance of the speaker towards the addressee resulted in the application of complex strategies. So, it seems, with regard to politeness, Iranian cultural system to be

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hierarchical. Moreover, regarding the use of the request strategies by ITS, the findings didn't show any difference between the two corpora, i.e., the data gathered via DCTs and role-plays.

Keywords: request, social dominance, type of request strategies, number of request strategies, Iranian teenage students[1]

1. Introduction

Pragmatics, according to Senft (2014), is a linguistics discipline that deals with actual language use. As Sneft (2014) states, language use is both dependent on linguistic (grammatical and lexical) knowledge, and on cultural, situative and interpersonal context and convention.

In addition, one of the central aims of pragmatics is to research how context and convention contribute to meaning and understanding. One of the most attractive areas of study in the domain of pragmatics is the study of speech acts. Based on the notions mentioned by Blum-Kulka et al. (1989), as to the speech acts, considerable attention has been paid from two main perspectives: some researchers like Austin (1962) and Searle (1969, 1975) claimed that they operate by universal pragmatic principles; and those like Green (1975) and Wierzbicka (1985) believed that they vary in conceptualization and verbalization across cultures and languages. The latter perspective led Blum-Kulka et al. (1989) to initiate a project named Cross Cultural Speech Act Realization Project (CCSARP) that worked on the applicability, similarities, and differences of two speech acts, i.e., request and apology across diverse cultures and languages. CCSARP started in 1982 for the first time. It opened up a new field of cross-cultural and cross-linguistic investigation focusing on the two speech acts of apology and request in eight language varieties of native and non-native speakers (Blum-Kulka et al., 1989, p. 11). The languages selected by them were Australian English, American

[1] abbreviations: 1SG, 1st person singular; 2SG, 2nd person singular; 3SG, 3rd person singular; 2PL, 2nd person plural; 3PL, 3rd person plural; ATTR, Attributive; EP, epenthesis; EZ, Ezafe particle; IMP, imperfect tense; IMPER, imperative; INDEF, indefinite article; INF, infinitive marker; ITS, Iranian teenage students; lit., literally; NEG, negative; OM, object marker; PAST, past stem; PP, past participle; PL, Plural; PRES, present stem; PRO.CLIT, pronominal clitic; REL, relativiser; SG, singular; SUBJ, subjunctive; SUPER, superlative, =, clitic boundary.

English, British English, Canadian French, Danish, Hebrew, and Russian. After that, the model was modified in 1989 by these researchers and again was employed in the mentioned languages, except for Russian. Blum-Kulka et al. (1989) claimed that CCSARP follows three main objectives: the investigation of cultural variation, sociopragmatic variation, and interlanguage variation. Thus, they believed that CCSARP was to prepare the possibility of valid comparability in situational, cultural, native, and non-native directions (sociopragmatics).

Following CCSARP's objectives, including he universality of applying speech acts and their culture-specificity, this study deals with extracting and categorizing request strategies in Persian, based on Blum-Kulka et al.'s (1989) taxonomy. In addition, the study discusses the effect of the addressee's social dominance on the type and number of request strategies employed by Iranian teenage students (ITS) collected via the DCT and role-play. Correspondingly, this study seeks to answer the following questions:

1. Is there any significant relationship between the addressee's social dominance and the type of request strategies employed by ITS in the DCT?
2. Is there any significant relationship between the addressee's social dominance and the number of request strategies employed by ITS in the DCT?
3. Is there any significant relationship between the addressee's social dominance and the type of request strategies employed by ITS via role-play?
4. Is there a significant relationship between the addressee's social dominance and the number of request strategies employed by ITS via role-play?

To evaluate the meaningful relationship between the type and the number of request strategies used, on the one hand, and the effect of the addressee's social dominance on the use of request strategies, on the other hand, the following null hypotheses are formulated:

1. There is not a significant relationship between the addressee's social dominance and the type of request strategies employed by ITS in the

DCT.

2. There is not a significant relationship between the addressee's social dominance and the number of request strategies employed by ITS in the DCT.
3. There is not a significant relationship between the addressee's social dominance and the type of request strategies employed by ITS via role-play.
4. There is not a significant relationship between the addressee's social dominance and the number of request strategies employed by ITS via role-play.

As to the theoretical significance of the present study, its findings can contribute to the notion of universality of the request strategies claimed by Blum-Kulka et al. (1989) in different languages and cultures. In addition, regarding the empirical significance of the study, the research results signifies that being unfamailliar with linguistic pragmatic principles in different cultures and languages may lead to problems while establishing verbal communication among the speakers of different languages. Therefore, investigating these pragmatic principles and using them correctly can prevent misunderstandings and cross-cultural communicative problems in different situations.

This paper includes the following sections: the introduction, a review of the related literature, the research methodology (introducing the participants of the study, instrument and procedure, coding scheme), data analysis, the results of the study, the discussion, and the conclusion which locates at the end of this paper as the last main section.

2. Review of the related literature

In a study of the speech act of request, Al-Tayeb Umar (2004) began a socio-linguistic investigation considering the request strategies used by advanced Arab learners of English as compared to those strategies used by native speakers of English based on Blum-Kulka et al. (1989) while applying a DCT. The two groups employed similar strategies while addressing their request to equals or people in higher positions and relied heavily on

conventionally indirect strategies. However, concerning those requests addressed to people in lower position, the Arabic sample showed a marked tendency towards using more direct strategies than the British sample. In addition, the results indicated some significant differences between the two groups in the way they modified their request strategies; i.e., the native speakers of English used more semantic and syntactic modifiers than their Arabic counterparts, and hence their requests sounded more polite and more tactful. The reason for this may be the linguistic superiority of the native speakers group, according to Al-Tayeb Umar (2004).

Hong Gao' s study (2009) refered to one of the most meaningful findings of the CCSARP (by Blum-Kulka et al., 1989), i.e., all languages studied almost preferred conventionally indirect request strategies. However, as she (2009, p. 1) pointed out, "there remains a distinct Western bias in the CCSARP: all of the languages and varieties studied (except for Hebrew) are either Germanic or Romance, and all of the cultures studied are either Western or heavily influenced by Western culture". As a result, in this article, she focused on the strategy types of making requests as classified in CCSARP for analyzing the linguistic features in Chinese speakers request speech act realization. On the basis of all the differences discussed in her paper, she (2009, p. 13) concluded that "Chinese does not fit into the universal category of conventionally indirect requests claimed by CCSARP"; and more clearly, "Chinese finds imperatives the most proper and efficient way of making requests".

Al-Marrani and Sazalie (2010) concentrated socio-pragmatically on the polite request strategies used by Yemeni learners of English as a foreign language based on Blum-Kulka et al. (1989). They (2010) suggested that Yemeni EFL students used conventionally indirect strategies more than other strategies. They also found that these students would select using direct strategies when the speakers and their addressees had equal status and when the speakers had a higher social status than the addressee. The students behaved so to show solidarity with their addresses.

Shahrokhi (2012) focused on the request strategies applied by Persian

male speakers regarding social distance, social dominance and imposing request according to Blum-Kulka et al. (1989). He described "challenging ability" as a cultural strategy. Furthermore, his results showed that those Iranian men who had speaking dominance on their hearers, knew each other well, and their imposition of request was low, employed this strategy more. He also added this strategy to the list of direct strategies.

Ghavamnia, Tavakoli and Rezazadeh (2012) worked on the request strategies used by Iranian English learners, Persian speakers and English speakers to achieve the type, frequency and semantic framework contents related to the addresses power. The data were coded and analyzed following Hudson, Detmer, and Brown (1995) model. Their findings suggested that there were some differences with regard to frequency and type of request strategies employed by these groups. Although English native speakers used more indirect requests, Persian native speakers tended to use more direct strategies while requesting.

Rattanapitak (2013) dealt with the request strategies in the Burmese language. The findings indicated that the three main request strategies in Burmese were: direct, conventional indirect, and non-conventional indirect. With regard to the preference strategy, both direct and conventional indirect requests were applied in Burmese. This result contrasted with the universal request phenomena proposed by Blum-Kulka et al (1989). Similarly, direct requests almost reported impolite in other languages were not necessarily considered impolite in Burmese.

Shahidi Tabar and Akbari Malek (2013) discussed the notion of indirectness in the speech act of request among Iranian Turkish speakers with regard to the two factors, social distance and social dominance based on Blum-Kulka and Olshtain (1984) and Brown and Levinsohn (1987). Results of this study made clear that these two models were not satisfactory for investigating all the answers. Furthermore, the study yielded conflicting data because most of the responses could not be coded based on these frameworks.

Khalib and Tayeh (2014) addressed the request strategies used by Malaysian students according to the taxonomy proposed by Blum-Kulka et al.

(1989). Regarding power and social distance, they aimed to identify the degree of indirectness of request strategies used by these students while encountering their professors and classmates. The results demonstrated that the students preferred conventionally indirect strategies, when they made requests to their professors and to their friends as well. Moreover, the findings confirmed that "the Malay culture conformed to Brown and Levinson (1978) theory on face which highlights that in order to keep either positive or negative face on FTA (Face Threatening Acts), politeness or indirectness strategies employed" (Khalib and Tayeh, 2014, p. 44).

Yazdanfar and Bonyadi (2016) put forward a comparative study of request speech act in Persian and English. They examined the request strategies used by Persian and English speakers based on directness level and supportive moves in English and Persian TV series adopting Blum-Kulka et al. (1989). The results revealed that speakers of both languages selected the direct level as their most frequently used strategy; however, the English speakers employed more conventionally indirect strategies than the Persian ones. Conversely, the Persian speakers used more non-conventionally indirect strategies than the English speakers. Also, they concluded that American English speakers used more mitigation devices than Persian speakers.

Sheykhmohammadi, Yarahmadzehi and Mohammadian (2019) aimed to describe and analyze the type and number of request strategies in Kurdish, Mokri dialect, regarding the effectiveness or non-effectiveness of social factors, such as gender and power of the addressee, based on Blum-Kulka et al.'s (1989) model. Their findings showed a meaningful difference between genders regarding the type of request strategies; and power of the addressee had significant effect on choosing the strategies. With regard to the "negative and positive face" in Brown and Levinson's (1987) theory, Kurdish people, as members of a cooperative group, employed Positive face saving acts in their interactions more.

Rahmadiyanti Tambulana and Sutrisno (2020) investigated the types of request strategies used by the characters in the movie Silver Linings Playbook (Russell, 2012) according to Blum-Kulka and Olshtain (1984). They

also looked at the types of request goals made by this movie characters. The study findings showed that "mood derivable" (a direct request) was most frequently used request strategy in this movie. Regarding goals, "requests for action" was the most frequent employed type by the the movie characters and dominated by "mood derivable" strategy.

Shakki, Naeini, Mazandarani and Derakhshan (2020) reviewed the instruction of the L2 speech acts in English pragmatics in the Iranian context from 2000 to 2020. Their results revealed that pragmatics was amenable to instruction; and also, the most frequently instructed speech act was request (conducted in 29 studies), whereas the least instructed speech act was invitation (applied just in one study).

Derakhshan and Shakki (2021) aimed to provide a quantitative and reliable measure of the effects of instruction for the speech act of request in Iran, and also illustrated a description of the relationship between some variables that moderate its effectiveness (for example, age and gender). Their results revealed that (1) an overall large effect size on the effectiveness of the instruction of request ($g = 1.48$) existed in an Iranian context; (2) some variables like gender and treatment type were found to be a moderator for this effectiveness; (3) as to the gender, males yielded larger effect size ($g = 3.09$) than females ($g = 1.10$); (4) and considering treatment types, the explicit group produced a larger effect size ($g = 1.53$) than the implicit one ($g = 1.20$).

Shakki, Naeini, Mazandarani and Derakhshan (2023) unraveled the overall effectiveness of the intervention on the speech acts of request, apology, and refusal in an Iranian EFL context. To this aim, out of 80 studies, 57 papers were chosen based on the inclusion and exclusion criteria, and coded for the analysis. The results showed the effectiveness of the instruction of request, apology, and refusal. Also, they generated a mean of ($g = 1.43$) which was significant; and reflected a quite large gain of instruction.

3. Methodology

3.1. Participants

One hundred Birjandi teenage students (50 males and 50 females)

studying in two high schools of Birjand, namely Shahid Beheshti (boys' high school) and Farzanegan Hazrat Zeynab (girls' high school), were randomly selected. The participants were studying at the seventh to the ninth grade of the first intermediate level, and their age ranged from 12 to 16 years. To decrease the effects of other variables, those Birjand high schools with the same educational, and the same inhabitancy level were selected. To choose students with almost the same family backgrounds the participants were asked some information, including the living place, father and mother's job, and their educational levels (this part locates at the beginning of the questionnaire).

3.2. Instrument and procedure

The instruments applied for the data collection were Discourse Completion Test/Task (DCT) and role-play, the former is the primary instrument employed in the studies related to speech acts and cross cultural pragmatics (Chaudron, 2005; Kasper & Dahl, 1991). It's worth noting that DCTs are open-ended questionnaires used by Blum-Kulka in 1982 for the first time. The type of the questionnaire designed by Blum-Kulka (1982) describes speech act situations involving the setting, the social distance between the interlocutors, and their relative status. Then, an incomplete dialogue is distributed among the partcipants. These participants being native and nonnative Hebrew speakers, were asked to fill in the dialogue with their potential reactions to the situations represented. Of course, DCTs have some advantages and disadvantages. One of the most considerable advantages of DCTs is being useful for collecting a large amount of data in a short period of time (Wolfson, Marmor & Jones, 1989). In addition, there is the possibility of controlling situational variables, like social power, age, gender and second language skills. In contrast, one of the main criticisms of DCTs is that they are not natural speech. Therefore, in order to decrease the effect of this weakness on the results, the authors decided to employ role-play for gathering the data of their study, as well as a DCT.

The DCT applied in the present study comprised two parts; the first one included some personal information of the participants, such as gender,

age, birth place, living place, level of education, place of education, parents' jobs and their levels of education. The second part contained six discourse situations containing some dialogues. These situations represented a short description of the situation related to the speech act of request. The participants were asked to consider themselves in the situations provided and make a request from their addresses. The situations involved normal and daily circumstances. In order to answer the possible questions asked by the participants, one of the authors was present while they were filling out the questionnaire. In the present study, the social dominance ($X^1>Y^2$, $X<Y^3$, $X=Y^4$) of the students was taken into consideration.

In role-play as another method of gathering data, the participants were asked to play a specific role and employ a speech act. Kasper and Dahl (1991) express that role-play involves some properties of a natural speech, such as turn taking, false starts and hesitations. Moreover, Houck and Gass (1996) believe that role-play is an oral mode, and the data gathered in this way are close to the data used in a natural way.

3.3. Coding scheme and data analysis

In the present research, requests were categorized according to the taxonomy presented by Blum-Kulka et al. (1989). We paid attention to the types of strategies found in the data based on the social dominance of the addresses toward ITS in the DCT and role-play. In addition, the linguistic data extracted from the questionnaires and role-plays indicated that the participants responses generally involved more than one strategy. Thus, apart from the type of the request strategies employed, the researchers decided to analyze the effect of the the addressee's social dominance on the number of request strategies used by the participants in each situation as well (i.e., they took into account the number of request strategies used by each participant in response to each of the addressees, e.g., 1, 2, 3 or more strategies included in one

[1] X is the student and Y the addressee
[2] social dominance of the speaker to the addressee
[3] social dominance of the addressee to the speaker
[4] same social dominance of the speaker and the addressee

response). The data were subsequently analyzed using the Statistical Package for the Social Sciences (SPSS). For all of the analyses, the Alpha level sets 0.05. Pearson's Chi-Square test (X2) was applied to assess whether there was a significant relationship between the addressee's social dominance and the type and number of request strategies employed by the ITS. Besides, this test applied to show whether the existing relationship was inverse or not.

4. Results

This section illustrates the strategies found in the DCTs and role-play categorized in accordance with the taxonomy proposed by Blum-Kulka et al. (1989).

I. Alerters.

An alerter is an element whose function is to alert the Hearer's attention to the ensuing speech act (Blum-Kulka et. al., 1989, P. 277)

- Title/role

1) *dane/amuz-an*
student-PL
"The students"

- Surname

2) *ʔæhmædi*
Ahmadi
"Ahmadi"

- First name

3) *mærjæm*
maryam
"Maryam"

- Endearment term

4) *ʔæziz=æm*
Dear=CLIT.1SG
"My dear!"

- Pronoun

5) *ʔun*

they

"They"

- Attention Getter

6) be-bæxʃ-id

IMPER-forgive.PRES-2PL

"Excuse me!"

II. Request strategies (related to the main speech act)

A request strategy is the obligatory choice of the level of directness by which the Request is realized. (Blum-Kulka et al, 1989, p. 278). Below is the classification of these strategies by Blum-Kulka et. al. (1989, p. 278-289) together with some instances of the data of the present study with regard to these strategies:

a. *Mood derivable*. The grammatical mood of the locution conventionally determines its illocutionary force as a Request. The prototypical form is the imperative. However, functional equivalents, such as infinite forms and elliptical sentence structures express the same directness level.

7) dæftær=e rijazi=t-o be-h=em be-de

notebook=EZ math=CLIT.2SG-OM to-EP=CLIT.1SG IMPER-give.PRES.2SG

"Give me your math notebook."

b. *Hedge performative*. The illocutionary verb denoting the requestive intent is modified, e.g., by modal verbs expressing intention.

8) mi-xast-æm ʔæz ʃoma tæqaza kon-æm

IMP-want.PAST-1SG from you request SUBJ.do.PRES-1SG

ke ma ra be ʔordu be-bær-id

that we OM to camp SUBJ-take.PRES-2PL

"I wanted to ask you to take us to a camp."

c. *Locution derivable*. The illocutionary intent is directly drivable from the semantic meaning of the locution.

9) ʃoma bajæd ketab-ha-j-i ke ʔæz ketabxane

you must book-PL-EP-REL that from library
gereft-e-ʔ-id *ra* *bærgærdan-id*
take.PAST-PP-EP-2PL OM SUBJ.return.PRES-2PL
"You have to return the books you have borrowed from the library."

d. *Suggestory formula*. The illocutionary intent is phrased as a suggestion by means of framing routine formula.

10) *ʧera* *bæraje* *bærgozari-j=e* *ʔordu* *ba*
why for holding-EP=EZ camp with
ʔedare *sohbæt* *ne-mi-kon-id*
office speech NEG-IMP-do.PRES-2PL
"Why don't you talk to the officials for holding a camp?"

e. *Preparatory*. The utterance contains reference to a preparatory condition for the feasibility of the Request, typically one of ability, willingness, or possibility, as conventionalized in the given language. Very often, but not necessarily so, the speaker questions rather than states the presence of the chosen preparatory condition (query preparatory).

11) *mi-ʃe* *hæfte-j=e* *dige* *kar* *ʔæmæli=mun*
IMP-become.PRES.3SG week-EP=EZ other work
practical=CLIT.1PL
ro *bi-j-ar-im*
OM SUBJ-EP-bring.PRES-1PL
"May we deliver our homework follow-up practices to you next week?"

f. *Strong hint*. The illocutionary intent is not immediately derivable from the locution; however, the locution refers to relevant elements of the intended illocutionary and/or prepositional act. Such elements often relate to preconditions for the feasibility of the Request. Unlike the preparatory strategy, hints are not conventionalized and thus require more inferencing activity on the part of the hearer.

12) *ma* *ʔindʒa* *dar-im* *dærs* *mi-xun-im*
we here have.PRES-1PL lesson IMP-
read.PRES-1PL

"We are studying our lessons here." (intent: Clean the library later!)

III. Request perspective.

A request can be realized from the viewpoint of the hearer, the speaker, or both participants, or any explicit mentioning of the agents can be (deliberately) avoided. In cases of embedded structures, coding relates to the verb in the Head Act.

a. Hearer dominance

13) *miʃe* *bi-j-aj* *be* *mæn* *komæk*
IMP-become.PRES.3SG SUBJ-EP-come.PRES.2SG to me help
kon-i
SUBJ.do.PRES-2SG
"May you help me?"

b. Speaker dominance

14) *ma* *tæsmim* *gereft-im* *bæʔd* *ʔæz*
we decisiontake.PAST-1PL after from
tæmum *ʃod-æn=e* *ʔemtehan-at* *be-r-im* *ʔordu*
end become-INF=EZ exam-PL SUBJ-go.PRES-1PL camp
"We decided to go to a camp after finishing the exams."

c. Speakers and hearer dominance

15) *miʃe* *ba* *hæm* *ʔæz* *ʔin* *soʔal-at* *foto*
IMP-become.PRES.3SG with together from this
question-PL copy
be-gir-im
SUBJ-take.PRES-1PL
"May we take some copies of these sample questions together?"

d. Impersonal

16) *kæsan-i* *ke* *ketab-ha-j-e* *ketabxane* *ra*
everybody-REL that book-PL-EP-EZ library OM
bord-ænd *ta* *færda* *be* *ketabxane* *bærgærdan-*
ænd
take.PAST-3PL till tomorrow to library
IMPER.return.PRES-3PL

"Those who borrowed the library books, return them till tomorrow!"

IV. Syntactic downgraders.

Syntactic downgraders modify the Head Act internally by mitigating the impositive force of the Request by means of syntactic choices. Both the syntactic devices and their mitigating function are part of the structural properties of a given language and the ways these are put to use, and hence specific for individual languages.

a. Negation of a preparatory condition.

17) ne-mi-she miz-o sændæli-ha ro
NEG- IMP-become.PRES.3SG table-and chair-PL OM
ʔælan ʤabeʤa næ-kon-id
now moved NEG-do.PRES-2PL
"May you not move the tables and the chairs now?

V. Lexical and phrasal downgraders. The categories listed below serve as optional additions to soften the impositive force of the Request by modifying the Head Act internally through specific lexical and phrasal choices.

a. *Politeness marker*. An optional element added to request to bid for cooperative behavior.

18) xaheʃ mi-kon-æm
please IMP-do.PRES-1SG
"Please!"

b. *Understater*. Adverbial modifiers by means of which the speaker under-represents the state of affairs denoted in the proposition.

19) *hosejn dæftær=e rijazi=t ro je læhze*
Hossein notebook=EZ math=CLIT.2SG OM one moment
be-h=em mi-d-i mæn diruz qajeb bud-æm
to-EP=CLIT.1SG IMP-give.PRES-2SG I yesterday absent be.PAST-1SG

"Hossein, do you give me your math notebook one moment? I was absent yesterday."

c. *Downtoner*. Sentential or propositional modifiers which are used by a speaker in order to modulate the impact his or her request is likely to

have on the hearer.

20) *zæhra dʒan momken-e ʔin bærge-ha-ro*
Zahra dear possible-be.PRES.3SG this sheet-PL-OM
bæra=m foto be-gir-i mæn kar ba dæstgah ro
for=CLIT.1SG copy SUBJ-take.PRES-2SG I work with machine OM
bælæd nist-æm
know NEG.be.PRES-1SG
"Dear Zahra, can you take some copies of these papers? I don't know how the machine works."

d. *Cajoler*. Conventionalized speech items whose semantic content is of little transparent relevance to their discourse meaning. Cajolers commonly do not enter into syntactic structures, but are interspersed to increase, establish, or restore harmony between the interlocutors, which may be endangered through the request.

21) be-bxʃ-id xanom mi-dun-id ma diruz mæriz
IMPER-forgive.PRES-2PL Mrs IMP-know.PRES-2PL we yesterday sick
bud-im næ-tunest-im kar=e=mun ro
be.PAST-1SG NEG-can. PAST-1PL work=EZ=CLIT.1PL OM
tækmil kon-im
completion SUBJ.do.PRES-1PL
"Excuse me teacher. You know I was (Lit. we were) sick yesterday, I (Lit. we) couldn't accomplish my (Lit. our) homework."

VI. Upgraders.

Upgraders are elements whose function is to increase the impact of the request.

a. *Commitment indicator*. Sentence modifiers by means of which a speaker indicates his or her heightened degree of commitment vis-à-vis the state of affairs referred to in the proposition.

22) miʃe dæftær=et ro be-h=em be-d-i

IMP-become.PRES.3SG notebook=CLIT.2SG OM to-EP=CLIT.1SG SUBJ-give.PRES-2SG

ta tæmrin-a ro be-nvis-æm ta zæng=e bæʔd

so exercise-PL OM SUBJ-write.PRES-1SG till bell=EZ next

hætmæn be-h=et mi-d-æm

certainly to-EP=CLIT.2SG IMP-give.PRES-1SG

"May you lend me your notebook to write the exercises, I'll give it to you before the next session."

b. Time intensifier.

23) *ketab-ha-j-i ro ke ʔæz mædrese gereft-id*

Book-PL-EP-REL OM that from school take.PAST-2PL

zud pæs bi-j-ar-id

soon return IMPER-EP-bring.PRES-2PL

"Return the books you borrowed from the school soon."

c. Repetition of request (literally or by paraphrase)

24) miʃe bæʔdæn indʒa ro dʒaru kon-id

IMP-become.PRES.3SG later here OM sweep SUBJ-do.PRES-2PL

ægе bæʔdæn dʒaru be-zæn-id mæmnun mi-ʃ-æm

if later sweep SUBJ-bit.PRES-2PL thankfulIMP-become.PRES-1SG

"Can you sweep here later? I'll be thankful, if you sweep later."

VII. Supportive moves.

In using specific types of supportive move, a speaker intends to mitigate or aggravate his request. Supportive moves are external to the Head Act occurring either before or after it.

a. *Getting a precommitment*. In checking on a potential refusal before making

his or her request, a speaker tries to commit his or her hearer before telling him or her what he is letting himself or herself in for.

25) lotf *mi-kon-id* *ma* *ro* *be-bar-id* *ʔordu*
favor IMP-do.PRES-2PL we OM SUBJ-take.PRES-2PL camp
"Would you please take us to a camp?"

b. *Grounder*. The speaker gives reasons, explanations, or justifications for his or her request, which may either precede or follow it.

26) xanom *diruz* *ʔemtehan* *daʃt-im* *næ-tunest-im*
Mrs. yesterday exam have.PAST-1PL NEG-can.PAST-1PL
kar=e=mun *ro* *tækmil* *kon-im* *mi-ʃe*
work=EZ=CLIT.1PL OM completion do.PRES-1PL IMP-become.PRES.3SG
je *forsæt=edige* *be* *ma* *be-d-id*
one opportinuty=EZ other to we SUBJ-give.PRES-2PL
"Teacher, we had an exam yesterday, we couldn't finish our work, would you give us another chance?"

c. *Disarmer*. The speaker tries to remove any potential objections the hearer might raise upon being confronted with the request.

27) daneʃamuz-an=e *ʔæziz* *bizæhmæt* *ketab-ha-j-i*
Student-PL=EZ dear without trouble book-PL-EP-Rel
ke *ʔæz* *ketabxane* *gereft-id* *ra* *be* *ketabxane*
that from library take.PAST-2PL OM to library
bærgærdan-id
IMPER.return.PRES-2PL
"Dear students, please return the books you borrowed from the library."

d. *Promise of reward*. To increase the likelihood of the hearer's compliance with the speaker's request, a reward due on fulfillment of the request, is announced.

28) 28) kæsan-i *ke* *ketab-ha-j=e* *ketabxane* *ra* *be*

moqe

those-REL that book-PL-EP=EZ library OM to time

tæhvil dæh-ænd kart=e dʒajze xah-ændgereft

deliver give.PRES-3PL card=EZreward want.PRE-3PL take.PAST.3SG

"Those who return the library books on time will receive a reward card."

e. *Imposition minimizer*. The speaker tries to reduce the imposition placed on the hearer by his request.

29) xanom=e dʒælali ʔæge ʃoma sælah mi-dan-id

Mrs.=EZ Jalali if you good IMP-know.PRES-2PL

mara be ʔordu be-bær-id …

we OM to camp IMPER-take.PRES-2PL…

"Mrs. Jalali, if good, take us to a camp."

VIII. Aggravating supportive moves:

a. *Threat*. To ensure compliance with his or her request, a speaker threatens his or her hearer with potential consequences arising out of noncompliance with the request.

30) bætʃe-ha ʔin dige tæzækkor=e axær-e pæs

child-PL this other warn=EZ last-be.PRES.3SG so

ketab-a-j-i ro ke ʔæz ketabxune gereft-in

book-PL-EP-REL OM that from library take.PAST-2PL

pæs bi-j-ar-in

return IMPER-EP-bring.PRES-2PL

"You students (lit.: you children)! This is the last warning, so return the books you borrowed from the library."

b. *Moralizing*. In order to lend additional credence to his or her request, a speaker invokes general moral maxims.

31) mæge ne-mi-dun-id xijanæt dær ʔæmanæt kar=e

Unless NEG-IMP-know.PRES-2PL betrayal in

trust work=EZ

bæd=i ʔæst…

bad=INDEF be.PRES.3SG

"Don't you know that betrayal is bad?"

5. Analysis of the data

This section comprises two parts. The first one represents the data analysis concerning the type of request strategies. The second part accounts for the data analysis regarding the number of request strategies.

5.1. Type of the request strategies

This subsection addresses the type of request strategies used by the participants. Firstly, we represent the results showing the frequencies and percentages of request strategies employed by the ITS based on the social dominance of the students and their addressees used in DCTs (table 1) and role-plays (table 2).

As table 1 demonstrates, "alerters" (765 times: 223 times encountering the addressees with same social status, 229 times and 313 times meeting the addressees/hearers with lower and higher social status, respectively) is the most common request strategy employed by ITS in DCTs. Therefore, ITS used this strategy more, while encountering those with lower social status. "Hearer dominance" is the next most applied request strategy (523 times: 198 times encountering the addressees with same social status, 189 times and 136 times meeting the addresses with lower and higher social status, respectively). ITS employed this strategy more, while they encountered those with the same social status. The participants used "preparatories" 455 times (190 times meeting the hearers with the same social status, 96 times and 169 times encountering the hearers with lower and higher social status, respectively). It shows they tended to employ "preparatories" more when meeting those with the same social status. "Grounders" are the fourth most used strategies by ITS (346 times: 136 times encountering the hearers with the same social status, 96 times and 114 times meeting the ones with lower and higher social status, respectively). Again, ITS showed tendency to apply this strategy more while encountering those with the same social status.

Table 1

Frequencies and percentages of request strategies obtained through the DCT

Type of the Request Strategy		Social dominance			Total
		X=Y	X>Y	X<Y	
Alerters	Fr	223	229	313	765
	%	8/9%	9/2%	12/5%	30/6%
Preparatory	Fr	190	96	169	455
	%	7/6%	3/8%	6/8%	18/2%
Mood derivable	Fr	9	92	16	117
	%	0/4%	3/7%	0/6%	4/7%
Hedged performative	Fr	1	6	5	12
	%	0/0%	0/2%	0/2%	0/5%
Strong hint	Fr	0	4	6	10
	%	0/0%	0/2%	0/2%	0/4%
Grounder	Fr	136	96	114	346
	%	5/4%	3/8%	4/6%	13/9%
Negation of a preparatory condition	Fr	0	6	2	8
	%	0/0%	0/2%	0/1%	0/3%
Hearer dominance	Fr	198	189	136	523
	%	7/9%	7/6%	5/4%	21/0%
Speaker and hearer dominance	Fr	2	0	6	8
	%	0/1%	0/0%	0/2%	0/3%
Imposition minimizer	Fr	2	0	1	3
	%	0/1%	0/0%	0/0%	0/1%
Understator	Fr	10	5	43	58
	%	0/4%	0/2%	1/7%	2/3%
Politeness marker	Fr	4	28	12	44
	%	0/2%	1/1%	0/5%	1/8%
Time intensifier	Fr	1	29	0	30
	%	0/0%	1/2%	0/0%	1/2%
Disarmer	Fr	1	1	0	2
	%	0/0%	0/0%	0/0%	0/1%
Repetition of request	Fr	1	1	1	3
	%	0/0%	0/0%	0/0%	0/1%

Appealer	Fr	0	0	1	1
	%	0/0%	0/0%	0/0%	0/0%
Commitment indicator	Fr	2	2	1	5
	%	0/1%	0/1%	0/0%	0/2%
Locution derivable	Fr	0	2	0	2
	%	0/0%	0/1%	0/0%	0/1%
Impersonal perspective	Fr	0	11	0	11
	%	0/0%	0/4%	0/0%	0/4%
Threat	Fr	0	11	0	11
	%	0/0%	0/4%	0/0%	0/4%
Getting a precommitment	Fr	0	1	0	1
	%	0/0%	0/0%	0/0%	0/0%
Moralizing	Fr	0	4	0	4
	%	0/0%	0/2%	0/0%	0/2%
Speaker dominance	Fr	0	0	58	58
	%	0/0%	0/0%	2/3%	2/3%
Cajoler	Fr	0	3	3	6
	%	0/0%	0/1%	0/1%	0/2%
Suggestory formula	Fr	0	0	6	6
	%	0/0%	0/0%	0/2%	0/02%
Syntactic downgraders	Fr	0	2	0	2
	%	0/0%	0/1%	0/0%	0/1%
Promise of reward	Fr	4	1	0	5
	%	0/2%	0/0%	0/0%	0/2%
Total	Fr	784	819	893	2496
	%	31/4%	32/8%	35/8%	100/0%

Table 2 represented the frequencies and percentages of request strategies extracted from role-play, with regard to the social dominance of the addressees. According to this table, taking account of the social dominance of the addressees, "alerters" were the most applied request strategy by ITS (901 times: 237 times encountering the addressees with the same social status, 301 times and 363 times meeting the addressees with lower and higher social status, respectively). ITS used this strategy more, while encountering those

with lower social status. "Hearer dominance" was the next most applied request strategy (512 times: 197 times encountering the addressees with the same social status, 192 times and 123 times meeting the hearers with lower and higher social status, respectively). ITS employed this strategy more, as they encountered those with the same social status. The participants used "preparatories" (465 times: 189 times meeting the addressees with the same social status, 111 times and 165 times encountering the hearers with lower and higher social status, respectively). This shows they tended to employ "preparatories" more when encountering those with the same social status. "Grounders" were the fourth most used strategies by ITS (400 times: 137 times meeting the addressees with the same social status, 109 times and 154 times encountering the addressees with lower and higher social status, respectively). Again, ITS showed tendency to apply this strategy more, when they met those with the same social status.

Table 2

Frequencies and percentages of request strategies obtained through the role-play

Type of the Request Strategy		Social dominance			Total
		X=Y	X>Y	X<Y	
Alerters	Fr	237	301	363	901
	%	8/8%	11/1%	13/4%	33/4%
Preparatory	Fr	189	111	165	465
	%	7/0%	4/1%	6/1%	17/2%
Mood derivable	Fr	7	81	18	106
	%	0/3%	3/0%	0/7%	3/9%
Hedged performative	Fr	1	5	3	9
	%	0/0%	0/2%	0/1%	0/3%
Strong hint	Fr	3	3	7	13
	%	0/1%	0/1%	0/3%	0/5%
Grounder	Fr	137	109	154	400
	%	5/1%	4/0%	5/7%	14/8%
Negation of a preparatory condition	Fr	1	1	5	7
	%	0/0%	0/0%	0/2%	0/3%
Hearer dominance	Fr	197	192	123	512
	%	7/3%	7/1%	4/6%	19/0%
Speaker and hearer dominance	Fr	3	0	12	15

	%	0/1%	0/0%	0/4%	0/6%
Imposition minimizer	Fr	4	0	0	4
	%	0/1%	0/0%	0/0%	0/1%
Understator	Fr	12	8	45	65
	%	0/4%	0/3%	1/7%	2/4%
Politeness marker	Fr	4	36	21	61
	%	0/1%	1/3%	0/8%	2/3%
Time intensifier	Fr	2	30	0	32
	%	0/1%	1/1%	0/0%	1/2%
Disarmer	Fr	1	0	0	1
	%	0/0%	0/0%	0/0%	0/0%
Repetition of request	Fr	1	1	0	2
	%	0/0%	0/0%	0/0%	0/1%
Commitment indicator	Fr	0	3	3	6
	%	0/0%	0/1%	0/1%	0/2%
Locution derivable	Fr	0	2	0	2
	%	0/0%	0/1%	0/0%	0/1%
Impersonal perspective	Fr	0	8	1	9
	%	0/0%	0/3%	0/0%	0/3%
Threat	Fr	0	7	0	7
	%	0/0%	0/3%	0/0%	0/3%
Getting a precommitment	Fr	0	2	1	3
	%	0/0%	0/1%	0/0%	0/1%
Moralizing	Fr	0	5	0	5
	%	0/0%	0/2%	0/0%	0/2%
Speaker dominance	Fr	0	0	64	64
	%	0/0%	0/0%	2/4%	2/4%
Cajoler	Fr	0	1	2	3
	%	0/0%	0/0%	0/1%	0/1%
Suggestory formula	Fr	0	0	9	9
	%	0/0%	0/0%	0/3%	0/3%
	Fr	799	906	996	2701
Total	%	29/6%	33/5%	36/9%	100/0%

5.2. Number of the request strategies

As to the social dominance and number of request strategies used by ITS, table 3 and 4 signify the frequency and percentages of the simple and complex strategies employed by the participants in DCTs and role-plays.

Table 3

Frequencies and percentages of the number of request strategies obtained through the DCT

Number of the request strategies		Social dominance			Total
		X=Y	X>Y	X<Y	
2 strategies	Fr	6	6	4	16
	%	1/0%	1/0%	0/7%	2/7%
3 strategies	Fr	77	50	27	154
	%	12/8%	8/3%	4/5%	25/7%
4 strategies	Fr	71	78	74	223
	%	11/8%	13/0%	12/3%	37/2%
5 strategies	Fr	31	53	62	146
	%	5/2%	8/8%	10/3%	24/3%
6 strategies	Fr	9	10	29	48
	%	1/5%	1/7%	4/8%	8/0%
7 strategies	Fr	5	3	3	11
	%	0/8%	0/5%	0/5%	1/8%
8 strategies	Fr	0	0	1	1
	%	0/0%	0/0%	0/2%	0/2%
9 strategies	Fr	1	0	0	1
	%	0/2%	0/0%	0/0%	0/2%
Total	Fr	200	200	200	600
	%	33/3%	33/3%	33/3%	100/0%

Table 3 shows the frequencies and percentages of request strategies used by ITS in DCTs considering the social dominance and number of the strategies. This table reflects that combination of 4 strategies (223 times: 71 times encountering the addressees with the same social status, 78 times and 74 times meeting the addressees with lower and higher social status, respectively) is the first most used complex strategy by ITS. This finding denotes that ITS used this strategy more while encountering those with lower social status than those with the same and higher social status. In addition, based on the data in table 3, the combination of 3 strategies (154 times: 77 times encountering the addressees with the same social status, 50 times and 27 times meeting the addressees with lower and higher social status, respectively) is the next more complex strategy used by ITS. In these circumstances, they tended to apply this type of complex strategy as encountering those with the same social status. The next most used complex strategy is the combination of 5 strategies (146 times:

31 times encountering the addressees with the same social status, 53 times and 62 times meeting the addressees with lower and higher social status, respectively). As the data revealed, ITS used this complex strategy more when they encountered those with higher social status.

Table 4

Frequencies and percentages of the number of request strategies obtained through the role-play

Number of request strategies	Social dominance			Total
	X=Y	X>Y	X<Y	
2 strategies	23	2	0	25
	3/8%	0/3%	0/0%	4/2%
3 strategies	53	23	16	92
	8/8%	3/8%	2/7%	15/3%
4 strategies	63	81	65	209
	10/5%	13/5%	10/8%	34/8%
5 strategies	36	57	62	155
	6/0%	9/5%	10/3%	25/8%
6 strategies	18	25	39	82
	3/0%	4/2%	6/5%	13/7%
7 strategies	6	10	16	32
	1/0%	1/7%	2/7%	5/3%
8 strategies	1	2	2	5
	0/2%	0/3%	0/3%	0/8%
Total	200	200	200	600
	33/3%	33/3%	33/3%	100/0%

Accordingly, table 4 displays the frequencies and percentages of request strategies used by ITS in role-plays as the social dominance and number of the strategies are concerned. This table illustrates that combination of 4 strategies (209 times: 63 times encountering the addressees with the same social status, 81 times and 65 times meeting the addressees with lower and higher social status, respectively) is the first most used complex strategy by ITS. This result confirmed that ITS used this strategy more, when they met those with lower social status than those with the same and higher social status. In addition, based on the data in table 4, the combination of 5 strategies (155 times: 36 times encountering the addressees with the same social status, 57 times and 62 times meeting the addressees with lower and higher social status,

respectively) is the next more complex strategy used by ITS. In this context, while ITS encountered those with the same social status, they tended to apply this type of complex strategy more. The next most used complex strategy is the combination of 3 strategies (92 times: 53 times encountering the addressees with the same social status, 23 times and 16 times meeting the addressees with lower and higher social status, respectively). As the data indicated, ITS used this complex strategy more when encountering those with higher social status. The next most employed request strategy applied by ITS is the combination of 6 strategies (82 times: 18 times encountering the addressees with the same social status, 25 times and 39 times meeting the addressees with lower and higher social status, respectively). This data makes clear that ITS tended to use this complex strategy encountering those with higher social status.

Chi-square and correlation test results are shown in tables 5 and 6. Table 5 designates Chi-square results of the study as to the relationship between the social dominance of the addressees and the type of request strategies used by ITS (found in DCTs and role-plays). As the table displays, the significance number in both corpora is 0.000 and less than 0.05 ($p<0.05$). Consequently, the first and third hypotheses of the study are rejected. Therefore, as the first hypothesis regards, there is a significant relationship between the social dominance and type of request strategies used by ITS in DCTs. As to the third hypothesis of research, there is a significant relationship between the social dominance of the addressees and the type of request strategies used by ITS in role-plays.

Table 5

Chi-square test results related to the effect of social dominance of the addressees and type of the request strategies

Variable		Chi-square test results			
Social dominance	Instrument	X^2	DF	P	Level Reliability
	DCT	516.4	52	0.000	99%
	Role-play	483.9	46	0.000	99%

As shown in table 6, Chi-square results of the study indicate that the

significance (P value) for both corpora, i.e., DCTs and role-plays, is 0.000 and less that 0.05 ($p<0.05$). As a result, the second and fourth hypotheses of the research are rejected. It demonstrates a significant relationship between the social dominance of the addressees and the number of request strategies used by ITS in DCTs. With regard to the fourth hypothesis, there is a significant relationship between the social dominance of the addressees and number of request strategies used by ITS in role-plays. Furthermore, Spearman's correlation test value in table 6 is a negative number for both DCTs and role-plays; this confirms that the complexity of the request strategies would increase with increasing the social dominance of the addressees toward the addressees, and vice versa.

Table 6

Chi-square test results related to the effect of social dominance of the addressees and the number of request strategies

Variable		Chi-square test results				Spearman's correlation
Social dominance	Instrument	X^2	DF	P	Reliability Level	correlation value
	DCT	56.3	14	0.000	99%	- 0.150
	Role-play	78.8	12	0.000	99%	- 0.106

6. Discussion and Conclusion

This study came across two issues stated by Blum-Kulka et al. (1989, p. 7) in a cross-cultural investigation of different speech acts which have attracted particular attention: "(a) the value and function of politeness or deference in speech act realization, and (b) the universality of politeness phenomena across languages and cultures" (Blum-Kulka et al., 1989, p. 7).

Considering the first issue mentioned by Blum-Kulka et al. (1989), and based on the data represented in table 5, there is a significant relationship between the social dominance of the addressees and the type of request strategies used by ITS in the DCTs and role-plays. The findings indicated that when ITS were in a higher social status toward their addresses, they used

request strategies which were not employed in other situations (with the same social status or lower); in this reagard, the strategies like “threat”, “moralizing”, and "applying syntactic downgraders” were not used by ITS. Using these strategies by ITS demonstrted that with increasing the social dominance of the addressees, they tended to increase the imposition of their request; and increase the use of intensifying supportive moves. In addition, in this situation (the higher social dominance of the addressee), ITS had much tendency to use the main request speech act directly (“Locution derivable” and “Mood derivable”). We broadly agree with Blum-Kulka et al.’s (1989) interpretation, where they assert those in higher positions have the tendency to request more directly than those in a powerless position. On the other hand, the participants of this study which were in the lower social status or the same social status toward their addressees employed more “grounders” and “understaters”. This finding offers a good evidence for the argument stated by Scollon and Scollon (1983) predicting greater indirectness in upward speech from people in positions of relatively low power to their superiors (as mentioned in Blum-Kulka et al., 1989, p. 137). In addition, the results of the present research is consistent with the results of some studies such as Altayyeb Umar (2004), Al-Marrani and Sazalie (2010), and Sheykhmohammadi et al. (2019). Altayyeb Umar (2004) holds that applying indirect strategies will moderate the inherent imposition of request speech acts, and make it politer and more elegant. Moreover, according to Al-Marrani and Sazalie’s (2010) study, to show solidarity with the addressees, Yemeni students would select using direct strategies when the speaker and hearer have equal social status and also, when the speaker has a higher social status than the hearer. Sheykhmohammadi et al. (2019) also claim that there was a reverse relationship between the addresses power and using direct strategies in Kurdish; this means that applying the direct strategies will decrease when the power of addresses increases.

Furthermore, the results found in both corpora indicated that when the social dominance of the speakers was higher than the addressee, most of the requests were hearer-dominant. While in situations with lower social dominance of the addressees, ITS made their requests as speaker-dominant to

decrease the level of imposition inherent in the requests.

Furthermore, the results of the present study support the second issue stated by Blum-Kulka et al. (1989, p. 7), i.e., "the universality of politeness phenomena across languages and cultures". In this regard, the request strategies used by ITS showed almost a similar pattern to those mentioned in CCSARP by Blum-Kulka et al. (1989). It may also bears a striking resemblance to Ochs' (1996) Universal Culture Principle. Ochs (1996) claims that certain commonalities exist across the world's language communities; and communities of practice in the linguistic means used to convey situational meanings. This principle proposes that interlocutors apply certain similar linguistic means to obtain certain similar social ends. However, ITS didn't use some request strategies mentioned in the taxonomy proposed by Blum-Kulka et al. (1989). Among these were: "explicit performative", "want statement", "interrogative", "conditional clause", "intensifier", "expletive", "lexical uptoner", " downtoner", appealer", "subjectivizer", "insult" and promise of reward". Reasons for this remain unclear and needs more considerations and studies. Therefore, investigating the behavior of a large number of participants as well as socio-cultural factors may indicate different findings.

Finally, as to the effect of social dominance of the addressees on the type and number of request strategies used by ITS, we see that the both corpora, i.e., the DCT and role-play data seemed to show the same results (the Chi-square results of the both corpora are significant). As for the relationship between the social dominance of the addressees and the type of request strategies, Chi-square test results in table 5 demonstrated that ITS behaved similarly. So, they employed almost the same request strategies, when they filled in the DCTs, and when they were playing roles as well.

According to the results of Chi-square and correlation tests in table 6, there is a significant and reverse relationship between the addressee's social dominance and the number of request strategies used by ITS in the DCTs and role-plays ($p=0.000<0.05$). It means that with the increase in social dominance of the speakers toward the the addressees, the complexity of request strategies decreases. Moreover, the findings from the two corpora, e.i., DCTs and role-

plays, indicated that in situations with higher social dominance or the same social dominance of addressees, the combination of two or three request strategies were the most prevalent complex strategy applied. Conversely, when the speakers were in a lower social status towards their addressees, they tended to use more the combination of 5, 6 and 7 strategies. Moreover, the findings specified no use of 8 and 9 strategies combination by ITS in the situations with the higher social dominance toward the addressees. The results closely match with those obtained in the study of the speech act of apology by Ahangar, Sarani and Zeynali Dastuyi (2015), Ahangar and Zeynali Dasstuyi (2016), Afghari (2007), and in the study of refusals by Ahangar, Sarani and Zeynali Dastuyi (2012) and Ahangar and Zeynali Dastuyi (2013), Felix-Brasdefer (2002), Markus (2009) and Voncanon (2006). These studies show the use of more combinated strategies by the participants, while encountering those with higher social status.

Using more complex strategies when encountering the addresses with higher social dominance by ITS seems to be related to this idea: they behave so to increase the possibility of request acceptance by the addressees and also to decrease the imposition of their requests. To put it another way, requesting a person with higher social dominance necessitates more explanation and justification than requesting a person with equal or lower social status. This result also approves the statement by Eslamirasekh, Tavakoli, and Abdolrezapour (2010) when they asserted Iranian cultural system is hierarchical in connection with politeness. It means the power of addressees is considerably effective in assuring the speakers that their requests would be accepted or rejected.

Moreover, table 6 affirmed that ITS tended to use almost the same number of request strategies while encountering the addressees with different social dominance. Given the discussion above, this study surprisingly found that both DCTs and role-plays could be appropriate and alternative methods of gathering data, especially when we have time limit and cannot use natural methods for data collection. In conclusion, we may claim that it doesn't matter which of these two methods of data collection the researchers apply in their

studies as the results may not be significantly different.

In conclusion, this study aimed at extracting and categorizing the relationship between the addresee's social dominance and the type and number of request strategies used by ITS following the Cross Cultural Speech Act Realization Project (CCSARP) coding scheme proposed by Blum-Kulka et al. (1989). The data collection was done via Discourse Completion Test (DCT) and role-play, filled and performed by 100 high school students (50 girls & 50 boys). Some tentative conclusions can be drawn. Firstly, the Chi-square test results confirmed that there was a significant relationship between the social dominance of the addressees and the type and number of request strategies used by ITS. This result indicates that social dominance is an effective factor in applying the speech act of request by ITS in two methods of data collection, i.e., DCTs and role-plays. Secondly, the findings disclosed that in situations 3 and 6 with the speaker's high social dominance towards the addressee with lower social status, applying "aggravating supportive moves" and the direct use of the head act of request increased. Thirdly, decreasing the social dominance of the speaker towards the addressees resulted in the application of more complicated strategies. It means that in these situations, the students explained the situation more to peruade the addressee for performing their request. Therefore, it gives the impression that concerning politeness, the Iranian cultural system is hierarchical. That is to say, the power (social dominance) of the addressee has a central role in the speakers' assurance toward the acceptance or rejection of their requests. Fourthly, in most situations, the participants used the request strategies in the suggested classification by Blum-Kulka et al.'s (1989). Therefore, "the universality of politeness phenomena across languages and cultures" claimed by Blum-Kulka et al (1989, p. 7), is confirmed in this study. Fiftly, ITS didn't employ all the request strategies mentioned in the model proposed by Blum-Kulka et al. (1989). For example, they didn't use "interrogatives", "conditional clauses", "downtoners", "appealers", "intensifiers", "expletives", "lexical uptoners", "insults" and "explicit performatives". Hence, the culture-specifity of applying the speech act of request is confirmed here. Finally, this study indicated no significantly

different results in the use of the request strategies employed by ITS in the two corpora, i.e., the data collected using the DCTs and role-plays. This can be a good result as it may help the researchers in this field to decide which method they would select for data collection. The authors end their paper with some suggestions for further research or implications: other researchers can investigate the transferred pragmatic errors in request speech act used by Iranian foreign language learners. In addition, they may examine the negative effects of the interference of pragmatic rules on the request speech act strategies used by Iranian bilingual students.

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Appendix

Request situations

Situation 1. Making a copy of some sample questions

It's exam time, and you want to copy sample questions using the copy machine, but you don't know how it works. At the same time, one of your classmates whom you are not so intimate, is passing there. You want to ask for help (+SD X=Y).

You: ……..

Your classmate (whom you are not intimate with): Yes, just do it a little faster, now the class begins.

Situation 2. Borrowing the mathematics notebook

You were sick and did not take part in the math class. You want to request one of your classmates to see if she would give you the answers to the questions (-SD X=Y).

You: ……...

Your classmate: Yes, of course. Just do not forget to bring it back until tomorrow. I have not still done my next session's homework.

Situation 3. Handing in the library books

You have been appointed as the principal of the school in Modam Project day[1] and have decided to ask the students to return the books they have borrowed from the library (+SD X>Y)

You (as the principal of the school):……..

The students: Yes! Is there a puunishment if we bring it until the end of the week?

Situation 4: Going to a camp

It's the last days of the exams, and the summer holidays are coming closer. You would like to go to a camp with your classmates. You decide to talk to the school principal (+SD X<Y).

You:……

Principal of the school: We agree as well. But holding a camp needs the officials

[1] A special day in which the students, themselves, would administer differenet parts of the school

permission, and we are not allowed to decide alone.

Situation 5: Handing in the homework follow-up practices

The teacher of "professions and skills" course asks you to hand in your homework follow-up practices in a week, but the opportunity has ended, and you have not still completed your homework. You want them to give you another chance (-SD X<Y).

You:……..

The teacher: Ok! I can give you another chance until the next session, but if you don't hand in your homework on time, you will not obtain the score of the homework follow-up practices.

Situation 6: Cleaning the study hall

You are studying in the study hall, at the same time, the school janitor enters and moves the tables and chairs for cleaning. You want to ask them to do this later (-SD X>Y).

You:……..

The school janitor: Sorry, I remove just these and leave the rest. I will move them later.

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The Relationship between Verb Comprehension and Verb Production among Non-Native Persian Learners Based on Systematic Functional Approach[1]

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Abstract

This research has been done to investigate the relationship between verb comprehension and verb production of Persian learners in Persian language writing as a second language, based on the processes of ideational metafunction in Halliday's systemic functional grammar. The statistical population was the Persian learners of the international center of teaching Persian to non-Persian speakers in Ferdowsi University of Mashhad. The data collection method was based on field study and random sampling method. The data were gathered through tests, interviews and essays which were divided into two parts: verb comprehension and verb production. The results of the tests were analyzed for verb comprehension, while the outputs of compositions were used in verb production. The collected data then were analyzed by SPSS. The results indicated that there was a positive correlation between comprehension and verb production of mental process at elementary levels. On the other hand, no correlation was found between Persian learners' verb comprehension and verb production at intermediate level. Furthermore, there was a negative correlation between comprehension and production of the behavioral process at intermediate level and the comprehension and production of the material process at the advanced level. This showed the effect of three factors on creating a positive and negative correlation

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between processes in foreign Persian learners: 1) the objectivity and subjectivity of processes, 2) the versatility of processes, 3) Persian learners' language level.
***Keywords**:* verb, comprehension, production, process, functional grammar, foreign Persian learners

1. Introduction

Unlike those who ignore the humanistic natural side of a language under the title of a scientific survey, Halliday instead provides a sound systemic basis for interpreting language as an essential part of the human experience (Nation, 2019; Wei, 2018). He sees in every act of meaning the potential for discovering the true nature of language, even and especially in the speech of children — for it is out of the mouths of babies, so to speak, that language develops and humanity evolves (Hackett et.al, 2021; Vainio, 2019). Every act of meaning is an opportunity for change in language and society (Halliday, 2003; Jaspers, 2018). He named his approach Systematic Functional Grammar (SFG). His views differ from most of linguistic theories in the Language unit for linguistic description. Halliday states that SFG takes the text rather than the sentence as its unit of study. "Note that [a] text is a semantic unit, not a grammatical one." Elsewhere, Halliday refers to the text as "the basic unit of the semantic process". And the text is defined as "any passage, spoken or written, of whatever length that does form a unified whole" (Butler, 2003).

Understanding the relationship between the processes of production and comprehension can help language teachers to design more effective and efficient language teaching methods. Secondly, it can provide insights into the cognitive processes involved in language learning and production. Finally, it can contribute to the development of theories and models of language acquisition and processing. Therefore, this research aims to investigate the correlation between verb comprehension and verb production of Persian learners in Persian writing skill, based on the processes of *ideational* metafunction in Halliday's Systemic Functional Grammar.

According to this approach, we explored texts which had been comprehended and produced by Persian learners to investigate the existing

correlation in comprehension and production processes of foreign Persian learners at all levels of Persian learning in writing. It seems that production and comprehension are separate entities though related to each other; comprehension is perceived as the primary source of learning in producing language.

2. Literature Review

The comprehension and production of verbs are essential components of language learning and use (Branigan et al., 2008). Verb comprehension refers to the ability to understand the meaning of verbs in context, while verb production refers to the ability to use verbs appropriately in speech or writing (Bates et al., 1994). Previous studies have shown that there is a close relationship between verb comprehension and verb production (Bates et al., 1994; Branigan et al., 2008). However, the nature and strength of this relationship may vary depending on various factors such as language proficiency, age, and task demands (Branigan et al., 2008; Gollan et al., 2011).

In the context of Persian language learning, there is a lack of research on the relationship between verb comprehension and verb production. However, some studies have investigated the factors that affect Persian learners' performance in these two processes. For example, Ahmadi (2017) found that Persian learners' vocabulary size and knowledge of grammatical structures can significantly predict their performance in verb comprehension and production tasks. Another study by Khosravi and Kassaian (2015) showed that teaching verb collocations can improve Persian learners' comprehension and production of verbs.

Ghiyasiyan (2000) in his thesis made a syntactic-semantic classification of Persian verbs based on Halliday's Systematic Functional Grammar. He used natural examples and evidence in order to describe Persian. According to the hypothesis of the thesis which is on the experiential process, he used the Halliday's classification for Persian, thereby concluding his studies with these words "Halliday's classification is applicable for except in minor difference" (Ghiyasiyan, 2000).

Tabrizimanesh (2006) investigated a five-volume set of AZFA books named *Farsi Biyamuzim* (*Let's Learn Persian*) based on Halliday's Systematic Functional Approach following two goals: a content analysis of the book and some suggestions for the authors of similar books. Data showed that Halliday's classification of the processes and different functions of their participants are applicable in the series mentioned above, and indicated some significant differences in frequency of different processes as well as a relationship between spoken variants and types of processes (Tabrizimanesh, 2006).

Pahlavannezhad and Najafi (2008) based on Halliday's Systematic Functional Approach, introduced the experiential function of language and emphasized the importance of presenting this metafunction to elementary school children. In his research, the context of *Bekhanim* (*Let's Read*) books as the most important, official sources of learning investigated in elementary schools from the first grade to the fifth grade. The results of the research indicated that in these contexts, all of the processes had not been presented to elementary school children and when authors had written these books, they did not pay any particular attention to the experiential functions of language as the final stage of the evolution of language acquisition. Moreover, the language processes were not presented to the children as a tool for verbalizing experiences and a purposeful communication. Furthermore, the low frequency of the two existential and behavioral processes should be considered in the mentioned texts (Pahlavannezhad and Najafi, 2008).

Aghaee (2012), in her thesis, tried to establish mechanisms related to syllabus design and the preparation of teaching materials for foreign learners of Persian at elementary level. To attain this objective, based on Halliday's language-based theory of learning, the speaking and writing tasks performed by 20 pre-school children aged 9 or less were recorded. Then, various types of processes, as well as adjuncts used by children were evaluated in form of *interpersonal* and *ideational* metafunctions, the finite elements. And finally, it was concluded that circumstantial adjuncts are larger in number than those of modal adjuncts. They are 72.72 % in the speech of pre-school children, 59.72% in the speech of primary school children, and 86.84% in the writing of

elementary school children. The material processes were the most common processes (70.10 in pre-school, 55.71% in primary school, and 53.72% in writing). Plus, the present tense was more applicable than the past tense in elementary school cases; conversely, the past tense was more applicable than the present in pre-school children (Aghaee, 2012).

3. Theoretical approach

The root of Halliday's works lies in the works of Firth, whose categories of system, structure and characterization of meaning as function in context, were particularly influential in Halliday's development of his teacher's ideas, as was also the work of Malinowski, the Prague School and Helmsley (Halliday, 1993). Initially, Halliday's reshaping of these ideas gave rise to Scale and Category grammar. In the 1960s and 1970s, this model developed into what became known as Systematic Grammar, and later as Systemic Functional Grammar (Halliday, 2004). The main developments were made through the progressive semanticiation of grammar as well as the introduction of the new ways of looking at a function in language, and through Halliday's suggestion that the fundamental aspects of linguistic patterning were paradigmatic (i.e. systemic, in Firth's sense of the term), being formalized as the networks of closed "systems" of option offered by the language under description (Butler, 2003).

The systemic approach to language is functional in two main respects: 1) because it raises functional questions about language, in other words, systematists ask how people use language. 2) because it interprets the structure of language functionally, in other words, systematists ask how language is structured for use.

Answering the first question involves a focus on authentic, every day, and social interaction. This analysis of texts leads systemicists to suggest that people negotiate texts to make meanings with each other. In other words, the general function of language is a semantic one.

Reinterpreting the functional question semantically, systemicists ask:

1. Can we differentiate between the types of meanings in language? i.e. how

many different kinds of meanings do we use in language to make meaning?
2. How are texts (and the other linguistic units which make them up, such as sentences or clauses) structured so that meanings can be made? , i.e. how is language organized to make meaning? (Eggins, 2004)

The phrase "social act of meaning" in the quotation above is significant; as in the work of Firth, the term of "meaning" has a very wide usage in systematic linguistics. For Halliday, too, all aspects of language are meaningful, and it is important to bear this breath of approach in mind when considering his writing. In sense, it might be said that the fundamental goal of SFG is to construct a theory of linguistic meaning (Butler, 2003).

The way in which human being's language use is classified in SFL into three broad categories known as metafunctions: interpersonal, textual and experiential. Language is used to enable us to participate in communicative acts with other people, to take on roles as well as expressing and understanding feelings, attitudes and judgments. This metafunction is known as the interpersonal metafunction.

Language is used to relate what is said (or written) to the rest of the text and to other linguistics events. This involves the use of language to organize the text itself. This is known as the textual metafunction (Bloor & Bloor, 2004).

The experiential function refers to the grammatical choices that enable speakers to make meanings about the world around us and inside us:

> Most obviously, perhaps, when we watch small children interacting with the objects around them, we can see that they are using language to construe a theoretical model of their experience. This is language in the experiential function; the patterns of meaning are installed in the brain and continue to expand on a vast scale as each child, in cahoots with all those around, builds up, renovates, and keeps in good repair the semiotic "reality" that provides the framework of day-to-day existence and is manifested in every moment of discourse, spoken or listened to. We should stress, Halliday think, that

> the grammar is not merely annotating experience; "it is construing experience" (Halliday, 2003, 16).

Our most powerful impression of experience is that it consists of ongoing events, doing, sensing, meaning and becoming. All these ongoing things are sorted out in the grammar of the clause. Thus, as well as being a mode of action, of going and demanding goods and services and information, the clause is also a mode of reflection, of imposing order on the endless variation and flow of events. Grammatical system by which this is achieved is transitivity. The transitivity system construes the world of experience into a manageable set of process types (Halliday, 1994).

3.1 Types of the process

Based on Halliday's Systemic Functional Grammar, verbs are classified into three main processes: mental, behavioral, and material processes (Halliday and Matthiessen, 2014). These processes are used to represent different types of actions or events in language use.

3.1.1. Material

Material processes are processes of "doing". They express the notion that some entities "do" something – which may be done "to" some other entities. So we can ask such processes, or "probe" them, in this way: what did the lion do? what did the lion do to the tourist? Looking at it from the tourist's "perspective"; so we can also say what happened to the tourist? Consequently, if there is a goal of the process, as well as an actor, the representation may come in both two forms: either active, the lion caught the tourist, or passive, the tourist was caught by the lion. (Halliday, 1994, p. 110). Material clauses do not necessarily represent concrete, physical events; they may represent abstract doing and happening (Halliday, 2014, p. 243).

3.1.2. Mental

Some processes involve no action but phenomena best described as states of mind or psychological events. To these, we give the label mental processes. Mental processes tend to be realized through the use of the verbs like think, know, feel, smell, hear, see, want, like, hate, please, disgust, admire,

enjoy, fear, frighten. For example, I dislike your manner (Bloor & Bloor2004, p.116). In the clause 'mental' process, there is always one human participant; this is the "senser". In some clauses, there is the "phenomenon" — that is felt, thought, wanted, or perceived, the position is in a sense reversed (Halliday, 2004, pp. 201-203).

3.1.3. Relational

Relational clauses serve to characterize and identify an entity (Halliday, 2004, p. 210). Relational processes are typically realized by the verb "to be" or some verbs of the same class (known as copular verbs); for example, seem, become, appear (as in "She appeared cheerful") or sometimes by verbs such as have, own, possess (Bloor and Bloor, 2004, p. 120).

Halliday classify the processes Material, Mental, and Relational as major processes and the other ones as minor. (Bloor and Bloor, 2004, p. 125).

3.1.4. Behavioral

These are the processes of (typically human) physiological and psychological behavior, like breathing, coughing, smiling, dreaming, and staring. They are the least distinct of all the six process types because they have no clearly defined characteristics of their own; rather, they are partly like the material and partly like the mental type. The participant who is "behaving", labeled "Behaver" is typically a conscious being, like the senser; the process is grammatically more like one of "doing"s (Halliday, 2004, pp. 248-250).

3.1.5. Verbal

These are clauses of saying, as in what did you say? – I said it's noisy here. Such clauses are an important resource in various kinds of discourse. They contribute to the creation of narratives by making it possible to set up dialogic passages (Halliday, 2014, p. 302).

3.1.6. Existential

They represent that something exists or happens, as in "there was a little guinea-pig", "there seems to be a problem", "Has there been a phone call?", "There is not enough time" (Halliday, 1994, p.142). The existential process has only one participant, the *Existent* (Bloor & Bloor, 2004, p. 125).

4. Methodology

This research employed a quantitative approach to investigate the correlation between verb comprehension and verb production of Persian learners in Persian language writing as a second language. The statistical population was the Persian learners of the international center of teaching Persian to non-Persian speakers in Ferdowsi University of Mashhad. Data collection method was based on field study and random sampling method. The data were gathered through tests, interviews and essays which were divided into two parts: verb comprehension and verb production. The tests were designed to measure the participants' comprehension of verbs in context, while the essays were used to assess their ability to produce verbs appropriately in writing. The collected data then were analyzed by SPSS.

4.1. Participants

The participants of this study were 30 non-Iranian Persian learners who were chosen randomly from 60 available learners at three Persian proficiency levels (elementary, intermediate, and advanced) according to the levels defined in teaching Persian to non-Persian speakers center in Ferdowsi University of Mashhad. We divided them into three 10-person groups. Every Persian learner was over twenty years old.

Elementary level: There was a man and two women from Korean learners, two Italian girls and five Iraqi men.

Intermediate level: There were two Yemeni women, six Yemeni men, and two Iraqi men**.**

Advanced level: There was one German woman, one Lebanese-American woman, four Iraqi men, two Yemeni men, and two Iraqi women.

4.2. Data collection

We collected our data with the help of two methods: tests and composition. The data gathered were divided into two parts: verb comprehension and verb production. The results of the tests were analyzed for verb comprehension, while the outputs of compositions were used in verb

production. Therefore, in the first-stage, in order to test the level of comprehension in each process, considering the proficiency level of the participants, we almost designed three equivalent exams that were the same for three levels of Persian learners. Then the exams were administered during their terms and they were asked to answer every question according to their level of Persian proficiency. The tests include 98 processes (31 material processes, 21 relational, and 20 mental processes, 8 behavioral, 11 verbal, and 7 existential processes). To compute the reliability coefficient of the tests, we used the KR-20 method of Kuder and Richardson because the exams included various types of items, such as multiple-choice, matching, gap filling, synonyms, antonyms. Plus, the questions in a test did not have approximately the same difficulty. The reliability coefficient of tests 1 and 2 was 0.85 and for test 3, it was 0.83. In the second stage, at the end of each exam a picture was given to the learners and they were supposed to write something about it. We tried to provide various contexts for writing, In other words, images were initially selected in such a way to persuade Persian learners to use all types of processes. For example, one of the images was about poor children who were cleaning cars on the street, while rich children were playing with their toys. Production of the processes related to feelings like a mental process can be understood from this image. (Feizi, 1394, p. 36-47).

5. Results

In this section, for obtaining the correlational relationship among process comprehension and process production, first of all, the Persian learners' comprehension scores of each process were computed, then the number of each process in the composition was determined. Finally, the Pearson correlation of the variables was computed by using the statistical software SPSS. Table 1, 2, 3, separately indicate the comprehension and production scores of Persian leaners in each level.

Table1

Verb comprehension and production score of Persian learners at elementary level

	Material 1		Relational 1		Mental 1		Behavioral 1		Verbal 1		Existential 1	
Comprehension & Production	C	P	C	P	C	P	C	P	C	P	C	P
learner1	16	8	7	2	6	0	7	2	8	0	3	1
learner2	8	1	3	0	8	0	1	3	4	0	2	0
learner3	19	5	11	2	4	0	3	4	5	0	2	5
learner4	18	9	7	7	3	1	2	4	2	0	3	0
learner5	12	2	4	0	4	0	3	0	3	0	1	0
learner6	15	4	5	1	5	0	5	6	3	0	3	0
learner7	14	6	7	6	8	1	4	2	5	0	3	2
learner8	20	11	12	9	3	1	4	6	4	0	3	2
learner9	13	4	7	3	2	0	3	4	4	0	2	0
learner10	16	3	6	0	5	0	6	4	1	0	1	0

The table provides the verb comprehension and production scores of 10 Persian learners at the elementary level. The scores are categorized into six types of verbs: existential, verbal, behavioral, mental, relational, and material. The comprehension and production scores are presented for each verb type. For example, learner 1 has a comprehension score of 1 for existential verbs and a production score of 3 for verbal verbs. Learner 2 has a comprehension score of 0 for all verb types except for relational verbs where they have a score of 1. Learner 3 has a high production score of 19 for material verbs and a high comprehension score of 11 for relational verbs. Overall, the learners have varying scores across different verb types and skills. The descriptive statistics provided earlier show the mean and standard deviation scores for each verb type and skill.

Table2

Verb comprehension and production score of Persian learners at intermediate level

	Material 1		Relational 1		Mental 1		Behavioral1		Verbal 1		Existential 1	
Comprehension & Production	C	P	C	P	C	P	C	P	C	P	C	P
learner 1	23	6	14	4	10	1	6	6	9	0	3	3
learner 2	23	12	11	5	10	0	7	2	7	0	4	1
learner 3	23	8	13	6	11	2	7	3	7	0	5	3
learner 4	22	15	12	11	9	0	6	5	8	1	6	2
learner 5	20	10	9	4	11	1	6	6	8	0	3	1
learner 6	19	13	13	10	11	2	6	8	6	1	3	0
learner 7	20	9	15	2	10	2	6	6	7	0	6	0
learner 8	26	25	14	6	14	3	6	2	7	1	5	2
learner 9	21	8	15	3	15	3	7	4	8	0	4	5
learner 10	28	16	18	3	11	3	8	2	8	0	5	0

The table shows the verb comprehension and production scores of 10 intermediate level non-Iranian Persian learners. The learners were assessed in terms of their comprehension and production proficiency of five different types of verbs: existential, verbal, behavioral, mental, relational, and material. The scores are presented in terms of the number of correct responses out of a possible total score for each type of verb. For example, learner 1 scored 3 out of 5 in comprehension and 3 out of 5 in production for existential verbs, 0 out of 5 in comprehension and 9 out of 10 in production for verbal verbs, and so on. The total comprehension and production scores for each learner are also provided at the end of each row. Overall, the scores vary across learners and across verb types. Some learners perform better in comprehension than production, while others show the opposite pattern. The scores also suggest that some verb types are easier to comprehend and produce than others, with relational verbs being the most challenging for most learners.

Table3

Verb Comprehension and production score of Persian learners at advanced level

	Material 1		Relational 1		Mental 1		Behavioral1		Verbal 1		Existential 1	
Comprehension & Production	C	P	C	P	C	P	C	P	C	P	C	P
learner 1	25	15	18	2	14	0	8	6	8	0	6	0
learner 2	24	16	21	9	11	4	7	2	8	2	4	1
learner 3	25	10	16	0	14	4	7	2	6	0	5	0
learner 4	26	14	15	18	12	6	7	2	9	0	6	3
learner 5	25	17	18	7	14	0	6	2	9	1	7	0
learner 6	26	9	12	7	14	1	7	1	8	0	5	4
learner 7	24	15	8	10	8	3	7	3	8	1	3	2
learner 8	25	10	13	7	17	1	6	6	8	0	4	1
learner 9	25	9	15	15	14	6	6	3	9	1	5	2
learner 10	27	6	16	3	18	0	6	3	6	0	5	4

The table shows the verb comprehension and production scores of 10 Persian learners at the advanced level. The scores are categorized into six types of verbs: existential, verbal, behavioral, mental, relational, and material. The comprehension and production scores are presented for each verb type. For example, learner 1 has a comprehension score of 6 for verbal verbs and a production score of 18 for material verbs. Learner 2 has a comprehension score of 4 for existential verbs and a production score of 21 for relational verbs. Learner 3 has a high production score of 25 for material verbs and a high comprehension score of 16 for behavioral verbs. Overall, the learners have varying scores across different verb types and skills. The descriptive statistics provided earlier show the mean and standard deviation scores for each verb type and skill.

There is a correlation coefficients between the scores of comprehension and production process for each verb type and skill level of the Persian learners. The correlations range from -0.699 to 0.837 and are high at different levels of significance. For example, there is a strong positive

correlation ($r = 0.837$, $p < 0.01$) between the comprehension and production scores for material verbs at the elementary level. This suggests that learners who have a good understanding of material verbs are also likely to produce them accurately. On the other hand, there is a weak negative correlation ($r = -0.348$, $p > 0.05$) between the comprehension and production scores for mental verbs at the advanced level. This suggests that learners who have a good understanding of mental verbs may not necessarily produce them accurately. Overall, the correlations suggest that there is some degree of relationship between comprehension and production skills for different verb types and skill levels, but the strength and direction of the relationship vary.

The results of this study showed that there was a positive correlation between comprehension and verb production of mental process at elementary levels. This suggests that Persian learners who have a better understanding of mental process verbs are also more likely to use them correctly in their writing. On the other hand, no correlation was found between Persian learners' verb comprehension and verb production at intermediate levels. This may be due to the fact that at this level, learners have already acquired a certain level of proficiency in Persian language writing, and therefore, their performance in verb comprehension and production tasks is less influenced by each other. Furthermore, there was a negative correlation between the comprehension and production of the behavioral process at intermediate level and the comprehension and production of the material process at advanced levels. This may indicate that these two types of processes require different cognitive skills and strategies, and therefore, learners who are good at one process may not necessarily be good at the other.

6. Discussion

According to the evidence, there was a positive correlational relationship between comprehension of material processes and its production at elementary level and there was no correlation between them at intermediate level. Conversely, there was a negative correlation at advanced level. There is no correlational relationship between mental comprehension and its

production at elementary and advanced level, but there is a positive one at intermediate level. There is a positive correlational relationship between relational comprehension and its production at elementary level and no correlational relationship at intermediate and advanced level. There is a negative correlational relationship between behavioral comprehension and its production at intermediate level but not at two other levels. There is not any correlational relationship for verbal and existential processes at three levels.

Data analysis showed that rising learners' level is connected with the correlational relationship between processes comprehension and production because in the case of material processes as a prototype of action and concrete process, there is a positive correlational relationship at elementary level and the negative one at advanced level. It shows that material processes were replaced by more abstract processes like mental processes at higher levels. Actually, they had been poorly comprehended and produced at elementary levels (Feizi, 1394, pp. 61-68). This assertion becomes more plausible when we saw the positive correlation between mental processes comprehension and its production at intermediate level and also negative correlational relationship between behavioral comprehension and its production at the same level because behavioral processes have concrete mood, like material processes. On the other hand, since the elementary Persian learners were beginners with a little amount of verb learning, they used concrete and the most common processes in their writing. Therefore, it can be claimed that there is a more positive correlation between process comprehension and its production at elementary level than the other levels because the material and relational processes are the most common processes in Persian learning as a second language (Feizi, 1394, p. 68). This can lead to a positive correlational relationship at elementary levels. Finally, it seemed that there were several agents for the presence or absence of correlational relationship between process comprehension and process production at each level in writing.

For the positive correlation between comprehension and production of concrete and action processes like material and behavioral, the Persian learners had been at lower levels. For the negative correlation between

comprehension and its production of concrete and action processes like material and behavioral, the Persian learners had been at higher levels. And for the positive correlation between comprehension and production of more abstract processes like mental, Persian learners had been at higher levels. For the positive correlation between comprehension and production of relational processes, these processes had been the more common in Persian learning.

Regarding teaching Persian to non-Persian speakers, in order to prevent incorrect and unscientific evaluation of teachers about learning Persian verbs by foreign students, the process of comprehension and production of Persian verbs was separated. For example, if a verb were not produced by Persian learners, it would not mean that Persian learners have not comprehended it, but there may be other reasons. In other words, increasing Persian learners' comprehension of any verb does not always mean increasing more production for some since it depends on the characteristics of each verb. Also, determining the correlation between verb comprehension and verb production helps to prioritize teaching each type of verbs. This means that having increased the level of learners, the less common and mental verbs should be replaced by concrete, action and the less common verbs.

These results of this research are consistent with previous studies that have shown a close relationship between verb comprehension and verb production (Bates et al., 1994; Branigan et al., 2008). However, they also highlight the importance of considering the type of process involved in verb comprehension and production tasks. Moreover, they suggest that the level of Persian learners can also affect the nature and strength of this relationship.

7. Conclusion

The results showed that there is a more positive correlational relationship between process comprehension and process products at lower levels of learners than the higher-level ones except for abstract processes like mental process or not common processes in Persian learning like verbal and existential processes at elementary level. Also, as learners' level increases, the negative correlational relationship between comprehension and production of

the action and concrete verbs like material and behavioral processes increases because they are replaced by other processes in the essays of higher levels. Finally, it can be concluded that, in general, three factors are effective in creating a significant correlation between comprehension and production of the processes: 1) the degree of objectivity and subjectivity of the processes, 2) the versatility of the processes, and 3) the level of language learners.

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A Construction Morphology Approach to the Analysis of Compound Adjectives Made of *Sāz* (*Maker*) in Persian[1]

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Abstract

In the present study, we attempted to specify the constructional schemas relevant to the compounds made by the present stem '*sāz*' in Persian within the framework of the construction morphology (Booij, 2010). To this end, 150 compounds were brought together from numerous sources, such as the *Persian Corpus of Bijankhan*, Persian novels as well as some Persian websites. Having collected the data, we tabulated and categorized them on the basis of the preverbal elements. Afterwards, a comparison was made, as a result of which it was indicated that there can be a general constructional schema inside which 5 sub-schemas can be placed. Certainly, the broad schema denotes the construction by which a noun (preverbal element) is combined with the verbal element (present stem *sāz*) to create an adjective that implies the agent of an action, namely the agent of building or making an object. However, there were two exceptions among the whole dataset: a compound in spite of resembling the other compounds regarding its construction denotes the semantic role of patient: *dastsāz* (handmade), referring to an object which is made by hands as well as the compound *ʤāsāz* (*embedded object*), whereas in other compounds, the stem means the agent that builds,

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creates or makes. Consequently, as might be expected, two broad constructional schemas have been obtained: one relevant to the agents and the other relevant to patients.

Keywords: compound, construction morphology, stem, schema, semantic aspect

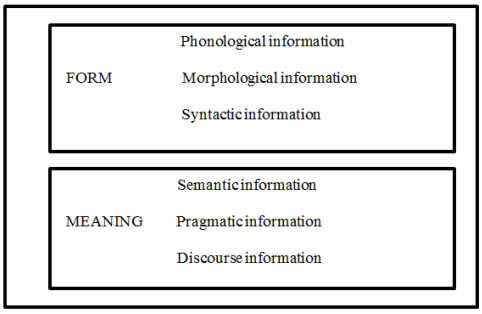
1. Introduction

Construction Morphology, hereafter CM, which is introduced by Booij (2010) is a theory established on the basis of syntactic, morphological and lexical relations as well as the semantic features of the complex words. In this theory, the structure of words is represented by some schemas at the lexical level in a way that a constant position is allocated to suffixes (Shaghaghi, 2016, p. 103).

According to Booij (2009), CM is a lexeme-based approach within the framework of which the internal structure of the complex lexemes along with the syntagmatic relations among them is perceived through making a comparison between the systematic correlations of form and meaning. Stated by Booij (2010), words are considered as the linguistic signs enjoying the conventional form and meaning associations. Booij (2012) believed that constructional schemas are regarded as some tools for the representation of morphological constructions. Indeed, every construction has two parts: semantic and formal. The former is composed of morpho-syntactic as well as phonological features, whereas the latter comprises semantic, pragmatic and discourse features, all of which can be depicted by a figure as below called a construction:

Figure 1

Constructions as pairings of form and meaning (Booij, 2010)



CM considers word-formation patterns as abstract schemas where form and meaning are paired. As an example, when native speakers of a language like English are exposed to words such as *writer*, *listener*, *speaker*, *runner*, *driver* and *follower*, they will conclude that there is a pattern, namely a construction like [[V] er]$_{N.}$ To put it another way, the native speakers will arrive at the fact that as a result of attaching *–er* to the simple form of the verbs, nominal agent will be produced. Such a production could be called a construction.

With respect to the abovementioned enlightenments, the current research question can be stated as follows:

What constructional schema the compound words made of *sāz* (*maker*) in Persian follow?

1.1. The Persian Language and the Structure of Words

Contemporary Persian is considered as the language frequently used in Iran. It is also regarded as the official language of the Iranian people as well (Sadeghi, 2000, p.111). The Persian language, henceforth Persian, which is considered as the mother language of Iran enjoys multiple varieties with respect to time, place, social situations as well as pragmatic aspects (Bateni, 1970, pp. 8-10). The Standard Persian, however, is the variety on which linguistic analyses have always been done unless a particular accent or dialect is the focus of a specific study. Likewise, throughout this paper, by Persian it is meant the standard variety of this language spoken in Tehran, the capital of Iran, and is written and used for education, media and so on.

Like the words of global living languages, the words in Persian, as Natel-Khanlari (1972, p. 162) states, are classified into two types: simple and complex. According to him, simple words refer to the words for which no independent constituent does exist. By contrast, complex words are composed of two or more constituents.

Proposed by Gholamalizadeh (1995, p. 255), given the way they have been made as well as their structure, the Persian words can be put into one of these three categories: simple, compound and derivational. By simple words, he

means the lexical units which are composed of only one single morpheme such as *dar* (door), *panʤere* (window) and *medād* (pencil). Compound words, by contrast, refer to the words composed of more than one lexeme, generally two lexemes such as *dāruxāne* (drugstore). In addition, by derivational words he meant the words in the structure of which at least one bound morpheme is used such as *divāri* (pertaining to wall). In Persian, most of the attributive adjectives are made by adding –i to the end of nouns: *divār* (=wall) + *-i* (=attributive adjective maker suffix) = *divāri* (=relevant to wall).

1.2. Persian Stems

Stems may be considered as either a single root morpheme or two root morphemes. They can also be a combination of a root morpheme plus a derivational affix. However, what all these forms have in common refers to the fact that they are the linguistic units inflectional affixes can be attached to (Crystal, 2003).

In Persian, there are two types of stem: past and present. These two stems are called verbal stems, as they are the forms from which different verbal inflections are made (Jahanshiri, 2020). As an example, the infinitive form of the verb *sāxtan* (to build) can be referred to from which two stems are derived: *sāxt* and *sāz*. The former is the simple past form of the verb, whereas the latter is in the present form. Thus, *sāxt* means *made* while *sāz* means *make*. However, as both stems can play the role of the second element of the secondary compounds in Persian, the present stem *sāz* semantically equals *maker* when it participates in the process of compounding.

1.3. Paper Structure

The remainder of this paper has been organized in the following way. Section 2 is a brief account of prior pieces of research, which have been done in English, Persian and several other languages throughout the world. In Section 3, the method via which the data has been collected, compared and analyzed will be described. The tabulation of findings alongside their English versions is the main focus of Section 4. The analysis of data will be put into discussion in

the same section as well. In the last section, that is to say Section 5, the concluding remarks will be expressed.

2. Literature Review

Needless to say, the CM approach proposed by Booij in 2010 and revised in 2016 is a newly established theory within the framework of which not much research has been done throughout the world. However, as far as the authors have found, a handful of studies have been conducted in such languages as German, Arabic, Chinese, Japanese, Italian and Greek, which are pointed out below. It ought to be stated that the following pieces of research have been ordered from the most recent ones to the oldest ones.

Koutsoukos and Pavlakou (2009) have studied Modern Greek in terms of its agent suffixes. They have studied masculine and feminine agent suffixes on the basis of the framework of CM introduced by Booij (2005a). They have argued for both masculine and feminine suffixes while comparing them to their cross-linguistic data. Arcodio (2010) has done a research in Mandarin Chinese in CM framework. Hüning (2018) has studied the verbs in *–ieren* in German. He has discussed the problems relevant to the study of foreign word formation in German. In fact, he has tried to show that CM is very appropriate to justify this phenomenon with respect to its central notions. Davis and Tsujimura (2018) have examined the non-concatenative morphological system of Arabic with respect to CM. Arcodia and Basciano (2018) analyzed the word-formation process in Chinese based on CM. Tsujimura and Davis (2018) published an article concentrating on word formation in Japanese in CM framework. Masini and Lacobini's paper focusing on schemas in Italian is a body of research published in 2018. Their attention is restricted to both schemas and discontinuity in Italian. In his article Spuy (2020) has discovered the English plurals are in line with CM.

As for Persian, it should be said that there are multiple works which have been carried out with regard to the approach proposed by CM (Bamshadi & Ghatreh, 2017; Bamshadi & Davari Ardakani, 2018; Bamshadi, Ansarian & Davari Ardakani, 2018; Bamshadi, Ansarian & Davari Ardakani, 2019;

Bamshadi & Ansarian, 2020; Bamshadi, Ansarian & Davari Ardakani, 2020). However, it appears that there are only two pieces of research which are highly relevant to the current study. One is the work by Azimdokht and Rafiei (2019) who have examined the semantic variations of the present stem *paz* (cook), concluding that the compounds whose second part is this stem have the agentive meaning. Moreover, they have argued that the traditional hypothesis of extending the concept of agent fails to justify how the relevant sub-schemas can be formed. Another study belongs to Azimdokht, Rafiei and Rezaei (2018) in which they have discovered the semantic variations of the present stem *yaab* [*jāb*] (=find) in Persian. They have concluded that the traditional hypothesis of extending the concept of agent fails to justify how the relevant sub-schemas can be formed.

3. Method

From the Persian Corpus of Bijankhan, the online version[1], as well as multiple electronic sources such as websites, articles and books alongside the linguistic intuition of the authors, 82 compound words the second part of which was *sāz* (maker) were extracted and each was examined within the theoretical framework of CM. Eventually, comparisons were made among the words all to see what type of constructional schema their structure follows. It is notable that from the whole data, for the sake of saving space, only 68 compound words whose second element is *sāz* has been tabulated in this paper.

4. Findings and Discussion

In this section, the linguistic expressions comprising the compound words in question are presented in both Persian and English. Indeed, the English versions exhibit not only the phonetic transcription relevant to each compound construction in Persian, but they also display the semantic equivalents as well. It is also worth noting that the data were primarily in a sentential or syntactic phrases form, but due to saving space and for the sake of simplicity, only the compound words were mentioned here, as Table 1 shows:

[1] http://corpora.phil.hhu.de/bonito/run.cgi/

Table 1

Phonetic forms and the English equivalents of Persian compound words

Compound Words	Phonetic Transcription	English Meaning
آهنگ ساز	āhangsāz	composer
طلاساز	talāsāz	goldsmith
برج ساز	borʤsāz	jerry-builder
سبب ساز	sababsāz	causer
زمینه ساز	zaminesāz	precursor
مدرسه ساز	madresesāz	school builder
بازیکن ساز	bāzikonsāz	player maker
شخصیت ساز	ʃaxsijatsāz	character maker
مسأله ساز	mas?alesāz	problematic
مکان ساز	makānsāz	locator
صفت ساز	sefatsāz	adjective maker
مسجد ساز	masʤedsāz	mosque builder
جواهر ساز	ʤavāhersāz	jeweler
لغت ساز	loqatsāz	word producer
بهینه ساز	behinesāz	optimizer
انبوه ساز	anbuhsāz	mass constructor
فضا ساز	fazāsāz	space creator
شبیه ساز	ʃabihsāz	simulator
*دست ساز	dastsāz	hand-made
آتی ساز	ātisāz	future maker
شهر ساز	ʃahrsāz	planner
فرهنگ ساز	farhangsāz	culture creator
مسکن ساز	maskansāz	home maker
راه ساز	rāhsāz	road builder
بنا ساز	banāsāz	constructor
آسفالت ساز	āsfāltsāz	asphalt producer
قهوه ساز	qahvesāz	coffee maker

پول ساز	pulsāz	money maker
چاره ساز	ʧāresāz	remedial
جاساز	ʤāsāz	embedded object

Exploring the fact that what type of schema the overall construction of the compounds tabulated here follows is the core subject of the next section.

From the two basic types of morphological patterns, that is affixation and compounding (Haspelmath, 2002, p. 34), the latter, according to Lieber (2010), has a head with two main properties: it functions as the syntactic category determiner, and it identifies the semantic type of the whole compound. For instance, in the compound *greenhouse*, the word *green* is an adjective while *house* is a noun, but as English is a right-head language, the compound *greenhouse* is a noun.

The study of the structure of compound words suggests that most of them have originally been syntactic structures (Shaghaghi, 2008, p. 92). Due to the frequently used collocations of these syntactic structures, they have gradually turned into compound words. One class of such syntactic categories refers to those compounds the second parts of which are the present stems of verbs. The following examples were taken from Shaghaghi (2008):

Table 2

Persian compounds with verbal stems

Persian Compounds	English Equivalents	First Element	Meaning	Second Element	Meaning
ābpāʃ	sprinkler	āb	water	pāʃ	splash
nurafkan	lighting	nur	light	afkan	cast
delneʃîn	sweet	del	heart	neʃîn	sit

Given what has been stated above, it ought to be said that the compound we are going to discuss throughout this paper belongs to this category, as it is composed of two parts whose second element is the stem of a

present verb. As Shaghaghi (2008, p. 93-94) says, the compound words in Persian are divided into two groups based on the constituents they are composed of, hence primary and secondary compounds. In primary compounds, no elements are verbal stems. In contrast, if one of the compound elements is a verbal stem, the compound will be considered as a secondary compound. Therefore, the compounds made of *sāz* (maker) in the present article are of the secondary type, as the element *sāz* is the present stem of a verb.

In what follows, the schemas and subschemas relevant to *sāz* are explored. It is worth mentioning that having been reviewed the data extracted from the corpus and other available sources, it was found that the compound words the second element of which is *sāz* are of the nominal and adjectival syntactic categories. In effect, the compounds schemas can be figured out as follows:

$$[[\mathrm{x}]_{\mathrm{N/ADJi}} \quad [\text{-}s\bar{a}z]_{\mathrm{PRS\ STM}}]_{\mathrm{N/ADJj}} \longleftrightarrow [\mathrm{SEM_i} \quad \text{agent of creation}]_{\mathrm{N/ADJj}}$$

In the above schema, *X* refers to any nominal category which can substitute X. Hence, N has been used beside it outside the bracket. By *PRS*, *STM* and *ADJ*, the schema means *present*, *stem* and *adjective* respectively. The two indices *i* and *j* denote the two parts of the compounds made by *sāz*. The notation SEM means the semantic interpretation of the compounds and the arrow in between refers to the two-sided connection between the form and meaning of the compound. By the expression agent of creation, the schema points out the fact that via the attachment of the present stem to the nominal elements, an adjective will be produced that denotes any entity that builds, makes or creates something.

Notably, the schema is indeed the main schema. However, with respect to the semantic variations of the data, it subsumes four sub-schemas which will be introduced as follows.

It should be said that the outcome of such a combination, that is the combination of a noun and the verbal stem *sāz* can be regarded as either a nominal agent or an adjectival agent. As two examples, the following expressions can be pointed to where one compound can serve to be a nominal

agent (Expression I) and the other one can be regarded as an adjectival agent (Expression II):

Expression I

dar indʒā bordʒsāz zijād ast

in here tower builder many is

There are too many jerry-builders here.

Expression II

in mozu barāje xānevāde moʃkelsāz ast

this matter for family problematic is

This matter is problematic for the family.

According to Expression I, the compound word *bordʒsāz*, made of two parts *bordʒ* (tower) and *sāz*—functions as the main subject of the sentence which makes it to be taken as a nominal agent, whereas in Expression II, the compound functions as the subject complement which functions as an adjective. Hence, it can be regarded as the adjectival agent in this sentence.

This section is allocated to the investigation of the analysis of the construction of the compounds made out of *sāz*. To begin with, it may be essential to restate the research question here: What constructional schema do the compound words made of *sāz* in Persian follow? In order to provide the question with an appropriate answer in line with the CM approach, the following analyses are worth arguing. As mentioned earlier, a general schema could be assumed for the compounds whose second element is *sāz* as follows:

$$[[x]_{Ni} \quad [\text{-}sāz]_{PRS\ STM}]_{N/ADJj} \longleftrightarrow [SEM_i \quad \text{agent of creation}]_{N/ADJj}$$

A number of 52 compound words whose second part is *sāz* were brought together from a couple of sources as the *Persian Corpus of Bijankhan*, some monolingual Persian dictionaries, Persian grammar course books as well as the authors' linguistic intuition. As our data were going to be analyzed within the theoretical framework of CM, the inspection of them revealed that for the present stem *sāz*, 5 sub-schemas may be defined as follows, showing such semantic relations as agent, cause and instrument:

1) $[[N]_i\ [sāz]_j]_N \leftrightarrow$ [the 'agent' which does SEM_i in SEM_j]$_N$

According to this sub-schema, when the stem is added to a nominal

base, a sort of compound will be made which semantically refers to the agent of an affair. As an example, the compound *filmsāz* (=movie maker) can be pointed out which means a person who makes movies. Other relevant examples of this schema are presented in the following table:

Table 3

Compounds with agentive meaning

Compounds	Meaning
filmsāz	movie maker
āhangsāz	composer
kābinetsāz	cabinet maker
dārusāz	pharmacist
talāsāz	goldsmith
kelidsāz	locksmith
maskansāz	house maker
maqulesāz	category maker
bordʒsāz	jerry-builder
rāhsāz	road constructer

Sometimes the stem *sāz* is added to a nominal base and makes an adjective with causative meaning. The relevant schema for such compounds would be depicted as follows:

2) $[[N]_i\ [sāz]_j]_{ADJ} \leftrightarrow$ [the property of 'agent' which does SEM_j in $SEM_i]_{ADJ}$

In this case, the associated compounds semantically refer to an entity that causes something. To put it another way, the stem *sāz* refers to the fact that something in the outside world causes the nominal base of the compound to exist. Table (4) displays the pertinent specimens:

Table 4

Compounds with cause-effect (causative) meaning

Compounds	Meaning
xabarsāz	high profile
ebhāmsāz	ambiguity maker
pulsāz	profitable
sababsāz	causer
tārixsāz	history maker
dāstānsāz	story maker
moʃkelsāz	problematic
farhangsāz	culture builder
zaminesāz	precursor
behinesāz	optimizer

In some cases, the stem *sāz* in combination with another element, typically a noun, refers to an instrument with the help of which some edible object will be produced. The following schema shows such a relation:

3) $[[N]_i\ [sāz]_j]_N \leftrightarrow$ [the 'instrument noun' which does SEM_j in SEM_i]$_N$

The most frequently used compounds included in this schema are the ones shown by Table (5):

Table 5

Compounds with instrumental meaning

Compounds	Meaning
qazāsāz	food maker
qahvesāz	coffee maker
ʧājsāz	tea maker
sāndeviʧsāz	grill

For the word *dastsāz*, being an adjective, and the element *dast* (hand) is considered an instrument for it, the following sub-schema seems to be appropriate:

4) $[[N]_i\ [s\bar{a}z]_j]_{ADJ}$ ↔ [the property of the factitive in which the act of SEM_j has done by the instrument $SEM_i]_k$

For the compound *ʤāsāz* (embedded object), being an adjective and a noun, some notions as follows could be considered:

As a nominal compound, it refers to an object furtively located in some place, whereas as an adjectival compound, it refers to the properties of an object furtively located in some place. Therefore, two schemas will belong to this compound as follows:

5-1) $[[N]_i\ [s\bar{a}z]_j]_{Ni}$ ⟷ [the 'theme' to which the act of SEM_j has been done furtively$]_N$

5-2) $[[N]_i\ [saz]_j]_{ADJi}$ ⟷ [the property of the 'patient' to which the act of SEM_j has been done furtively$]_{ADJ}$

6. Conclusion

As stated by CM, there is a mutual relationship between form, meaning and the overall construction of words. Throughout this paper, with respect to the theoretical framework proposed by Booij (2010; 2018), the Persian compounds made by *sāz* (maker) were examined as a result of which it was revealed that there could be a general constructional schema at the core of which 5 sub-schemas can be located. The comprehensive schema represents the overall construction by virtue of which a noun (preverbal element) is combined with the verbal element (present stem *sāz*) to create a compound noun, which indicates the agent of an action, specifically the agent of building or making an object. Nevertheless, there were two types of exclusion among the whole data. There was a compound notwithstanding resembling the other compounds with respect to its construction points toward the semantic role of patient: *dastsāz* (handmade), which is an adjective describing the objects made by hand. The other compound is *ʤāsāz* (embedded object) which refers to the property of an object in a way that that object has been stealthily hidden. In contrast, in other compounds, the present stem means the agent that builds, creates or makes an object. Needless to say, two broad constructional schemas

have been gained: one associated to agentive adjectives and the other associated to patient ones.

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Interactional Metadiscourse Markers in the Discussion and Conclusion Sections of Research Papers in Political Science and Religious Studies[1]

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Abstract

Metadiscourse is an essential component of academic writing, as it helps authors better communicate their ideas and engage their readers. It is through the analysis of the text's metadiscourse that one can explore academic writing and compare the rhetorical traits and preferences of various discourse communities (Hyland, 2005). To this end, this study examined the differences in the use, type, and frequency of interactional metadiscourse markers in the discussion and conclusion sections of political science and religious studies articles written in English language. The corpus of this study consisted of 45032 words extracted from fifty research articles, twenty-five articles in the field of political science, and twenty-five articles in the field of religious studies published between 2019 and 2023 in the top one high-impact factor and peer-reviewed international journals.

To analyze the data, one Eta and two Chi-square tests were run. Considering the interactional resources of Hyland's (2005) metadiscourse model, the researchers

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uncovered that despite some subtle differences in the use, frequency, and types of these metadiscourse markers, "hedges" were the most and attitude markers were the least frequently used metadiscourse markers employed in both political science and religious studies disciplines. The findings have some educational
implications that shed light on the need to encourage English language teachers, university professors, and publishers in the fields of TEFL and ESP to provide EFL learners with appropriate sources and settings to increase their familiarity with various metadiscourse markers, especially the category of interactional MDMs that aids them write coherently and establish genuine interaction with audiences.
Keywords: metadiscourse markers, interactional features, academic writing, religious studies, political science

1. Introduction

Metadiscourse (MD) constitutes an essential element in academic writing, given its capacity to enhance authors' communication of their ideas and foster reader engagement. Writers can use metadiscourse to explain their arguments, emphasize important points, and elucidate complicated concepts to the reader resulting in the creation of academic texts that are well-written and persuasive (Hyland, 2005).

Metadiscourse has been defined by a number of researchers. In Williams (1981), metadiscourse is considered "writing about writing, whatever does not refer to the subject matter being addressed" (p. 212). In addition, Vande Kopple (1985) delineates it as "the linguistic element which does not add propositional content, but rather signals the presence of the author in the text" (p. 83). Hyland (2005) gives a comprehensive clarification of the concept of metadiscourse, characterizing it as comprised of the explicit organizational elements within a discourse or the writer's position towards the content or the reader. To him, metadiscourse means using certain words and phrases to help introduce or summarize ideas, indicate transitions between topics, express the author's attitude or stance toward the material being presented, provide evidence for claims, establish coherence and cohesion within the text, and engage as well as helping the reader or listener to understand the social and communicative intentions of the writer (p. 14). The model of metadiscourse

markers established by Hyland (2005), which is utilized in the current study, categorizes metadiscourse markers as interactive which provide the reader with guidance throughout the text and incorporate transitions (e.g., "thus"), frame markers (e.g., "finally",), endophoric markers (e.g., "in section 2"), evidentials (e.g., "Z states") and code glosses (e.g., "namely") or interactional which concern the extent to which the writer makes their ideas clear and includes the reader in their text through the utilization of hedges, boosters, attitude markers, self-mentions, and engagement markers (Hyland & Tse, 2004).

Considerable research (e.g., Abbaszadeh et al., 2019; Estaji & Vafaeimehr, 2015; Khedri et al., 2012; Rezaei et al., 2015; Saidi & Karami, 2021; Sheikh, 2020; Susanti et al., 2017) has explored the frequency, use, and type of interactional metadiscourse markers across various fields of study and sections of research articles; however, a look into the literature exposes that there is a paucity of research on the use of interactional metadiscourse devices in the two disciplines of political science and religious studies. Research on political and religious articles is of high importance to showcase how the use, type, and frequency of the aforementioned markers are used in producing valid arguments. Therefore, such a paucity encouraged the present researchers to conduct this study which also responds to calls of scholars (e.g., Estaji & Vafaeimehr, 2015; Khedri et al., 2012; Nawawi & Ting, 2022) to further study the type, frequency, and use of interactional MDMs across other disciplines and research sections, namely, discussion and conclusion segments of political and religious articles.

The study aims to:

1. compare the type, frequency, and use of interactional metadiscourse markers in the discussion and conclusion sections of the articles.
2. determine the most commonly recurring class of interactional metadiscourse markers across the two sections of the disciplines under study.

2. Review of the Related Literature

The concept of "Metadiscourse" has been defined and elaborated by

numerous academics (Bunton, 1999; Crismore & Fansworth, 1990; Dafouz-Milne, 2003; Hyland, 2000, 2005; Hyland & Tse, 2004; Luuka, 1994; Crismore et al., 1993; Vande-Kopple, 1985, 2002; William, 1981). It was first invented by Harris (1970) and further elaborated by Williams (1981). Williams (1981, p. 212) clarifies meta-discrimination merely as "writing about writing, which does not refer to the subject under consideration". In his book entitled "*Metadiscourse*" Hyland (2005) expounded on the significance of metadiscourse in conveying the intention of authors or speakers in their written or spoken communication. He further asserted that the presence of metadiscourse can enhance the effective transmission of textual messages.

A number of metadiscourse taxonomies have been suggested by metadiscourse theorists (Crismore et al., 1993; Hyland, 2005; Vande Kopple, 1985, 1997). Vande Kopple (1985) introduces the initial categorization of metadiscourse. His model is composed of "textual" and "interpersonal" meta-discoursal markers. In this taxonomy, textual metadiscourse incorporates four categories: text connectives, illocution markers, code glosses, and narrators, whereas interpersonal metadiscourse falls into three categories: attitude markers, validity markers, and commentaries. Vande Kopple's taxonomy was particularly important as it was the primary organized and efficient endeavor to offer a model that sets the stage for several studies as well as new taxonomies.

Crismore et al. (1993) propose a modified version of the Vande Kopple model. In this particular taxonomy, the dominant textual and interpersonal classifications have remained constant, albeit with a subdivision and rearrangement of sub-categories. They also break the textual metadiscourse into two broad classes of "textual" and "interpretive" markers. Textual metadiscourse presents markers that can help organize the discourse, and interpretative markers attend to facilitate the reader's comprehension and rendering of the author's desired message (Crismore et al., 1993).

In subsequent taxonomies, distinctions have been drawn between categories like "interactive" and "interactional" (Hyland & Tse, 2004). Hyland's model of metadiscourse research (Hyland, 2000, 2005) may be the most

comprehensive. Based on earlier works like Vande-Kopple (1985) and Crismore et al. (1993), his model is primarily comprised of two distinct forms of metadiscourse, namely interactive and interactional. The former aids in the overall organization of the text, whereas the latter serves to engage the reader in the text. Hedges, boosters, attitude markers, self-mentions, and engagement markers are all parts of the interactional category. It basically aims to provide a vivid text in which the writer's voice is easily discernible to the reader. When it is employed to deliver the writer's reactions to the content, it also aims to cultivate a personal bond with the audience. Through a variety of comments on the message that is being conveyed, it focuses on how the author organizes interaction. Readers are made aware of the author's perspective on propositional information and are provided with opportunities to contribute to the discussion (Hyland, 2005). According to Paltridge (2012), interactional metadiscourse resources include the ways in which authors explicitly engage with or address their readers in their texts as well as how they express their stance regarding what they are saying.

The following is a list of the five types of interactional MDMs adopted from Hyland's (2005) interpersonal model of metadiscourse markers which are illustrated in Table 1.

Table 1

Analysis framework for interactional metadiscourse markers

Category	Functions	Examples
Boosters	Emphasize certainty or close dialogue	in fact, definitely, only
Hedges	Withhold commitment and open dialogue	may, might, would
Self-mentions	Explicit reference to writer(s)	first person pronouns
Attitude markers	Express writer's attitude to proposition	simply, unfortunately
Engagement markers	Explicitly build a relationship with reader	personal asides

Note. Interactional metadiscourse markers adopted from Hyland's (2005)

In the case of this study, Hyland's (2005) taxonomy of metadiscourse was utilized, as opposed to other models (Crismore et al, 1993; Vande-Kopple, 2002), given its comprehensive and streamlined classification (Orta et al.,

2006). Additionally, it was found to be straightforward, clear, and comprehensive (Abdi et al., 2010). The metadiscourse markers have been the subject of numerous academic studies, including research papers (Abdi, 2002; Atai & Sadr, 2008; Hyland, 1996, 2005; Yağiz & Demir, 2015), doctoral and master's theses (Akoto, 2020; Hyland & Tse, 2004; Salahshoor & Afsari, 2017; Samraj, 2008). In addition, the frequency of metadiscourse markers has been examined in the subsections of academic papers. This was done by looking at the introductions, discussion sections, and abstracts of research articles (Faghih & Rahimpour, 2009; Gillaerts & Van de Velde, 2010; Rubio, 2011).

The studies by Aragonés (2009) and Estaji & Vafaeimehr (2015), which investigated the frequency and function of interactional metadiscourse markers in patent abstracts and in the introduction and conclusion sections of engineering research articles, respectively, are the two most relevant studies to the present investigation. Moreover, Aragonés (2009) analyzed patent abstracts in four fields—medicine, chemistry, telecommunications, and information technology— in four different languages, including Chinese, Spanish, French, and English. Premised upon the findings of the study, boosters and hedges are both rhetorical devices for modifying tone in patent abstracts and are used to persuade readers of the invention's usefulness. Estaji & Vafaeimehr (2015) also concluded that there was no statistically significant difference between the disciplines, despite a few minor contrasts within the frequency and type of these metadiscourse markers. This is due to the close relationship between these fields.

Because the nature of MD is dynamic, and it changes depending on the discipline and the context, additional studies are needed to achieve a comprehensive understanding of the rhetorical form and significance, distribution, use, and type of MDMs, despite these studies' contribution to the field of metadiscourse. In addition, undertaking such a study would potentially facilitate the comprehension of effective employment of metadiscourse markers among researchers and authors in their academic papers. As a result, the purpose of this research is to bridge the gap in the existing body of knowledge regarding the application of MDMs to the discussion and conclusion

sections of research articles in the fields of political sciences and religious studies. Particularly, this study aims to determine the field and nature of MD components utilized in the discussion and conclusion segments of political science and religious studies research articles. In this study, Hyland's (2005) model was utilized as a framework for determining the type, use, and frequency of MDMs employed in the aforementioned sections.

The present research paper intends to address the following research inquiries:

1. What are the most and the least frequently recurring types of interactional metadiscourse markers across the two sections of these disciplines?
2. Is there a statistically significant difference in the use of metadiscourse markers in the discussion and conclusion sections of the political sciences and religious studies' research papers?

3. Method

3.1 Corpus

The current study probed the variety, frequency, and differences in the metadiscourse markers used in the discussion and conclusion parts of research articles in the two branches of political science and religious studies. This study's corpus was comprised of 45032 words excerpted from a total of fifty research articles written in English language, twenty-five articles (each five from one journal) in the field of political science, and twenty-five articles (each five from one journal) in the field of religious studies. This study endeavors to select scholarly articles that feature at least one author who is a native speaker, by cross-referencing their affiliations and names as indicated in their profiles on ResearchGate and Google Scholar. The articles included in this analysis were sourced from prominent, peer-reviewed international journals with a distinguished, superior impact factor and were published during the time period of 2019 to 2023. To explain, two major disciplines, namely, Social Science and Arts and Humanities, were selected from SCIMAGO institutions rankings. From Social Science, the sub-discipline of "Political Science and International Relations" was selected and "Religious Studies" from Arts and

Humanities. Moreover, it should be noted that five journals of high repute were chosen from the sub-discipline of "Political Science and International Relations" as presented in Table 2, while another five (as indicated in Table 3) were selected from "Religious Studies".

Table 2

Descriptive statistics of the selected journals in the field of political science

Title	Type	SJR		Country
American Political Science Review	Journal	5.816	Q1	United Kingdom
American Journal of Political Science	Journal	4.913	Q1	United Kingdom
Political Analysis	Journal	4.712	Q1	United Kingdom
International Organization	Journal	3.606	Q1	United Kingdom
British Journal of Political Science	Journal	2.918	Q1	United Kingdom

Table 3

Descriptive statistics of the selected journals in the field of religious studies

Title	Type	SJR		Country
Sociology of Religion	Journal	1.239	Q1	United States
Journal of the Scientific Study of Religion	Journal	1.109	Q1	United States
Religion, Brain, and Behavior	Journal	1.011	Q1	United Kingdom
Journal of Religion and Health	Journal	0.740	Q1	United States
Journal of Health Care Chaplaincy	Journal	0.623	Q1	United States

The researchers carefully considered Nwogu's (1997) three criteria for selecting the aforementioned articles: representativeness, reputation, and accessibility. For the study to be conducted more precisely, those articles were chosen that were nearly representative of the genres being investigated and written under one title called discussion and conclusion section. The present investigation has collected and screened scholarly publications from English-language journals that have been designated and evaluated according to the SCIMAGO Institution Rankings, as recently published in 2021. Moreover, it is essential to note that all of the articles were chosen at random to ensure the reliability. Furthermore, Table 4 illustrates the descriptive statistics of the corpus analyzed in this study for the two specific fields under investigation.

Table 4

Descriptive statistics of the corpus

Journal Titles	No. of Research Articles	No. of Words	Mean of Words per Article
Political Science	25	22606	904.24
Religious Studies	25	22426	897.04
Overall	50	45032	900.64

3.2 Procedure

This research study is grounded in theoretical underpinnings that aligns with the interactional metadiscourse model provided by Hyland (2005) in which he proposes an overarching model for writer and reader interaction. As it was earlier discussed in the literature review section, there are two dimensions of interaction in this model: interactional as well as interactive. However, due to the nature of the study, only the interactional dimension of MDMs was studied. The interactional dimension, which includes the implementation of hedges, boosters, attitude markers, self-mentions, and engagement markers was the focus of this study to address the research questions. Appendix A provides an all-embracing inventory of said markers and occurrences. To examine the dispersion of interactional metadiscourse markers within the discussion and conclusion sections of the research studies and to analyze the data, the frequency, forms of use, and type of interactional metadiscourse markers, a manual corpus analysis method augmented by a concordance package approach was conducted to offer an inclusive depiction of the utilization of metadiscourse devices by native English writers in the genre of academic writing in political science and religious studies fields. To attain this objective, every instance of interactional metadiscourse markers listed by Hyland (2005) was looked for in the corpus.

3.3 Data Analysis

The corpus-identified interactional metadiscourse markers were

subjected to quantitative analysis. A manually conducted analysis of the collected corpus was conducted to ascertain the occurrence rate of individual MDMs in the discussion and conclusion sections of research papers in both political science and religious studies. The researchers analyzed the data to ensure that the type, use, and frequency of MDMs in the selected corpus were correctly identified and calculated. Following a content analysis and frequency count, Chi-square was employed to determine how statistically significant the variance of the employment of metadiscourse markers was in research articles, specifically within the discussion and conclusion sections. It is imperative to acknowledge that the quantitative analysis was conducted using SPSS software version 28.

4. Results

Interactional metadiscourse markers refer to the writer's use of linguistic devices to enhance clarity and engage the reader in their writing. These devices include attitude markers (e.g., admittedly), boosters (e.g., definitely), hedges (e.g., apparently), self-mentions (e.g., I), and engagement markers (e.g., imagine) (Hyland & Tse, 2004). First, the number of times each type of metadiscourse marker was employed in the sample of each discipline (political science and religious studies) was computed and compared. Table 5 shows the results.

Table 5

Frequency and Percentage of Meta-Discourse Markers in Each Discipline

	Religious Studies		Political Science	
Interactional Meta-discourse Markers	frequency	percent	frequency	percent
Attitude Markers	79.00	7.66	104.00	7.03
Boosters	135.00	13.09	207.00	13.99
Hedges	433.00	42.00	461.00	31.15
Self-mentions	163.00	15.81	321.00	21.69
Engagement Markers	221.00	21.44	387.00	26.15
Overall	1031	100	1480.00	100.00

As it can be seen in Table 5, the frequency and percentage of all forms of interactional metadiscourse markers are relatively higher in research papers related to political science compared to religious studies. It means that the interactional MDMs were employed more often in political science compared to religious studies as indicated by the higher number of overall markers used (1480 in political science compared to 1031 in religious studies).

According to the table, the most frequently recurring category of the interactional meta-discourse marker in both religious studies and political science was "hedges", with a frequency of 433 and a percentage of 42.00% for the religious studies and a frequency of 461 and a percentage of 31.15% for the research papers in the field of political science. It appeared that the researchers in religious and political studies had a higher tendency to be cautious and avoid making strong claims or conclusions in their research paper than using other meta-discourse markers.

When comparing the frequency and type of interactional metadiscourse markers between the political science and religious studies, it was found that the least frequently recurring types of the interactional metadiscourse markers in both disciplines were "attitude markers" and "boosters" (104 and 207 in political science compared to 79 and 135 in religious studies respectively). In fact, both disciplines made almost similar use of "attitude markers" and "boosters". The comparatively low proportion of boosters suggested that the researchers in these two fields tended to express their ideas and conclusions in a less confident and assertive manner. In addition, the low proportion of "attitude markers" depicted that in both disciplines the writers were not highly willing to express their personal feelings or assessments towards what was presented.

Overall, regarding the use, frequency, and type of interactional metadiscourse markers in the discussion and conclusion segments of the articles in political science and religious studies, there were some similarities and differences between the two disciplines. Both disciplines used a range of interactional meta-discourse markers, including attitude markers, boosters, hedges, self-mentions, and engagement markers. However, there were some

differences with regard to the frequency of their uses. Hedges were the most frequently recurring category of interactional MDMs across the discussion and conclusion sections of both political science and religious studies articles. Figure 1 displays the distribution of the MDMs in the research papers across the two disciplines.

Figure 1

The Distribution of the Meta-Discourse Markers across the Two Disciplines

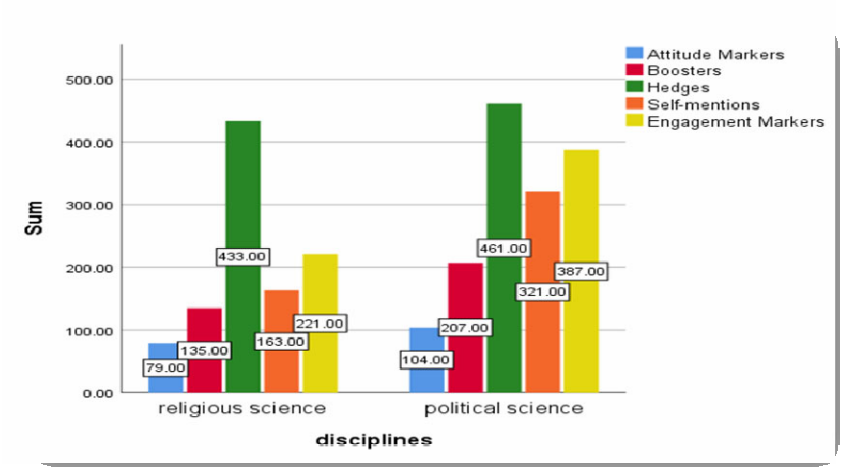

Figure 1 displays the total MDMs employed in two disciplines under the study: religious studies and political science. It suggests that there are a few differences in the use of meta-discourse markers between these two academic fields. It could be observed that in both disciplines, hedges were the most commonly used type of meta-discourse markers. Additionally, the instances when the author mentioned themselves in their writing were more frequent in research papers related to the political science than the religious studies.

For the purpose of studying the possible difference between the academic discipline and the type and frequency of MDMs used in research papers, the non-parametric Pearson correlation test followed by measures of association, namely Eta test was conducted. The findings are shown in Table 6.

Table 6

Pearson Chi-Square Tests

	Pearson Chi-Square Value	df	Asymptotic Significance (2-sided)
total meta-discourse markers	10.000	9	.350
Attitude Markers	10.000	5	.075
Boosters	10.000	9	.350
Hedges	6.000	7	.540
Self-mentions	10.000	9	.350
Engagement Markers	8.000	8	.433

Table 6 shows the results the Pearson Chi-square test achieved pertaining to the potential differences between the academic discipline and the frequency of metadiscourse devices used in research papers. The Pearson Chi-square value for the total meta-discourse markers was 10.00, with 9 degrees of freedom and an asymptotic significance level of .350 suggesting that no statistically significant difference was found between academic discipline and the total frequency of meta-discourse markers used in the research papers.

The results also indicated that the Pearson chi-square values for "attitude markers, boosters, and self-mentions" were also 10.000, but with varying degrees of freedom and asymptotic significance levels. Nevertheless, none of these categories showed statistically significant differences between the two areas.

For "hedges", the Pearson chi-square value was 6.000, with 7 degrees of freedom and an asymptotic significance level of .540, indicating that there was no significant difference in the employment of "hedges" between both disciplines.

Finally, for "engagement markers", the Pearson chi-square value was 8.000, with 8 degrees of freedom and an asymptotic significance level of .433, suggesting that there was no statistically significant difference between academic discipline and the frequency of "engagement markers" employed in the selected research papers.

Overall, the Pearson chi-square test results illustrated no statistically significant difference in the use of meta-discourse markers in the research papers used in the political and religious disciplines. Table 7 demonstrates the findings of the Eta test that building on the Pearson Chi-square results, shows the degree of the difference between the variables.

Table 7

Eta test

Values		
total meta-discourse markers	Eta	.584
Attitude Markers	Eta	.485
Boosters	Eta	.468
Hedges	Eta	.148
Self-mentions	Eta	.623
Engagement Markers	Eta	.632

Table 7 showed the results of the Eta test that provided insight into the size and direction of the difference between the academic disciplines and the frequency of meta-discourse markers used in research papers in two disciplines, political science and religious studies. Eta is a measure of association that ranges from 0 to 1, where higher values mean a stronger relationship (Berry & Armitage, 1995).

The total Eta value for all meta-discourse markers combined was 0.584, indicating a moderate difference between academic discipline and the frequency of MDMs used in the selected research papers.

When examining the specific categories of meta-discourse markers, “attitude markers” had an Eta value of 0.485, suggesting a moderate relationship between academic discipline and the frequency of these markers. “Boosters” had an Eta value of 0.468, also indicating a moderate relationship. “Engagement Markers” had the highest Eta value of 0.632. Moreover, “Self-mentions” had a relatively high Eta value of 0.623, suggesting a moderate relationship between the academic discipline and the frequency of self-referential language used. Finally, “hedges” had the lowest Eta value of 0.148,

indicating a weak relationship between academic discipline and the frequency of these markers. However, none of these relationships were statistically significant.

5. Discussion

This paper intended to examine the implementation of the interactional metadiscourse devices in researches in political science and religious studies published in top journals. The statistical analysis showed that the authors of the aforementioned articles had the tendency to implement these rhetorical markers to execute the interpersonal function in this insufficiently researched area. The findings revealed that "hedges" were the most frequently recurring class of interactional MDMs, while "attitude markers" were the least commonly used category. Based on the findings, the two most frequently employed interactional metadiscourse markers were "hedges" and "engagement markers" respectively, whereas "attitude markers" and "boosters" were the least often utilized categories of interactional MDMs.

This study is in line with Estaji & Vafaeimehr's (2015) study which probed the difference in the implementation and occurrence of MDMs in the two fields of mechanical and electrical engineering. The results suggested that the least commonly used category of metadiscourse markers were "attitude markers". Also, the findings demonstrated that there was no statistically significant difference in the employment of MDMs across the two aforementioned disciplines. Moreover, the results of this study corroborate the findings of Blagojevic's (2004) study which also illustrated no statistically significant difference in the utilization of MDs in the English native and non-native speakers' academic research papers. Furthermore, this study supports Hyland's (2000) findings that "hedges" are the most frequently employed category of metadiscourse markers in academic research papers. Contrastively, the findings of the present paper are not in accordance with those of Saidi and Karami (2021) who explored the frequency of interactional metadiscourse markers in applied linguistics reply articles and the findings of Khedri et al.'s (2012) study investigating interactional metadiscourse devices in the four

fields of English Language Teaching, Biology, Economics, and Civil Engineering. To illustrate, Saidi and Karami (2021) discovered that "self-mentions" were the highest ordinarily employed interactional metadiscourse markers while in Khedri et al.'s (2012) study, "boosters" were the most commonly used class.

6. Conclusion

Interactional metadiscourse markers as contended by Hyland (2005) play a vital role in birthing new knowledge as well as producing academically established claims. The current study examined the type, use, and frequency of interactional MDMs in the discussion and conclusion sections of research papers in the two areas of political science and religious studies. Further, to determine the type, use, and frequency of interactional MDMs, Hyland's (2005) model was utilized. Also, to analyze the data, one Eta and two Chi-square tests were implemented to investigate the differences between the two majors in respect of their use of MDMs in the discussion and conclusion sections in the corpus. The recommendations drawn from the conclusions of the current study can benefit ESP (English for Specific Purposes) and EFL teachers in various ways, including familiarizing them with various metadiscourse markers, and preparing them to write coherently in a way that helps establish true interaction with their audiences. Also, it is of the findings of the current research that helps English language teachers, students and also researchers from text analysis and writing conventions to benefit for the purpose of writing appropriately in various contexts.

The application of MDs in the discussion and conclusion sections of both political science and religious studies, highlighting the significance of interactional functions of language in academic discourse, demonstrating that metadiscourse markers play a pivotal role. The core finding of this paper was that "hedges" were the most recurring markers employed in both political sciences and religious studies papers which signify the writer's commitment is explicitly qualified. This could be done to convey deference, modesty, or respect for the viewpoints of peers or to demonstrate uncertainty and signal that the information is presented as a personal opinion rather than an acknowledged

fact. Further, hedges are typically found in groups, but in this case, they serve to enhance the author's propositions' uncertainty attributed to them. Therefore, hedges emphasize the fact that statements not only convey ideas but also convey the author's attitude toward them as well as the readers. On the other hand, attitude markers were the least frequently used metadiscourse devices in the discussion and conclusion parts of the aforementioned research papers.

This study's findings have some educational implications that could shed light on the immediate necessity to urge EFL teachers, university professors, and research publishers in the fields of TEFL and ESP to make an undertaking to supply EFL learners with suitable materials and settings to increase their familiarity with various metadiscourse markers, especially the category of interactional MDMs which can prepare them for writing coherently and establish genuine interaction with readers and audiences.

In order to better comprehend the nature of metadiscourse markers as an interactional resource, future research studies can investigate a number of aspects of MDMs. It is important to note that the corpus selected for this study consisted of 50 research articles selected from a small number of journals, making it possible to classify it as a small corpus. For more generalizable results, it is proposed that this article be replicated with a much larger corpus. In addition, researchers can determine the authors' extent of awareness of the patterns of writing in diverse genres by examining the implementation of all types of metadiscourse markers in distinct texts, other rhetorical parts, and contexts.

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Appendix A:

Instances of Metadiscourse Markers

Attitude Markers

admittedly, agree, agrees, agreed, amazed, amazing, amazingly, appropriate, appropriately, astonished, astonishing, astonishingly, correctly, curious, curiously, desirable, desirably, disappointed, disappointing, disappointingly, disagree, disagreed, disagrees, dramatic, dramatically, essential, essentially, even x, expected, expectedly, fortunate, fortunately, hopeful, hopefully, important, importantly.

Boosters

actually, always, believe, believed, believes, beyond doubt, certain, certainly, clear, clearly, conclusively, decidedly, definite, definitely, demonstrate, demonstrated, demonstrates, doubtless, establish, established, evident, evidently, find, finds, found, m fact, incontestable, incontestably, incontrovertible, incontrovertibly.

Hedges

about, almost, apparent, apparently, appear, appeared, appears, approximately, argue, argued, argues, around, assume, assumed, broadly, certain amount, certain extent, certain level, claim, claimed, claims, could, couldn't, doubt, doubtful, essentially, estimate, estimated, fairly, feel, feels, felt, frequently, from my perspective, from our perspective, from this perspective, generally, guess.

Self-mention

I, we, me, my, our, mine, us, the author, the author's, the writer, the writer's.

Engagement Markers

(the) reader's, add, allow, analyse, apply, arrange, assess, assume, by the way, calculate, choose, classify, compare, connect, consider, consult, contrast, define, demonstrate, determine, do not, develop, employ, ensure, estimate, evaluate, find, follow, go, have to, imagine, incidentally, increase, input, insert, integrate, key, let x=y, let us, let's, look at, mark, measure, mount, must, need to, note, notice, observe, one's, order, ought, our (inclusive), pay, picture, prepare, recall, recover, refer, regard, remember, remove, review, see, select, set, should, show, suppose, state, take (a look/ as example), think about, think of, turn, us (inclusive), use, we (inclusive), you, your.

Abstracts
in Persian

فصلنامه علمی زبان‌پژوهی

فصلنامهٔ علمی زبان‌پژوهی دانشگاه الزهرا(س)
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آسیب‌های زبانی وجه‌ویژه و تکلیف‌ویژه در گفتار و خواندن: مطالعه موردی یک بیمار زبان‌پریش فارسی‌زبان[۱]

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چکیده

یکی از مسائل نظری مطرح در مطالعات زبان‌پریشی بررسی این پرسش اساسی است که آیا الگوی‌های آسیب‌دیدگی میان وجوه گوناگون زبان مجزا، مرتبط یا دارای گسستی دوگانه هستند. مقالهٔ حاضر توصیفی از یک بیمار فارسی‌زبان (ای.جی) است که پس از سکتهٔ مغزی انسدادی دچار آسیب‌های زبانی وجه‌ویژه و تکلیف‌ویژه شده‌است. ارزیابی کلی آسیب‌های زبانی ای.جی با استفاده از نسخهٔ بالینی آزمون تشخیصی زبان‌پریشی فارسی، شاخص شدت زبان‌پریشی ۸۶ را نشان داد. افزون بر این، بررسی عملکرد او در آزمایه‌های خواندن آزمون تشخیصی زبان‌پریشی فارسی۳ نشان‌دهندهٔ شاخص بهرهٔ زبانی ۶۰ بود. همچنین، توانایی خواندن واژه، خواندن جمله و تکرار جمله را در آزمایه‌های نسخهٔ فارسی آزمون زبان‌پریشی برای دوزبانه‌ها مورد ارزیابی قرار دادیم. با ارزیابی عملکرد بیمار از طریق این ابزارها در زمان پس از شروع عارضه (دورهٔ مزمن) مشخص شد که او دچار زبان‌پریشی حرکتی فراقشری است. دو مشخصهٔ بارز این بیمار مشتمل بودند بر (الف) وجود نوعی گسست وجه‌ویژه با آسیب چشمگیر درک خواندن با وجود توانایی درک شنیداری نسبتاً سالم؛ و (ب) وجود مجموعه‌ای از علائم دستورپریشی تکلیف‌ویژه در بیان کلامی و روخوانی بلند جمله‌ها با وجود توانایی نسبتاً سالم در تکرارکردن جمله‌ها. افزون بر این، بررسی مشخصه‌های کلی خطاهای دستوری در این بیمار نمایانگر وجود برخی از علائم دستورپریشی همگانی و زبان‌ویژه بود. داده‌های بالینی حاضر در تقابل با بخث‌های مطرح پیرامون وجود مناطق زبانی یکپارچه در مغز است.

واژه‌های کلیدی: زبان‌پریشی، گسست وجه‌ویژه، دستورپریشی تکلیف‌ویژه، زبان فارسی

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[*] نگارندگان بر خود لازم می‌دانند که از سکینه مقانی‌زاده، گفتاردرمانی که ای.جی را برای ارزیابی تشخیصی اختلالات زبانی خود معرفی کرد، قدردانی کنند. همچنین از دکتر عباس علی‌آقایی، متخصص مغز و اعصاب، به سبب بحث‌های ارزشمندشان در مورد اسکن مغز ای.جی بی‌نهایت سپاسگزاریم.

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بازنمایی متن مبتنی‌بر بافت با استفاده از موضوعات پنهان برای دسته‌بندی مقالات علمی[۱]

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چکیده

سالانه، پژوهشگران در حوزه‌های گوناگون علمی یافته‌های پژوهش‌های خود را به‌صورت گزارش‌های فنی یا مقاله‌هایی در مجموعه‌مقالات یا مجله‌ها چاپ می‌کنند. گردآوری این نوع داده توسط موتورهای جست‌وجو و کتابخانه‌های دیجیتال، برای جست‌وجو و دسترسی به نشریه‌های پژوهشی به کار گرفته می‌شود که معمولاً مقاله‌های مرتبط بر اساس کلیدواژه‌های پرسمان به‌جای موضوعات مقاله بازیابی می‌گردد. در نتیجه، دسته‌بندی دقیق مقاله‌های علمی می‌تواند کیفیت جست‌وجوی کاربران را هنگام جست‌وجوی یک سند علمی در پایگاه‌های اطلاعاتی افزایش دهد. هدف اصلی این مقاله، ارائه یک مدل دسته‌بندی برای تعیین موضوع مقاله‌های علمی است. به این منظور، مدلی را پیشنهاد کردیم که از دانش بافتی غنی‌شده مقاله‌های فارسی مبتنی‌بر معناشناسی توزیعی بهره می‌برد. بر این اساس، شناسایی حوزهٔ خاص هر سند و تعیین دامنهٔ آن توسط دانش غنی‌شدهٔ برجسته، دقت دسته‌بندی مقاله‌های علمی را افزایش می‌دهد. برای دست‌یابی به هدف، ما مدل‌های درونه‌یابی بافتی، اعم از ParsBERT یا XLM-RoBERTa را با موضوع‌های پنهان در مقاله‌ها را برای آموزش یک مدل پرسپترون چندلایه غنی می‌کنیم. بر اساس یافته‌های تجربی، عملکرد کلی ParsBERT-NMF-1HT ۷۲/۳۷ درصد (ماکرو) و ۷۵/۲۱ درصد (میکرو) بر اساس معیار-اف بود که تفاوت عملکرد این مدل در مقایسه با مدل پایه از نظر آماری معنادار (p<۰/۰۵) بود.

واژه‌های کلیدی: تحلیل محتوایی مقاله، بازنمایی بافتی، معناشناسی توزیعی، شبکهٔ عصبی، دسته‌بندی مقالهٔ علمی، مدل‌سازی موضوع

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بررسی مقایسه‌ای پارامترهای ریتم گفتار در تشخیص هویت گویندگان فارسی‌زبان: دیرش در برابر شدت[۱]

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تاریخ پذیرش: ۱۴۰۲/۰۹/۱۲

چکیده

پژوهش‌های پیشین نشان داده‌اند که پارامترهای ریتم گفتار می‌توانند گویندگان زبان‌های گوناگون با ساختارهای واج‌آرایی متفاوت را از هم تشخیص دهند. به‌طور خاص، در زبان فارسی تاکنون دو دسته از پارامترهای ریتم گفتار یعنی پارامترهای مبتنی بر دیرش و پارامترهای مبتنی بر شدت بررسی شده‌اند. با توجه به پژوهش‌های پیشین، برآنیم تا در پژوهش حاضر بررسی گسترده‌تری پیرامون قابلیت‌های فردویژهٔ این پارامترها انجام دهیم. به این منظور، با استفاده از مدل آماری رگرسیون لجستیک چنداسمی، پارامترهای مختلف ریتم گفتار را در پیکره‌ای متشکل از ۲۰ گویشور مرد فارسی‌زبان که هر کدام ۱۰۰ جملهٔ فارسی را با سرعت عادی بیان کرده بودند، بررسی کردیم. یافته‌ها نمایانگر آن بود که پارامترهای مبتنی بر دیرش نسبت به پارامترهای مبتنی بر شدت عملکرد نسبتاً بهتری داشته‌اند. این احتمال وجود دارد که دلیل برتری این پارامترها به‌سبب ساختار هجایی ساده زبان فارسی و نیز اتکای بیشتر آن به دیرش برای بازنمایی تکیهٔ واژگانی باشد. یافته‌های این پژوهش از این جهت اهمیت دارد که از یک سو به درک پارامترهای مناسب‌تر در تشخیص هویت گوینده‌های فارسی‌زبان کمک می‌کند و از سویی دیگر، بر این نکته نیز همزمان تأکید می‌کند که ویژگی‌های زبان‌ویژه در مطالعات تشخیص هویت گوینده بایستی مورد توجه قرار گرفته شوند.

واژه‌های کلیدی: آواشناسی قضائی، تشخیص هویت گوینده، پارامترهای ریتم گفتار، زبان فارسی

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بررسی تأثیر جنسیت، سن و تحصیلات بر نگرش زبانی کردزبانان شهر مهاباد با استفاده از آزمون تطبیق صدا[۱]

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چکیده

مقالهٔ حاضر به بررسی تأثیر متغیرهای جنسیت، سن و تحصیلات بر نگرش عاطفی کردزبانان شهر مهاباد نسبت به زبان فارسی معیار و زبان کردی می‌پردازد. از آن‌جا که احساسات افراد نسبت به زبان خودشان یا دیگران با نگرش زبانی آن‌ها در ارتباط است، این مؤلفهٔ مهم در تعیین موفقیت در برنامه‌ریزی زبان، سرعت یادگیری، انتخاب و به کاربردن زبان و پیش‌بینی منقرض‌شدن یا پایداربودن یک زبان اثرگذار است. جامعهٔ آماری این پژوهش ۸۰ نفر از دو زبانه‌های کردی-فارسی شهر مهاباد بود که به‌صورت تصادفی انتخاب شدند. پژوهش حاضر در چهارچوب نظری زبان‌شناسی اجتماعی-شناختی قرار دارد و نگرش‌سنجی پژوهش به روش غیرمستقیم (آزمون تطبیق صدا) انجام شد. پس از توزیع پرسشنامه و انجام آزمون تطبیق صدا، داده‌های گردآوری‌شده مورد تحلیل قرار گرفتند. یافته‌های تحلیل آماری نشان داد که متغیرهای جنسیت، سن و تحصیلات در شهر مهاباد تأثیری بر نگرش عاطفی کردزبانان دوزبانه نسبت به زبان فارسی معیار و زبان کردی نداشت و کردزبانان مهاباد نسبت به زبان فارسی معیار و زبان کردی نگرش مثبتی داشتند و تفاوت معناداری میان دو زبان مورد بررسی دیده نشد.

واژه‌های کلیدی: زبان‌شناسی اجتماعی، نگرش زبانی، دوزبانگی، آزمون تطابق گوینده

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صفحات ۱۱۸-۹۷

تحلیل معنایی ساخت‌های متشکل از«با» در زبان فارسی[۱]

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تاریخ پذیرش: ۱۴۰۲/۰۷/۰۳

چکیده

این مقاله ساخت‌های همراهی در زبان فارسی را مورد بررسی قرار می‌دهد. ساخت‌های همراهی مشتمل بر سه شرکت‌کنندهٔ معنائی موقعیت همراهی، همراهی‌کننده و همراهی‌شونده هستند. از جنبهٔ نحوی نیز در شکل‌گیری این ساخت‌ها دو گروه اسمی نقش دارند. دستوریان بر طبق سنت، ساخت‌های همراهی متشکل از «با» را در دستهٔ گروه حرف‌اضافه‌ای قرار می‌دادند و «با» را حرف اضافه در نظر می‌گرفتند. یکی از هدف‌های اصلی پژوهش حاضر، پاسخ به این پرسش است آیا «با» در جمله‌های فارسی حرف اضافه یا رابط است و یا هر دو نقش را دارد؟ بنابراین، بررسی جایگاه و نقش این تکواژ دستوری در این نوع ساخت‌های فارسی هدف اصلی پژوهش حاضر است. هدف دیگری که در این بررسی مورد توجه است، چالش میان ساخت‌های عطفی و ساخت‌های همراهی است. مفروض این است که تکواژ دستوری «با» در ساخت‌های همراهی در زبان فارسی در دو جایگاه و نقش دستوری متفاوت مطرح است. با استناد بر چنین فرضی، ساخت‌های همراهی به دو گروه اصلی دسته‌بندی می‌شوند: گروه اول، ساخت‌های همراهی متقارن/دوسویه هستند. در این گروه سازه [با + گروه اسمی۲] یک سازه اختیاری نیست؛ به بیان دیگر یک سازه افزوده نیست. «با» در این گروه نقش یک رابط یا پیونددهنده را بر عهده دارد. این گروه از جمله‌ها با توجه به نوع فعل به گونه‌هایی دسته‌بندی می‌شوند که عبارتند از ساخت‌های همراهی متقارن با افعال جمعی، ترکیبی، محمول‌های رابطه‌ای و قیاس همسان. گروه دوم گروه ناهمسان هستند که سازه [با+ گروه اسمی۲] یک افزوده است و حرف اضافه انگاشته می‌شود. این گروه همراهی نامتقارن/یک‌سویه نامیده می‌شوند که خود به گونه‌هایی دسته‌بندی می‌شوند و عبارتند از افعال غیر جمعی، عضو بدن، وسیله حمل و نقل و نوع ابزاری. زیرطبقهٔ ابزاری، از دو نوع عامل واسطه‌گری و تسهیل‌کنندهٔ کنش تشکیل می‌شود. دستاورد پژوهش حاضر را می‌توان در آموزش دستور زبان فارسی و تحلیل‌های نحوی به کار گرفت.

واژه‌های کلیدی: ساخت همراهی، همراهی متقارن، همراهی نامتقارن، همپایگی عطفی، زبان فارسی

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خلق گروه واژگانی در چارچوب دستور ساختاری و کاربست آن در فرهنگ‌های فارسی[۱]

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تاریخ دریافت: ۱۴۰۲/۰۴/۱۷
تاریخ پذیرش: ۱۴۰۲/۰۶/۱۷

چکیده

اصطلاحات و همایندها بخشی از گروه‌های واژگانی هستند که در فرهنگ‌نگاری از اهمیت بالایی برخوردارند. یکی از معیارهای تمایز بین این دو گروه از یک‌دیگر، عدم انعطاف‌پذیری عناصر سازندهٔ آن‌ها است. اصطلاحات، برخلاف همایندها، در آرایش واژگانی انعطاف‌پذیر نیستند و همیشه در قالبی مشخص و ثابت به کار می‌روند. هدف پژوهش حاضر این بود که نخست نشان دهد آیا همهٔ اصطلاحات فارسی در برابر تغییرات نحوی انعطاف‌ناپذیر هستند یا برخی از آن‌ها انعطاف‌پذیرند؛ دوم اینکه نشان دهد چگونه در نتیجهٔ تبدیل اصطلاح به همایند، گروه واژگانی جدیدی به وجود می‌آید. به منظور نشان دادن این مسئله، تعریفی جدید و کاربردی از اصطلاحات و همایندها، بر اساس ملاک‌های نحوی، و نه فقط معنایی ارائه شد. بر مبنای دستور ساختاری، اصطلاحات بر اساس چهار آزمون نحوی «مجهول‌سازی»، «اسنادی‌سازی»، «فک اضافه» و «پرسشی‌سازی» بررسی شدند. دویست اصطلاح از دو منبع جامع و به‌روز یعنی *فرهنگ فارسی عامیانه* (نجفی، ۱۳۸۷) و فرهنگ دوجلدی *کنایات سخن* (انوری، ۱۳۹۸)، گردآوری شدند. برخی اصطلاحات در برابر تغییرات نحوی انعطاف‌پذیر بودند و در نتیجه رفتاری شبیه به همایندها داشتند. انعطاف‌پذیری اصطلاحات منجر به ارائهٔ تعریفی جدید از این نوع عبارت‌ها بر اساس ملاک‌های نحوی شد. بنابراین، این گونه عبارت‌ها نوعی همایند به شمار آمدند، نه اصطلاح. نتیجه نشان داد که تبدیل اصطلاح به همایند، همواره موجب خلقِ گروه واژگانی با معنای جدید، یا معنای جدیدی از یک واژه به حوزهٔ واژگان یک زبان می‌شود. در پایان، طرحی برای بازنمائی چنین اصطلاحاتی به شیوه‌ای کاربردی در فرهنگ‌های لغت فارسی مطرح شد.

واژه‌های کلیدی: اصطلاح، همایند، دستور ساختاری، گروه واژگانی، فرهنگ‌نگاری فارسی

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رابطه بین تسلط اجتماعی مخاطب و کاربرد راهبردهای درخواست توسط دانش‌آموزان نوجوان ایرانی[۱]

عباسعلی آهنگر*[۲]، صدیقه زینعلی دستوئی[۳]، سمیه محدث[۴]

تاریخ دریافت: ۱۴۰۲/۰۴/۲۵
تاریخ پذیرش: ۱۴۰۲/۰۷/۱۹

چکیده

پژوهشگران بسیاری به بررسی کنش گفتاری درخواست در فرهنگ‌ها و جوامع گوناگون پرداخته‌اند. همسو با هدف‌های این پژوهش‌ها، مقالهٔ حاضر در پی استخراج و مقوله‌بندی راهبردهای (کنش گفتاری) درخواست به‌کاربرده‌شده به‌وسیلهٔ دانش‌آموزان نوجوان ایرانی بر اساس الگوی درک کنش گفتاری بین‌فرهنگی مطرح‌شده توسط بلوم-کولکا، هاوس و کاسپر (۱۹۸۹) با در نظر گرفتن رابطهٔ بین تسلط اجتماعی (قدرت) مخاطب بر نوع و تعداد راهبردهای درخواست است. داده‌ها از طریق پرسشنامه تکمیل گفتمان و ایفای نقش گردآوری شد که به‌وسیلهٔ ۱۰۰ دانش‌آموز نوجوان دبیرستانی بیرجندی (۵۰ دختر و ۵۰ پسر) تکمیل و اجرا شد. یافته‌های آزمون خی‌دو و همچنین دو روش گردآوری داده‌ها نشان داد که تفاوت معناداری بین تسلط اجتماعی مخاطب و نوع و تعداد راهبردهای درخواست به‌کاربرده‌شده به‌وسیلهٔ این نوجوانان وجود دارد. افزون بر این، «آگاه‌کننده‌ها»، «آماده‌سازها» و «زمینه‌سازها» بیشترین راهبردهای به‌کاررفته در داده‌های پژوهش، چه در پرسشنامه تکمیل گفتمان و چه در ایفای نقش بودند. همچنین، تسلط اجتماعی پائین‌تر گویشوران نسبت به مخاطب منجر به کاربرد راهبردهای پیچیده شد. بنابراین به‌نظر می‌رسد که نظام فرهنگ ایرانی با درنظر گرفتن ادب زبانی شکل سلسله‌مراتبی داشته باشد. همچنین، از جنبهٔ کاربرد راهبردهای درخواست توسط نوجوانان بیرجندی تفاوتی بین دو پیکره، یعنی داده‌های گردآوری شده از طریق پرسشنامه تکمیل گفتمان و ایفای نقش وجود نداشت.

واژه‌های کلیدی: درخواست، تسلط اجتماعی، نوع راهبردهای درخواست، تعداد راهبردهای درخواست، دانش‌آموزان نوجوان ایرانی

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نوع مقاله: پژوهشی
صفحات ۲۰۴-۱۸۷

رابطه درک فعل و تولید فعل در بین فارسی‌آموزان غیر بومی بر اساس رویکرد نقش‌گرای نظام‌مند[۱]

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تاریخ ارسال: ۱۴۰۲/۰۴/۱۲
تاریخ پذیرش: ۱۴۰۲/۰۹/۱۱

چکیده

این پژوهش به بررسی روابط بین درک و تولید فعل‌ها در نوشتار زبان فارسی به‌عنوان زبان دوم بر پایهٔ فرایندهای فرانقش اندیشگانی در دستور نقش‌گرای نظامند هلیدی پرداخته‌است. جامعهٔ آماری پژوهش فارسی‌آموزان مرکز آموزش زبان فارسی به غیر فارسی زبانان دانشگاه فردوسی مشهد است. گردآوری داده‌ها به‌صورت میدانی و با روش نمونه‌گیری تصادفی انجام شده‌است که به دو شیوهٔ آزمون، مصاحبه و انشا بوده‌است و خود به دو بخش درک و تولید فعل دسته‌بندی شده‌اند. داده‌های مربوط به درک فعل از طریق آزمون‌ها و داده‌های مربوط به تولید فعل از طریق انشاها گردآوری شده‌است. در نهایت، پس از ارزیابی داده‌ها به‌وسیلهٔ نرم افزار اس.پی.اس.اس، این یافته به دست آمد که بین درک و تولید فرایند ذهنی در سطح مقدماتی و بین درک و تولید فرایند ذهنی در سطح متوسط، همبستگی مثبت وجود دارد. همچنین، بین درک و تولید فرایند رفتاری در سطح متوسط و درک و تولید فرایند مادی در سطح پیشرفته همبستگی منفی وجود داشت. این خود نشان‌دهندهٔ تأثیر سه عامل در ایجاد رابطهٔ همبستگی مثبت و منفی بین فرایندها در فارسی‌آموزان خارجی بود: ۱. میزان عینی و ذهنی‌بودن فرایندها ۲. پرکاربردبودن فرایندها ۳. سطح زبان‌آموزان.

واژه‌های کلیدی: فعل، درک، تولید، فرایند، دستور نقش‌گرا، فارسی‌آموزان خارجی

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نوع مقاله: پژوهشی
صفحات ۲۲۰-۲۰۵

رویکرد صرف ساخت‌بنیاد به تحلیل صفت‌های مرکب ساخته‌شده از «ساز» در فارسی[۱]

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تاریخ دریافت: ۱۴۰۲/۰۳/۱۵
تاریخ پذیرش:۱۴۰۲/۰۹/۱۱

چکیده

در پژوهش حاضر کوشش شد تا طرحواره‌های ساخت‌بنیاد مربوط به واژه‌های مرکب ساخته‌شده توسط ستاک حال فعل «ساز» در فارسی را در چارچوب نظریه صرف ساخت‌بنیاد مشخص کنیم (بوی، ۲۰۱۰). به این منظور، تعداد ۱۵۰ واژه مرکب از منبع‌های گوناگون از جمله پیکره فارسی بیجن‌خان، رمان‌های فارسی و برخی از وبگاه‌های فارسی گردآوری شد. پس از گردآوری داده‌ها، آن‌ها را بر اساس عناصر پیش‌کلامی جدول‌بندی و از یک‌دیگر متمایز کردیم. پس از آن، مقایسه‌ای انجام شد و در نتیجه نشان داده شد که می‌توان یک طرحواره کلی ساخت‌بنیاد داشت که ۵ زیرطرحواره را در درون خود دارد. بی‌گمان، طرحواره گسترده بیانگر ساختی است که توسط آن یک اسم (عنصر ما قبل فعل) با عنصر فعلی (ستاکِ حالِ فعلِ «ساز») ترکیب می شود و صفتی می‌سازد که دلالت بر فاعل یک فعل دارد، یعنی عامل ساختن یک شی. با این وجود، در میان همهٔ داده‌ها دو استثنا وجود داشت: یکی واژه مرکبی که با وجود شباهت به ترکیبات دیگر از نظر ساخت، نقش معنایی کنش‌پذیر را نشان می‌دهد: «دست‌ساز»، اشاره به شیئی که با دست ساخته می شود و همچنین ترکیب «جاساز». (شیء جاسازی‌شده)، در حالی که در دیگر ترکیبات، ستاک به‌معنای عاملی است که ایجاد می کند یا می‌سازد. در نتیجه، همان‌گونه که انتظار می‌رود، دو طرحواره ساخت‌بنیاد گسترده به دست آمده‌است: یکی مربوط به کنشگر و دیگری مربوط به کنش‌ور.

واژه‌های کلیدی: واژهٔ مرکب، صرف ساخت‌بنیاد، ستاک، طرحواره، جنبه معنایی.

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نوع مقاله: پژوهشی
صفحات ۲۴۲-۲۲۱

نشانگرهای فراگفتمان تعاملی در بخش‌های بحث و نتیجه‌گیری در حوزه‌های علوم سیاسی و مطالعات دینی[۱]

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چکیده

فراگفتمان یکی از اجزای ضروری در نوشتار آکادمیک است، به این سبب که به نویسندگان کمک می‌کند تا ایده‌های خود را بهتر انتقال دهند و خوانندگان خود را درگیر نمایند. از طریق تحلیل فراگفتمان متن است که می‌توان نوشتار آکادمیک را بررسی کرد و ویژگی‌های بلاغی و ترجیحات جوامع گفتمانی گوناگون را با هم مقایسه کرد (هایلند، ۲۰۰۵). به این منظور، این پژوهش به بررسی تفاوت‌ها در استفاده، نوع و فراوانی نشانگرهای فراگفتمان تعاملی در بخش‌های بحث و نتیجه‌گیری مقاله‌های علوم سیاسی و مطالعات دینی نوشته‌شده به زبان انگلیسی پرداخته‌است. پیکرهٔ این پژوهش شامل ۴۵۰۳۲ واژهٔ استخراج‌شده از پنجاه مقاله پژوهشی، بیست و پنج مقاله انگلیسی در حوزه علوم سیاسی و بیست و پنج مقاله انگلیسی در حوزه مطالعات دینی است که بین سال‌های ۲۰۱۹ تا ۲۰۲۳ در مجله‌های ممتاز و معتبر بین‌المللی چاپ شده‌اند. برای تجزیه و تحلیل داده‌ها، یک آزمون اتا و دو آزمون کای‌دو اجرا شد. با در نظر گرفتن منابع تعاملی مدل فراگفتمان هایلند (۲۰۰۵)، نگارندگان دریافتند با وجود برخی تفاوت‌های ظریف در کاربرد، فراوانی و انواع این نشانگرهای فراگفتمانی، «تردیدنماها» بیشترین و نشانگرهای نگرش کمترین استفاده از نشانگرهای فراگفتمانی را در هر دو رشته علوم سیاسی و علوم دینی داشتند. یافته‌های این پژوهش می‌تواند به ارائه منابع کافی و ایجاد موقعیت‌های مناسب به دانشجویان زبان انگلیسی برای افزایش آشنایی آن‌ها با نشانگرهای فراگفتمانی مختلف به‌ویژه در حوزه نشانه‌های فراگفتمانی تعاملی کمک نماید تا آن‌ها بتوانند منسجم بنویسند و تعاملی واقعی با مخاطبان داشته باشند.

واژه‌های کلیدی: نشانگرهای فراگفتمانی، مشخصه‌های تعاملی، نوشتار آکادمیک، مطالعات دینی، علوم سیاسی

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فهرست مطالب

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