Semantic frames of *tašxis* ("identification") in Persian A corpus-based study

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One of the lexical conceptual relations in language is the polysemy relation by which Finch (2000) and Saeed (2009) mean that a word or lexeme has more than one meaning. In polysemy, out of the polysemous word, multiple meanings are interpreted which are closely related to each other. According to what Richards and Schmidt (1985) define, the semantic units composed of a sequence of events or affairs which are relevant to specific situations evoke their own semantic frames. In fact, a frame is a representation of the context including the sentence in which linguistic items are presented (Matthews, 1997). The concept of Frame was primarily proposed by Fillmore (1977; 1982; 1985) in 1970s. The present research has been done in two phases with the goal of comparing the semantic frames of the word tašxis (Identification) by determining the relationship among them in a way that first the sentences containing it were looked up in the Persian Corpus of Bijankhan. Then, the sentences including tašxis (Identification) were separated from the sentences comprising different inflectional forms of the verb tašxis dādan (to identify). Afterwards, each sentence was converted into its equivalent noun/adjective phrase. In the second phase, the English equivalents of Identification in each phrase were obtained from three different Persian to English dictionaries to be able to extract the semantic frames for them. After extracting the frames, each English counterpart called Lexical Unit in the FrameNet alongside its semantic frame was compared to other frames and ultimately the following conclusions were drawn: the contexts where *Identification* is used are classified into 5 categories as linguistics, medical science, law, security checking and politics. Regarding the same usage of some words in two categories, four semantic frames are evoked out of five contexts all of which share the concept of the capability of making distinction and that of making decision.

Keywords: identification, semantic frame, frame semantic, polysemy, lexical relations

1. Introduction

One of the lexical conceptual relations in language is the polysemy relation which, according to Finch (2000) and Saeed (2009), means a word or lexeme has more than one meaning; however, the relation is

distinguished from the homonymy relation where two words are by accident of the same spoken or written forms. In fact, the main distinction between the two conceptual relations is relevant to the fact that the coexistence of many possible meanings for a word or phrase is called polysemy, whereas the existence of two or more words which have the same forms but different meanings and origins is called homonymy. In polysemy, multiple readings from a word are interpreted which are closely related to each other. As an example, it is possible to excerpt different meanings like obvious, clear, and unadorned from a word like Plain. By contrast, the word plane is considered as a homonymous word having such interpretations as carpenter's tool and airplane (Crystal 2003).

One of the frequently used types of polysemy in Persian is the word *rošan* "light" (Safavi 2006) which makes such phrases as $r\bar{u}z$ -e rošan "a sunny day," $\check{c}e\check{s}m$ -e rošan "a blue-eyed," $\bar{a}bi$ -e rošan "light blue" when it is preceded by the words $r\bar{u}z$ "day," $\check{c}e\check{s}m$ "eye" and $\bar{a}bi$ "blue," respectively. Indeed, when the adjective is preceded by any words, it denotes the transparency of that word. As an example, if it is said kif-e rošan "light bag," it is meant the bag whose color is light, whether light blue, light green, light red or any other light color, there is no difference. Therefore, it should be said that among the meanings of the word rošan there is a kind of semantic association, namely clarity or transparency, which makes the word rošan to be considered polysemous. However, each of the phrases mentioned earlier are used in a particular context. To put it another way, as defined by Richards and Schmidt (1985), semantic units which comprise the sequence of events as well as that of the affairs relevant to specific contexts evoke their own frame. Indeed, frame is the representation of the context including the sentence in which linguistic items are represented (Matthews 1997).

The concept of frame was primarily introduced by Fillmore in 1970s in his theory of Frame Semantics. It is derived from the theory of Case Grammar (Fillmore 1986) the developed form of which is known as the Frame Semantics Theory (Fillmore 1977; 1982; 1985). Fillmore and Atkins (1994) have emphasized the significance of the Frame Semantics Theory, regarding it as a theory relevant to lexicography. Based on this theory, the meaning of words would be interpretable by the help of using the semantic frame of those words which is composed of events, participants, and the relations among the constituents of the events. In other words, the representation of the semantic frames of Lexical Units has been inserted in the FrameNet (http://framenet.icsi.berkeley.edu/fndrupal).

In the FrameNet, Lexical Units are dealt with rather than words. A Lexical Unit is the association between a word and its concept. FrameNet is a developing project which is considered as a database for English vocabularies involving some instances of words in their actual usage. From the students' point of view, the project is a dictionary including 13000 conceptual words most of which imply the semantic as well as pragmatic aspect of the words by virtue of annotated examples. For a researcher in

Natural Language Processing (NLP), there are more than 200,000 annotated sentences which are in connection with 1200 semantic frames (The FrameNet Database).

In FrameNet, the citation form (Booij, 2005) of each syntactic category has been inserted as a Lexical Unit. In front of each Lexical Unit, the semantic frame(s) of the unit exists which involves the definition of that frame alongside the Core Frame Elements, Non-Core Frame Elements, Frame-frame relations, and the FE Core set(s) which comprise the semantic frame of that unit altogether. Tables 1. and 2. depict the semantic frames of two closely related syntactic categories:

Lexical Unit	Semantic	Core	Frame	Non-Core
Lexical Offic	Frame	Elements		Frame Elements
				Depictive;
		Differn	tiating_fact;	Circumstances;
		Dimens	ion;	Degree;
Distinction	Similarity	Entities	;	Explanation;
		Entity-	1	Manner;
		Entity-2	2	Place;
				Time

Table 1. Semantic frame of Distinction

Lexical Unit	Semantic Frame	Core Frame Elements	Non-Core Frame Elements
			Depictive;
		Differntiating_fact;	Circumstances;
	Distinct Similarity	Dimension;	Degree;
Distinct		Entities;	Explanation;
		Entity-1	Manner;
		Entity-2	Place;
			Time

Table 2. Semantic frame of Distinct

According to Table 1., the semantic frame for the Lexical Unit Distinction is "similarity" which has five Core frame Elements and eight Non-Core Frame Elements. In Table 2., the semantic frames of the Lexical Unit Distinct have been illustrated. As the two tables show, the two syntactic categories share identical semantic frames.

It should also be mentioned that there are two other semantic frames for the Lexical Unit Distinct which are "identicality" and "distinctiveness," as Table 2. reveals. However, as the only semantic frame for the Lexical Unit "distinction" is "similarity" which the two syntactic categories have in common, we ignore providing further explanations about them. In what follows, the most outstanding pieces of research carried out within the framework of Frame Semantics Theory will be pointed out and then, the main goal of the current study will be referred to.

Up to now, a great body of research has been done with respect to the theory of Frame Semantics in Persian, the most recent of which are Gandomkar (2014), Nayebloui *et al.* (2015), Mousavi *et al.* (2015), Hesabi (2016), Haji Ghasemi and Shameli (2016), Delaramifar (2017), Ajdadi and Razavi (2018), Mousavi and Amouzadeh (2019), Amraei *et al.* (2019), Mousavi and Zabihi (2019), Dehghan and Karami (2019), Dehghan and Vahabian (2020), Imani and Motavallian (2020a), Imani and Motavallian (2020b) and Imani and Motavallian (2020c).

In the aforementioned works, the semantic frames of some verbs and nouns have been discussed. As far as the present authors know, none of these works and no other work have focused on the study of the semantic frames of *tašxis* "identification."

Our research question can be stated as follows: Is there any relationship among the semantic frames of the word *tašxis*?

The article contains four sections. In the next section, a detailed description of the method of collecting data, making comparison and analysis will be presented. The third section argues for the way the semantic frames of the word in question are interrelated. The concluding remarks will be expressed in the fourth section.

2. Method

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The research data have been collected in two phases and then, they were analyzed in a descriptive way. In the first phase of data collection, the word *tašxis* "identification" was searched through the Persian Corpus of Bijankhan, as a result of which a number of 12298 sentences including the word *tašxis* and the infinitive form *tašxis dādan*¹ "to identify" appeared. From among them, the sentences including

 $^{^{1}}$ In Persian, the citation form for the verbs as lexical entries in dictionaries is their infinitive forms which are typically made by such light verbs as $d\bar{a}dan$ "to give," kardan "to do," $d\bar{a}$ štan "to have," and a few other verbs which have been grammaticalized. In such cases, these verbs mean 'to do the noun' followed by them.

tašxis (identification) were separated from those including the various inflectional forms of the verb tašxis dādan. Thereafter, for the sake of simplicity and saving space, sentences containing the word tašxis were converted into their noun/adjective phrase counterparts. Afterwards, the repeated phrases were removed and at last, out of the 400 phrases under investigation, 30 phrases were selected and included in this paper. In the second phase, the English equivalents of the word tašxis were obtained via three distinct Persian to English dictionaries (Aryanpur 2007; Aryanpur and Aryanpur 2008; Haim 2010) so that the extraction of their semantic frames from FrameNet would be feasible. Then, the extracted semantic frames along with what they have inside were separately tabulated and finally comparisons among the frames were made.

3. Discussion

As mentioned earlier, the FrameNet is structured in a way that its Lexical Units are of various syntactic categories and their citation form (Booij 2005) has been specified in the database. Moreover, for each Lexical Unit, there is at least one semantic frame and five semantic frames at most. This depends on the syntactic category of the Lexical Units as well as the idioms constructed out of them as well. For the word <code>tašxis</code>, ten English equivalents were obtained from three different Persian to English dictionaries and then, the English counterparts were looked up through the FrameNet to seek for their semantic frame(s). Some equivalents have only one semantic frame, whereas some others evoke more than one semantic frame and for some others no semantic frame was proposed, since it refers to the fact that the English version does not exist as a Lexical Unit at all. To put it another way, from the FrameNet that equivalent is absent.

At this point, before making comparisons among the semantic frames, the syntactic phrases involving the word *tašxis* will be checked out and then, the semantic frames will be compared and argued via tables.

In what follows, phrases 1. through 30. will represent the contexts where tašxis is used:

- 1. اداره محترم تشخیص هویت edāre mohtaram-e tašxis-e hoviyat
 - 2. باتشخیص پزشک bā tašxis-e pezešk
 - 3. بنا به تشخیص خود banā be tašxis-e xod
 - 4. نشخیص رمز tašxis-e ramz
 - tašxis-e kalamāt كلمات 5.
 - 6. تشخیص مصلحت نظام tašxis-e maslahat-e nezām

- 7. مرکز تشخیص و پیگیری markaz-e tašxis va peygiri
 - 8. تشخیص خوب از بد tašxis-e xub az bad
 - 9. تشخیص صحیح از سقیم tašxis-e sahih az saqim
- 10. مانع تشخیص و آگاهی از جزئیات māne' tašxis va āgāhi az joz'iyāt
- sistem-e tasdiq va tašxis-e hoviyat سيستم تصديق و تشخيص هويت
- 12. قدرت تشخيص و انتخاب كانديدا godrat-e tašxis va entexāb-e kāndidā
 - tašxis-e masir-e penālti مسير پنالتي 13
- 14. مسئولیت تشخیص مشاغل سخت و زیان آور mas'uliyat-e tašxis-e mašāqel-e saxt va ziyān āvar
 - be tašxis-e pezesk va tosiye morabiyān ربيان و توصيه مربيان 15. به تشخيص پزشک و توصيه مربيان
 - be tašxis-e dādgah va qāzi و قاضى دادگاه و قاضى. 16
- 17. دستگاه اسکنر دستی بر ای تشخیص سرطان dastgāh-e eskaner-e dasti barāye tašxis-e saratān
- morājje'e be afrād-e xebre barāye tašxis-e marja'e مراجعه به افراد خبره برای تشخیص مرجع تقلید. 18 taqlid
 - 19. فضاى آز مايشگاهي تشخيص اعتياد fazāye āzmāyešgāhi-e tašxis-e e'tiyād
 - 20. تشخيص سريع نقاط قوت و ضعف tašxis-e sari'e nogāt-e za'f va govat
 - 21. تشخيص به موقع و درست ناملايمات tašxis-e be moge va dorost-e nāmolayemāt
- behtarin vasile barāye tašxis-e tanāsob- بهترین وسیله بر ای تشخیص تناسب داستان کوتاه با سن مخاطب e dāstān-e kūtah bā sen-e moxātab
 - 23. تشخیص راه صحیح و شیوه درست tašxis-e rāh-e sahih va šive dorost
 - 24. تشخیص و در مان مسمومیت tašxis va darmān-e masmūmiyat
 - 25. تشخيص و دقت شما tašxis va degat-e šomā
 - 26. آز مایشگاه تشخیص طبی azmayešgāh-e tašxis-e tebi
- e'zām-e tim-e qahremāni be tornoment bā عرام تيم قهرمانى به تورنمنت با تشخيص فدراسيون tašxis-e fedrāsiyon
 - 28. ضعیف بودن کودک در تشخیص دوری یا نزدیکی za'if būdan-e kūdak dar tasxis-e duri yā nazdiki
 - 29. تشخيص و تميز صداهاي كلامي و غير كلامي غير كلامي tašxis va tamiz-e sedāhāy-e kalāmi va qeyr kalāmi

30. تشخیص علت مرگ tašxis-e elat-e marg

- 1. The respectable identification office
- 2. By doctor's diagnosis
- 3. By one's own recognition
- 4. Code specification
- 5. Vocabulary recognition
- 6. Expediency Council
- 7. Identification and tracking center
- 8. To distinguish good from bad
- 9. To make a distinction between correct and incorrect
- 10. The prevention of detection and awareness of details
- 11. Authentication and Identification System
- 12. The power to identify and select candidate
- 13. Penalty track detection
- 14. The responsibility for identifying hard and harmful jobs
- 15. At the physician's discretion and on the coaches' advice
- 16. At the court and judge's discretion
- 17. Handheld scanner to diagnose cancer
- 18. To refer to experts to identify the imitation reference
- 19. Laboratory space for addiction diagnosis
- 20. Quick identification of strengths and weaknesses
- 21. Timely and correct diagnosis of accidents
- 22. The best tool for determining the appropriateness of a short story to the age of the audience
- 23. To identify the right way

- 24. The diagnosis and treatment of poisoning
- 25. Your diagnosis and accuracy
- 26. Medical diagnosis laboratory
- 27. To send the championship team to the tournament at the discretion of federation
- 28. The child's weakness in near or far diagnosis
- 29. To make a distinction between verbal and nonverbal sounds
- 30. The diagnosis of the cause of death

It is worth noting that although it seems that the word *tašxis* in the abovementioned data has been used in 30 different contexts, it must be said that some of them are almost semantically identical. To put it another way, the word appears to have been used in two or more diverse contexts; however, it is interpreted in the same way. For instance, examples 1., 11. and 16. can be referred to, all of which evoke the semantic frame of law. Moreover, in examples 2., 4., 5., 10., 15., 17., 19., 24., 26., 29. and 30., in spite of the fact that the word *tašxis* has been used in two various contexts—linguistics and medical sciences—its uses are semantically synonymous in a way that they are interpreted as and pointed to the capability of recognition and specification as well. Likewise, examples 3. and 25. on the one hand, and examples 6., 12., and 18. on the other, are considered to be synonymous, as a result of which they will evoke the same semantic frame.

Table 3. illustrates the semantic frames of the equivalents and Table 4. displays each frame together with its Core and Non-Core Frame Elements:

Lexical Unit	Semantic Frames	
Distinction	Similarity	
Discernment	Mental_property	
Identification	Document	
Assessment	Examination; Assessing	
Finding	Verdict; Documents	
Evaluation	Assessing	
Diagnosis		
Recognition		
Detection		
Discretion		

Table 3. Semantic frames of *tašxis*

Laviaal Unit	Cana anti a France ao	Cana Fugue a Flamanata	Non Como Franco Floro contr
Lexical Unit	Semantic Frames	Core Frame Elements	Non-Core Frame Elements
		Differentiating_fact;	Circumstances; Degree;
Distinction	Similarity	Dimension; Entities-1;	Depictive; Explanation
		Entities-2	Manner; Place; Time
Diagonat	Mantal manager	Behavior; Practice;	Degree; Domain; Judge
Discernment	Mental_property	Protagonist	Manner
		Bearer; Document;	
Identification	Document	Issuer; Obligation; Right;	Descriptor; Medium;
		Dimension; Entities-1; Entities-2 Behavior; Practice; Protagonist Bearer; Document;	Specification
		Examination; Examinee;),), ₂ 1
Assessment	Examination	Examiner; Knowledge;	Manner; Means; Place
		Qualification	Purpose; Time
			Beneficiary;
			Circumstances;
			Co-participant; Degree
		Assessor; Feature;	Depictive; Duration;
Finding	Assessing	Medium; Method;	Evidence; Explanation
		Phenomenon	Frequency; Manner;
			Means; Place; Purpose
			Result; Standard; Time
			Value
		c cl	Circumstances;
- 1		G	Explanation; Legal_basi
Evaluation	Verdict	Defendant; Finding;	Manner; Means; Place;
		Judge	Purpose; Time

Table 4. The Core and Non-Core Frame Elements of tašxis

According to Table 3., such English equivalents as Diagnosis, Recognition, Detection and Discretion lack semantic frames. In other words, these four words have not been included in the list of the FrameNet Lexical Units. By contrast, the word "distinction" has only one semantic frame: "similarity." Furthermore, for each of the Lexical Units, that is to say Assessment and Finding, two semantic frames have been defined. One of the frames evoked by Finding is shared by Identification—Document—

relevant to which the two Lexical Units, that is to say Identification and Finding exist. They have identical Core and Non-Core Frame Elements.

Another point to be stated is that from among the Core Frame Elements, merely the elements belonging to the Identification and Finding Frames have been totally repeated, whereas the repeated Non-Core Frame Elements can almost be found within all frames. Thus, with regard to the two latter facts, Tables 5. and 6. will be shown:

Core Frame Elements	Relevant Frames
Bearer	
Document	
Issuer	Finding
Obligation	Finding Identification
Right	identification
Status	
Phenomenon	

Table 5. The Core Frame Elements all frames have in common

Non-Core Frame Elements	Relevant Frames
Manner	Similarity
Medium	Mental_property
Place	Document
Time	Examination
Purpose	Assessing
Specification	Verdict
	Documents

Table 6. The Non-Core Frame Elements all frames have in common

As Table 5. shows, the Frame Elements all frames have in common are solely restricted to Finding and Identification Frames while the Non-Core Frame Elements of the same type are not only limited to the two aforementioned frames but are also relevant to every frame evoked by *tašxis*. It is worth noting that although there are no semantic frames for Diagnosis, Recognition, Detection as well as Discretion, for such verbs as Detect and Recognize the FrameNet has Lexical Units and semantic frames. The

semantic frames of Detect are Perception_experience² and Becoming_aware,³ and the only semantic frame of Recognize is Becoming_aware. As the latter frame is shared by the two verbs, the Core and Non-Core Elements belonging to it will be considerable:

Lexical Units	Semantic Frames	Core Frame Elements	Non-Core Frame Elements
			Circumstances; Degree;
			Evidence; Explanation;
Dahaah	December even	Cognizer;	Frequency; Ground; Manne
Detect	Becoming_aware	Instrument; Means;	Time; Particular_iteration;
Recognize	Becoming_aware	Phenomenon; Topic	Period_of_iterations;
			Purpose; State; Frequency

Table 7. Core and Non-Core Frame Elements of Becoming_aware

It must be stated that the two elements Means, and Phenomenon are prominent here, as the former is what the Non-Core Frame Elements in Table 6. have in common while the latter is what Assessment Frame has amongst its Core Frame Elements. In addition, the investigation of the phrases containing the word *tašxis* (phrases 1. through 30.) on the one hand and taking the semantic frames the word evokes into consideration on the other, would express that tašxis (identification) in Persian enjoys the four following English equivalents:

- 1. Recognition
- 2. Identification
- 3. Evaluation
- 4. Distinction

Indeed, the contexts in which *tašxis* is used are classified into the following five categories. However, given the fact that the two words Diagnosis and Identification can be substituted in the field of medicine, the four semantic frames are evoked out of the five distinct contexts as follows:

 2 According to the FrameNet, "This frame contains perception words whose Perceivers have perceptual experiences that they do not necessarily intend to."

³ According to the FrameNet, "Words in this frame have to do with a Cognizer adding some Phenomenon to their model of the world. They are similar to Coming-to-belive words, except the latter generally involve reasoning from Evidence."

- a. Vocabulary recognition
- b. Doctor's identification = diagnosis
- c. Judge's discretion
- d. Identification Center
- e. Imitation Reference/ Candidate/ Correct or incorrect identification

Regarding the abovementioned classifications as well as the English versions pertaining to each context, the semantic frames set for *tašxis* will be considerable:

Lexical Unit	Context of Use	English Equivalents	Semantic Frames
Becoming_aware	Linguistics	Recognition	Becoming_aware
Document	Medical science	Identification	Document
Assessing Similarity	Law Security checking	Evaluation	Assessing
Similarity	Politics	Distinction	Similarity

Table 8. Practical classification of tašxis (identification) and its semantic frames

4. Conclusion

The word *tašxis* that is frequently used in both spoken and written forms in Persian will be disparately interpreted in different contexts like any other words of polysemy. Contexts, which were considered as frames in this paper, make the word evoke different frames in diverse situations. As the word *tašxis* is a polysemous word, the semantic frames relevant to it were expected to be meticulously associated in a way that its several elucidations are closely related to each other. After extracting from the FrameNet, the semantic frames of the word in question were compared. Consequently, it became clear that different uses of *tašxis* are restricted to five contexts or frames which are linguistics, medicine, politics, security checking and law. Like the close relationship existing among the various interpretations of the word *tašxis*, there are also near associations among the semantic frames evoked by the word under study as well, which are the capability of making decision as well as distinction.

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