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Research Paper

Spatial Encoding in English and Persian: Typological Influences on Second Language Acquisition

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Abstract

Cross-linguistic influence is a documented cause of errors committed by second language learners. Since Talmy (2000) proposed two categories to classify languages of the world regarding their preferred lexicalization patterns of a *literal* motion event, known as verb-framed and satellite-framed languages, the effect of typological properties of the first language on second language acquisition specifically in the domain of motion expressions has been subject to extensive scrutiny. The present research examines whether the typological properties of Persian (L1) and English (L2) affect adult second language acquisition, particularly in the spatial domain comparing controls (English and Persian native speakers). To this end, three groups (every 25 members) of participants were asked to watch 12 short animated cartoons representing voluntary motion carried out in vertical and trajectory directions. The participants' descriptions were recorded and analyzed regarding information *density*, semantic *focus*, and semantic *locus* of utterances. The findings of the research revealed that in spite of different lexicalization patterns to encode manner in English and Persian, Persian learners of English across two levels of proficiency, do not face challenges to lexicalize motion components in English, but they produce utterances with low density which is the typical way of focusing on spatial components in their native language, suggesting that the challenge learners face encoding motion events was not a linguistic issue, but rather a cognitive one. Persian learners' use of English motion expressions regarding information density was more aligned with that of English motion expressions as they advanced to a higher proficiency level.

Keywords: *Language Transfer, Lexicalization, Linguistic Typology, Restructuring, Second language Acquisition, Spatial Language*

بررسی تاثیر ویژگی های گونه شناسی زبان فارسی به عنوان زبان اول بر یادگیری زبان انگلیسی به عنوان زبان دوم توسط بزرگسالان

دخالت بین زبانی یکی از دلایل ثابت شده اشتباهاتی است که زبان آموزان هنگام یادگیری زبان دوم مرتکب می شوند. از زمانی که تالمی (2000) برای دسته بندی زبان های دنیا بر اساس الگوی مورد ترجیح آنها برای واژگانی کردن وقایع حرکتی، دو مقوله فعل بنیاد و تابع بنیاد را ارائه داد، تاثیر ویژگی های گونه شناسی زبان اول بر روی یادگیری زبان دوم موضوع بسیاری از تحقیقات بوده است. تحقیق پیش رو به بررسی تاثیر ویژگی های گونه شناسی زبان فارسی به عنوان زبان اول بر یادگیری زبان انگلیسی به عنوان زبان دوم توسط بزرگسالان می پردازد. به همین منظور از سه گروه از شرکت کنندگان (که هر کدام متشکل از 25 نفر بودند) درخواست شد تا 12 انیمیشن کوتاهی را که شامل حرکات اختیاری انجام شده در دو جهت عمودی و مرزگزر بودند را مشاهده کنند. توصیف شرکت کنندگان از مشاهداتشان ضبط و با توجه به سه عنصر حرکتی تمرکز معنایی، جایگاه معنایی و چگالی مورد تحلیل قرار گرفتند. یافته های مربوط به تحقیق نشان دادند که علاوه بر اینکه فارسی زبانان و انگلیسی زبان ها از الگوهای واژگانی کردن متفاوتی برای رمزگذاری حالت حرکت استفاده می کنند، زبان آموزان ایرانی در سطح متفاوت از مهارت زبانی، با چالش جدی برای واژگانی کردن عناصر حرکت (حالت و میسر) در زبان انگلیسی روبرو نمی شوند. جملات شرکت کنندگان از چگالی پایینی برخوردار بود. آنها تنها به یکی از عناصر حرکت در جمله های خود اشاره می کردند. همان شیوه تمرکز بر روی عناصر حرکت توسط فارسی زبانان می باشد. این پدیده نشانگر آن است که چالشی که زبان آموزان در توصیف رویدادهای حرکتی با آن روبرو می شوند ناشی از یک مسئله شناختی است نه یک مسئله زبانی. هرچه سطح مهارت زبانی زبان آموزان ایرانی بالاتر می رفت چگالی عناصر حرکتی در جملاتی که برای توصیف وقایع حرکتی به کار می بردند با الگوی استفاده شده توسط انگلیسی زبان ها بیشتر مطابقت پیدا می کرد. **واژگان کلیدی:** انتقال زبانی، واژگانی کردن، گونه شناسی زبان، باز سازی کردن، یادگیری زبان دوم، زبان فضایی

Introduction

Spatial conception plays a crucial role in human life. It affects many aspects of cognition such as finding directions, and locations (Levinson, 2003). Although lexicalization of spatial concepts and motion events is a universal issue that is attended to in all languages, features of the same spatial information can be mapped to different linguistic units and be selectively represented. In other words, spatial language is a domain in which we can find a wide variety of linguistic expressions across different languages in the world (Talmy, 1985, 2000).

Typological differences between first and second languages challenge learners' acquisition of target-like lexical elements of a particular language and more specifically influence the way second language learners approach and classify specific aspects of motion events. It is speculated that this cross-linguistic influence may not be merely a linguistic one, while L1 conceptualization of motion can also have an impact on the L2 acquisition of motion expressions leading to conceptual transfer from L1 to L2. As noted by Robinson and Ellis (2008) the development of L2 competence in describing motion events is a function of "rethinking for speaking". Therefore there is a cross-linguistic influence that involves transferring concepts from L1 to L2 that are resulted from linguistic relativistic effects (Odlin, Pavlenko & Jarvis, 2008).

Typological differences between languages have been the center of linguistic theorizing over the past decades. Talmy (2000) proposed two categories to classify languages of the world in relation to their preferred lexicalization patterns of a *literal* motion event, which are recognized as verb-framed (V-language) and satellite-framed (S-language) languages. Based on this typology, verb-framed languages such as Spanish, French, Turkish, and Japanese, encode path in the main verb (e.g., descend, cross), whereas in satellite-framed languages such as English, German, Dutch, Russian, and Chinese, the path is expressed by a satellite-a verb particle or preposition (e.g., *go down*, *go across*). Talmy (2000, P. 26) clarified the encoding of path and manner of motion events through the following examples: In sentence (1), Manner of the verb 'roll' is incorporated into Motion, while in a sentence (2), Cause of the verb 'blow' is conflated with Motion. Both sentences use the preposition 'off' as the satellite to represent a path of the motion.

1. The pencil [s, figure] rolled [v, motion, manner] off [p, path] the table [o, ground].
2. The pencil[s, figure] blew [v, motion, cause] off [p, path] the table [o, ground].

Regarding Talmy's typology of languages (S-framed & V-framed) based on lexicalization of motion events, the same types of happenings are conceptualized differently in languages of the world (Talmy, 2000). This cross-linguistic variation in terms of spatial concepts might create a challenge for second language learners. In this regard, Slobin's 'new' or 'weak' version of linguistic relativity known as the "thinking- for- speaking" (TFS) hypothesis has been a fruitful attempt for the question of conceptual transfer in SLA. (Slobin, 1991, 1996, 2000). Slobin's TFS hypothesis proposes that "the contents of the mind take on a special form when they are being mobilized for the verbal expressions" (Slobin, 1987, P. 435). "While in the act of speaking, the contents of the mind are coerced into a format that fits the lexicalization patterns of the language. In brief, each native language has trained its speakers to pay different kinds of attention to events and expressions when talking about them" (Slobin, 1996, P.89). Further, he claims that in order to fully gain mastery in an L2, the learner must learn to think like a native speaker (Slobin, 1996). In light of Slobin's TFS framework and Talmy's typology, SLA researchers have gained more insights into the potential influence of the first language on cognition in second language acquisition. The differences in typology between languages are considered influential in second language acquisition. If the pattern of thinking for speaking is different in two languages (L1 and L2), learners of the second language are expected to learn the L2 pattern of thinking for speaking to gain proficiency in L2 speaking (Stam, 2006). That is, second language learners need to acquire native-like ways of structuring meaning in L2 besides learning new lexical items to encode the same concepts they express in their native



language. Therefore, there has been an increasing number of research on L2 context to explore the impact of L1 TFS on conceptualization processes in the second language (L2) acquisition (Flecken, 2011; Soroli et al., 2012).

Following these lines of research, the present research examined whether the typological properties of Persian (L1) and English (L2) affect adult second language acquisition, especially in the domain of space. In contrast to most studies that focus on transfer at the level of lexical forms, the present study investigates the relationship between thinking shaped by the first language and speaking in the second language. Since these two languages are categorized into two different categories (Talmy, 1985, 2000), the ability of L2 learners to adjust to new TFS patterns in their descriptions of motion events was explored.

Literature Review

One technique to investigate the thinking-for-speaking hypothesis, according to Slobin (1991), is to look at second language learners and the challenges they have understanding aspects of second languages (Stam, 2006; see also Han, 2004). If our native language has a deep influence on our linguistic behavior that goes beyond speech, adjusting to the new spatial system might not be an easy task for L2 learners. Research on second language acquisition provides further evidence to substantiate this claim by revealing the relationship between linguistic properties and conceptualization processes.

In a study by Brown & Gullberg (2008), the way Japanese learners of English expressed Path in motion events was examined. Participants contained Japanese–English speakers, as well as relatively monolingual speakers of both languages. Fifty-seven adults distributed across four groups participated in this study. Oral animated cartoon retells were used to elicit the data. Monolingual respondents only narrated animations in their native language, while bilingual groups took part in the study twice and produced narratives in both their L1 and L2 using the same animated cartoon retells. The bilinguals generated more target expressions than either of the monolingual groups, based on the research. Whereas most research in SLA assumes the first language (L1) and the second language (L2) influence each other in one direction, the findings of this study showed the prospect of a bidirectional relationship.

Soroli et al. (2012), investigated the extent to which typological differences between L1 and L2 in spatial domain influence how L1 English learners of L2 French lexicalize motion events in comparison to English and French native speakers. The participants consisted of four different groups of speakers: 24 English and French monolingual control speakers (12 per language); 24 English learners of French at two levels of proficiency (12 per group). They were asked to watch 12 short animated cartoons depicting voluntary motion done by animal and human characters in a variety of situations (Hickmann et al., 2009). The analysis of utterances produced by learner participants showed that typological differences between their L1 and L2 influenced the way they lexicalized motion events. In addition, they employed different strategies in their descriptions which was a reflection of their distinct underlying conceptualization processes, and it was concluded that thinking for speaking is not completely under the influence of one's native language, but the properties of each language may give the learner more organizational options to choose from to talk about space.

Ikovleva (2012) in a research on the expression of voluntary motion by advanced Russian learners of English, explored the conceptual transfer from first to the second language. She compared three groups of participants including 12 Russian natives; 17 English natives, and 12 Russian learners of English at an advanced level of proficiency. The participants were requested to describe 24 very short animated clips each of which lasted for 30 seconds. The results of the study showed that although Russian and English native speakers performed differently, learners described motion events with idiosyncratic forms that were similar to both L1 and L2 motion conceptualization.



Alonso Alonso (2013) carried out research to see what pattern of encoding Spanish L1 speakers prefer to describe boundary-crossing, and non-boundary-crossing situations in L2 English, as different patterns of encoding, are followed to express these events in their L1 and L2. Fourteen subjects participated in the study. The participants were asked to translate 10 sentences from Spanish into English, half of them consisted of motion verbs that were used to express non-boundary situations, and the other half contained boundary-crossing constraint situations. These sentences were used to clarify how Spanish L1 speakers expressed Motion in English. After analyzing the translations provided by the participants, the researcher found that to translate the sentences into English, the Spanish subjects were inclined to encode Manner in a separate constituent from the Verb. To put it in another way, they followed their L1 lexicalization pattern in the L2.

Hijazo-Gascón (2017) looked at how second language learners with typologically distinct first languages learned to describe motion events in the second language. In addition to native Spanish speakers, native speakers of French, German, and Italian produced oral narratives for later comparison. Four groups of 12 participants – NSs, respectively, of French, German, Italian and Spanish –took part in this research. The speakers of French, German and Italian expressed narratives in both their native language and their second language Spanish. The results of the study showed that these languages follow different patterns to encode motion components, as a result, these differences lead speakers to transfer concepts into their second language, Spanish. Since L1-based preferences are not entirely transferred, the acquisition of target-like patterns of spatial encoding by L2 learners of English with different L1 preferences is not that challenging (Montero-Melis, 2017).

Another study by Park & Ziegler (2014) examined how L1 Korean learners of L2 English described and non-verbally categorized both voluntary (called “spontaneous” by the author) and caused-motion events. The learner participants were sampled at varying proficiency levels (N = 80). Their descriptions were compared with each other and with those of Korean and English native speakers (N = 15 each). After analyzing the bilinguals' L2 descriptions of motion events, the researchers found evidence that L2 speakers did not acquire all of the linguistic aspects used to describe such events in a native-like fashion. Regarding non-verbal categorization, however, no sign of conceptual restructuring was found.

Poshtvan & Haghbin (2015) investigated the prevalent pattern Persian pre-school children follow to express motion components, namely Manner and Path in elicited narratives. Twenty-five pre-school children and twenty-one adult Persian native speakers took part in this study. The data obtained from adult speakers were used as a baseline with which the children's data was compared. Both groups were asked to watch and describe 10 short animated clips representing vertical and boundary-crossing movements by an animated character. After transcribing and coding the participants' utterances for motion components, a comparison was made between children's narratives and those of adult speakers to find differences and similarities in encoding two components of motion. The analysis of sentences showed that children followed the same pattern as adults do to lexicalize manner and path; both groups used path verbs with or without path satellites to describe vertical displacement and to talk about boundary crossing situations prepositional phrases were employed.

Akhavan et.al (2017), examined how gestural representations of motion events are connected to linguistic expressions in Persian, as this language exhibits characteristics of both satellite- and verb-framed languages. For this purpose, 19 Persian native speakers between the ages of 19 and 30 were requested to watch short animated cartoons to describe 20 motion events. Their utterances were transcribed and coded to find the pattern they followed to express the path and manner of motion. After this analysis, the researchers tried to find a correspondence between the speakers' speech at the clause level and their gestures. The results of the study showed that when Persian speakers encoded both Path and Manner in their speech, manner was not represented in gestures, suggesting that there isn't a one-to-one mapping between linguistic and gestural expressions of Persian native speakers.



In summary, research on the impact of L1 TFS on L2 acquisition of motion expressions is still sparse and presents somewhat inconclusive results. Some of the findings showed a single-direction interaction between the first (L1) and second (L2) languages, some others highlighted the prospect of bidirectional interaction. Therefore, a close examination of patterns L2 speakers from different L1 backgrounds follows to describe motion events can provide valuable insight into our understanding of language and cognition in the process of second language acquisition. Thus, based on these lines of research, the present study aims to answer the following questions:

- Q1. Do typological differences between English and Persian play a role in how Persian learners of English lexicalize the concept of motion in their L2 English productions?
 Q2. Does learners' level of proficiency affect the development of potential conceptual restructuring patterns?
 Q3. If a typological effect is observed, how do learners overcome the influence of their L1 during L2 acquisition?

Methodology

Design of the Study

In order to answer research questions, this study was conducted within a descriptive design. Accordingly, the participants in three groups including Persian learners of English at two levels of language proficiency and native speakers of Persian received an elicitation task that required them to watch short animated cartoons. Their voice was recorded for later transcription and analysis of all linguistic devices expressing Manner, Path, or both Manner+Path. Four dependent variables were investigated in this study: a) *locus* refers to whether a description encoded path in the main verb (verb framing) or outside of the main verb (satellite framing); b) *focus* refers to the motion component that was emphasized more in descriptions, manner or path; c) *density* refers to the extent to which the participants expressed both manner and path in a single utterance; d) *complexity* refers to whether motion events were described with complex sentences or not. The collected data were analyzed quantitatively using parametric statistics.

Participants

A total of 75 subjects ranging in age between 17 to 28, participated in this descriptive study. Twenty-five Persian (Farsi) monolinguals, 25 Low proficient Persian learners of English, and 25 high proficient Persian learners of English. Native speakers' data was collected as the baseline with which the data produced by L2 learners was compared. The monolingual speakers were exposed to an L2 minimally, did not study an L2 actively, and did not use an L2 in their everyday lives; therefore, they were considered functionally monolingual. Sex was of no relevance to this study, therefore the participants were selected from both male and female populations.

Table 1

Demographic Background of the Participants

Number of participants	Age	Language Background	Sex	Ethnic Background
25	17-28	High level of Grammatical Proficiency	Male & Female	Persian learners of English
25	17-28	Low level of Grammatical Proficiency	Male & Female	Persian learners of English
25	17-28	No Background of English	Male & Female	Persian Native Speakers

Materials and Instrument(s)

For discrimination of high and low proficiency groups, the Oxford Placement Test of Grammar (Allan, 1992) that comprises 100 multiple-choice questions was administered to learner participants. Based on their performance, and using 55 scores as the cut-off point the participants were divided into two groups of low-level and high-level learners of English each with 25 members. The NS participants completed only the main task of the study (oral animated cartoon retells). The data obtained from Iranian participants together with the data collected from English native speakers already available online were compared and analyzed later. Since in Iran we do not have access to a large number of native English speakers, we used the results of a similar study based on the same methodology for data collection and analysis conducted by Soroli et al. (2012). Table 2 illustrates descriptive data related to the Oxford Placement Test of Grammar results.

Table 2

Descriptive Data Related to the Oxford Placement Test of Grammar Results

Group	N	Minimum	Maximum	Mean	Std. Deviation
Low	25	35.00	55.00	46.88	4.73
High	25	70.00	94.00	81.52	5.95

To test the normal distribution and homogeneity of the results of the OPT in the High and Low groups of learners, the Shapiro-Wilk and Levene tests were employed respectively, to make sure that the participants of the two groups were significantly different in terms of grammatical knowledge t-test was used. The elicitation task utilized in this study consisted of 12 short animated cartoons (each lasted for six seconds) depicting voluntary motion carried out by agents animal and human agents in different scenes. Six represented motion in the upward direction and then a downward direction in connection with a vertical ground (e.g. *tree, telegraph pole...*). Six others included crossing a boundary (e.g. *street, river...*). In both cases, manner was represented differently across items (e.g. *walk, run, swim...*) (Hickmann et al., 2009). Figure 1 displays examples of “across” and “upward” items used in the elicitation task.

Figure1

Examples of ‘across’ and ‘upward’ Motion



Data Collection Procedure

After giving the Oxford Placement Test of Grammar to the participants and assigning them to different proficiency groups, they met the experimenter individually in a quiet room. First, they were shown a

training item to get familiar with the experimental setup. After each cartoon, the researcher asked them to tell “what happened”. Each participant saw all stimuli on a “15.4” monitor of a laptop. The Items were organized in a semi-random order in six different parts, and the whole session was audio-taped for later transcription and analysis of how motion events were lexicalized. The participants who produced utterances with a high density like those of English native speakers were interviewed to determine what strategies they followed to overcome typological differences between L1 and L2.

Data Analysis Procedure

The data on the participants’ lexicalization of motion events shown in the elicitation task was transcribed based on CHAT format (MacWhinney, 1995) and coded to gain information related to semantics, parts of speech, and the type of utterance. Data were coded with respect to information *density* (the quantity of the information expressed in a given utterance), semantic *focus* (Manner and Path information as expressed in all parts of speech), semantic *locus* (Manner and Path information as encoded in the main verbs and in other linguistic devices). The results were turned into percentages and the Chi value was computed for each case.

Results

The first analysis examined the semantic information used in participants’ responses (focus) and as a result the number of motion components packaged in their responses (density). The animations used in this study elicited utterances that focused on two types of semantic information: manner, path, or both of them simultaneously. For density analysis, participants’ responses were given the score of 2, when both manner and path were expressed in the utterance, and the score of 1 when the responses expressed either path or manner. The score 0 was used for Density when no semantic component was expressed. In the second analysis, information locus was examined. It allowed us to capture the type of linguistic means that the participants employed to encode spatial information in their utterances.

Information Focus and Density Analysis for Persian Native Speakers, Low and High Groups

To find the density of the motion information (Manner and Path) expressed by Persian native speakers, Low and High groups of learners, the Chi-square value was computed. Table 3 presents the information concerning the Chi-square value for the three groups of the study.

Table 3

The Density of Motion Components in all Participants’ Responses

	Persian Native Speakers		Low Group		High Group		χ^2	df	Sig.
	f	p	f	p	f	p			
M/P	435	54.4	409	49.3	438	47.7	11.717	4	.020
MP	69	8.6	66	8.0	98	10.7			
None	296	37.0	355	42.8	383	41.7			
Total	800	100.0	830	100.0	919	100.0			

Note. M=Manner, P= Path, MP=Manner & Path

Based on the results of Table 3 Persian native speakers produced utterances with minimal density, expressing either manner or path in a given utterance (Density 1: 54.4 %). They rarely used both manner and path in their utterances (Density 2: 8.6 %) ($P < 0.05$).

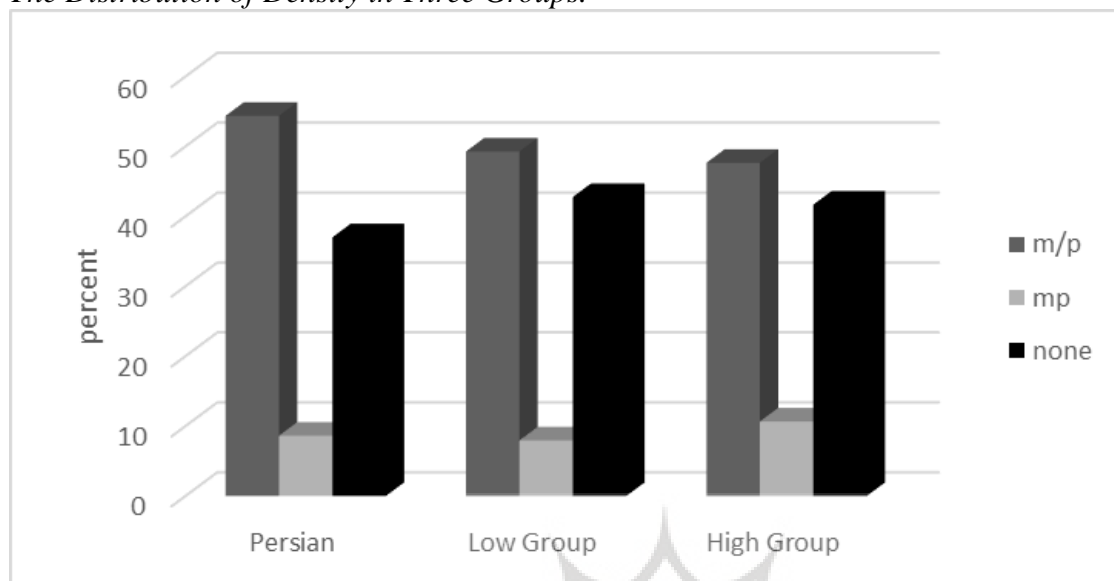
The participants of the Low group produced utterances with an almost low density like those of Persian monolinguals (Density 1: 49.3 %). The frequency of both components of manner and path in a single utterance was not high (Density 2: 8 %) ($P < 0.05$). The utterances produced by High- group learners had a higher density than those of the other two groups (Density 2: 10.7 %). They also mainly expressed one



component in their utterances (Density 1:47.7 %) ($P < 0.05$). Figure 2 shows the distribution of density in Persian monolinguals, High- and Low- level learners.

Figure 2

The Distribution of Density in Three Groups.



Semantic Locus Analysis of Persian Native Speakers

To find the preferred pattern used by Persian native speakers to lexicalize motion events, the Chi-square value was computed. Table 4 presents the information concerning the Chi-square value for the Persian monolinguals.

Table 4

Locus Analysis of Persian Native Speakers

	Other		Verb		Total		χ^2	df	Sig.
	f	P	f	p	f	p			
M	111	75.0	37	25.0	148	100.0	37.000	1	<.001
P	335	98.0	7	2.0	342	100.0	314.573	1	<.001
MP	0	0.0	0	0.0	0	0.0	---	---	---
None	0	0.0	537	100.0	537	100.0	---	---	---

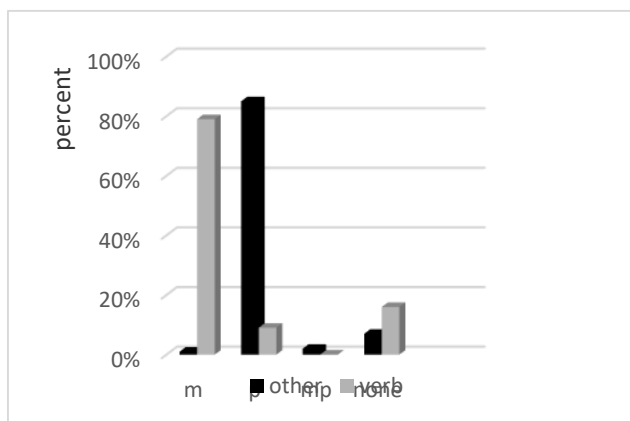
Note. M=Manner, P= Path, MP=Manner & Path

As it is illustrated, monolingual Persian speakers in the control group, typically encoded manner (M) in other linguistic devices other than verbs (75 %) and following the typical satellite framed pattern, path (P) was expressed in the periphery using other linguistic means (98 %). They did not use two semantic components (MP) simultaneously (0%).

Semantic Locus and Information Density Analysis of English Native Speakers

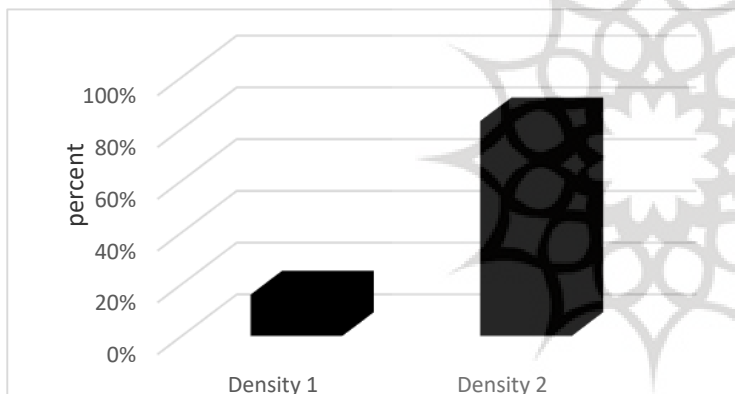
Figure 3 presents the data related to Semantic locus analysis of English native speakers (Soroli et al., 2012) available online.

Figure 3
Information Locus for English Native Speakers.



As the figure displays about 80% of English native speakers used verbs to encode manner and other linguistic devices to encode the path of the motion. Figure 4 presents the data related to information density of English native speakers (Soroli et al., 2012) available online.

Figure 4
Information Density for English Native Speakers.



As it is shown about 90% of English native speakers produced utterances with high density expressing both manner and path of the motion simultaneous

Semantic Locus Analysis of the High Group

Further analysis examined information locus in the High group of learners. The Chi-square value was computed to find the frequency of linguistic devices used by the participants of the High group to encode motion components (Manner, Path). The results of the Chi test are tabulated in Table 5.

Table 5
Semantic Locus of High Group

	Other		Verb		Total		χ^2	df	Sig.
	f	P	f	p	f	p			
M	31	9.9	282	90.1	313	100.0	201.281	1	<.001
P	248	74.9	83	25.1	331	100.0	82.251	1	<.001
MP	0	0.0	0	0.0	0	0.0	---	---	---
None	0	0.0	363	100.0	363	100.0	---	---	---

Note. M=Manner, P= Path, MP=Manner & Path

The High group speakers, frequently used verbs (90.1 %) to express manner (M), and other linguistic devices (74.9 %) to encode path (P). as the results of the Chi- test reveal, the participants of the High group didn't rely on verbs to express path very often (25.1 %). Using other linguistic devices to express manner is not frequent (9.9 %). They did not use two semantic components (MP) simultaneously (0%) ($P < 0.001$).

Semantic Locus Analysis of the Low Group

To capture the information locus in the Low group of learners, the Chi-square value was computed and the frequency of linguistic devices used by the participants to encode motion components (Manner, Path) was determined. The results of the Chi test are tabulated in Table 6.

Table 6

Semantic Locus of Low Group

	Other		Verb		Total		χ^2	df	Sig.
	f	P	f	p	f	p			
M	19	8.6	2.3	91.4	222	100.0	152.505	1	<.001
P	227	80.8	54	19.2	281	100.0	106.509	1	<.001
MP	0	0.0	0	0.0	0	0.0	---	---	---
None	0	0.0	419	100.0	419	100.0	---	---	---

Note. M=Manner, P= Path, MP=Manner & Path

The Low group speakers mostly preferred to use verb stems (91.4 %) to express manner (M). They encoded path (P) in other linguistic devices (80.8 %) more than verbs (19.2 %). expressing two motion components (MP) in a single word was not observed (0%) ($P < 0.001$). The results above suggest that English and Persian are typologically different to describe motion events, and these typological differences play a role in how learners lexicalize the concept of motion in their L2 productions.

The complexity of Utterances Produced by the Participants of Low and High Groups

Hunt (1970) defines the T-unit as “the main clause in addition to all subordinate clauses and nonclausal structures attached to or embedded in it” (p.4). Therefore to measure the complexity of sentences produced by the learners in the High and Low groups, the Mean length of T-Units (MLTU) (Hunt, 1965; Freedman, 1980) was computed.

MLTU, as the average number of words per T-unit, is an appropriate index to investigate the syntactic development in L2 learners that discriminates them at different levels of second language proficiency. To investigate whether the participants of the two groups are significantly different in terms of producing complex sentences t-test was employed. The results of the t-test are tabulated in Table 7.

Table 7

The Results of The t-test between “High” and “Low” Groups

variable	Group	N	Mean	Std. Deviation	t	df	Sig. (2tailed)
Complexity	High	25	6.10	.54	6.009	48	<.001
	Low	25	5.23	.48			

As it is shown, there is a significant difference between the mean scores of the members of the two groups regarding the complexity of sentences. The participants of the High group produced more complex

sentences ($P < 0.001$). These results suggest that, in order to express motion events based on the L2 (English) TFS pattern, L1 (Persian) learners are required to employ complex sentences.

In addition to capturing the complexity of sentences produced by learners in both High and Low groups, to complete our investigation of strategies used by competent learner participants, we also interviewed the participants who produced utterances with a high density like those of English native speakers in order to know what strategies they followed to overcome typological differences between L1 and L2. The following table summarizes strategies they claimed to employ.

Table 8

The Results of the Interview with Competent Participants Who Followed English Pattern of Spatial Encoding

Number of Interviewees	Strategies		
	Reading Story Books	Watching Movies	Learning English at Low Ages
8	6	8	3

As the results of Table 8 show, a few participants were able to restructure their L1 thinking pattern regarding spatial encoding and described motion events following the L2 thinking pattern. They proposed some strategies to overcome typological differences between English and Persian such as reading storybooks, watching movies, and learning English at low ages.

Discussion

This study was motivated by several questions concerning the relationship between spatial language and conceptualization in the second language. The findings of the study seem to reveal similarities as well as interesting variations in the ways spatial information is expressed across all the groups including Persian monolinguals, Low proficient L2 learners of English, High proficient L2 learners of English, and English native speakers. The results obtained from the three groups of participants provided evidence to answer the first research question. As the results indicate, unlike English native speakers who follow the lexicalization pattern of S-framed languages and mainly express the manner in verb stems, Persian monolinguals had a general preference to encode manner in other linguistic devices, mainly light verbs (e.g. 3).

3. Yek	mard	rooye	daryache	yakh zade	liz khord
INDEF.ART	man	over	DEF.ART lake	frozen	slide Light verb
	"A man	sled	over the frozen lake"		
Figure		Manner	Ground		

In Farsi (Persian) the use of compound verbs is very common. These verbs are made up by adding a light verb (e.g. *kardan* "to do", *shodan* "to become", *zadan* "to hit") to a non-verb element (e.g. a noun or an adjective). However, the original meaning of the light verb is not always preserved in the compound verb (Folli, Harley & Karimi, 2005). Examples include *parvaz kardan* (lit: fly to do) "to fly", *penhan shodan* (lit: hidden to become) "to hide", *ghadam zadan* (lit: step to hit) "to stroll". With respect to the path of the motion, both groups of speakers mostly rely on other linguistic devices (satellites) in their descriptions which characterizes them as speakers of S- framed languages (e.g.4).

4. yek	khers	raft	balaye	derakht
INDEF.ART	bear	went	up	tree
	"A bear climbed	up	the tree"	
Figure		Path		

The analysis concerning the overall semantic density of utterances showed that English native speakers produced sentences with much more density in comparison with Persian native speakers; English speakers paid attention to both components of motion (manner and path) while Persian monolinguals mostly focused on the path of the motion in their utterances. Actually, “Since manner is expressed automatically and habitually, this semantic component has become particularly noticeable in the way motion events are conceptualized in S-languages. On the other hand, manner does not stimulate sensitivity of speakers of V-languages and thus manner is mentioned in their utterances only when it is an important aspect of the event or when it is noticeably focused on in the scene”(Slobin, 2003, P.5).

This finding that categorizes Persian as a V-language provides evidence to confirm another typological difference between English and Persian. The process whereby Persian native speakers mapped the semantic components of motion events onto linguistic surface forms showed that Persian speakers followed a hybrid pattern that displays features of both S-framed and V-framed languages to lexicalize motion events. The pattern identified is also in parallel with previous typological literature (Feiz, 2011; Verkerk, 2014). As Berman & Slobin (1994, P.118) pointed out “categorical characterizations often reflect tendencies rather than absolute differences between languages”. It means that the boundary between languages in terms of spatial encoding is not absolute, and any given language may follow the lexicalization patterns of other language categories too.

After confirming that English and Persian typologically differ in the way they express motion events, how learners employed spatial referents to map semantic information onto L2 surface forms during second language acquisition was explored. Both groups of High and Low proficiency learners, seemed to have no difficulty acquiring the lexicalization pattern of English native speakers; they exploited verb stems more frequently than other linguistic devices to encode the manner of the motion, and to describe the path of the motion, they were inclined to use satellites more than verbs. In terms of density, producing utterances with high density posed a challenge to both groups of learners. They carried over L1 habitual language use to their L2 speech across two levels of proficiency and produced sentences with low density (expressing only one motion component mostly path of the motion in a single utterance).

The results concerning our nonnative data provided evidence towards answering the second question. Typological differences between English and Persian affect the acquisition of target-like motion expressions by Persian learners of English. The way speakers construct special events in their L1 in addition to the way they organize discourse more globally, are influenced by typological factors, leading to resistance to change during L2 acquisition. Although some high proficient learners generally demonstrated a better command of producing sentences with high density, the others, especially low proficient learners resisted restructuring their native language pattern of density, suggesting that L2 TFS about motion expressions is dynamic (Cadierno & Ruiz, 2006; Stam, 2010) and can gradually change in the course of second language acquisition as their L2 proficiency improves. It's implied from these findings that L2 speakers might find it easier to imitate the linguistic behavior of the target language community rather than to imitate its non-linguistic behavior (L2 ways of thinking). Generally, it is challenging for L2 learners to completely adjust to the particular ways in which spatial information is selected and syntactically distributed across a sentence in the target language. The obtained results are consistent with Slobin's (1996) proposal that to describe motion events, L1 acquirers develop patterns for connecting semantic units to lexical items and it is very difficult to restructure this habituated pattern while learning the second language.

Further inspection of learners' data provided evidence to address the third research question. Focusing on how some learners overcome the influence of typological differences, it was observed that the High proficient learners differed from Low proficiency learners with respect to how they organize discourse. They described motion events with more complex sentences. It suggests that dense responses require rather complex structures, and as learners' grammatical knowledge increases, they exploit more complex sentences in order to combine. Different kinds of information concisely express spatial information. Such



situations might enhance the acquisition of complex structures in discourse by highlighting the necessity of using complex sentences to pack spatial information more efficiently. It's in parallel with other studies that point to the significance of encouraging learners to learn native-like discourse strategies that move beyond grammatical knowledge at the level of the sentence (Gumperz, 1982; Hyland, 2009; Flowerdew, 2013). Whereas discourse structuring is implemented frequently in first language classrooms, it is insufficiently addressed in classroom teaching for second language acquisition.

Whenever path and manner are expressed together, satellite-framed languages allow the conflation of these motion components into a single clause, while verb-framed languages generally express path and manner in two separate clauses (Slobin, 2005). Thus, speakers of verb-framed languages usually express only path and omit manner while using a satellite-framed L2, as its verbalization in these languages needs more complex structures (Slobin, 2006).

Furthermore, an interview was conducted with those who could restructure their existing conceptual representations and comply with L2 TFS patterns to express utterances with high density. They claimed to employ different strategies including reading English storybooks and watching English movies that are considered as beneficial sources to gain more L2 input in the form of positive evidence. These outcomes suggest that although learners' native system provides a window on to events that do not change easily, exposure to a new linguistic system (L2) can reverse conceptual categories that they learned through long-term experience with their native language.

Conclusion

Achieving native-like proficiency is the purpose of most language learning programs, and despite all the efforts put into training competent L2 learners, many of them even at advanced levels do not use motion verbs properly and show features of non-nativeness in their descriptions. Therefore, such studies that deal with conceptual transfer during second language acquisition offer L2 educators a comprehensive picture of the relationship between linguistic behavior and cognitive processes in L2 learners from a cross-linguistic perspective. This information has implications to develop teaching strategies and pedagogical activities that train L2 learners to think like native speakers and internalize L2 TFS patterns concerning spatial language. The competent learner participants whose descriptions of motion events patterned well with those of L2 native speakers used some strategies to describe motion events. These strategies can be employed by educators, material designers, and task developers to put more emphasis on incorporating L2 discourse strategies into language programs and provide abundant input in the form of positive evidence that requires learners to actively use the target language. This research deals with second language acquirers' spatial encoding at the level of the lexicon, therefore further research can be carried out to broaden our perspective about typological parameters of languages, and their potential effect on second language acquisition. To gain a more qualified understanding of the possible effect of language variation on cognition, it is suggested to incorporate more general syntactic and pragmatic features to the data analysis method. For example, we can video-tape the participants' performance to examine the pattern of their gestures while describing the path and manner of motion. Collecting data in other media (e.g., written) or other genres (e.g., everyday conversation, lectures, news broadcasts, essays, advertisements, etc.) would bring to light interesting findings relating to linguistic typology concerning motion verbs that can be implemented for pedagogical purposes.

More studies with several theoretical viewpoints and various types of measurement in larger scales are required to reveal how conceptual change takes place as a consequence of learning and using a second language. One limitation of this research is that the participants may feel stressed at the presence of the researcher and do not perform as they are expected to, therefore automated computer-run methods which minimize the researcher's presence are suggested. Since in Iran we do not have access to enough English native speakers, we used the results of another study which were available on the internet. It is recommended to administer our test to our intended participants to control all variables of the study.



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