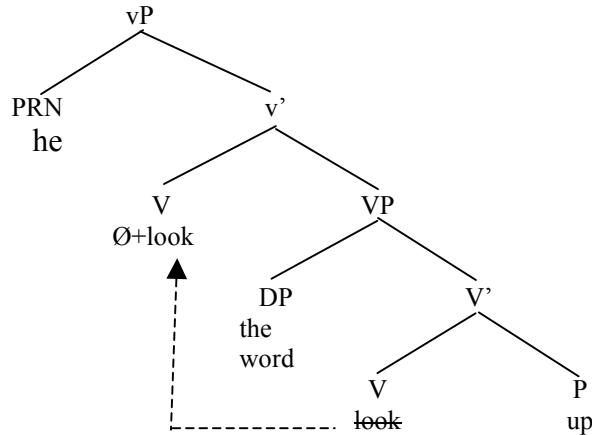


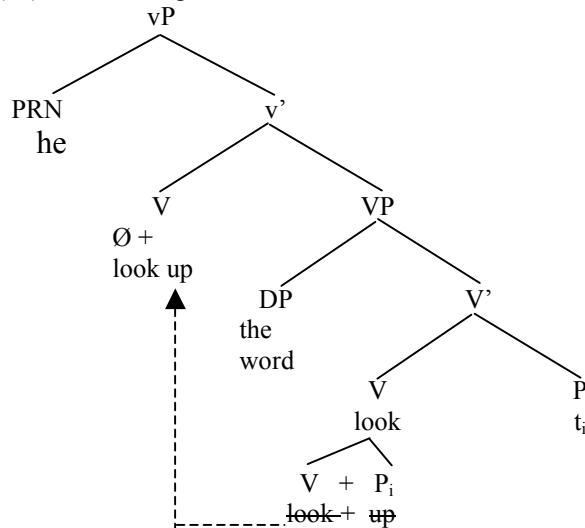
3. Syntactic analysis of VPCs and VPPs

Assuming the [v [VP]] structure of the verb phrase, Radford (2005) (p.c) proposes that the particle in a VPC is merged with a V, as illustrated in (9). Through the movement of V to v , the unvalued Case feature of the DP *the word* is valued as accusative and the discontinuous construction (9) is formed. The incorporation of the particle into the V and its pied-piping to v gives rise to the continuous construction, as in (10).

(9) He looked the word up.



(10) He looked up the word.



The incorporation of the particle to the verb and its pied-piping is optional for full DPs. The discursal and prosodic factors interact with the syntax to determine whether incorporation analysis should be adopted or not. However, there are some verbs such as *get off*, *come across*, *run into* and *take after* which do not allow alternation and can only be used in continuous structures. The particle incorporation for these verbs is obligatory¹.

¹Radford's (2005) syntactic account can explain the cross-linguistic variation observed in similar languages having VPCs in their lexicon. Assuming that these constructions are constrained by UG, we have three options; Firstly, some languages such as Danish have selected particle incorporation in their grammar. Secondly, languages such as Swedish do not select particle incorporation when dealing with VPCs. Particles indeed are not adjacent to

By contrast, PPs in VPP constructions, as illustrated in (11), are complements to V. The unvalued Case feature on *the hill* is assigned the value [Acc Case] by the transitive preposition *up* under agreement.

(11) [e T [_v John [_{VP} run [_{PP} up the hill]]]].

4. VPPs and VPCs in Persian

Both English and Persian are head-first languages with regard to PPs. Nevertheless, unlike English, Persian is an SOV language. Verbs in Persian are either simple (e.g. *neveshtan* = to write) or complex (e.g. *rânandegi kardan*= to drive). The complex predicates consist of a nonverbal element plus a light verb. The nonverbal elements may consist of nouns, adjectives, adverbs or prepositional phrases.

Persian has a very limited number of VPCs. The closest equivalent to the English transparent VPC involves a particle-verb construction (12) with a different linear order. In such cases, no separation of the particle from verb by the object is possible (13). The path features (direction or location) contained in English transparent particles such as *out* and *on* can be encoded within an adverbial particle in Persian. For instance, the verb ‘throw out’ in (12) is represented as ‘*biroon andâkhtan*’ consisting of an adverbial particle *biroon* (out) and the simple verb *andâkhtan* (throw). In contrast, there are no idiomatic or aspectual VPCs in Persian. Table (1) presents the equivalents of different VPC types in Persian.

(12) Rezâ toop râ biroon andâkht.
 Reza the ball SOM² out throw-pas-3sg
 Reza threw out the ball / Reza threw the ball out.

(13)* Rezâ biroon toop râ andâkht.
 R. out ball SOM throw-past-3sg
 Reza threw the ball out.

English VPC Type	Persian equivalents
Transparent VPCs	Particle-verb constructions
Idiomatic VPCs	Simple or complex predicates
Aspectual VPCs	Simple or complex predicates with an adverbial phrase

Table 1. Persian Equivalents of English VPCs

5. Learnability Problem for Persian Learners of English

The acquisition of the VPP & VPC properties instantiates a potential learnability problem given the following considerations:

(i) Persian learners will encounter constructions like (14) but will not encounter sentences like (15):

- (14) a. The fire fighters put out the fire.
 b. The fire fighters put the fire out.
 c. Mary takes after her father.
 d. John ran up the hill
 e. Up what did John run?
 f. John ran right up the hill.
 g. Up this hill John ran.

the lexical verb. The last option selected by languages such as English, Norwegian and Icelandic is that the above syntactic mechanisms are not typically obligatory and particles may or may not be incorporated.

² SOM stands for specific object marker.

- (15) * a. Mary takes her father after.
 * b. Out what did the fire fighters put?
 * c. The fire fighters put right out the fire.
 * d. John ran the hill up.
 * e. Up the letter John tore.

The fact that particles in VPCs can appear before or after the internal argument is derivable from the L2 input. Nonetheless, frequency of the relevant forms in input does not offer much help for the L2 learners to attain the complexities involved in the distinction between VPPs and VPCs. Given that the particle in separable VPCs occurs freely before or after the verb (14a-b), and that PPs occur freely in pied-piped constructions (14e), topicalized structures (14g) and can be preceded by adverbial modifiers (14f), in addition to the fact that L2 learners' grammars are productive, there is nothing in the input to tell learners that PCs cannot pied-pipe (15b), be preceded by the adverbial modifier (15c), be topicalized (15e) or to tell them that prepositions cannot be post-posed (15d). Two additional comments are relevant here, in connection with the POS argument. Specifically, there is no reliable evidence that Persian learners of English are instructed about the contrasts between VPCs and VPPs. Instruction neither deals with those VPCs which do not alternate nor with the fact that VPPs cannot be postposed. Secondly, the properties of English VPC and VPP constructions are underrepresented in the L1. The elements of Persian complex verbs are adjacent to each other, i.e. they cannot be separated by the internal arguments of the predicate. Also, Persian does not allow VPCs in general.

6. The Present Study

6.1 Research Hypotheses

I hypothesize that L1 Persian learners of English will approach this learnability problem in one of two ways:

(a) If UG constrains L2 grammatical knowledge, Persian learners of English will distinguish the syntactic properties associated with VPPs and VPCs. They should accept the topicalization and pied-piping of the prepositions on the one hand and reject the topicalization and pied-piping of the particles on the other.

(b) Given the absence of discontinuous VPCs in Persian, learners will initially accept continuous VPCs more than the discontinuous ones due to the transfer of L1 properties. Given the L1 influence, they should also prefer continuous transparent VPCs more than the other types.

6.2 Subjects

A total of seventy nine adults constituted the main participants of this study: sixty five native speakers of Persian acquiring English as a foreign language and a control group of fourteen native speakers of English. The L2 subjects were assigned into different proficiency levels by virtue of their performance on the Oxford Quick Placement Test (OQPT) (2001). Some basic information on the number of subjects, their age range and mean as well as their scores on the language proficiency test are tabulated in Table (2).

	N.	Age range	Age mean	OQPT range	OQPT mean
Elementary	18	18-44	24	17-27	22.4
Intermediate	25	18-32	21	33-41	37
Advanced	22	19-42	29	48-58	53.3
Native Speaker	14	20-55	32	N/A	N/A

Table 2. Participants' Bio-data

6.3 Task and Procedures

The subjects were given a grammaticality preference task in which the subjects read pairs of sentences and decided whether or not one of the sentences was better than the other. A sample stimulus is presented in (16) below.

- (16) a. He paid her debt off. b. He paid off her debt.
 Only **a** is right Only **b** is right Both right Both wrong Don't know

The task included 45 real verbs (Table 3) and 11 nonce verbs (Table 4) used to test the productive knowledge of the L2 constructions. The number of real and nonce tokens is also presented in Table (3). The subjects were asked to indicate their grammaticality preference by underlining the correct option. The option 'Don't know' was included to avoid random guessing by the respondents in cases where they did not know the answer. The correct answers were coded as 1 and incorrect answers as 0. For separable VPCs, the subjects' responses were coded as 0 if they selected either the continuous or discontinuous construction.

Construction Type	Token	Test verbs
Verb + PP	5+1	run up, argue with, dine at, lay on, drive down
Adverbial Insertion	3+1	run up, turn off, walk to
Conjoined Structures	3+1	look after, let out, tear up
Pied-piping in Interrogatives	3+1	(walk up, tear up), (put on, rest on), (throw out, dine at)
Pied-piping in RCs	3+1	(run down, tear up), (live in, hand in), (drive up, hang up)
Topicalization	3+1	(walk up, tear up), (leave on, try on), (relax on, depend on)
Separable VPCs	9+1	pay back, mix up, hand in, pay off, put out, use up, pass on, bring in, hang up
Non-separable VPCs	4+1	come across, run into, get off, take after
Pronoun Placement	6+1	try on, call off, put out, hang up, hand in, mix up, read through
Preposition stranding in Interrogatives	3+1	work in, apply for, hand in
Preposition stranding in RCs	3+1	work in, apply for, hand in

Table 3. Construction Types, Tokens and Test Verbs

VERB	DEFINITION	VERB	DEFINITION
Plip up	Destroy	Pleem	Run
Veach out	Delete	Nace	Crawl
Yock at	throw stones	Greem	Travel
Tweep up	eat noisily	Dalk	Report
Broan down	decrease volume	Glame at	to achieve an agreement or decision
Mout	Jump		

Table 4. Nonce Verbs and their Definitions

7. Results

The descriptive results of the grammaticality preference task on continuous and discontinuous VPPs and VPCs are displayed in Table (5). The elementary learners show variability in their performance in all contexts due to the complexity of the distributional properties involved with VPP/VPC constructions; hence, their results are not further discussed in this section. All intermediate and advanced subjects disallow inversion of the prepositions and their complements. The intermediate and advanced subjects opt for both continuous and discontinuous structures with separable VPCs at 49% and 57% respectively ($p > 1.000$). They have recognized the + alternation property of VPCs, event

though their behaviour is not target-like (one-way ANOVA, $F=10.213$, $p<.0001$). In separable VPCs, the intermediate and advanced learners clearly prefer continuous over discontinuous VPCs. With non-separable VPCs which display the lexical cohesion of VPCs but the syntactic behavior of VPPs, both intermediate and advanced learners perform in a target-like way (p (intermediate/native control group) $>.759$; p (advanced/native control group) $>.418$).

Construction Type	Elementary			Intermediate			Advanced			NSs		
	Con	Dis	Bo	Con	Dis	Bo	Con	Dis	Bo	Con	Dis	Bo
VPP	45	20	20	84	02	13	97	00	02	99	00	00
Sep. VPCs	28	23	41	34	08	49	31	10	57	14	02	83
Non-sep. VPCs	37	21	30	78	04	08	95	00	01	85	01	09

Note: [Con= Continuous constructions; Dis= Discontinuous constructions; Bo= Both continuous and discontinuous constructions]

Table 5. Mean Comparison (%) on Continuous & Discontinuous VPPs and VPCs

Table 6 further displays the subjects' preference for the different types of separable VPCs. The L2 learners do not have any particular tendency on any of the different types of separable VPCs. The advanced group is significantly different from the native control group in transparent VPCs ($p<.017$) not idiomatic ($p>.103$) and aspectual ($p>.133$) ones³. Contrary to the existence of transparent continuous particle-verb combinations in Persian, the L2 learners are treating transparent, idiomatic and aspectual VPCs similarly. Hence, the second hypothesis is rejected. This is in contrast with child L1 acquisition in which children acquire transparent VPCs earlier than the other types (Sawyer, 1999).

Type of VPC	Elementary			Intermediate			Advanced			NSs		
	Con	Dis	Bo	Con	Dis	Bo	Con	Dis	Bo	Con	Dis	Bo
Transparent	28	28	33	29	09	53	23	24	53	05	07	88
Idiomatic	32	21	44	35	05	45	32	07	60	18	00	79
Aspectual	22	20	44	36	09	49	39	01	56	17	00	83

Note: [Con= Continuous constructions; Dis= Discontinuous constructions; Bo= Both continuous and discontinuous constructions]

Table 6. Mean Comparison (%) on the Types of Separable VPCs

Tables 7, 8 and 9 offer the results of adverbial insertion, conjoined structure and pronoun placement respectively. The analysis of the learners' preference in all three constructions above reveal a significant effect of the grouping factor ($p<.0001$). The higher proficiency learners are increasingly performing as expected. Looking at the results of adverbial constructions in Table (7), it becomes clear that the intermediate and advanced subjects are significantly different from each other with Bonferroni adjustment ($p<.022$). However, no significant difference is found between the advanced and native control group ($p>1.000$). The subjects have increasingly identified that the adverbial modifier cannot be positioned between the prepositions and their internal arguments. They correctly allow the sentential adverb *right* on the specifier of the prepositions.

Response Type	Elementary	Intermediate	Advanced	NSs
Adv.-P-DP	40	64	84	91
P-adv-DP	39	11	5	0
Both <i>adv-p-DP</i> & <i>p-adv-DP</i>	11	7	1	4
Neither <i>adv-p-DP</i> & <i>p-adv-DP</i>	6	13	10	5

Table 7. Mean Acceptance (%) of Adverbial Constructions

Turning to Table 8, which shows the results of conjoined structures, it can be seen that none of the proficiency groups are significantly different from each other (p (intermediate/advanced) $>.844$; p (intermediate/native control group) >1.000 ; p (advanced/native control group) $>.942$). This shows that

³ The small number of tokens for each separable VPC type can account for the asymmetry of the results.

the conjoined structures are acquired earlier than other constructions. The subjects have readily recognized that particles cannot appear on their own in conjoined structures. In fact, they have disallowed the particle and its following DP as a syntactic constituent.

<i>Response Type</i>	Elementary	Intermediate	Advanced	NSs
Single particle	49	90	84	89
Double particle	22	4	1	2
Both single & double particles	10	3	10	9
Neither single nor double particles	14	2	5	0

Table 8. Mean Acceptance (%) of Conjoined Structures

The results of the subjects' performance in pronominal contexts in Table (9) indicates that the intermediates and advanced subjects are significantly different from each other ($p < .036$) while the advanced and native control groups are behaving similarly ($p > .965$). The learners have increasingly disallowed continuous constructions whenever the internal argument is a pronoun. The L2 learners know that pronouns have a weak enclitic status and should be cliticized to the verb.

Response types	Elementary	Intermediate	Advanced	NSs
Discontinuous construction	40	63	89	94
Continuous construction	27	18	6	0
Both continuous and discontinuous	11	1	0	3
Neither continuous nor discontinuous	20	16	3	3

Table 9. Mean Acceptance (%) of Pronominal Structures

Table 10 tabulates the results of pied-piping and topicalization constructions. The intermediate and advanced participants differ significantly from each other in their treatment of pied-piping in interrogatives ($p < .039$) and relative clauses ($p < .0001$) but not topicalized contexts ($p > .419$). Comparing the pied-piping constructions in interrogatives and relative clauses, it seems that the intermediate learners have more problems with relative (48%) than interrogative clauses (62%) although the difference in judgement between the two contexts just reaches significance ($p = .05$). No significant difference can be observed between these two structures (82% and 74%) at the advanced proficiency level ($p > .088$).

<i>Construction Type</i>	Elementary				Intermediate				Advanced				NSs			
	PP	PC	B	N	PP	PC	B	N	PP	PC	B	N	PP	PC	B	N
Pied-piping in inter.	24	21	15	26	62	1	13	20	83	2	0	14	82	0	7	9
Pied-piping in RCs	19	17	26	18	48	2	11	34	74	1	3	20	92	0	2	5
Topicalization	33	11	22	17	47	3	19	27	56	1	16	26	52	0	25	23

(PP= Pied-piping with prepositions; PC= Pied-piping with particles; B= Both prepositions and particles; N= Neither prepositions nor particles)

Table 10. Mean Comparison (%) on Pied-piping and Topicalization Structures

The intermediate, advanced and native control groups are showing a conservative behavior in topicalization contexts by rejecting both prepositions and particles. This is mainly due to the marked status and very low frequency of these constructions in English. The last construction considered in this study is preposition stranding the results of which are displayed in Table (11).

Construction Type	Elementary				Intermediate				Advanced				NSs			
	PS	NU	B	N	PS	NU	B	N	PS	NU	B	N	PS	NU	B	N
Stranding in inter.	36	26	21	10	59	23	11	2	84	3	10	2	93	2	3	2
Stranding in RCs	39	32	15	11	59	15	21	2	80	2	15	3	89	0	5	2

(PS= Prepositions are stranded; NU= Prepositions are not stranded (null); B= Both stranded and null prepositions; N= Neither stranded nor null prepositions)

Table 11. Mean Comparison (%) on Preposition Stranding Structures

Unlike Persian, the complement of a preposition can be moved to the specifier of CP in English, leaving behind the preposition. As the proficiency level increases, the subjects are performing better and in a more target-like fashion on these particular structures. The intermediate and advanced groups are significantly different from each other in interrogative ($p < .0001$) and relative clause contexts ($p < .027$). The advanced group and the native control group, however, are not significantly different from each other in these contexts ($p > 1.000$) implying that the L2 learners are showing convergent knowledge with the native speakers (see Rezai, 2006 for further details).

Comparing the subjects' performance in preposition stranding and separable VPCs both of which are disallowed in the Persian grammar, we can notice that the subjects have reached a target-like performance with the former not with the latter. The saliency of structure as well as the frequency of the occurrence in the input, as argued by Ellis (1994) and Gass (2002) among others, can be regarded as an effective factor. The frequency of the stranding constructions in the L2 input is much higher than that of separable VPCs which is rather low.

A further comparison has been made between the real verbs on the one hand and nonce verbs on the other the results of which are displayed in Table (12)⁴.

	Elementary	Intermediate	Advanced	Natives
Real verbs	39	65	80	89
Nonce verbs	25	50	66	64

Table 12. Mean Percentage Responses on Real and Nonce Verbs

The results of the one-way ANOVA on the nonce verbs shows a significant effect for grouping factor [$F(3, 75) = 42.505$ $P < .0001$]. The response trend is progressive for the proficiency groups. These results demonstrate that L2 learners' knowledge of VPP and VPCs is productive. The L2 learners can extend their acquired knowledge to novel situations.

8. Discussion

Persian L2 learners initially treat particles as if they were prepositions. This is consistent with the absence of intransitive particles of the English type in Persian, and initial transfer of the properties of Persian into learners' Interlanguage Grammars (ILG). As proficiency increases, learners begin to identify forms that can function as particles. Once recognized, UG ensures that a verbal object and a particle cannot be pied-piped, topicalized, conjoined and modified by an adverb, because they do not constitute a syntactic constituent. At the advanced proficiency level, Persian L2 learners of English have distinguished a wide range of VPCs from VPPs, and have target-like representations for them, even though their properties are underrepresented by the input. The ILG of the L2 learners display evidence for L1 transfer because (a), the intermediate and advanced subjects are more accurate on

⁴ This type of comparison would be ideally effective if there were the same number of items for the real and nonce verbs. However, due to practicality restrictions, only one nonce verb was used for each construction tested, giving 11 verbs in total.

VPPs and non-separable VPC constructions than on separable VPCs and (b), they opt for continuous structures more than discontinuous ones in the case of separable VPCs consistent with Persian.

The results of the present study demonstrate that the interlanguage representations of the L2 learners are sensitive to the subtle distinctions between particles and prepositions. The intermediate subjects show asymmetrical responses to prepositions and particles in pied-piping in interrogatives (62% vs. 1%), pied-piping in relative clauses (48% vs. 2%) and topicalization (47% vs. 3%). When they get to the advanced level, this asymmetrical performance is more marked in that they distinguish between particles and prepositions in pied-piping in interrogatives (83% vs. 2%), pied-piping in relative clauses (74% vs. 1%) and topicalization constructions (56% vs. 1%). Furthermore, the intermediate and advanced learners allow both continuous and discontinuous structures with separable VPCs at 49% and 57% respectively, whereas they are not behaving so in the case of VPPs (13% and 2%). The learners' preference for continuous VPCs in Table 5 can (a), reflect the properties of the L1 where the preverbal element and the light verbs are adjacent and (b) signify the effect of the processing constraints introduced by Hawkins (2004) who argues that ordering in which there is a need for minimum domain size is preferred.

How could Persian L2 learners acquire such distinctions despite the poverty of the stimulus problem? To acquire these VPP/VPC properties, the L2 grammar must be constrained by some internal mechanisms governing the distribution of prepositions and particles. The knowledge of abstract Case is a determining element guiding L2 learners. If the knowledge of Case checking or Case assignment is universal, L2 learners should recognize which syntactic elements can carry Case assigning/checking properties. They further should know that prepositions have Case-assigning/checking properties whereas particles, although superficially identical, do not carry such properties.

To sum up, the input L2 learners receive on the VPP/VPC properties underdetermines their final attainment. Their output in fact far outstrips the information available in the primary linguistic data, suggesting that their ILGs are restricted by domain-specific constraints. The findings evince that the interlanguage mental representations of L2 learners are sensitive to abstract Case assignment properties, which in turn implies that their knowledge can stem from an inherent propensity beyond positive input and explicit instruction, i.e. UG, which is claimed to be the foundation of language knowledge.

9. Conclusion

The results of the current study lend support to the notion of the 'poverty of the stimulus' in L2 acquisition. The findings demonstrate that L2 learners are sensitive to the underdetermined distinction between the constituency status of prepositions and their DP complements on the one hand and the lack of the constituency status of particles and their DP complements on the other. Knowledge of the distributional properties of VPPs and VPCs follows if L2 grammars are constrained by UG. This is consistent with claims in other studies that L2 ILGs have properties that are not reliably inferred from input (Kanno, 1997; Perez-Leroux & Glass, 1999; White, 2003 among many others).

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