



## **L1 Persian Attrition**

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### **Abstract**

This study aims at investigating first language attrition in Persian speakers of English as L2. Three groups are compared: Persian monolinguals, early bilinguals and late bilinguals. An acceptability judgment test is used in which the test sentences consist of pairs of sentences each of which follow either the English structure or the Persian structure in three syntactic areas of relative clause, adverb position and pro-dropping which constitute three main areas of syntactic differences between Persian and English. The results revealed that the type and degree of L1 attrition that early bilingual speakers undergo is different compared to late bilinguals and the degree of L1 education conditions attrition. The implication is that age of L2 acquisition has a major influence on how bilinguals represent their L1: late bilinguals often retain a large amount of underlying competence in their first language while early bilinguals lose it more quickly.

### **Introduction**

The notion of language attrition has been a topic of investigation for more than three decades. It attracted the attention of language researchers in the late 1970's and subsequently the inaugural conference on *Attrition of Language Skills* at the University of Pennsylvania (Upenn) in 1980 was a turning point for research in this field. Before the conference, 'language loss' was used to refer to pathological disorders such as aphasia, or language disorders caused by tumors, strokes, or traumas to the head (Smith & Wilson, 1979, Yağmur, 2004). This conference was a starting point for further research and conferences that probed into the process of language loss as a non-pathological disorder from many other perspectives.

From a non-pathological perspective, the idea of language loss first rose with reference to foreign language students who had spent an enormous amount of time learning a second language but subsequently lost it as time passed. The study of first language attrition began in the early 1980's with Richard D. Lambert's interest in

language loss. As one of the organizers of the inaugural UPenn conference and co-editor of the following conference volume by Lambert & Freed (1982), Lambert was a pioneer in [steering](#) attention to the language loss that happens so often among bilinguals or those who have knowledge of more than two languages. Lambert & Freed's publication shed light on many issues regarding first and second language loss from different perspectives. It probed into issues such as language shift, language death, pathological language loss, social and political influential factors as well as methodological issues. It served as a guideline for further research.

Fascinated with the UPenn conference, many other scholars contributed to the field of language loss. At the turn of the millennium, workshops on L1 attrition were organized at international conferences at the Second Language Research Forum 2000 in Madison, Wisconsin by Dorit Kaufman in addition to the third International Symposium on Bilingualism in Bristol, 2001, by Agnes Bolonyai.

Papers and publications on language attrition and the divergent methods of data collection, sampling and instrumentation called for a framework that was distinct from language learning. The efforts paved the way for a taxonomical framework proposed by Van Els (1986) within which language attrition research would be conducted. The framework was established in terms of the language that is lost (L1 & L2) and the environment (L1 & L2). The taxonomy is as follows:

L1 loss in L1 environment (aging, dialect loss)

L1 loss in L2 environment (loss of L1 by immigrants)

L2 loss in L1 environment (loss of L2)

L2 loss in L2 environment (loss of L2 by aging immigrants)

### **Attrition from different perspectives**

The notion of attrition has been defined by scholars from a variety of perspectives [in fields](#) such as linguistics, psycholinguistics, neurolinguistics or sociolinguistics. Depending on their perspective, researchers study patterns of language loss in various populations including aphasia, dementia, healthy aging, bilingual and multilingual speakers. Attrition was primarily studied from a pathological perspective in people with

aphasia but later the term was extended to cover the non-pathological cases of language loss. From a non-pathological perspective, primary language attrition refers to the loss of language abilities of non-disordered individuals in an L2 environment (Altenberg & Vago, 2004).

Language attrition has been used in the study of language loss in the context of bilingualism (Goral, 2004). Accordingly, certain components of language are more vulnerable to loss than others (Lambert & Freed, 1982, Seliger & Vago, 1991). In a bilingual setting language loss can be manifested as L1 or L2 loss. Some researchers view attrition in the light of a reduction in individual's abilities, usually measured expressively in his/her L1 (Kaufman & Aronoff, 1991; Turian & Altenberg, 1991; Anderson, 1999) and associate it with non-use or lack of contact with the primary language. Seliger (1996) argues that L1 attrition occurs as a natural outcome of acquiring another language but this does not mean that this process is an automatic consequence of acquiring another language. Furthermore, L1 attrition is not a process that leads to total loss of L1 knowledge but rather as a convergence towards an L2 whereby attriters take up L2 structures in some aspects of grammar (Pavlenko, 2002).

### **Regression hypothesis**

As one of the earliest linguistic frameworks, Regression Hypothesis deals with the processes of learning and forgetting. This theory initially proposed by Jakobson (1941, cited in Köpke, 2004) for aphasia is based on the assumption that language loss in aphasia mirrors language development in children. It was later adapted to attrition by de Bot and Weltens (1991) in that language components might be lost in the reverse order in which they were acquired. It rapidly became evident that this hypothesis does not hold with respect to aphasia, since this disorder is generally not progressive in nature and affects only parts of linguistic competence, depending not on internal linguistic factors, but on external factors related to brain injury.

There exist two versions of the theory; one that is based on chronology (order) which states that the order in which attrition occurs is opposite to the order in which language was acquired; and one that is based on reinforcement (Köpke & Schmid, 2004) which is

also called inverse relation hypothesis (Yoshitomi, 1994, cited in McCormack, 2004) which states that what has been learned best, i.e. most often used/reinforced, will be most resistant to loss.

While an important body of research (Jordens, de Bot, Van Os, & Schumans, 1986; Jordens, de Bot & Trapman, 1989; Kuhberg, 1992; Olshtain, 1989; Schmid, 2002, cited in Köpke, 2004) has been conducted within Regression Hypothesis framework and several studies demonstrated the power of regression hypothesis (Hansen & Chen, 2001 as cited in Goral, 2004), it has been accepted that Regression Hypothesis can not account for all cases of observed language decline (Caramazza & Zurif, 1978; Hyltenstam & Viberg, 1993) and does not hold with respect to aphasia (Caramazza & Zurif, 1978).

### **Universal grammar**

There have been a number of studies conducted within the UG framework such “as the use of null vs. overt pronoun in Italian or Greek vs. English (Bouba et al., 2002; Sorace, 2000) in Turkish vs. English (Gürel, 2004) and Japanese vs. English (McCormack 2004) or the compounding parameter in Spanish vs. English (Cuza, 2002)” (p. 18).

The controversy as to whether parameters can be reset in L2 acquisition and the role of markedness has interested many researchers (Clashen & Muysken, 1989). It has been suggested that a marked parameter in L1 might be reset to an unmarked value in L2. The principle underlying this notion is the Redundancy Reduction Principle (Seliger, 1996). The simple idea behind this theory is that “when two languages come into contact within the same psycholinguistic environment, the speaker is forced to solve the duplication of rules and functions in two languages and simplify the cognitive overload” (p. 616). Based on UG framework, attrition is not random forgetting but is guided by principles for arriving at the most effective grammar that can serve both languages. Accordingly the bilingual creates a new rule for L1 in those areas of grammar where the L2 rule is simple or less marked. Those forms that are less marked in L2 are more likely to replace more marked forms in L1, thus the less marked forms in L1 seem to be more resistant to attrition.

While within the UG framework the process of attrition is guided by [the](#) Redundancy Reduction Principle, it is also motivated by learning principles that determine the learnability of structures in L1 acquisition namely Uniqueness Principle and Subset Principle. According to [the](#) Uniqueness Principle, for any semantic concept there will be only one syntactic or morphological realization. In the case of bilingualism a semantic concept may be realized in two different grammars. In the process of primary language attrition the two languages of the bilingual have a semantic concept or function in common which is expressed in two different ways, but only one of these realizations that are available to the speaker will survive (Seliger, 1996).

Based on the subset principle, given two possible grammatical versions of the same concept, that which is most restrictive and present in the input will be preferred. In other words, in the process of L1 attrition when the input data in the L2 contains a comparable grammatical feature that is more universal and less marked than the competing grammar in the primary language, that form in the L2 will be favored. Therefore, [the](#) Uniqueness Principle and [the](#) Subset Principle guide the reduction of redundancy between combined L1 and L2 grammars.

### **Linguistic feature hypothesis**

Another linguistic theory which accounts for the process of attrition is Andersen's (1982) linguistic feature hypothesis. This hypothesis accounts for the fact that an item in the attriting language similar to the corresponding structure in the other language will be more likely to be retained than a dissimilar one. He explained this hypothesis along with [the](#) Regression Hypothesis and elaborated that these hypotheses focus on two major areas. First, these hypotheses state that the nature of the linguistic elements themselves, such as whether they are of high or low frequency, and whether they are marked or unmarked, will be important in determining if they are lost. Second, these hypotheses propose that the relationship between the corresponding structures in the dominant and attriting language is a factor; moreover the amount of contrast between the structures in the two languages will help determine what will be vulnerable to attrition.

### **Psycholinguistic perspective**

Psycholinguistic aspects of attrition have received little attention until recently, but the evidence available suggests that attrition may be psycholinguistic in nature (de Bot, 2002).

### **Activation threshold hypothesis**

[The Activation Threshold](#) Hypothesis (ATH) was initially proposed by Paradis (1985, 1993) to account for differential recovery in polyglot aphasia and only recently has the theory been applied to the study of language attrition (Köpke, 2002). It specifies the relation between the frequency of use of a linguistic item and its activation and availability to the language user. Accordingly it is assumed that linguistic items have thresholds that change on the basis of frequency and recency of use. Low activation thresholds yield faster and easier access than higher thresholds.

Activation and inhibition mechanisms appear to account for the control of multiple languages in the brain (Green, 1986; Paradis, 1993) as well as for changing dominance patterns. ATH assumes that items (or languages) that are more frequently activated need less stimulation to be reactivated than items (or languages) that are less frequently activated (Paradis, 1985, 1993). In other words, when a particular linguistic item has a high activation threshold, more activating impulses are needed to reactivate it (Paradis, 1997, cited in Gürel, 2004). Within this framework, attrition is predicted in the form of reduced accessibility as a natural consequence of lack of language use (Köpke & Schmid, 2004).

Applying this notion to the context of bilingual memory, when one language is selected, the other language is simultaneously inhibited. This means that the activation threshold of the unselected language is raised (Paradis, 1989, cited in Gürel, 2004). Thus language attrition occurs as a result of long-term absence of stimulation of one of the languages of the bilingual. It should be noted that this does not mean that the linguistic system of the bilingual is completely lost due to inhibition or a high activation threshold (Green, 1986). Depending on the frequency of use, different linguistic items

within the same language might require various degrees of stimulation in order to become activated (Paradis, 1997).

### **Critical period hypothesis**

One of the areas related to psycholinguistic aspect of attrition is age. As Kaufman (2001) points out “attrition of L1 among older children and adults differs from the L1 attrition process among pre-puberty children” (p. 19). Since attrition and acquisition are tightly linked, it is assumed that attrition is influenced by the same factors which have led to **the** Critical Period Hypothesis (CPH) which assumes that due to brain maturation constraints L2 learning becomes more difficult after a certain age. **Since** no consensus has been reached so far with respect to existence and age limits of critical period, a ‘sensitive period’ was suggested which implies that younger children are better L2 learners due to maturational constraints and consequently more readily forget their L1 (Ventureyra & Pallier, 2004).

Studies indicate that the age of the onset of bilingualism and the age of the onset of attrition are important (Montrul, 2002). There is converging evidence that an L1 system can indeed be eroded to a quite dramatic degree if the attrition process sets in well before puberty (Isurin, 2000; Kaufman & Aronoff, 1991; Nicoladis & Grabois, 2002; Schmitt, 2004; Seliger, 1989, 1991; Turian & Altenberg, 1991; Vago, 1991). Similar findings were obtained for L2 attrition among children (Berman & Olshtain, 1983; Kuhberg, 1992; Olshtain, 1986). Preliminary results from a recent study even point towards the L1 being lost to an extent that psycho-neurolinguistic methods can detect no trace of it any more (Ventureyra & Pallier, 2004). Köpke (2004) points out that attrition in children is much more severe than in adults. All studies dealing with L1 attrition in young children relate substantial restructuring of the children’s linguistic competence beyond **anything** that has been observed in adult L1 attrition. Studies investigating adopted children (Ventureyra & Pallier, 2004) suggest that in such extreme cases L1 is forgotten at a very quick rate (Isurin, 2000; Nicoladis & Grabois, 2002). Others have found that the younger the children and the lower the language proficiency, the faster the attrition process (Bahrick, 1984; Hansen, 1999; Kaufman & Aronoff, 1991).

Some studies involving subjects for whom the onset of attrition was after puberty found no age effect (Jaspaert & Kroon, 1989) regardless of the languages involved or the means of data elicitation. The dramatic attrition effect found in children is not compatible with findings with respect to adults. In most cases attrition was mild considering the amount of time spent in an L2 environment, even after many decades (Köpke, 2004). Köpke reports that de Bot & Clyne (1994) and Jordens et al. (1989) found little or no attrition in first generation immigrants and in many studies communication in L1 did not appear to be severely disrupted by attrition.

### **Competence vs. performance**

Sharwood Smith (1983a & 1983b) is among the first scholars who drew attention to the distinction between competence and performance. As he says, attrition at the level of competence is concerned with underlying linguistic competence and entails a restructuring of what is known about the language. Attrition at competence level is reflected in the inability to make grammaticality judgments or to perform tasks such as paradigmatic conjugations or declensions done by native speaker monolinguals.

As Seliger and Vago (1991) pointed out “the languages spoken by the bilingual may be said, metaphorically, to coexist in a state of competition for a finite amount of memory and processing space in the mind of the speaker” (p. 5). Seliger (1996, p. 606) states that attrition in competence and can express itself as:

- 1) the ability to recall a meaning shared by both the L1 and the L2 but only being able to retrieve the L2 lexical item;
- 2) rule reordering or simplification in the morphophonemics of the L1 or the inability to inflect in accordance with previously acquired morphology, or not being aware that incorrectly inflected morphology is deviant where previously the speaker inflected in accordance with the L1 grammar;
- 3) the acceptance of syntactically deviant sentences and the correction of syntactically grammatical sentences.

At the level of performance attrition results in difficulties in controlling knowledge (Ammerlaan, 2001) which results in two types of phenomena: Lexical retrieval or word

finding problems (Goral, 2004; Köpke, 2004; Seliger, 1996) and processing difficulties which are in close relation with the cognitive demands of the tasks used for data collection (Dussias, 2002).

In the case of a reversal of dominance patterns, with L2 gradually becoming the stronger language, bilinguals may reach a point where “(a) processing of L1 is not only slowing down but also becoming more and more influenced by L2; (b) and where lack of speed and/or accuracy may eventually lead to difficulties” (Köpke, 2004, p. 6). It is at this point that attrition starts to be manifested.

The clearest demonstration of this disorder can be found in Ammerlaan et al. (2001) whose studies are based on a “psycholinguistic design allowing a differentiation between productive and receptive language skills with respect to lexicon” (p. 21). Both use a picture naming task to test lexical retrieval and a picture-word-matching task for testing lexical access. The results show that accessibility of the lexicon is clearly reduced as evidenced by difficulties in the [picture-naming](#) task, whereas receptive skills measured in the matching task are less impaired.

Sharwood Smith (1983a) suggests that competence/performance distinction reveals itself in three distinct stages:

- 1) Systematic deviation in performance while competence remains stable.
- 2) Transitional period where the bilingual is in possession of a new externally conditioned variety of his/her language, but preserves the ability to switch back to the standard version of the language when required by the circumstances.
- 3) Emergence of a new competence characterized by a decrease in structures available to the speaker.

While such restructured linguistic systems have not yet been described for late attriters, they have repeatedly been observed in children (Kaufman & Aronoff, 1991; Seliger, 1989, 1991). Regarding late bilinguals, the evidence suggests that attrition is in most cases restricted to performance deviations as in stage 1 above. In some cases (whether under specific external conditions or regarding particular linguistic features or domains)

it might be possible to observe the coexistence of two varieties as described in stage 2 above which Major (1992) observed for phonetics.

### **Level of education in L1**

In the context of bilingualism, proficiency level is influential for bilinguals who have completed their L1 acquisition before attrition. But this may not be the case for bilinguals who have begun losing their L1 before its acquisition has been completed (Köpke, 2002; Turian & Altenberg, 1991). Jaspaert and Kroon's (1989, cited in Köpke & Schmid, 2004) pilot study on attrition among 30 Italian immigrants in the Netherlands measured by scores on various language tests (vocabulary, text editing, sentence correction, and general comprehension measured by a picture sentence matching task) showed education level to be the most strongly significant factor in the tests where there was evidence for attrition, namely text editing and vocabulary tests.

### **Length of stay**

Some studies have pointed towards a link between the time that an immigrant has been exposed to another language and the degree of attrition in L1 (Waas, 1996; Soesman, 1997; Hutz, 2004), eventually leading to a change in the language dominance (Magiste, 1979; Köpke & Schmid, 2004), while others have suggested that time factor may only have a limited effect (de Bot & Clyne, 1994; de Bot, Gommans, & Rossing, 1991; Hutz, 2004). Despite the controversy over the time factor, an 8-year stay is believed to be a baseline (De Bot, Gommans, & Rossing 1991; Jordens, de Bot, & Trapman, 1989).

### **This study**

This study attempts to make a contribution to the field of primary language attrition in the second language environment. It investigates Persian-English language pair and studies the influence of English as a second language on Persian as the first language of speakers. It aims to illustrate traces of attrition in the syntactic domain namely relative clause, adverb position, and pro-drop. It particularly focuses on those who have completed acquisition of their L1 before moving into an L2 environment. Specifically speaking, this study attempts to see if there is a difference between Persian

monolinguals and bilinguals on their preference for L1 and L2 relative clause structure, adverb position and pro-drop parameter.

### **Participants**

The participants in this study included both Persian monolinguals and Persian bilinguals with English as their L2. The first group included 30 native speakers of Persian with little knowledge of English with ages ranging between 16 and 17. This group was selected for two reasons. First, they had already attained ultimate attainment in their L1. Second, they had not started their higher education in which case a good command of L2 could have affected their L1. The second group included 35 native speakers of Persian with English as their L2. The criterion for inclusion was a minimum of an 8-year stay in an English speaking country. This is an accepted baseline reported in attrition studies (see above).

Some of the participants were selected from the International School in Tehran where students who have just come back from an L2 environment and have linguistic difficulty adapting to the L1 environment study. Most of them left Iran when they were in primary school and were exposed to English at the age of 7-10. In other words, they had learned their L1 before being exposed to the L2. They came back to Iran quite recently and were between 16 and 18 years of age. Out of 50 students who filled out the questionnaire only 20 enjoyed the criterion of living in an English speaking country for at least 8 years. These 20 participants were given the test booklet but only 9 of them were selected for further analysis. A deeper and more precise examination of the questionnaires revealed that 11 of these students were born in an English speaking country and it was decided that this could intervene with purposes of research because we needed to include those who had already acquired their L1. This group of participants constituted the early bilingual group, because they started learning their L2 at an early age, i.e., between 7 and 10 years old. The participants from the International School were all girls.

A second group of the bilingual participants were adults who had left Iran after they finished guidance school and were exposed to English at the age of 16 to 20 and lived in

an English speaking country for more than eight years. While living there, they were using English rather than Persian quite often (data about these details were gathered through a questionnaire). These participants were identified by the researchers' colleagues in Canada and England. This group of participants aged between 24 and 32 constituted the late bilingual group because they started learning their L2 at a later age. Both monolingual and bilingual groups were naïve to the purposes of study. The following table shows the distribution of participants whose data were chosen for statistical analysis.

**Table 1.** Distribution of subjects

	N	Age range	Gender	First exposure to L2	
Monolinguals	35	16 – 17	35F	–	–
Early bilinguals	9	16 – 18	9F	–	7 – 10
Late bilinguals	15	24 – 32	4F	11M	16 – 20

### **Materials**

The materials in this study included a questionnaire and a test. The questionnaire had three sections. The first section elicited personal information including the participants' name, sex, telephone and e-mail address, date and place of birth, occupation as well as highest level of schooling. The second section provided linguistic information about the subjects' mother tongue, language of education at different levels of primary school, guidance school, high school, and university, the degree of using English and Persian which was elicited indirectly by asking them about their language of communication at home, work and social encounters. The third section was concerned with data regarding the age of first exposure to English, age of arrival to Iran and length of stay in an English speaking country.

The test sentences used in this study, which were in Persian, were designed by the researchers. They were checked and rechecked for naturalness by three other Persian native speakers. Since the early bilinguals had limited knowledge of Persian, attempt was made to choose simple sentences. Any vague or difficult word was avoided so that it would not affect the subjects' performance and consequently the test results. The test included 50 pairs of sentences in Persian (30 pairs made up the test sentences and 20

pairs the fillers). The sentences belonged to **three** categories including relative clause, adverb position, and pro drop. For each category there were 10 sentence pairs. In each pair, one sentence followed the Persian structure and the other followed the rules of English. Each pair was sequenced randomly. Below you see examples for each category.

<b>Structure</b>	<b>Examples:</b>	<b>English</b>	<b>Persian</b>
Relative clause	This is the instrument that you had ordered it.	Wrong	Correct
	This is the instrument that you had ordered.	Correct	Correct
Adverb position	Mary angrily ate her breakfast.	Wrong	Correct
	Mary ate her breakfast angrily.	Correct	Correct
Pro-drop	The test was so difficult that failed.	Wrong	Correct
	The test was so difficult that I failed.	Correct	Correct

It is worth mentioning that in each pair both sentences are possible in Persian, though except for the case of adverb position (where the two structures are equally acceptable) one is considered as more acceptable (prescriptively speaking, see Gholam-ali-zadeh, 1998/1377). But based on the English structure, only one is accurate. Throughout this study, the structure which is ungrammatical in English will be referred to as the Persian structure.

## **Results**

The design of the study is  $2 \times 3$ . There are two independent variables in this study: group with two levels including monolinguals and bilinguals and the syntactic structure with three levels including relative clause, adverb position and pro-drop. The participants' score on the test is the dependent variable.

### **Persian monolinguals' performance**

The Persian monolinguals' performance on each of the three syntactic structures is shown in Table 2.

**Table 2.** Descriptive statistics for the Persian monolinguals' preferences for the three structures (N = 30)

		Mean	SD
Relative Clause	English	4.13	2.08
	Persian	5.86	2.08
Adverb Position	English	5.50	1.99
	Persian	4.50	1.99
Pro-drop	English	2.06	1.76
	Persian	7.83	1.94

Based on the mean scores of relative clause structure, the monolinguals prefer the Persian structure. The mean score for Persian structure is 5.86 while the mean score for English structure is 4.13.

Regarding the Adverb position, the results show that the monolinguals' mean score for the English structure is 5.50 and their mean score for the Persian structure is 4.50. This result could be explained by the fact that in Persian both positions are equally acceptable.

Considering the Pro-drop parameter, the mean score suggests that the monolinguals have an inclination towards the Persian setting; they have a mean score of 7.83 for Persian structure and a mean of 2.06 for the English structure. The monolingual group's performance provides a baseline against which the bilinguals' performance will be compared.

To see if there is any significant difference between the monolinguals' preferences for the English and the Persian structures in each structure type, paired sample t-tests were conducted. Table 3 below shows the results:

**Table 3.** Results of paired t-tests for the difference between Persian monolinguals' preferences for the three structures in English and Persian

	t	df	Sig.
Relative Clause (English vs. Persian)	-2.282	29	<b>.030</b>
Adverb Position (English vs. Persian)	1.372	29	.181
Pro-drop (English vs. Persian)	-8.598	29	<b>.000</b>

Comparisons conducted through t-test revealed that in relative clause the difference in English and Persian structure is significant ( $t_{29} = -2.28$ ,  $p < .05$ ) and this shows that monolingual native speakers have a high preference for Persian structure in relative clauses.

Concerning adverb position, the difference is not significant ( $t_{29} = 1.372$ ,  $p > .05$ ); it means that to a native speaker of Persian the two adverb positions, i.e., before the object and between the object and the verb, are equally acceptable. However, the difference is significant regarding the Pro-drop in English and Persian structure ( $t_{29} = -8.598$ ,  $p < .05$ ). The monolingual native speakers have a high preference for Persian pro-drop structure. The results for the monolingual group is used as a [yardstick](#) to find out whether the bilinguals perform differently from the monolinguals and whether there is any divergence which could indicate attrition.

### Persian bilinguals' performance

Descriptive statistics was calculated for the bilinguals' performance in the three structures. The results are presented in Table 4.

**Table 4.** Descriptive statistics for the Persian bilinguals' preferences for the three structures (N = 24)

		Mean	SD
Relative Clause	English	5.58	.416
	Persian	4.66	.419
Adverb Position	English	5.33	.419
	Persian	4.75	.409

Pro-drop	English	3.83	.627
	Persian	6.54	.637

Considering the mean scores for each syntactic category, it can easily be noticed that in relative clause, the bilinguals have a tendency towards the English structure by having a mean of 5.58 which is different from their score on Persian structure, i.e., a mean of 4.66. Regarding the adverb position, the bilinguals preferred English structure by gaining a score of 5.33.

While the bilingual subjects showed deviation from the Persian structure and a preference for English structure in relative clause and adverb position, their performance in Pro-drop was quite different. The results show that the bilinguals have not yet lost their preference for the Persian structure. The mean score for Persian structure is 6.54 while that for the English one is 3.83. Paired sample t-tests were conducted to find out whether these differences are significant or not. Table 5 shows the results.

**Table 5.** Results of paired t-tests for the difference between Persian bilinguals' preferences for the three structures in English and Persian

	t	df	Sig.
Relative Clause (English vs. Persian)	1.126	23	.272
Adverb Position (English vs. Persian)	.717	23	.481
Pro-drop (English vs. Persian)	-1.923	23	<b>.048</b>

Based on the planned comparisons, it can be inferred that despite the difference in mean scores of the relative clause of Persian and English structures, this difference is not statistically significant ( $t_{23} = 1.126, p > .05$ ).

Regarding the adverb position, the same results were obtained. The mean scores show a difference in performance but statistical analysis indicates that this difference is not significant ( $t_{23} = .717, p > .05$ ).

However, regarding pro-drop parameter in English and Persian structure the difference is significant ( $t_{23} = -1.923, p < .05$ ). It indicates that the bilinguals have not yet lost their preference for Persian structure. This supports the Regression Hypothesis (Jakobson, 1941, cited in Köpke, 2004) which states that language components might be lost in the reverse order in which they were acquired. Pro-drop parameter is among the first areas of language acquired by children and based on the Regression Hypothesis it is the most resistant to loss. The available results provide support for this argument.

Since age of L2 acquisition has always played a role in learners' performance, the researchers decided to categorize the bilinguals into two groups of early and late based on their first exposure to L2. It might be the case that early bilinguals undergo attrition because their L1 acquisition has not been completed. But if it is found that the pattern of attrition is the same for both early and late bilinguals, it will be concluded that level of education in L1 is not a determining factor in attrition, while Jaspaert and Kroon's (1989, cited in Köpke & Schmid, 2004) study showed that education level is a significant factor. Based on this justification, those participants who left Iran for an English speaking country before the age of 10 were considered as early bilinguals and those who left here after the age of 16 were considered as late bilinguals.

### Early bilinguals' performance

Table 6 illustrates descriptive statistics for the performance of early bilinguals.

**Table 6.** Descriptive statistics for the Persian early bilinguals' preferences for the three structures (N = 9)

		Mean	SD
Relative Clause	English	6.44	2.29
	Persian	3.55	2.29
Adverb Position	English	6.11	2.75
	Persian	3.88	2.75
Pro-drop	English	7.33	2.06
	Persian	2.66	2.06

As you will remember, the monolinguals had a preference for Persian structure in relative clause, but as Table 6 shows, the early bilinguals have a different preference. The mean score for English structure is 6.44 which is very different from the mean score for Persian structure, i.e., 3.55. Based on this preliminary result it can be inferred that the early bilingual group has diverted from their monolingual peers.

Regarding adverb position, the descriptive statistics shows that the early bilinguals have a preference for the English structure by having a mean score of 6.11 as opposed to 3.88 for Persian structure. In other words, the early bilinguals are not satisfied with sentences that have the adverb between object and verb.

Furthermore, the English structure of Pro-drop was preferred at a higher rate by the early bilingual group. The mean score for English structure is 7.33 in comparison to the Persian structure which is 2.66. Although the descriptive statistics have provided an outlook of the early bilinguals' preference, in order to determine the precise amount of their divergence from the monolingual group, comparisons using t-test are conducted. The results are illustrated in Table 7.

**Table 7.** Results of paired t-tests for the difference between Persian early bilinguals' preferences for the three structures in English and Persian

	t	df	Sig.
Relative Clause (English vs. Persian)	1.886	8	.096
Adverb Position (English vs. Persian)	1.208	8	.261
Pro-drop (English vs. Persian)	3.395	8	<b>.009</b>

Despite the apparent difference in the mean score between English and Persian relative clause structures, the comparisons revealed that the difference is not statistically significant ( $t_8 = 1.886$ ,  $p > .05$ ). Although the difference is not significant, the P value is .096 which is very close to .05. It could be interpreted that a majority of the early bilinguals preferred the English structure but still another majority preferred the Persian structure. Even this result is enough to conclude that the early bilinguals perform differently from the monolingual group and have developed a divergence which could provide support for attrition.

As for the adverb position, the difference between English and Persian structure is not statistically significant in the early bilinguals performance ( $t_8 = 1.208$ ,  $p > .05$ ). Early bilingual, quite like the monolinguals, opt for both positions for adverbs.

With respect to the pro-drop, comparisons illustrated that the difference is significant ( $t_8 = 3.395$ ,  $p < .05$ ). The early bilinguals have lost their preference for the Persian structure and recognize the English structure as more natural. This supports the claim that attrition has occurred in the early bilingual group. The inclination towards English structure in pro-drop for early bilinguals can be explained in this way. When two languages come into contact, the bilingual has to reduce the duplication of rules and functions in two languages and simplify the cognitive overload. The less marked rules of L2 will therefore replace the more marked rules of L1. Applying this concept to attrition in pro-drop in early bilinguals, it could be suggested that being young and less proficient in their L1, the early bilinguals have replaced the Persian structure with English structure. The finding refutes the Regression Hypothesis which predicts that features that are acquired early in children are least vulnerable to loss.

### Late bilinguals' performance

Regarding the late bilinguals, a similar descriptive analysis was conducted and the results are presented in Table 8.

**Table 8.** Descriptive statistics for the Persian late bilinguals' preferences for the three structures (N = 15)

		Mean	SD
Relative Clause	English	5.066	1.751
	Persian	5.333	1.633
Adverb Position	English	4.866	1.407
	Persian	5.266	1.222
Pro-drop	English	1.733	.703
	Persian	8.400	.632

The late bilinguals' performance is quite different from the early bilinguals which could suggest that the age of exposure to an L2 and level of proficiency in L1 affect bilinguals' performance. With regard to relative clause, the late bilinguals have a preference for both structures. The means are 5.066 and 5.333. The late bilinguals treat both structures similarly and the mean score obtained is hardly any different. Contrary to the early bilinguals who had a higher preference for the English relative clause structure, although not to a significant degree, late bilinguals make no distinction between the two structures. *At any rate*, late bilinguals' performance is different from the monolinguals because monolinguals preferred the Persian relative clause structure. So there are traces of attrition both in the early bilingual and late bilingual groups: both differ from Persian monolinguals.

Concerning adverb position, the late bilinguals have an inclination towards the Persian structure by scoring a mean of 5.26. Nevertheless, it can be interpreted that the late bilinguals' performance is not different from that of monolinguals. Their preference is rated higher for Persian structure.

Interesting to notice is that the late bilinguals' performance on pro-drop was very different from that of early bilinguals. The late bilinguals have not yet lost their preference for the Persian structure despite the amount of time they have spent in an L2 environment. They have a mean score of 8.4 for Persian structure as opposed to the early bilinguals who scored 2.66. The results imply that the late bilinguals are more resistant to attrition and language loss than the early bilinguals. Further statistical analyses were conducted with t-test. Table 9 below shows the results.

**Table 9.** Results of paired t-tests for the difference between Persian late bilinguals' preferences for the three structures in English and Persian

	t	df	Sig.
Relative Clause (English vs. Persian)	-.326	14	.750
Adverb Position (English vs. Persian)	-.634	14	.536
Pro-drop (English vs. Persian)	-26.453	14	<b>.000</b>

Results show that the late bilinguals' preference for English and Persian relative clause structure is not statistically significant. This is also true for adverb position.

Regarding the pro-drop parameter, the difference is statistically significant. That is, their preference for Persian structure is at a higher rate than English. This can be explained through the Regression Hypothesis. The language components that are learnt first are more resistant to attrition. Moreover, since level of education affects the extent of attrition, it can be argued that the more the bilinguals are proficient in their L1, the more they are resistant to attrition.

Up to now, each syntactic category was examined within each group separately, and now we have a clear picture of each group's performance. Another planned comparison was conducted to observe the differences across groups. The results are illustrated in Table 10.

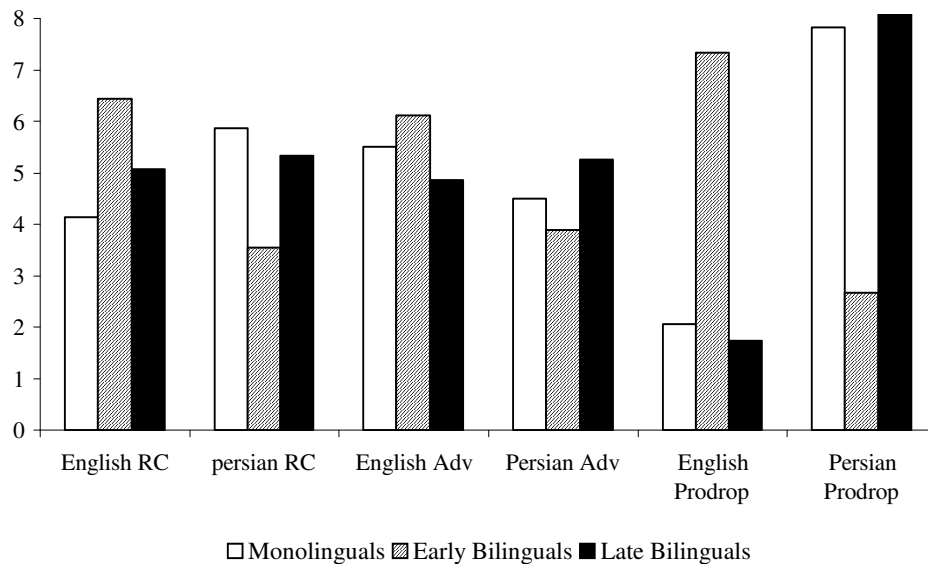
**Table 10.** Means for the three groups' preference for the three structures

	RC		Adverb position		Pro-drop	
	English	Persian	English	Persian	English	Persian
Monolinguals	<b>4.13</b>	<b>5.86</b>	5.5	4.5	<b>2.06</b>	<b>7.83</b>
Early Bilinguals	6.44	3.55	6.11	3.88	<b>7.33</b>	<b>2.66</b>
Late Bilinguals	5.06	5.33	4.86	5.26	<b>1.73</b>	<b>8.4</b>

Based on this table, it can be inferred that with regard to the relative clause, the monolinguals gained the lowest mean score for the English structure and the early bilinguals performed at a higher rate than the late bilinguals.

Considering adverb position, the late bilinguals had a lower mean score than the monolingual group for English structure and thus the early bilinguals scored the lowest for Persian structure.

Regarding the pro-drop parameter again the late bilinguals had the lowest mean score while the early bilinguals obtained the highest mean score for English structure. The findings are graphically represented in Figure 1 below.



**Figure 1.** Three groups’ preference for the three structures

As the above figure illustrates, the monolingual group scored higher for Persian relative clause than the English counterpart. Meanwhile the early bilinguals scored higher for the English relative clause structure than the Persian structure and the late bilinguals did not show a great difference in their choice of preference for either of the structures in relative clause. Therefore with regard to the English relative clause structure the early bilinguals score the highest followed by the late bilinguals and the monolinguals for the English structure. The pattern for the other structures can be found from the figure.

Now, in order to see if the groups differed in their preference for the English vs. the Persian structure in each of the three categories, separate one-way ANOVAs were conducted. Thus addressing question number 1 of this study, the following null hypothesis was tested; “there is no difference between Persian monolinguals and bilinguals as far as their performance on L1 and L2 relative clause structures is concerned”. The following table shows results.

**Table 11.** Results of ANOVA for the three groups' preferences for the English relative clause structure

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	38.711	2	19.356	4.687	.014
Within Groups	210.622	51	4.130		
Total	249.333	53			

The results show that the groups differ ( $F_{(2, 51)} = 4.687, p < .05$ ). The post-hoc Scheffe test results showed that only the difference between monolinguals and early bilinguals was significant ( $p = .016$ ). This means that early bilinguals have undergone attrition; their L1 is more like their L2.

Next, the following null hypothesis was tested: “there is no difference between Persian monolinguals and bilinguals as far as their performance on L1 and L2 adverb position is concerned.” The following table shows the results of ANOVA for the comparison of the three groups for their preference for English adverb position.

**Table 12.** Results of ANOVA for three groups' preferences for the English adverb position structure

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.081	2	4.541	1.135	.330
Within Groups	204.122	51	4.002		
Total	213.204	53			

As the table shows, the difference across groups for adverb position is not significant. This means that the three groups' preference of the English type of adverb position is equally the same. This is predictable because Persian allows the adverb to appear in every position.

Finally, the following null hypothesis was tested: “there is no difference between Persian monolinguals and bilinguals as far as their performance on L1 and L2 pro-drop parameter is concerned”. The following table shows the results.

**Table 13.** Results of ANOVA for the three groups' preference for the pro-drop structure in English

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	218.015	2	109.007	42.503	.000
Within Groups	130.800	51	2.565		
Total	348.815	53			

The difference across groups was significant for pro-drop. The post-hoc Scheffe test results suggest that early bilinguals scored higher than the two other groups in English structure. In other words, test results showed that while monolinguals and late bilinguals' preference is the same (the Persian structure), the early bilinguals significantly differ from both groups and opt for the English structure.

Generally speaking, the results demonstrated that regarding relative clause and pro drop, the difference between monolinguals and early bilinguals was significant. This means that, the early bilinguals have diverged from the Persian structure and rated a higher preference for the English structure. This can be taken as a sign of attrition.

## Discussion

The results of this study indicate that the bilingual group has diverged from the monolingual group in their choice of preference. The preliminary findings indicated that the late bilingual group had not lost their preference for pro-drop Persian structure despite the amount of time they had lived in an English speaking country. This provides support for the Regression Hypothesis (Jakobson, 1941, cited in Köpke, 2004) which states that language components might be lost in the reverse order in which they were acquired. Pro-drop parameter is among the first areas of language acquired by children and based on [the](#) Regression Hypothesis it is the last and most resistant to loss.

However, by dividing the bilingual group into early and late groups based on the age of exposure to an L2, further findings were drawn. It became apparent that the early bilingual group's preference was very different from the late bilingual group; the early

bilingual group had lost their preference for Persian structure in pro drop and the available data refuted [the](#) Regression Hypothesis. This supports the hypothesis that age of exposure to L2 and level of education in L1 significantly affect the bilinguals' preferences. This difference was particularly evident in pro-drop parameter. The early bilingual group had high inclination towards the English structure while the late bilinguals preferred the Persian structure.

### **Theoretical and pedagogical implications**

The findings of this study shed light on the Regression Hypothesis theory. It appears that age plays a role in the process of attrition. This hypothesis does not apply to early and late bilinguals in the same way.

Studies on attrition that focus on L2 attrition in L1 environment can have countless direct pedagogical implications. But this study concerned itself with L1 attrition and the way L2 affects this attrition. Thus, although the results cannot have direct pedagogical implications, they do provide researchers in the field of applied linguistics with fruitful implications. As an example, this study could show that there is a certain age at which bits of linguistic knowledge are immune to forgetting, which can be very helpful for those involved in language policy and curriculum design.

### **Suggestions for further research**

[This study was carried out in the field of Persian language attrition, an area where very little research has been conducted.](#) As explained above, this study dealt with syntax and studied attrition from a linguistic point of view. It did not take into account the influence of motivation and other sociolinguistic aspects of language. It will be useful if further study examines attrition from a sociolinguistic point of view.

Another area that needs further research is whether the rate of attrition is the same across all the language components. For further research it will be fruitful if attrition is examined in different domains i.e., lexicon, semantics, and morphology as well. Moreover, this study examined L1 attrition. But attrition in L2 is also another [worthy](#) area of research. [Finally](#), using different elicitation techniques and tasks for eliciting

data, one can see whether these results are corroborated or not. For example on-line instruments can be used since they will give a more precise account of brain processes.

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