



The Role of Persian L1 and English L2 on the Acquisition of L3 Indefinite Frequency Adverbs

Emad Khosravani

Department of English, Yazd University, Iran
Emad_Khosravani@Yahoo.Com

Ali-Akbar Jabbari (Corresponding Author)

Department of English, Yazd University, Iran
jabbari@yazd.ac.ir

Ali-Mohammad Fazilatfar

Department of English, Yazd University, Iran
afazilatfar@yazd.ac.ir

Mohammad-Javad Rezai

Department of English, Yazd University, Iran
mrezai@yazd.ac.ir

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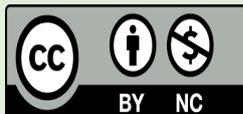
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Abstract

This study aims to identify the role of transfer in the L3 acquisition of indefinite frequency adverbs, be it L1, L2 or both; and to find out whether CLI occurs on a feature-by-feature basis or as a wholesale phenomenon. Also, this study intends to investigate the influence of the learners' L2 proficiency on the L3 acquisition of indefinite frequency adverbs; and to examine the effect of different task modalities on the facilitative/detrimental role of background languages in the transfer of indefinite frequency adverbs in the early stages of German learning. To this end, we studied 30 Persian-speaking L3 learners with previous L2 knowledge of English. We collected data from a grammaticality judgement task to account for learners' receptive knowledge and an element rearrangement task to measure learners' production. The data were analyzed using multivariate tests and paired samples t-tests, which allowed us to estimate the effects of background languages, learners' L2 proficiency, and task type on the acquisition of indefinite frequency adverbs in L3. The results contradicted the wholesale CLI and supported the hybrid transfer models of CEM and LPM, which claim that transfer occurs property by property. The results also refuted the role of micro-variables, including learners' L2 proficiency and task type.

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Introduction

Recently, there has been increasing interest in L3 Acquisition (L3A) in formal approaches to language, with several studies examining numerous language combinations (e.g., Jin, 2009; Berkes & Flynn, 2012; Hermas, 2015; Rothman, 2015; Westergaard, Mitrofanova, Mykhaylyk, & Rodina, 2017). Compared to Second Language Acquisition (SLA), the study of L3A is a new and flourishing field in linguistics. One of the main issues that has received extensive consideration in Third Language Acquisition (TLA) and which relates to both L2 and L3, is the Cross-Linguistic Influence (CLI) in language acquisition. CLI can clarify how and under what conditions prior linguistic information can influence the production and comprehension of a target language.

Frequency adverbs can be one of the necessary constructions of English grammar and a problematic area for EFL learners. Hernández (2006, 272) states that a very common type of error that learners make when producing grammatical structures involves the use of adverbs, specifically misplacing them in the sentence. L2 learners encounter problems in the acquisition and mastery of adverbs mainly from two perspectives: flexible positioning and L1 interference (Kanduboda, 2017). L3 learners may also experience such difficulties in the acquisition of adverbs, particularly in terms of flexible positioning, L1 and L2 intervention.

In this study, the researchers intend to investigate the role of Persian L1 and English L2 in the acquisition of German L3 indefinite frequency adverbs. Therefore, we will explain some previous models of L3A, starting with those that assume that either the L1 or the L2 has a privileged status in terms of CLI. Then, we will examine models that focus on the role of structural factors, such as CEM (e.g., Berkes & Flynn, 2012), LPM (e.g., Westergaard et al., 2017), and typology-based models such as TPM (e.g., Rothman, 2015), in order to investigate whether both languages will contribute to CLI in the L3A of frequency adverbs, or whether one of them is chosen as the sole source of influence.

Proficiency has been regarded as one of the most important elements in CLI research. There are contrasting views among researchers regarding the proficiency levels of both the target and the native language and their role in transfer. Some studies believe that transfer occurs at the low proficiency level (Williams & Hammarberg, 1998; Hammarberg, 2001), while others initiate a contrasting view by confirming that higher proficiency levels are strongly associated with more positive transfer in the L3A (see, for example, Williams & Hammerberg, 1998; Leung, 2006). Consequently, another important factor to be considered in this research is the extent to which learners' L2 proficiency that may contribute to the CLI in the L3A of indefinite frequency adverbs.

Previous studies that have taken into account the LPM have examined L3A contexts with mainly simultaneous bilinguals acquiring an L3 and used research designs that did not control for micro variables such as second language proficiency or task type. However, the learners studied in this research were not simultaneous bilinguals. Thus, this study can help to fill the gap by providing evidence that the level of second language proficiency or the type of tasks may be important factors in accounting for CLI in the LPM framework.

So far, a number of studies (Dehham, 2014; Kanduboda, 2017; Bobkina & Stefanova Radoulska, 2018) have demonstrated L2 learners' difficulties with the use of indefinite frequency adverbs, but no studies have addressed the problems that L3 learners may experience with the use of indefinite frequency adverbs specifically with this language combination (L1 Persian, L2 English, L3 German). Furthermore, no studies have investigated the sources of transfer in L3A of indefinite frequency adverbs within this language combination. Therefore, much research is needed to fill these gaps.

Literature Review

Theoretical background

Recently, many studies in the emerging field of L3A have investigated the nature and source of transfer in the early stages of L3A in order to find a rationale to justify a comprehensive theory of L3A, and five models have been proposed in this area: The L1 factor (Lozano, 2003; Jin, 2009), the L2 status factor (Bardel & Falk, 2007), the CEM (Flynn, Foley, & Vinnitskaya, 2004), the TPM (Rothman, 2010, 2013, 2015), and the LPM (Westergaard et al., 2017).

The L1 factor

The L1 factor hypothesis is one of the most important L3A hypotheses in CLI research, proposed by Hakansson, Pienemann, and Sayheli (2002). This hypothesis states that the mother tongue is the main source of transfer in the initial stage of L3A. In other words, L2 and L3 interlanguage grammars are restricted to L1 features, regardless of whether there is substantial positive evidence to motivate resetting. According to this strong claim, the L1 features are the only potential for transfer. However, no model of absolute L1 transfer has been proposed in L3A, and most studies have found evidence of L1 influence (Lozano, 2003; Jin, 2009). Hermas (2014a, 2014b) offered another weaker version of the L1 factor, arguing that the mother tongue is a preferred source of transfer in the early stages of L3A.

The L2 status factor

L2-only proposals also support main transfer from a background language, but in this case the learner's L2 is reported to have a particularly important influence on L3A because of cognitive and situational aspects that a formally learned L2 and a formally learned L3 have in common. The L2 status factor originated in Williams and Hammarberg's study of L3A (1998), where it was presented as a general tendency to activate a previously learned (second) language, rather than the L1 when acquiring a third language. Similarly, Bardel and Falk (2007) suggest that the most recently acquired language before the L3 usually blocks any direct access to the syntactic system of the L1.

The cumulative enhancement model

In contrast to the L2 status factor, CEM (Flynn et al., 2004) claimed a selective CLI from both L1 and L2. That is to say, both L1 and L2 can be the source of transfer at the initial stage of L3A. Therefore, all the prior languages can be beneficial in L3A. On the basis of CEM, language acquisition is gradual and cumulative, and each prior language can either improve subsequent language acquisition through its facilitating role or remain neutral. Consequently, it ignores the likelihood of non-facilitative transfer (Rothman, 2013). The important difference between this model and the other models mentioned above is that CEM has a property-by-

property basis rather than a holistic view of CLI in the L3A. In addition, there is no focus on the typological/psychotypological proximity of L1 and L2 in this model.

The typological proximity model

TPM (Rothman, 2010, 2011, 2013, 2015) supports the probable transfer from either L1 or L2 (in line with CEM), but also considers that transfer may be non-facilitative (which is not advocated by CEM), and delineates the significance of the typological similarity between the previous languages and the target L3. In other words, TPM takes into account both facilitative and non-facilitative transfer from the language that is typologically closer to the target language. Rothman (2015) explained that typological proximity is perceived by the learner on a holistic basis, rather than on a property-by-property basis.

The linguistic proximity model

The reported presence of CLI from the typologically more distant language is the most controversial matter for typology-based models, e.g. Jin (2009), indicating the influence from L1 Chinese rather than L2 English into L3 Norwegian, or Hermas (2014a), demonstrating the influence from L1 Arabic rather than L2 French into L3 English. The CEM, on the other hand, cannot justify the results of non-facilitating impacts in L3A, e.g., Rothman and Cabrelli Amaro (2010), revealing a transfer from L2 Spanish into L3 French for the null subject property. Consequently, a new model of L3A that provides support for CLI from both previously acquired languages and considers both facilitative and non-facilitative transfer, the LPM, is suggested.

Adverbs

"Adverbs are words that modify verbs, adjectives, other adverbs and sentences" (Yule, 2006, 110). They can be divided into three groups: (a) adverbs of time: today, still, soon, etc.; (b) adverbs of place: near, by, here, up, etc.; and (c) adverbs of manner: neatly, fast, nicely, angrily, etc. (as cited in Dehham, 2014). Each of these groups can be divided into subclasses. Adverbs of time, for instance, can be subdivided into three types: (a) adverbs of definite time, answering the question "when?": tomorrow, yesterday, late, etc.; (b) indefinite adverbs of frequency, answering the question "How often?": never, sometimes, often, usually, always, etc.; (c) adverbs of duration, answering the question "How long?": since yesterday, for hours, etc.

Adverbs of frequency

Frequency adverbs tell us how often an action happens, has happened, or will happen, and they can be either definite or indefinite. They are not generally used with continuous tenses. They are normally used merely with the present simple tense since we are talking about repeated or habitual activities. They are mostly used in positive sentences, but some adverbs may also be used in negative sentences. They involve always, usually, often, sometimes, occasionally, seldom, rarely, hardly ever, and never (Folse, 2012).

Positions of indefinite frequency adverbs in Persian, English, and German

Indefinite frequency adverbs can be used in the initial, middle, and final positions in all languages of this study except Persian, where the final position of adverbs is not allowed. In other words, adverbs, particularly indefinite frequency adverbs, can only be used in the initial and middle positions in Persian, but they are not permitted to be used in the final position due

to the existence of the verb in the final position. Thus, English and German are similar with respect to the use of indefinite frequency adverbs in the final position (e.g. examples 5 & 6).

The only position that the three languages Persian, English, and German have in common is the initial position where indefinite frequency adverbs are used for emphasis (e.g. examples 1, 2, & 3). The following examples illustrate the similarity and dissimilarity of the three languages in the use of indefinite frequency adverbs in the initial and final positions:

1. L1 = L2 = L3

Persian: ex 1: **Bazi vaqtha**, (man) be cinema miravam.

(**Sometimes**, (I) to cinema go.)

English: ex 2: **Sometimes**, I go to the cinema.

German: ex 3: **Manchmal**, gehe ich ins Kino.

(**Sometimes**, go I to cinema.)

2. L1 ≠ L2 = L3

Persian: ex 4: Man faqat **har az chand gahi** shena mikonam.

(I only once in a while swim.)

English: ex 5: I only swim **once in a while**.

German: ex 6: Ich schwimme nur **ab und zu**.

(I swim only **once in a while**.)

Most of the differences between the three languages in the placement of indefinite frequency adverbs are in the middle positions. Persian is more flexible in the use of indefinite frequency adverbs in the middle position compared to English and German because at least the second, third and fourth places of the middle positions are allowed for the use of indefinite frequency adverbs in Persian, whereas only the second and third places are permitted in English and the third and fourth places are accepted in German. We can classify the sentences in which indefinite frequency adverbs are used in the middle position into:

- a. Sentences containing main verbs.
- b. Sentences containing copular verbs (to be verbs).
- c. Sentences containing auxiliary/modal verbs.

Sentences containing main verbs. Persian has more flexibility in this type of sentences because at least the second (e.g. example 1), third (e.g. example 4) and fourth (e.g. example 7) positions are allowed for the use of indefinite frequency adverbs and it is optional which position is chosen, whilst English has the least flexibility since only the second (e.g. examples 2, 5, & 8) position is permitted. However, German has more flexibility than English in this type of sentences, as third (e.g. examples 3 & 6) and fourth (e.g. example 9) positions are allowed. As German is a V2 language, the second position is not allowed for the use of indefinite frequency adverbs and it is not optional to choose the third or fourth position. If object pronouns (whether dative or accusative) and dative nouns do not exist in this type of sentences, the third

position is allowed for the use of indefinite frequency adverbs. However, if there are object pronouns (whether dative or accusative) or dative nouns (e.g. example 9), the fourth position is allowed. The following examples show all the possible situations for the use of indefinite frequency adverbs in this type of sentences in the middle position:

1. L1 = L2 ≠ L3

Persian: ex 1: Tom **aqlab** qahve minoushad.

(Tom **often** coffee drinks.)

English: ex 2: Tom **often** drinks coffee.

German: ex 3: Tom trinkt **oft** Kaffee.

(Tom drinks **often** coffee.)

2. L1 = L3 ≠ L2

1 2 3 4 5

Persian: ex 4: Man Ali ra **hamishe** dar madrese mibinam.

(I Ali **always** at school see.)

English: ex 5: I **always** see Ali at school.

German: ex 6: Ich sehe **immer** Ali in der Schule.

(I see **always** Ali at school.)

3. L1 = L3 ≠ L2

1 2 3 4 5

Persian: ex 7: Man be Ali dar madrese **hamishe** komak mikonam.

(I Ali at school **always** help.)

English: ex 8: I **always** help Ali at school.

German: ex 9: Ich helfe Ali **immer** in der Schule.

(I help Ali **always** at school.)

Sentences containing copular verbs (to be verbs). English and German are similar in this type of sentences because indefinite frequency adverbs are allowed to place in the third position after the copular verbs (to be verbs) (e.g. examples 2 & 3). However, Persian has more flexibility than English and German in this type of sentences because second and third positions are permitted while the second position is mostly accepted (e.g. example 1). The following examples illustrate the use of indefinite frequency adverbs in this type of sentences in the middle position:

L1 ≠ L2 = L3

1 2 3 4

Persian: ex 1: Jack **bazi vaqtha** mariz hast.

(Jack **sometimes** sick is.)

English: ex 2: Jack is **sometimes** sick.

German: ex 3: Jack ist **manchmal** krank.

(Jack is **sometimes** sick.)

Sentences containing auxiliary/modal verbs. Persian has the most flexibility compared to German and English in sentences containing auxiliary/modal verbs because the second (e.g. example 1), third (e.g. example 4) and fourth (e.g. example 7) positions are allowed for the use of indefinite frequency adverbs while the second position is most likely to be accepted. That's why it is usually different from English and German, since both English and German use indefinite frequency adverbs between the auxiliary/modal verbs and the main verbs.

Although English and German are similar in the use of indefinite frequency adverbs between auxiliaries/modal verbs and main verbs, they can also be different because German allows the third position (e.g. example 6) in addition to the fourth position (e.g. examples 3 & 9) for the use of indefinite frequency adverbs, especially when object pronouns are present in the sentences. However, English mostly permits the third position (e.g. examples 2, 5, & 8) that is after the first modal verbs. The following examples demonstrate some of the likely options in this type of sentences.

1. L1 ≠ L2 ≠ L3

1 2 3 4 5

Persian: ex 1: To **hich vaqt** nemituni man ra peyda koni.

(You **never** can't me find.)

English: ex 2: You can **never** find me.

German: ex 3: du kannst mich **nie** finden.

(You can me **never** find.)

2. L1 = L2 = L3

1 2 3 4

Persian: ex 4: Ou bayad **hamishe** bebarad.

(He must always win.)

English: ex 5: He must **always** win.

German: ex 6: er muss **immer** gewinnen.

(He must always win.)

3. L1= L3 ≠ L2

1 2 3 4 5

Persian: ex 7: Ma bayad be ou **bazi vaqtha** komak konim.

(We should him **sometimes** help.)

English: ex 8: We should **sometimes** help him.

German: ex 9: Wir sollten ihm **manchmal** helfen.

(We should him **sometimes** help.)

Research Questions

Q1. Does the L1 transfer hypothesis have a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A?

Q2. Does the L2 status factor have a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A?

Q3. Does the CEM have a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A?

Q4. Does the learners' L2 proficiency have a significant impact on acquiring indefinite frequency adverbs in L3A?

Q5. Does the typological proximity of L2 have a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A?

Q6. Does the LPM have a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A?

Q7. Does the type of the task, i.e. GJT/ERT, have a significant impact on the facilitative/detrimental role of background languages in the transfer of indefinite frequency adverbs in the early stages of L3A?

Method

Participants

Thirty participants in two groups were selected to take part in this study. All subjects were over 18 years of age and all were native speakers of Persian residing in Iran. They were classified as lower intermediate to upper intermediate L2 English speakers based on their scores on the Oxford Quick Placement Test (OQPT, 2001). They all received compulsory tuition of English as L2 from the age of 13 in grade 7. However, some of them started acquiring English in language institutes before junior high school. The lower intermediate L2 English group (G1) and also the upper intermediate L2 English group (G2) each consisted of 15 native Persian speakers who were learning German as L3 at beginner level in the Barman and Kish Air language institutes of Sabzevar, Khorasan Razavi province, Iran. Table 1 below summarizes the information about the participants' bios.

Table 1. *Language Background of Participants*

Group	G1	G2
Proficiency level	Persian (L1): Native English (L2): Lower-intermediate German (L3): Elementary	Persian (L1): Native English (L2): Upper-intermediate German (L3): Elementary
Number of participants	15	15
Age	18-25	18-27
Gender	Female: 4 Male: 11	Female: 9 Male: 6

Materials and Instruments

Participants were asked to complete an English proficiency test (OQPT), a grammaticality judgment test (GJT), and an element rearrangement task (ERT). The aim of the proficiency test was to ensure the suitability of the learners to take part in this study and to divide the participants into groups based on their English proficiency. Additionally, two written tasks were used to elicit the target structure of indefinite frequency adverbs in initial German L3A. The purpose was to measure the participants' comprehension using a GJT and to elicit controlled production of the target structure using an ERT.

Oxford quick placement test (OQPT)

The OQPT (2001) was applied to measure the proficiency level of the participants. It was both quick and easy to administer and was suitable for placement purposes. Two versions of this test currently exist; a pen and paper version and a computer-based version (CBT). One of the advantages of the CBT was that it was adaptive and easy to mark and deliver. However, the pen and paper version of the test was used in the current research. Some of the main properties of this version were: a) a time limitation of 30 minutes was given to the participants to complete a 60-item version; b) all the questions were in multiple-choice format; c) there were two parts in the test. 40 questions of the first part had to be answered by all candidates. However, 20 questions of the second part were for higher ability learners who could get at least 30 correct answers in the first part.

The OQPT is a flexible test of English language proficiency designed to provide educators with a reliable and time-saving method of measuring learners' language proficiency. Geranpayeh (2006) believes that the OQPT, which is a standardized test of English language proficiency, has been pretested and validated by approximately 6,000 learners in about 60 countries.

The scores provided by the test developers were used to classify the participants into the target proficiency groups, that is, the lower intermediate and upper intermediate levels. Consequently, 30 participants comprising groups A (15 participants) and B (15 participants), whose scores ranged from 27-36 (lower intermediate) and 37-47 (upper intermediate) out of 60, were selected to complete further tasks.

Grammaticality judgment test (GJT)

The GJT is typically used to gather information about participants' competence and the underlying system. This task was composed of 24 items, 12 of which included indefinite

frequency adverbs (6 grammatical and 6 ungrammatical examples) and 12 distractors, which examined different structures in order to divert the learners' attention from the structures in focus. Since English and German pattern similarly regarding the structures in focus, especially in the final position and in sentences containing copular verbs, three grammatical items represent the English order of indefinite frequency adverbs and three ungrammatical items represent the Persian order. The following tokens show the test items:

1. Ich schwimme nur **ab und zu**.

I swim only **once in a while**.

2. * Ich nur **ab und zu** schwimme.

I only **once in a while** swim.

Additionally, since both Persian and German, unlike English, can have similar patterns in terms of the structures in focus, especially in the third and fourth positions, three grammatical items represent the Persian order of indefinite frequency adverbs and three ungrammatical items represent the English order. The following tokens show the test items:

3. Ich sehe ihn **selten** in der Schule.

I see him **seldom** at school.

4. * Ich **selten** sehe ihn in der Schule.

I **seldom** see him at school.

Since the participants of this research were in the initial stages of learning German, the untimed form of the GJT was used in order not to put any time pressure on the learners. The learners were asked to read the sentences and judge whether the underlined part of each sentence was grammatical or not. The participants who considered the example 1 grammatical were classified as L2 status factor transfer, while those who considered example 3 grammatical were categorized as L1 factor transfer. They had three choices: acceptable, unacceptable, and 'I don't know'. For the task scoring, the participants' answers were classified into two categories: correct judgement and incorrect judgement. A correct judgement was given when the participants judged a grammatical sentence to be grammatical or an ungrammatical sentence to be ungrammatical. An incorrect judgement was given when the participants judged a grammatical sentence to be ungrammatical or an ungrammatical sentence to be grammatical. Each correct judgement was given a score of one, and each incorrect judgement was given a score of zero, with a maximum score of 12.

Element rearrangement task (ERT)

The ERT was designed as a production task. The purpose of this task was to test whether participants were able to produce indefinite frequency adverbs appropriately. In this task, participants had to decode a series of scrambled statements. This task included 24 scrambled sentences, 12 of which contained the target structure and 12 of which were distractors containing other structures. Participants were required to rearrange the words to make correct sentences. To score the task, the raters focused on the target structure. In other words, the position of the indefinite frequency adverbs was the only criterion for scoring the task,

irrespective of any other kinds of errors. If participants place the indefinite frequency adverbs in the right position, they would receive a score of 1 for each correct answer. Therefore, the maximum total score for this task was 12. The examples would be:

5. krank/ ist/ **manchmal**/ Jack.

sick/ is/ **sometimes**/ Jack.

6. helfen/ **immer**/ mir/ muss/ Omid.

help/ **always**/ me/ has to/ Omid.

Procedure

In order to achieve the objectives of the study, the participants were first given the OQPT to measure their level of English proficiency. According to the scoring criteria set by the developers of the test for the proficiency levels, those participants who scored within the range of 27-36 were assigned to the lower intermediate level, and those whose scores range was 37-47 were classified as the upper intermediate level. That is to say, this test was only administered to select 30 lower intermediate and upper intermediate L2 English learners to form groups A and B.

Secondly, in order to examine the influence of the first and second language on L3A, participants completed an untimed GJT and an ERT. The GJT was only administered in one condition (declaratives) in order to investigate the students' comprehension and competence with German indefinite frequency adverbs. However, the ERT was administered in order to examine the participants' production ability and performance. The GJT was a set of grammatical and ungrammatical sentences that the participants were asked to judge for grammaticality on an untimed basis. The ERT was a set of scrambled sentences that the participants were asked to rearrange the words to make correct sentences. Based on the learners' responses to the GJT and ERT, the researcher would investigate which models of L3A were the main sources of transfer.

Design of the Study

In the absence of random selection, treatment, and control groups, the current research is qualitative in nature. Simultaneously, the process of data collection and analysis is quantitative, and consequently the current research design is regarded to be a mixed one, incorporating the features of both qualitative and quantitative research. In other words, the type of research method used in this study is quasi-experimental research. In a quasi-experimental design, the researcher lacks control over the assignment to conditions and/or does not manipulate the causal variable of interest.

Results

Research questions regarding the GJT

First research question

In order to answer the first research question, a multivariate ANOVA (MANOVA) for grammatical sentences and another MANOVA for non-grammatical sentences were conducted to examine the effects of the learners' "correct" (L1 positive transfer), "incorrect" (L1 negative

transfer), "don't know" (no transfer) judgments and their interactions on the knowledge of indefinite frequency adverbs in German.

Based on the results obtained from grammatical sentences (Table 2) and ungrammatical sentences (Table 3) in the context of the L1 factor, it can be concluded that, in general, there was a significant difference between the overall means of the "correct", "incorrect" and "don't know" judgements of the learners on the positions of indefinite frequency adverbs in German for the grammatical sentences [Wilks' Lambda = .200, $F(2, 28) = 56.000$, $p = .000$, partial $\eta^2 = .800$ indicating a large effect size] and for the ungrammatical sentences [Wilks' Lambda = .513, $F(2, 28) = 13.266$, $p = .000$, partial $\eta^2 = .487$ indicating a moderate effect size].

Table 2. Results of Multivariate Tests for the Grammatical Sentences of the GJT in L1 Factor Context

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Context	Pillai's Trace	.800	56.000	2.000	28.000	.000	.800
	Wilks' Lambda	.200	56.000	2.000	28.000	.000	.800
	Hotelling's Trace	4.000	56.000	2.000	28.000	.000	.800
	Roy's Largest Root	4.000	56.000	2.000	28.000	.000	.800

Table 3. Results of Multivariate Tests for the Ungrammatical Sentences of the GJT in L1 Factor Context

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Context	Pillai's Trace	.487	13.266	2.000	28.000	.000	.487
	Wilks' Lambda	.513	13.266	2.000	28.000	.000	.487
	Hotelling's Trace	.948	13.266	2.000	28.000	.000	.487
	Roy's Largest Root	.948	13.266	2.000	28.000	.000	.487

The results of the post-hoc comparison tests for grammatical sentences (Table 4) in the context of the L1 factor showed significant differences between L1 positive transfer and L1/L2 negative transfer ($MD = .800$, $P = .000$). There was also a significant difference between L1 positive transfer and no transfer ($MD = .800$, $P = .000$).

Table 4. Results of Post-Hoc Comparisons for the GJT Grammatical Sentences in the Context of the L1 Factor

	(I) Context	(J) Context	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
						Lower Bound	Upper Bound
1.	L1=L3(Ungrammatical-Grammatical)	2	-.800	.088	.000	.575	-1.025
		3	.800	.074	.000	.611	.989
2.	L1=L3(Ungrammatical-Ungrammatical)	1	-.800	.088	.000	-1.025	-.575
		3	1.388E-17	.048	1.000	-.122	.122
3.	L1=L3(Ungrammatical-Don't know)	1	-.800	.074	.000	-.989	-.611
		2	-1.388E-17	.048	1.000	-.122	.122

The results of the post-hoc comparison tests for ungrammatical sentences (Table 5) in the context of the L1 factor showed significant differences between L1 positive transfer and L1/L2 negative transfer ($MD = .256, P = .001$). There was also a significant difference between L1 positive transfer and no transfer ($MD = .444, P = .000$).

Table 5. Results of Post-Hoc Comparisons for the GJT Ungrammatical Sentences in the Context of the L1 Factor

(I) Context	(J) Context	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1. L1=L3(Ungrammatical-Grammatical)	2	-.256	.061	.001	-.411	-.100
	3	.189	.057	.007	.044	.334
2. L1=L3(Ungrammatical-Ungrammatical)	1	.256	.061	.001	.100	.411
	3	.444	.085	.000	.228	.661
3. L1=L3(Ungrammatical-Don't know)	1	-.189	.057	.007	-.334	-.044
	2	-.444	.085	.000	-.661	-.228

Based on the results presented in Tables 2, 3, 4, and 5, it can be concluded that the first null hypothesis, which states that the L1 transfer hypothesis does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, was supported.

Second research question

In order to answer the second research question, a MANOVA for grammatical sentences and another MANOVA for ungrammatical sentences were used to examine the effects of the learners' 'correct' (L2 positive transfer), 'incorrect' (L2/L1 negative transfer) and 'don't know' (no transfer) recognition and their interactions on their knowledge of indefinite frequency adverbs in German.

Based on the results obtained from grammatical sentences (Table 6) and ungrammatical sentences (Table 7) in the context of the L2 factor, it can be concluded that in general there was a significant difference between the overall means of the "correct", "incorrect" and "don't know" judgements of the learners on the positions of indefinite frequency adverbs in German for the grammatical sentences [Wilks' Lambda = .248, $F(2, 28) = 42.409, p = .000$, partial $\eta^2 = .752$ indicating a large effect size] and for the ungrammatical sentences [Wilks' Lambda = .553, $F(2, 28) = 11.317, p = .000$, partial $\eta^2 = .447$ indicating a moderate effect size].

Table 6. Results of Multivariate Tests for the Grammatical Sentences of the GJT in L2 Factor Context

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	
Context	Pillai's Trace	.752	42.409	2.000	28.000	.000	.752
	Wilks' Lambda	.248	42.409	2.000	28.000	.000	.752
	Hotelling's Trace	3.029	42.409	2.000	28.000	.000	.752
	Roy's Largest Root	3.029	42.409	2.000	28.000	.000	.752

Table 7. Results of Multivariate Tests for the Ungrammatical Sentences of the GJT in L2 Factor Context

	(J) Context	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1. L2=L3(Grammatica l-Grammatical)	2	.678	.074	.000	.490	.866
	3	.522	.090	.000	.294	.751
2. L2=L3(Grammatica l-Ungrammatical)	1	-.678	.074	.000	-.866	-.490
	3	-.156	.057	.032	-.300	-.011
3. L2=L3(Grammatica l-Don't know)	1	-.522	.090	.000	-.751	-.294
	2	.156	.057	.032	.011	.300

Table 8. Results of Post-Hoc Comparisons for the Grammatical Sentences of the GJT in L2 Factor Context

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Context	Pillai's Trace	.447	11.317	2.000	28.000	.000	.447
	Wilks' Lambda	.553	11.317	2.000	28.000	.000	.447
	Hotelling's Trace	.808	11.317	2.000	28.000	.000	.447
	Roy's Largest Root	.808	11.317	2.000	28.000	.000	.447

The results of the post-hoc comparison tests for grammatical sentences (Table 8) in the context of the L2 factor showed significant differences between L2 positive transfer and L2/L1 negative transfer (MD = .678, $P = .000$). There was also a significant difference between L2 positive transfer and no transfer (MD = .522, $P = .000$).

The results of the post-hoc comparison tests for ungrammatical sentences (Table 9) in the L2 factor context showed significant differences between L2 positive transfer and L2/L1 negative transfer (MD = .411, $P = .001$). However, there was not a significant difference between L2 positive transfer and no transfer (MD = .189, $P = .457$).

Table 9. Results of Post-Hoc Comparisons for the Ungrammatical Sentences of the GJT in L2 Factor Context

(I) Context	(J) Context	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1. L2=L3(Ungrammatical-Grammatical)	2	-.411	.102	.001	-.670	-.152
	3	-.222	.080	.030	-.427	-.018
2. L2=L3(Ungrammatical-Ungrammatical)	1	.411	.102	.001	.152	.670
	3	.189	.129	.457	-.138	.515
3. L2=L3(Ungrammatical-Don't know)	1	.222	.080	.030	.018	.427
	2	-.189	.129	.457	-.515	.138

According to the results of Tables 6, 7, 8 and 9, it can be concluded that the second null hypothesis, which states that the L2 transfer hypothesis does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, was confirmed.

Third research question

In order to test the third null hypothesis, a paired samples *t*-test was conducted to investigate the significance of the mean difference between the total number of positive and negative transfer from L1 and L2. The results presented in Table 10 indicate a significant difference between the mean of positive transfer and that of negative transfer, $t(29) = 15.031$, $p < .05$. Thus, the third null hypothesis, which states that CEM does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, is rejected.

Table 10. Paired Samples T-Test for Total Positive and Negative Transfer of L1 and L2 in GJT

	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t			
				Lower	Upper				
Pair 1 Total positive-Total negative	.53611	.19535	.03567	.46317	.60906	15.031	29	.000	

Fourth research question

To investigate the significance of the differences between the two proficiency levels in the L1 context, two independent samples *t*-tests were performed. The results in Table 11 show that the differences between the two proficiency levels in the (grammatical-grammatical) L1 context in GJT were not statistically significant, $t(17.7) = -1.29$, $p = .212$ (two-tailed) $> .05$. Similarly, there were no statistically significant differences between the two proficiency levels in the (ungrammatical-ungrammatical) L1 context in GJT, $t(28) = .240$, $p = .812$ (two-tailed) $> .05$. These small and non-significant differences between the two groups with different levels of English proficiency show that the proficient learners could not rely more on their L2 knowledge than the less proficient learners.

Table 11. Independent Samples T-Tests for the Group Performance in Different L1 Contexts in GJT

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
L1=L3 (Grammatical-Grammatical)	Equal variances assumed	9.61	.004	-1.29	28	.206	-.133	.102	-.344	.077
	Equal variances not assumed			-1.29	17.7	.212	-.133	.102	-.349	.083
L1=L3 (Ungrammatical-Ungrammatical)	Equal variances assumed	.268	.609	.240	28	.812	.022	.092	-.167	.212
	Equal variances not assumed			.240	27.7	.812	.022	.092	-.167	.212

In order to examine the significance of the differences between the two proficiency levels in the L2 context, two further independent samples *t*-tests were carried out. The results in Table 12 show that the differences between the two proficiency levels in (grammatical-grammatical) L2 context in GJT were not statistically significant, $t(28) = -.858$, $p = .398$ (two-tailed) $> .05$. Also, there were no statistically significant differences between the two proficiency levels in (ungrammatical-ungrammatical) L2 context in GJT, $t(28) = .302$, $p = .765$ (two-tailed) $> .05$. Thus, the fourth null hypothesis, which states that learners' L2 proficiency has no significant effect on the acquisition of indefinite frequency adverbs in L3A, was confirmed.

Table 12. Independent Samples T-Tests for the Group Performance in Different L2 Contexts in GJT

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
L2=L3 (Grammatical-Grammatical)	Equal variances assumed	.241	.627	-.858	28	.398	-.088	.103	-.301	.123
	Equal variances not assumed			-.858	27.6	.398	-.088	.103	-.301	.123
L2=L3 (Ungrammatical-Ungrammatical)	Equal variances assumed	.187	.668	-.302	28	.765	.044	.147	-.257	.346
	Equal variances not assumed			-.302	27.9	.765	.044	.147	-.257	.346

Research questions regarding the ERT

First research question

In order to answer the first research question, a multivariate ANOVA was conducted to examine the effects of L1 positive transfer, L1 negative transfer, no transfer from the background languages, negative transfer from the L2 and their interactions on the knowledge of indefinite frequency adverbs in German. According to the results obtained in the context of the L1 factor in Table 13, it can be concluded that, in general, there was a significant difference between the overall mean scores of the learners in the L1 positive transfer, no transfer from background languages, L2 negative transfer and L1 negative transfer groups on the positions of indefinite frequency adverbs in German [Wilks' Lambda = .041, $F(3, 27) = 209.328$, $p = .000$, partial $\eta^2 = .959$, indicating a large effect size].

Table 13. Results of Multivariate Tests for the ERT in the L1 Factor Context

		Hypothesis					Partial Eta Squared
Effect		Value	F	df	Error df	Sig.	
Context	Pillai's Trace	.959	209.328	3.000	27.000	.000	.959
	Wilks' Lambda	.041	209.328	3.000	27.000	.000	.959
	Hotelling's Trace	23.259	209.328	3.000	27.000	.000	.959
	Roy's Largest Root	23.259	209.328	3.000	27.000	.000	.959

The results of the post-hoc comparison tests for the sentences of the ERT (Table 14) in the context of the L1 factor showed significant differences between L1 positive transfer and no background language transfer (MD = 43.889, $P = .000$) and L2 negative transfer (MD = 59.444, $P = .000$). There was also a significant difference between L1 positive transfer and L1 negative transfer (MD = 41.111, $P = .000$). According to the results of Tables 13 and 14, it can be concluded that only L1 positive transfer is significant and L1 negative transfer is not significant. Thus, the first null hypothesis, which states that L1 transfer does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, was supported.

Table 14. Results of Post-hoc Comparisons for the Sentences of the ERT in the L1 Factor Context

(I) Context	(J) Context	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
1. L1 positive	2	43.889	8.916	.000	18.643	69.134
	3	59.444	5.034	.000	45.191	73.698
	4	41.111	4.973	.000	27.029	55.193
2. No language effect (nle)	1	-43.889	8.916	.000	-69.13	-18.64
	3	15.556	4.444	.009	2.971	28.140
	4	-2.778	5.767	1.000	-19.10	13.552
3. L2 negative effect (L2n)	1	-59.444	5.034	.000	-73.69	-45.19
	2	-15.556	4.444	.009	-28.14	-2.97
	4	-18.333	2.309	.000	-24.87	-11.79
4. L1 negative	1	-41.111	4.973	.000	-55.19	-27.02
	2	2.778	5.767	1.000	-13.55	19.107
	3	18.333	2.309	.000	11.795	24.872

Second research question

In order to answer the second research question, a paired samples t-test was carried out to see if the two types of L2 transfer and no background language transfer differed on the ERT. The results in Table 15 indicate that positive L2 transfer was significantly different from no background languages transfer, $t(29) = 12.420$, $p < 0.05$. It can also be concluded from the results in Table 15 that only positive L2 transfer was significant and negative L2 transfer was not produced at all by the learners. Thus, the second null hypothesis, which states that L2 transfer does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, was confirmed.

Table 15. Paired Samples T-Test for L2 Positive Transfer and No Language Effects in the ERT

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	L2 positive – No language effect (nle)	85.00	37.48563	6.84391	71.00264	98.99736	12.420	29	.000

Third research question

In order to test the third null hypothesis, a paired samples *t*-test was carried out to investigate the significance of the mean difference between the total number of positive and negative transfer from L1 and L2. The results displayed in Table 16 show a significant difference between the mean score of positive transfer and that of negative transfer, $t(29) = 17.574, p < .05$. In other words, learners' L1 and L2 were more facilitative than non-facilitative in their production of L3 structures, indicating that learners mostly positively followed their English word order when placing German indefinite frequency adverbs in declarative sentences with auxiliary verbs, and their Persian word order when placing them in declarative sentences with modal verbs. Thus, the third null hypothesis, which states that CEM does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, is rejected.

Table 16. Paired Samples T-Test for Total Positive and Negative Transfer of L1 and L2 in the ERT

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Total positive – Total negative	65.97222	20.56096	3.75390	58.29463	73.64981	17.574	29	.000

Fourth research question

In order to examine the significance of the differences between the two proficiency levels in L1 and L2 contexts, two independent samples *t*-tests were carried out. The results in Table 17 show that the difference between the two proficiency levels in the L1 context in the ERT was not statistically significant, $t(28) = -.241, p = .812$ (two-tailed) $> .05$. There was also no statistically significant difference between the two proficiency levels in the L2 context in ERT, $t(28) = -.725, p = .475$ (two-tailed) $> .05$. Thus, the fourth null hypothesis, which states that

learners' L2 proficiency has no significant effect on the acquisition of indefinite adverbs in L3A, was supported

Table 17. Independent Samples T-Tests for the Group Performance in L1 and L2 Contexts in the ERT

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
L1 positive	Equal variances assumed	.824	.372	-.241	28	.812	-2.22	9.23	-21.1	16.7
	Equal variances not assumed			-.241	26.6	.812	-2.22	9.23	-21.1	16.7
L2 positive	Equal variances assumed	2.24	.145	-.725	28	.475	-5.00	6.90	-19.1	9.13
	Equal variances not assumed			-.725	23.2	.476	-5.00	6.90	-19.2	9.26

Results of merged tasks

Fifth research question

According to the TPM, learners are expected to select English as the sole source of CLI and to copy the whole representation, whether the influence is positive or negative, because English is typologically the closer language to German than Persian and also because English is a West Germanic language while Persian belongs to the Indo-Iranian branch of the Indo-European language family. However, despite the typological similarity between English and German and according to the results of the GJT and ERT obtained above, L2 did not have a significant impact on the transfer of indefinite frequency adverbs in the early stages of L3A and it was not the only source of transfer. Therefore, the fifth null hypothesis, which states that TPM does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, was confirmed.

Sixth research question

In order to investigate whether CLI is always facilitative or whether it can also be non-facilitative, learners' responses to the grammatical and ungrammatical sentences of the GJT and the sentences that they produced in the ERT were analyzed.

Analyses of learners' responses to the GJT questions and their productions in the ERT showed that the learners transferred more positively from their L1 in some structures such as sentences with modal auxiliary verbs (must, can, may and should) which show CLI from Persian. The reason for this type of transfer is that Persian and German largely agree in this

particular area, both in conjugating modal auxiliaries and in using the main verbs at the end of sentences. Similarly, the negative L1 transfer especially in ungrammatical sentences of GJT and in the ERT showed that the learners were also negatively influenced by Persian because some of them used indefinite frequency adverbs before the pronouns between modal auxiliaries and main verbs, which is allowed in Persian which is a scrambling structure language in terms of indefinite frequency adverbs, whereas in German they are only placed after the pronouns between modal auxiliaries and main verbs (see, for example, the first sentence of the GJT: Du musst immer mir helfen). Consequently, the fact that Persian and German are similar in these types of structures and that English behaves differently helps to discover the underlying CLI processes.

On the other hand, learners used more of their L2 in their comprehensions and productions in some other structures, such as sentences with finite main verbs in which indefinite frequency adverbs are used at the end, modal auxiliary of "will", and copular verbs, since indefinite frequency adverbs in these types of sentences are patterned in the same way in both English and German, which is a sign of CLI from English. The existence of an example of L2 negative transfer in one of the ungrammatical sentences of the GJT and two cases of L2 negative transfer in learners' productions in two sentences of the ERT also showed that learners can also be negatively influenced by English. This looks like a selective transfer that supports LPM. It can therefore be concluded that CLI does not always come from the more typologically similar language, nor is it always facilitative. Thus, the sixth null hypothesis, which states that LPM does not play a significant role in the transfer of indefinite frequency adverbs in the early stages of L3A, is rejected.

Seventh research question

In order to investigate the significance of the mean difference between the total number of positive transfers from L1 and L2 in the GJT, a paired samples *t*-test was run. The results shown in Table 18 do not indicate a significant difference between the mean of positive transfer from L1 and L2, $t(29) = 1.654, p > .05$.

Table 18. Paired Samples T-Test for Total Positive Transfer of L1 and L2 in the GJT

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Total L1 positive – total L2 positive	8.333	27.59	5.038	-1.970	18.637	1.654	29	.109

In order to answer the final research question, a further paired samples *t*-test was carried out to investigate the significance of the mean difference between L1 and L2 positive transfer in the ERT. Based on the results in Table 19, there was a significant difference between the mean scores of L1 and L2 positive transfer, $t(29) = -8.342, p < .05$. Therefore, it can be concluded that the type of task did not affect the type of transfer, but rather it was the type of hypotheses or the type of structures that determined the type of transfer.

Table 19. Paired Samples T-Test for L1 and L2 Positive Transfer in the ERT

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	L1 positive L2 positive	-31.38	20.60	3.762	-39.08	-23.69	-8.342	29	.000

Discussion

The statistical results of both the GJT and the ERT confirmed the occurrence of L1 transfer, and this transfer was only significantly positive. That is, participants transferred the focused structure more positively from their L1 when they comprehended and produced it in their L3. This suggests that despite the typological dissimilarity between Persian (L1) and German (L3), both languages shared the same structural similarity in the placement of indefinite frequency adverbs in the sentences containing modal auxiliaries. However, the results showed no evidence to support the first hypothesis and the L1 was not the only deterministic factor in L3A for the two groups.

The findings of this study are not confirmed by Hermas (2014a) who investigated the acquisition of two properties of the null subject parameter in L3 English: subject-verb inversion in declarative sentences and null expletive subjects. His findings indicated that only L1 Arabic is the source of morphosyntactic transfer in the early stages of L1. However, the finding of the present study is in line with Fallah, Jabbari, and Fazilatfar (2016) who investigated the role of previously acquired linguistic systems, Mazandarani and Persian, in the L3A of English possessives in the early stages and proved that the L1 is not the sheer deterministic factor in the L3A.

The statistical results of both the GJT and the ERT revealed a relatively high degree of L2 transfer, which was only significantly positive. This means that the L2 background knowledge mostly helped the learners to use German indefinite frequency adverbs accurately in sentences with finite main verbs in which indefinite frequency adverbs are used at the end, modal auxiliary of 'will' and copular verbs. However, the results provided no evidence in support of the second hypothesis and the L2 was not the only deterministic factor in L3A for the two groups.

Contrary to the findings of the study, Ghezlou, Koosha, and Lotfi (2019), who sought to uncover the effects of the previously acquired languages, Azeri (L1) and Persian (L2), on the acquisition of English (L3) adjective properties in bilingual learners, confirmed the L2 status factor hypothesis. However, the study by Fallah et al. (2016) did not demonstrate the role of L2 in L3A, which is in harmony with the result of the present research.

The CEM suggests that third language learning is a cumulative and gradual process, and that all background languages can have an impact on L3A or remain neutral. An examination of learners' performance indicated that learners used their previous linguistic systems in a very

positive way to place focused structures in the third language. These findings support the predictions of the CEM and are similar to the findings of studies such as Flynn et al. (2004) and Berkes and Flynn (2012). Conversely, the CEM is refuted in the study of Kopečková, Gut, Wrembel, and Balas (2022), who investigated different sources of phonological CLI in the early stages of L3A in two groups of adolescent instructed learners with L1-German-L2-English-L3-Polish and L1-Polish-L2-English-L3-German language backgrounds, which is inconsistent with the result of the present study.

The TPM predicts that the psychotypology determines whether the L1 or L2 is transferred in L3A (Rothman, 2010). Since English and German language systems are closer to each other than Persian, one would expect English to be the main source of transfer in the acquisition of German L3 indefinite frequency adverbs. However, the results of this study were not in line with the prediction of the TPM, as L3 learners sometimes comprehended and produced indefinite frequency adverbs in a Persian-like manner and sometimes in an English-like manner.

Jamali, Jabbari, and Razmi (2021) investigated the effects of previously acquired languages on the acquisition of attributive adjectives and noun adjuncts by L3 learners of French and German. Their results revealed that the typological similarity of L2 English to German, but not to French, had a facilitating effect on the task performance of the German L3 group and a non-facilitating effect on the French L3 group. Their study provides evidence for the TPM that is incompatible with the findings of the present study. However, Unlike the proponents of the TPM, Jensen et al. (2023) investigated CLI at selected developmental stages of the L3A of English across three linguistic modules: syntax, morphology, and the syntax-semantics interface in Russian–Norwegian bilinguals. They did not find that the L3 learners selected one primary source of influence, as predicted by TPM for early stages of the acquisition process. The findings of their study were also compatible with the findings of the present study.

The LPM proposes incremental property-by-property learning and allows for both facilitative and non-facilitative influences from one or both of the previously acquired languages. The experimental data of this research suggested that the participants experienced a significant facilitating influence of Persian within the declaratives containing modal auxiliary verbs (must, can, may, and should), although Persian belongs to a different typological group than English and German. Similarly, the participants experienced a significant facilitating effect of English within the declaratives with finite main verbs, modal auxiliary of 'will' and copular verbs. The results also indicated that there was a non-facilitating influence from both languages.

The findings of the study are in support of the original article by Westergaard et al. (2017), who introduced the LPM and compared Russian-Norwegian learners of English as an L3 with two groups of L2 learners, one with L1 Norwegian and the other with L1 Russian. Their study examined two-word order phenomena, one where English was similar to Russian and one where English was similar to Norwegian. While one of the features was already acquired by all learners (subject-auxiliary inversion), the other (adverb-verb/verb-adverb word order) showed that the L3 learners scored between the two L2 groups, indicating that they had experienced influence from both prior languages.

According to the sixth research question, it was expected that the L3 learners who were at the upper intermediate level of English (L2) proficiency would outperform the learners at the lower intermediate level of proficiency. Contrary to this prediction, the findings of the study revealed that the two groups of learners performed differently in the accurate recognition and production of German indefinite frequency adverbs in both tasks administered, but there were no significant differences between the learners in the upper and lower intermediate groups. This implies that L2 proficiency does not play a significant role in the acquisition of German indefinite frequency adverbs, which is in agreement with the claims made in the studies conducted by Torabi and Jabbari (2018) and Jamali et al. (2021).

Conversely, Arıbaş and Cele (2021) compared the initial state of L2 and L3 acquisition of English articles to investigate the impact of L2 proficiency on positive transfer from L2 to L3. Their results indicated that L3 learners with high L2 German proficiency were significantly more successful than those with low L2 German proficiency in the four article contexts: [-definite; +specific] and [+definite; -specific], [+definite; +specific] and [-definite; -specific]. This implied that L2 proficiency was a determining factor in the positive morphosyntactic transfer from L2 to L3, which is contrary to the findings of the present study.

The results of the study revealed that the learners performed differently in the comprehension and production tasks because they used their L1 more positively than their L2 in the GJT, while they used their L2 more positively than their L1 in the ERT. However, this difference was not significant, suggesting that the type of task did not influence the type of transfer in this research, which is incompatible with the findings of studies by Proulx (2022).

Conclusion

The results of the study revealed that the learners' L1 knowledge positively influenced both their comprehension and production of L3 structures, but it was not the only source of transfer. Similarly, the effect of the learners' L2 knowledge on both their comprehension and production of L3 structures was facilitative, but it was not the only source of transfer. Therefore, the L1 transfer hypothesis and the L2 status factor cannot be accounted for in this research. Furthermore, despite the typological similarity between English and German and based on the results of both the GJT and the ERT, L2 did not have a significant influence on the transfer of indefinite frequency adverbs in the initial stages of L3A and it was not the sole source of transfer. Consequently, the TPM cannot be supported in this study either. It can therefore be concluded that this study differs from traditional models of L3A that focus on wholesale transfer. Rather, it proves that the sources of CLI vary feature-by-feature, based on structural similarity.

Based on the evaluations and comparisons made in the study, it was found that both languages, the L1 and the L2, can simultaneously influence the acquisition of L3 German indefinite frequency adverbs. Therefore, it can be concluded that the CEM provides a more comprehensive explanation for these findings than the other three hypotheses. It supports the idea that language learning is a cumulative process, indicating that all previous language systems are activated and available during the L3 processing.

The CEM predicts only the potential facilitative effect of the background languages and implies the unlikelihood of any negative transfer. In addition to the large amount of positive transfer that occurred in the present study, a small amount of negative transfer was also observed, which is contrary to the prediction of the CEM, but since the difference between the positive and negative transfer was significant, this hypothesis can be confirmed.

The results of both the GJT and the ERT tasks supported the hybrid transfer models represented by the LPM, which claims that transfer occurs property by property, and arguing against the overall transfer model. Furthermore, the comprehension and production data indicated that non-facilitative transfer from both background languages occurred in the both tasks. Thus, the LPM is the model that can best describe the transfer phenomenon in L3A of German indefinite frequency adverbs because it predicts both facilitative and non-facilitative transfer.

The overall results of the performance of the two groups showed no significant differences between them, which in turn refuted the role of L2 proficiency in the correct comprehension and production of German indefinite frequency adverbs. Similarly, the findings of the study revealed that the type of task did not affect the type of transfer, but rather it was the type of hypotheses that determined the type of transfer in this research.

The first limitation was the lack of a sufficient number of learners. A large sample size could strengthen the conclusions regarding the desired objectives. However, it was almost impossible to find a significant number of learners who met all the study criteria.

Similarly, the second limitation concerned the recruitment of the L3 learners. In order to better identify the role of the L1 and the L2 in the L3A process, (González Alonso et al, 2017, 644) highlight the important role of a mirror-image design, that is, the L1 and the L2 alternate while the L3 is kept constant.

The findings of this study open up some new suggestions that should be considered in the future research. For instance, it is suggested that different language combinations should be investigated, such as Persian-German/German-Persian bilinguals learning English as a third language, and that future studies should include simultaneous bilinguals in addition to the sequential bilinguals used in this study.

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