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The Role of English (L2) Education in Third Language (Arabic) Learning: A Comparative Examination

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Abstract: This study investigated the influence of prior English (L2) instruction on Arabic (L3) acquisition among Persian-speaking adolescents, specifically comparing sequential (L2 before L3) and concurrent (L2 and L3 simultaneously) learning approaches. Participants included a convenience sample of 64 ninth-grade students (aged 14-15; 32 per group, gender-balanced) from a private school complex in Yazd, Iran. The sequential group had pre-intermediate English proficiency while the concurrent group were English beginners; all participants were Arabic beginners. Using a mixed-methods design, the study employed an English proficiency test and three Arabic tasks: Grammatical Judgment, Gap-Filling, and Scrambled Sentences. Quantitative analysis used Mann-Whitney U tests for group comparisons and two-way ANOVA to examine gender and gender-by-group interaction effects. Qualitative data addressed proficiency gains and cross-linguistic transfer. Results showed no significant differences in Arabic acquisition between the sequential and concurrent learning groups. Furthermore, no significant effects of gender or gender-by-group interaction were observed. These findings suggest that prior L2 exposure offered minimal discernible advantage in L3 acquisition. This research contributes to multilingualism studies by providing empirical evidence on the role of prior language experience in L3 acquisition, challenging assumptions about the universal benefits of sequential learning. The findings highlight the need to further investigate factors like language typology, instructional methods, and L2 proficiency levels across educational settings.

Keywords: Concurrent Learning, Cross-linguistic Transfer, L2 Proficiency, Multilingualism, Sequential Learning

Introduction

In Iranian schools where Arabic and English are taught simultaneously, the effectiveness of prior foreign language (L2) learning in facilitating third language (L3) acquisition remains uncertain, even though many families invest early in English education precisely to gain such advantages**.** This tension between sequential and concurrent learning highlights the challenges of multilingual education in Iran's linguistically diverse context, where foreign language proficiency holds growing

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importance. This study examines how prior English (L2) knowledge influences Arabic (L3) acquisition among secondary students, contrasting learners with early English exposure (sequential) against those studying both languages concurrently. While extensive research exists on L3 acquisition, debate persists about how prior language experience affects sequential versus concurrent learning—especially for typologically distinct languages such as Persian (L1), English (L2), and Arabic (L3). This gap is particularly salient in Iran, where the influence of prior English exposure on sequential versus concurrent Arabic learning remains poorly understood. Moreover, to the best of our knowledge, no studies have examined the role of English (L2) in Arabic (L3) acquisition within the Iranian context.

Our objectives are threefold: (1) to assess the role of prior English knowledge in sequential versus concurrent L3 acquisition; (2) to identify how varied language backgrounds affect learning strategies in shared educational settings; and (3) to analyze cognitive mechanisms (e.g., cross-linguistic transfer) through grammatical structures, informing pedagogical approaches for Iran's linguistically diverse classrooms. Ultimately, this research evaluates the efficacy of sequential language instruction by L2 learners with pre-intermediate proficiency and proposes evidence-based strategies to enhance L3 learning outcomes. To address these objectives, we draw on competing theories of L3 acquisition that predict different transfer sources in initial stages of L3 learning. Current frameworks are predominantly classified as wholesale or partial transfer models (Brown, 2020; Puig-Mayenco et al., 2018). We contrast wholesale transfer models (L1 Privilege Model, L2 Status Factor, and Typological Primacy Model)—which predict complete reliance on either L1 or L2—with partial transfer models (Scalpel Model, Cumulative Enhancement Model, and Linguistic Proximity Model) that advocate feature-specific influences. Through comparison of sequential learners (early L2 exposure) and simultaneous learners (concurrent L2-L3 instruction), we examine: whether English proficiency facilitates Arabic acquisition, and transfer favors Persian (L1) or English (L2) as the primary source

Literature Review

The field of third language (L3) acquisition has established multiple theoretical models to explain how existing linguistic knowledge impacts the learning of an additional language. These frameworks are particularly significant for complex language combinations, such as Persian (L1), English (L2), and Arabic (L3), which belong to different typological families.

Wholesale Transfer Models

Among the prominent approaches are wholesale transfer models, which propose that the initial stage of L3 acquisition is primarily shaped by one previously acquired language. The L1 Privilege Model asserts that cognitive entrenchment leads to dominance of the first language, a phenomenon demonstrated by Arabic speakers applying null-subject structures to French even when their L2 English lacks this feature (Hermas, 2014). Yet this model's explanatory power weakens when the L2 shares typological proximity with the L3 or when pedagogical methods highlight relationships between the L2 and L3. Conversely, the L2 Status Factor maintains that the second language exerts greater influence owing to enhanced metalinguistic knowledge, particularly in classroom-based learning. Empirical evidence supports this: Swedish learners acquiring German preferentially used their L2 French over their L1 Swedish for pronoun positioning (Falk & Bardel, 2010). In another study by Eibensteiner (2019), the empirical support for a Second Language Status Factor in the L3 interlanguage was supported. This study examined the acquisition of perfective and imperfective aspects of L3 Spanish by L1 German-L2 English bilinguals. The default source of transfer into L3 Spanish was found to be L2 English due to the structural similarities between the two languages. For Iranian learners studying Arabic (L3) after structured English (L2) education, this implies English might supersede Persian (L1) as the primary source of transfer for specific grammatical features. The

Typological Primacy Model (TPM) offers an alternative view, contending that cross-linguistic transfer stems from perceived linguistic similarity rather than sequence of acquisition. Learners selectively adopt features from whichever previously acquired language they deem most analogous to the L3 (Rothman, 2015). Cabrelli Amaro, Amaro, and Rothman (2015) investigated the status of subject-to-subject raising over an intervening dative experiencer at the initial stages of L3 Brazilian Portuguese. They applied a mirror-image methodology, testing L1 English/L2 Spanish and L1 Spanish/L2 English. The results of a grammaticality acceptability task indicated that Spanish, irrespective of whether it was an L1 or L2, was the primary source of transfer. The authors of this study considered this to be supportive of the TPM.

Partial Transfer Models

In contrast to these wholesale transfer approaches, partial transfer frameworks propose more selective cross-linguistic influences. Among these, the Scalpel Model (Slabakova, 2017) posits property-by-property transfer, which we adopt as our primary framework due to its applicability to the Persian-English-Arabic triad. Applied to the Persian-English-Arabic context, Persian(L1) could govern "subject-pronoun deletion", whereas English(L2) might guide "negation" patterns. Alternative to wholesale transfer approaches, partial transfer frameworks provide a more nuanced explanation by permitting concurrent cross-linguistic influences from multiple sources. The Cumulative Enhancement Model (CEM) (Flynn et al., 2004) specifically posits that only advantageous linguistic features are transferred, though this perspective cannot account for instances where transfer proves detrimental. Parallel to this, Westergaard's (2016) Linguistic Proximity Model (LPM) describes L3 learning as a selective process where learners utilize particular elements from their existing linguistic repertoire. While typological models (e.g., TPM; Rothman, 2015) predict transfer from the ‘closest’ language, recent work on child L3 acquisition (Kolb et al., 2022; Westergaard et al., 2022) demonstrates that structural proximity can override typology. In the Persian-English-Arabic context, analysis demonstrates that Persian (L1) exerts more influence than English (L2) on Arabic's (L3) "subject-pronoun deletion", whereas English shows greater impact than Persian in the domain of "negation" structure. Expanding upon these theories, the Scalpel Model suggests that L3 acquisition may involve piecemeal transfer from either previously acquired language (L1 or L2), with both beneficial and interfering transfer occurring. This selective transfer process is governed by multiple factors including structural similarity, feature complexity, input salience, and the frequency of target language patterns (Slabakova, 2017). In other words, L3 learners have access to all previously acquired knowledge, therefore they can get facilitative or detrimental CLI from either or both of the previously acquired languages. The Scalpel Model suggests that if the L3 closely resembles one of the previously acquired languages, that language could be the primary source of transfer. Therefore, CLI takes place on a property-by-property basis (Ben Abbes, 2020).

Given these competing perspectives, the present study aligns with partial transfer models, which accommodate variable influences from Persian (L1) and English (L2) during Arabic (L3) acquisition. Specifically, we assess how learners selectively transfer features (e.g., subject-pronoun deletion, negation,) from both languages, consistent with property-by-property approaches like the Scalpel Model (Slabakova, 2017). A comprehensive overview of these models' transfer mechanisms is presented in Table 1, which informs the anticipated outcomes for Arabic L3 acquisition scenarios.

Table 1

Comparative Analysis of L3 Transfer Models

Model	Primary Transfer Determinant	Possible Source(s)	Transfer Scope	Transfer Effects
L1 Privilege Model	L1 dominance	L1 only	Wholesale	Both facilitative & non-facilitative
L2 Status Model	L2 metalinguistic salience	L2 only	Wholesale	Both facilitative & non-facilitative

Typological Primacy Model (TPM)	Perceived typological proximity	L1 or L2	Wholesale	Both facilitative & non-facilitative
Cumulative Enhancement Model (CEM)	Typological differences	L1 & L2	Feature-specific	Only facilitative
Linguistic Proximity Model (LPM)	Structural similarity	L1 & L2	Feature-specific	Both facilitative & non-facilitative
Scalpel Model	Multiple factors*	L1 & L2	Feature-specific	Both positive & non-facilitative

*Key factors in Scalpel Model: Typological proximity, grammatical complexity, input ambiguity, frequency of exposure, and target language usage patterns (Slabakova, 2017).

Cross-linguistic Variation: Persian, English, and Arabic

Persian, English, and Arabic exhibit significant differences in their language families and typological features. While they share some vocabulary and aspects of their writing systems, they diverge substantially in their linguistic classification, grammatical structures, lexical composition, orthographic conventions, phonological systems, and syntactic patterns. These differences generate specific testable predictions for models of third language acquisition. In terms of language families, Arabic belongs to the Semitic branch of Afro-Asiatic languages (Hetzron, 1997; Versteegh, 2014), while Persian is an Indo-Iranian language within the Indo-European family (Comrie, 1990; Windfuhr, 1979), and English is a Germanic language also belonging to Indo-European (Crystal, 2018). Grammatically, Arabic is characterized by its triconsonantal root system (Holes, 2004), complex case marking and grammatical gender (Ryding, 2005), with Classical Arabic following VSO word order while modern dialects tend toward SVO structures (Brustad, 2000). In contrast, Persian typically employs SOV word order (Mahootian, 2010), lacks grammatical gender and case inflections (Windfuhr, 1979), and utilizes the ezafe construction for nominal modification (Samvelian, 2018). English predominantly follows SVO ordering (Greenberg, 1963) and has undergone significant reduction in its inflectional systems (Crystal, 2018). Lexically, Persian has incorporated approximately 30-40% of its vocabulary from Arabic (Perry, 2005), while Arabic has borrowed comparatively less from Persian (Versteegh, 2014). Orthographically, both Persian and Arabic employ right-to-left writing systems, with Persian using a modified Arabic script containing additional letters (Windfuhr, 1979; Coulmas, 2003). Phonologically, Arabic contains distinctive pharyngeal and emphatic consonants not found in Persian (Watson, 2002). Syntactically, Persian and Arabic share post-nominal adjective placement (Greenberg, 1963), differing from English's pre-nominal pattern, while both English and Arabic employ definite articles (the, al-) absent in Persian (Windfuhr, 1979). Further elaborating on the grammatical differences, both Arabic and Persian exhibit subject-pronoun deletion, a feature known as "pro-drop" languages, which contrasts with English's requirement for overt subjects. In Arabic, this phenomenon is primarily due to its rich verb conjugation system, where the verb itself provides sufficient information about the subject's person and number, making the explicit pronoun often redundant (Wright, 1896). Similarly, Persian is also a null-subject language, allowing for the omission of personal pronouns in many contexts, especially when the subject is inferable from the verb's ending or from the preceding discourse (Windfuhr, 1979; Karimi, 2005).

Regarding negation, Arabic primarily utilizes particles such as لَا (lā) for present tense negation and commands, and مَا (mā) or لَمْ (lam) for past tense negation (Wright, 1896; Holes, 2004). Similarly, English forms negation using auxiliary verbs like "do," "does," plus "not" for the present tense and "did" followed by "not" for the past tense (e.g., "I do not go," "He did not come") (Quirk et al., 1985). Persian, on the other hand, employs a consistent pre-verbal negative prefix, primarily نَـ (na-), which attaches directly to the verb stem (Windfuhr, 1979; Thackston, 1993). These distinct negation mechanisms provide further evidence for the grammatical divergence among the three languages. The following section will detail the specific grammatical structures under examination in this study.

Subject-Pronoun Deletion Condition

Both Persian and Arabic permit subject-pronoun deletion at the beginning of sentences because the verb conjugation inherently indicates the subject. This means the verb's form provides enough information about the person, number, and often gender of the subject, making a separate pronoun redundant, as demonstrated in examples (1.a) and (1.b). In contrast, English grammar requires explicit subject placement at the start of sentences and prohibits such deletion, as illustrated in example (1.c). Omitting the subject pronoun in English would result in an ungrammatical sentence.

1.(a) nāme neveshtī = to nāme neveshtī (Persian)

letter wrote-2nd.sg= you letter wrote-2nd.sg

You wrote letter

(b) katabtunna rasāʾil = antunna katabtunna rasāʾil (Arabic)

wrote-2nd.pl.fem letters= you wrote-2nd.pl.fem letters

You wrote letters

(c) You wrote letters(English)

Negation Condition

In terms of negation, English (L2) and Arabic (L3) share a key similarity that differentiates them from Persian (L1). Both English and Arabic utilize separate, independent elements (auxiliary verbs or particles) to mark negation, and crucially, these elements often explicitly differentiate between present and past tense negation. In other words, English uses auxiliary verbs like "do/does not" for present and "did not" for past, preceding the main verb, as illustrated by (2.a) and (2.b)

2.(a) She does not lie (Present)

(b) She did not lie (Past)

Similarly, Arabic employs pre-verbal particles "لا" (la) for present tense and "ما" (ma) for past tense, also preceding the verb, as shown in examples (3.a) and (3.b).

3.(a) hiya lā takdhibu (Present)

she NEG lie. PRES

She does not lie

(b) hiya mā kadhabat (Past)

she NEG lie. PAST

She did not lie

Conversely, Persian (L1) employs a morphological strategy, attaching a consistent prefix "نـ" (-na) directly to the verb stem, regardless of tense, to form negation. This means the negation is integrated within the verb rather than being a separate word, as shown in (4.a) and (4.b).

4.(a) ow dorugh ne-miguyad (Present)

she lies NEG-say. PRES

She does not lie

(b) ow dorugh na-goft (PAST)

she lies NEG-said.

She did not lie

Therefore, from the perspective of a Persian speaker, acquiring English and Arabic negation involves shifting from an internal prefixed system to an external, particle/auxiliary-based system. This study has two main goals: first, to identify which of five existing theories best explains how individuals acquire Arabic as a third language; and second, to investigate if learning English as a second language before starting Arabic provides a greater advantage than learning English and Arabic simultaneously. This study will answer the following research questions:

Research Question One: Do groups learning sequentially versus concurrently show variations in how they handle "subject-pronoun" deletion?

Research Question Two: Is there a notable disparity in how well sequential and concurrent groups learn to use "negation"?

Research Question Three: Is there a significant difference in third language acquisition performance regarding gender in different participant groups?

Research Question Four: Does cross-linguistic influence (CLI) in L3 acquisition stem from one or all prior languages?

Research Question Five: Does language transfer facilitate or hinder L3 learning?

Methodology

Design of the Study

This research investigates the differences between sequential (learning L2 English followed by L3 Arabic) and concurrent (learning L2 English and L3 Arabic at the same time) approaches in acquiring Arabic syntactic structures. The target syntactic features were chosen from Arabic textbooks used in Iranian junior high schools (grades 7–8). Employing a mixed-methods design, the study evaluated these two learning approaches among 64 Persian-speaking adolescents (32 in each group). The quantitative data, which included an English proficiency test and three Arabic language assessments (Grammatical Judgment Task (GJT), Gap-Filling Task (GFT), and Scrambled Sentence Task (SST)), were analyzed using non-parametric statistical tests due to the non-normal distribution of the data. Specifically, Mann-Whitney U tests were employed to compare the performance between the two learner groups (sequential versus concurrent L3 learners). Additionally, between-subjects ANOVA was conducted to examine potential main effects of gender as well as gender-by-group interaction effects on Arabic proficiency scores. While quantitative analysis predominated, qualitative elements were integrated through: (1) participants' written justifications in all Arabic tasks (GJT, GFT, SST), which we thematically coded to identify transfer patterns, and (2) open-ended responses in background questionnaire that illuminated language learning experiences. This combination provided deeper insights into cognitive and transfer effects that complemented the statistical findings.

Participants

The study participants comprised 64 ninth-grade native Persian speakers (aged 14 years) recruited via convenience sampling from a private school complex (Sayed al-Shohada) in Yazd, Iran. The participants were equally divided into two groups of 32 students each, with balanced gender distribution (16 boys and 16 girls per group). The sequential learning group consisted of students with pre-intermediate English proficiency, achieved through private language institute classes that they had begun at approximately 5–6 years of age. In contrast, the concurrent learning group had no prior language learning experience before formal education and began studying both English and Arabic simultaneously in the seventh grade. Background questionnaire and 7th–8th grade Arabic scores confirmed that all participants, regardless of group, were at a uniform beginner level in formal

Arabic, despite any informal exposure (e.g., religious settings). Thus, Arabic was treated as an L3 in this context, as the study focused solely on classroom-based acquisition of Arabic grammar, with no prior academic knowledge assumed.

Instruments

Background Questionnaire*:* Administered at the start of grade nine, this form collected students' personal and language-learning background to assess demographic characteristics and prior language exposure.

English Placement Test: The study employed a 50-item grammar test adapted from UsingEnglish.com, using its original five-level scoring system: Beginner (0-20%), Elementary (21-40%), Pre-intermediate (41-60%), Intermediate (61-80%), and Upper-intermediate (81-100%). While the test lacked published psychometric data, we validated it through multiple measures. Test-retest reliability over a two-week interval demonstrated strong consistency ($r = .82$, $n = 20$), while internal consistency analysis yielded high reliability ($\alpha = .84$). Three experts in English language teaching independently evaluated the test's content validity, leading to minor refinements that improved its measurement precision. This comprehensive validation approach ensured the instrument's robustness for the study. Only participants scoring at the pre-intermediate level (the majority of learners) were included to ensure sample homogeneity when examining L2 (English) effects on Arabic (L3) acquisition. Although not standardized, these validation results support the test's appropriateness for the study's purposes, though cross-validation with established tests is recommended for future research.

Grammaticality Judgment Task (GJT): A 14-item task assessing Arabic sentence grammaticality, focusing on "subject-pronoun deletion" and "negation" structures, with responses marked *as* "correct, incorrect, or I don't know".

Gap-Filling Task (GFT): A 14-item task testing knowledge of "subject-pronoun deletion" and "negation" through sentence completion, with responses analyzed for correctness.

Scrambled Sentences Task (SST): Participants rearranged scrambled words into correct Arabic sentences, targeting the same grammatical structures (subject-pronoun deletion and negation). Scoring followed a strict rubric**:** For subject-pronoun items, responses showing Persian-like patterns (matching Arabic) scored 1, while non-Persian arrangements (aligning with English) scored 2. Negation items were coded as: 1 = correct Arabic negation (using independent tense-marked particles like "ما"/"لا", matching English's auxiliary verbs "do not"/"did not"), 2 = incorrect Persian-like pattern (using the tense-invariant prefix "ن" attached to the verb), or 3 = blank/"I don't know" responses.

Task Development and Validation: The three Arabic assessment tasks (GJT, GFT, SST) were developed using items from standard Iranian junior high school textbooks (grades 7-8) to ensure curricular validity. Prior to the main study, a pilot study with 15 participants (independent of the main study) established the instruments' psychometric properties, demonstrating strong test-retest reliability (GJT: $r = .85$; GFT: $r = .83$; SST: $r = .81$) and excellent intra-rater agreement ($\kappa = .89$) through systematic rescoring by a native Arabic-speaking linguist. Three independent experts further validated the tasks' construct alignment with target grammatical structures (subject-pronoun deletion/negation) and cultural appropriateness. This rigorous development process - incorporating textbook-based items, reliability testing with a pilot cohort, and expert validation - confirms the tasks' robustness for investigating L2-L3 transfer effects, while their focused design allows precise measurement of specific syntactic features.

Procedure

The study selected 64 male and female EFL learners from 380 ninth-grade students in Yazd through initial questionnaire screening. From these, 123 participants indicated they began English instruction at approximately age 5 and were only familiar with Persian (their native language) and English. All participants completed a standardized grammar test to evaluate their English syntax knowledge, with results categorized across five proficiency levels ranging from Beginner (0-20%) to Upper-intermediate (81-100%). Psychometric evaluation revealed strong test-retest reliability over two weeks ($r = .82$, $n = 20$) and high internal consistency ($\alpha = .84$). Three English language teaching specialists independently verified content validity, with their input guiding measurement refinements. Analysis revealed most test-takers performed at the Pre-intermediate level (41-60%), leading to the exclusion of those scoring outside this range (e.g., Beginner or Upper-intermediate). The final sample consisted of two groups: thirty-two Pre-intermediate learners (16 males, 16 females) following sequential language acquisition (L1 Persian→L2 English→L3 Arabic), and another thirty-two (16 males, 16 females) with no prior English exposure who learned English and Arabic simultaneously (L1 Persian with concurrent L2/L3 acquisition). Researchers employed three assessment tools (GJT, GFT, SST) to ensure methodological rigor through triangulation.

The Grammaticality Judgment Test contained 14 Arabic language items evaluating two key structures: four grammatically correct sentences demonstrating positive transfer, four ungrammatical sentences showing negative transfer, four distractors, and two practice items with different grammatical patterns. Participants selected from three coded response options (1=correct, 2=incorrect, 3=I don’t know) and provided very short written explanations for their choices. One week later, researchers administered the 14-item Gap-Filling Task containing four subject-pronoun deletion items, four negation structure items, four distractors, and two examples. Participants selected from three coded response options (1=correct, 2=incorrect, 3=I don’t know) and provided very short written explanations for their choices. On the subsequent day, participants completed a Scrambled Sentences Task (5 items: 2 subject-pronoun deletion, 2 negation markers, and 1 example). Responses following Persian-like subject-pronoun patterns were scored 1 (reflecting L1 transfer), while other arrangements were scored 2 (indicating potential L2 influence). For negation items, proper Arabic markers earned 1 point (coded as English transfer), incorrect usage scored 2 (coded as Persian transfer), and omitted responses received 3. Notably, for the concurrent group, English-like negation patterns were attributed to Arabic influence rather than English transfer.

To examine how prior language learning experience (sequential vs. concurrent) and gender influence the acquisition of Arabic grammar—particularly "subject-pronoun omission" and "negation"—we analyzed data using SPSS (Version 26). We initially categorized responses as correct (1), incorrect (2), or "I don't know" (3), then re-coded them for statistical analysis. Our first step was to summarize overall performance using descriptive statistics like means, medians, and standard deviations. Since normality tests (Kolmogorov-Smirnov and Shapiro-Wilk) indicated that the data wasn't normally distributed, we opted for non-parametric tests to compare groups. The Mann-Whitney U test revealed differences between those who learned languages sequentially and concurrently; these results are shown in Table 2 for subject-pronoun deletion and Table 6 for negation. We also investigated the influence of gender using a two-way between subjects ANOVA. In this analysis, the learning group and gender were the independent variables, and Arabic performance was the dependent measure. We performed Levene's test to check for data homogeneity. The two-way between subjects ANOVA outcomes, including significance levels, effect sizes (partial eta-squared), and interaction effects, are detailed in Tables 3–4 (subject-pronoun deletion) and Tables 7–8 (negation marker). To visualize performance trends, we used Figures 1–3 (subject-pronoun deletion) and 7–9 (negation marker). Furthermore, Tables 5/9 and Figures 4–6/10–12 illustrate the sources of transfer for each grammatical structure. Crucially, if we don't find a significant difference between sequential and concurrent learners, it would support our null hypothesis: that prior knowledge of English (L2) does not significantly affect the acquisition of Arabic (L3).

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Results

This research investigated how sequential and concurrent learners acquire Arabic's subject-pronoun deletion and negation through three specific tasks: GJT, GFT, and SST.

Subject-Pronoun Deletion Condition

Descriptive Analysis

Table 2 data reveals that the sequential group consistently achieved higher average correct scores across all tasks: GJT (78.90%), GFT (72.65%), and SST (64.06%). In contrast, the concurrent group's averages were GJT (75.78%), GFT (68.75%), and SST (56.25%).

Despite these differences in means, a Mann-Whitney U test, conducted because of non-normal variance, indicated no statistically significant differences between the sequential and concurrent groups for any of the tasks. Specifically, the results were: GJT (U=455.000, Z=−.835, p=.404), GFT (U=470.000, Z=−.612, p=.540), and SST (U=470.500, Z=−.633, p=.527). Table 2 presents a comprehensive summary of these descriptive statistics and the Mann-Whitney U test outcomes. Furthermore, Figures 1-3 provide visual representations of the average responses for the "subject-pronoun deletion" condition across the three tasks.

Table 2

The Summarized Descriptive Data and the Findings from the Mann-Whitney U Test

Task	Group	*M*	*SD*	*N*	*U*	*Z*	*P*	*R*
GJT	Sequential	78.90	21.16	16	455.00	-.835	.404	
	Concurrent	75.78	17.37	16				
GFT	Sequential	72.65	23.20	16	470.00	-.612	.540	
	Concurrent	68.75	23.75	16				
SST	Sequential	64.06	46.20	16	470.50	-.633	.527	
	Concurrent	56.25	48.77	16				

An analysis of correct, incorrect, and 'I don't know' responses (Figures 1-3) indicates that the sequential group consistently attained higher average correct scores than the concurrent group across the GJT, GFT, and SST tasks

Figure 1

Mean GJT Scores for Each Group, Categorized by Response Type

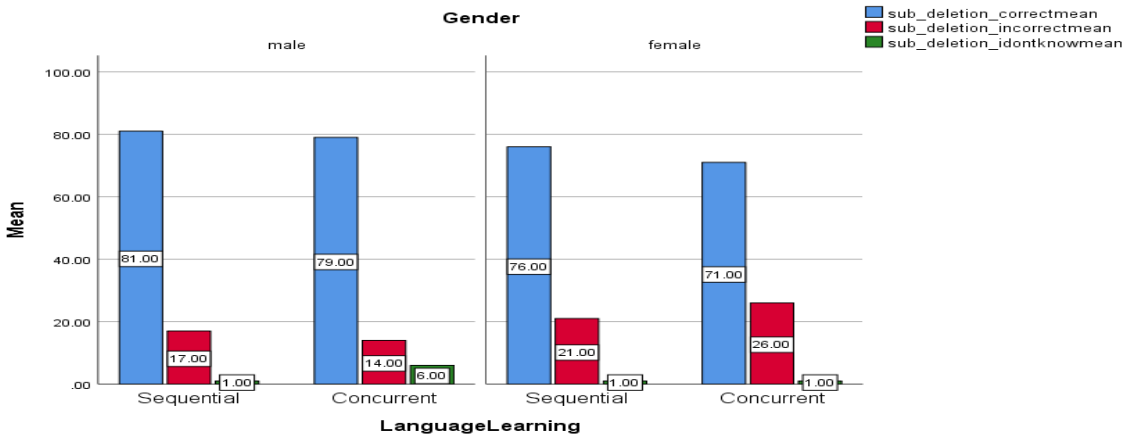


Figure 2

Mean GFT Scores for Each Group, Categorized by Response Type

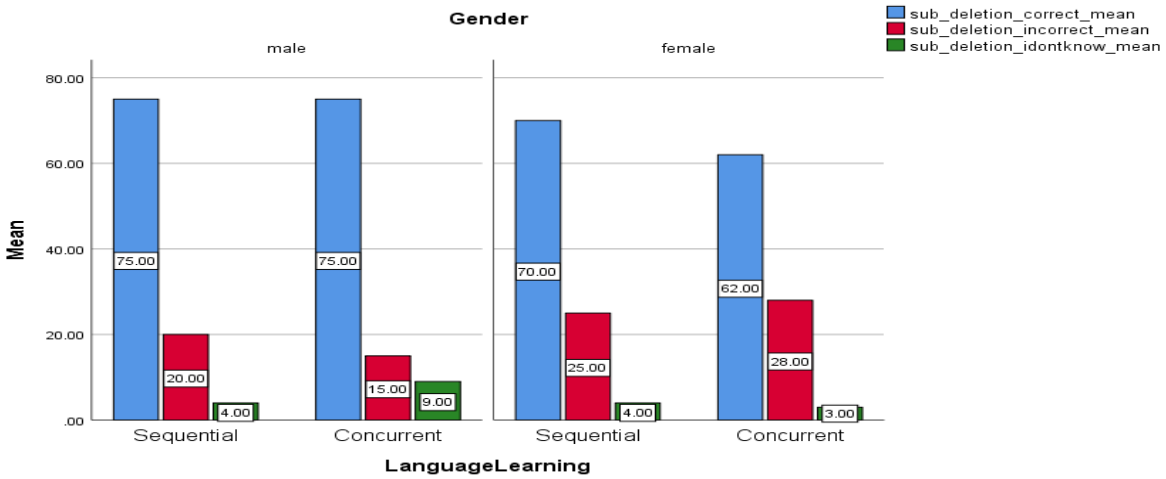
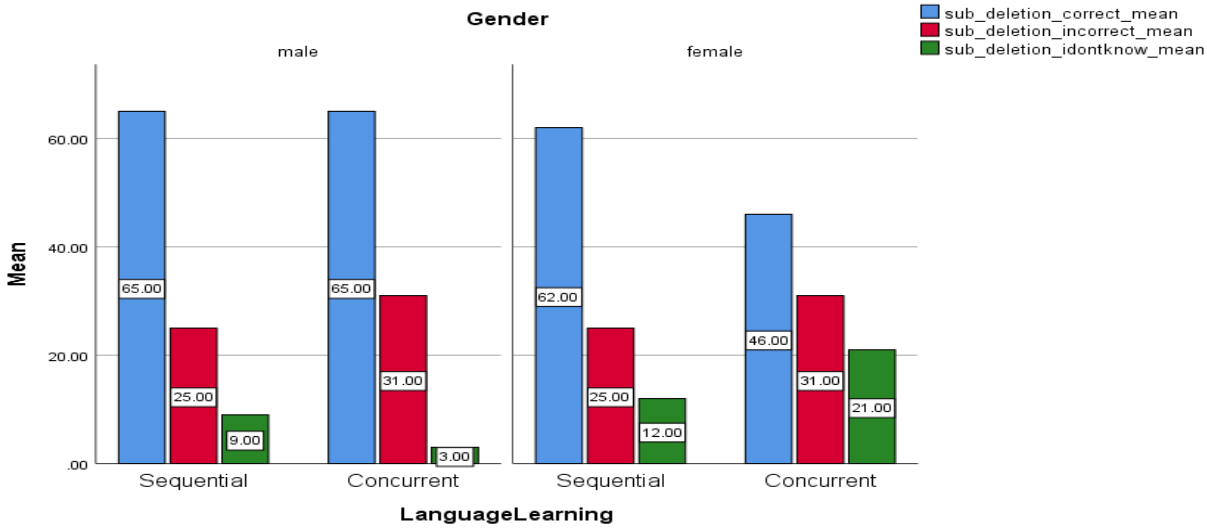


Figure 3

Mean SST Scores for Each Group, Categorized by Response Type



Two-way Between Subjects ANOVA

A two-way between subjects ANOVA was conducted to examine the effects of learning group (sequential vs. concurrent) and gender on the accuracy of "subject-pronouns deletion" in the GJT task. Levene's test confirmed homogeneity of variances (F (3, 60) = 1.209, p = .314). Descriptive statistics (Table 3) indicated that sequential groups had higher mean scores, with males marginally outperforming females. However, the ANOVA results (Table 4) revealed no statistically significant main effects for learning method (F (1, 60) = 0.415, p = .522), gender (F (1, 60) = 1.66, p = .202), or their interaction (F (1, 60) = 0.104, p = .748). Thus, neither learning method, gender, nor their interaction significantly influenced subject-pronoun deletion accuracy. For the GFT task, Levene's test confirmed that the data met the equal variances assumption (F (3, 60) = 2.603, p = .060). According to the descriptive statistics (Table 3) and further details in Table 4, the sequential learning groups generally achieved higher mean scores**,** and within these groups, Male participants slightly outperformed females. However, a two-way between subjects ANOVA indicated that these observed differences were not statistically significant**.** Specifically, there were no significant main effects for

learning method (F (1, 60) = .447, p = .506) or gender (F (1, 60) = 2.163, p = .147), nor was there a significant interaction between them (F (1, 60) = .447, p = .506). Therefore, it can be concluded that in this study, neither the learning method, gender, nor their combined influence significantly impacted accuracy in "subject- pronoun deletion" usage during the GFT. For the SST task, Levene's test indicated that the assumption of equal variances was met (F (3, 60) = 1.108, p = .353). While descriptive statistics (Table 3) showed that sequential groups had slightly higher mean scores, and males in both groups scored higher, a two-way ANOVA (Table 4) revealed no statistically significant main effects for learning method (F (1, 60) = .428, p = .516) or gender (F (1, 60) = .838, p = .364). There was also no significant interaction between learning method and gender (F (1, 60) = .428, p = .516). Therefore, in this study, neither the learning method, gender, nor their interaction had a significant impact on subject-pronoun deletion accuracy in the SST.

Table 3

Performance Overview by Task, Group, and Gender

Task	Group	Gender	*M*	*SD*	*N*
GJT	Sequential	Male	81.25	19.36	16
		Female	76.56	23.21	16
	Concurrent	Male	79.68	13.59	16
		Female	71.87	20.15	16
GFT	Sequential	Male	75.00	22.36	16
		Female	70.31	24.52	16
	Concurrent	Male	75.00	15.81	16
		Female	62.50	28.86	16
SST	Sequential	Male	65.62	43.66	16
		Female	62.50	50.00	16
	Concurrent	Male	65.62	47.32	16
		Female	46.87	49.89	16

Note. M =(correct) Mean; *SD* = Standard Deviation; *N* = Number.

Table 4

Results from the Two-way ANOVA

Task	Source of Variance	*df*	*F*	*p*	Partial η^2
GJT	Language Learning (A)	1	.415	.522	.007
	Gender (B)	1	1.661	.202	.027
	A B Interaction	1	.104	.748	.002
	Residual (Error)	60			
GFT	Language Learning (A)	1	.447	.506	.007
	Gender (B)	1	2.163	.147	.035
	A B Interaction	1	.447	.506	.007
	Residual (Error)	60			
SST	Language Learning (A)	1	.428	.516	.007
	Gender (B)	1	.838	.364	.014
	A B Interaction	1	.428	.516	.007
	Residual (Error)	60			

Note. df = Degrees of Freedom; *F* = F-statistic; *p* = p-value; Partial η^2 = Partial Eta Squared

Source of Transfer

Table 5 of the study reveals interesting findings on "subject-pronoun deletion" based on language acquisition. For the Persian (L1) in GJT, the sequential group (M = 78.90) scored higher than the concurrent group (M = 75.78). When the L2 was English, the sequential group (M = 19.53) significantly outscored the concurrent group (M = 0.000) on the GJT, indicating non-facilitative L2 transfer. This suggests the sequential group likely benefited from both facilitative L1 transfer and non-facilitative L2 transfer, while the concurrent group only experienced facilitative L1 transfer. It's important to note that neither group used Arabic during this specific task. On the GFT with Persian (L1), the sequential group again outscored the concurrent group (M = 72.65 vs. M = 67.96). Similarly, for the GFT with English (L2), the sequential group scored (M = 21.09) compared to the concurrent group's (M = 0.000), indicating non-facilitative L2 transfer. Neither group used Arabic. Thus, sequential learners showed both facilitative L1 and non-facilitative L2 transfer, while concurrent learners only showed facilitative L1 transfer. Lastly, in the SST, the sequential group again outperformed the concurrent group. They scored higher in Persian transfer (M = 64.06 vs. 56.25) and English transfer (M = 25.00 vs. 0.000). This collectively supports the idea that the sequential group showed both facilitative and non-facilitative language transfer, while the concurrent group only demonstrated helpful (facilitative) transfer, as summarized in Table 5.

Table 5

Transfer Source in Subject-pronoun Deletion Condition

Task	Source of Language	Language Learning Group	*M*	*SD*
GJT	Persian L1	Sequential	78.90	21.16
		Concurrent	75.78	17.37
	English L2	Sequential	19.53	21.75
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	0.00	0.00
GFT	Persian L1	Sequential	72.65	23.20
		Concurrent	67.96	23.95
	English L2	Sequential	21.09	21.16
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	0.00	0.00
SST	Persian L1	Sequential	64.06	46.20
		Concurrent	56.25	48.77
	English L2	Sequential	25.00	40.16
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	0.00	0.00

Figures 4 through 6 illustrate that groups learning languages sequentially consistently demonstrated greater language transfer (from both Persian and English) on the GJT, GFT, and SST tasks, when compared to groups learning languages concurrently.

Figure 4

GJT Language Transfer: Sequential vs. Concurrent Performance

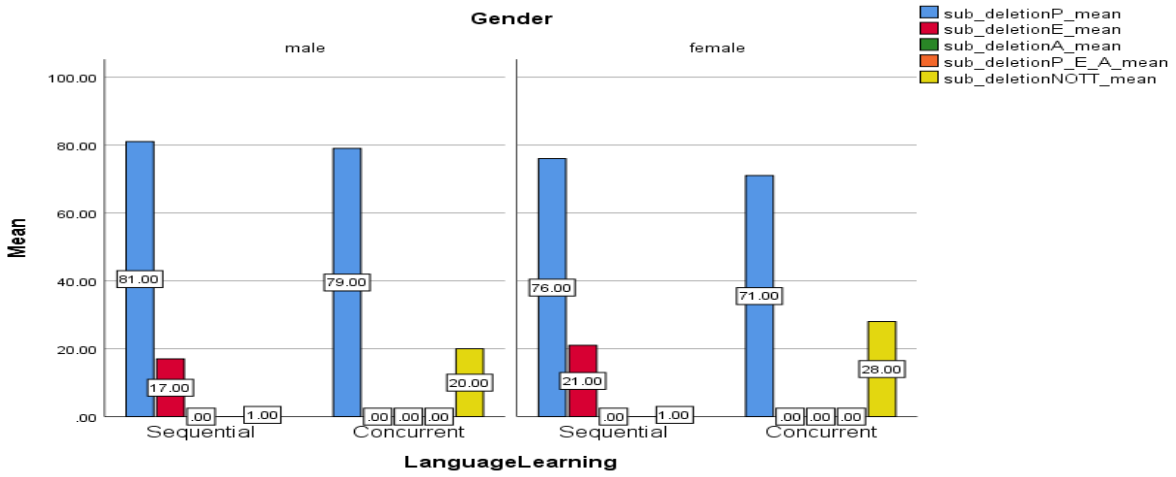


Figure 5

GFT Language Transfer: Sequential vs. Concurrent Performance

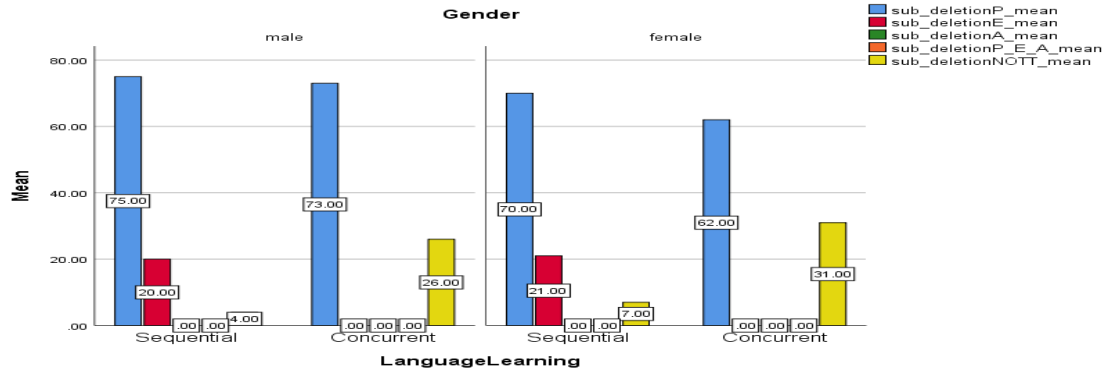


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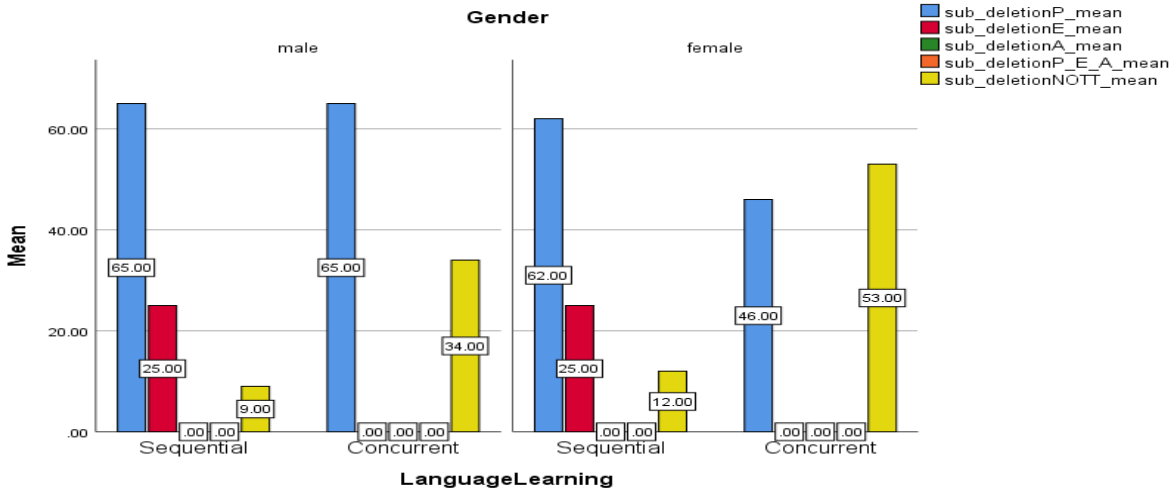
Figure 6

SST Language Transfer: Sequential vs. Concurrent Performance



Negation Condition

Descriptive Analysis

Although the sequential group had higher mean scores across tasks (GJT: 44.53, GFT: 58.59, SST: 18.75) compared to the concurrent group (GJT: 39.06, GFT: 50.78, SST: 10.93), as detailed in Table 6, statistical analysis showed mostly no significant difference. A Mann-Whitney U test was used because the data wasn't normally distributed. This test revealed no significant differences between the groups for the GJT (U = 445.500, Z= -.932, p = .352), GFT (U = 437.00, Z= -1.038, p = .299) and SST (U = 434.500, Z= -1.353 p = .176). Figures 7-9 further illustrate the group response means for the "negation marker" condition.

Table 6

The Summarized Descriptive Data and The Findings from the Mann-Whitney U Test

Task	Group	*M*(correct)	*SD*	*N*	*U*	*Z*	*p*
GJT	Sequential	44.53	25.18	32	445.500	-.932	.352
	Concurrent	39.06	24.54	32			
GFT	Sequential	58.59	32.13	32	437.00	-1.038	.299
	Concurrent	50.78	28.73	32			
SST	Sequential	18.7500	27.67	32	434.500	-1.353	.176
	Concurrent	10.93	24.54	32			

Figure 7

Mean GJT Scores for Each Group, Categorized by Response Type

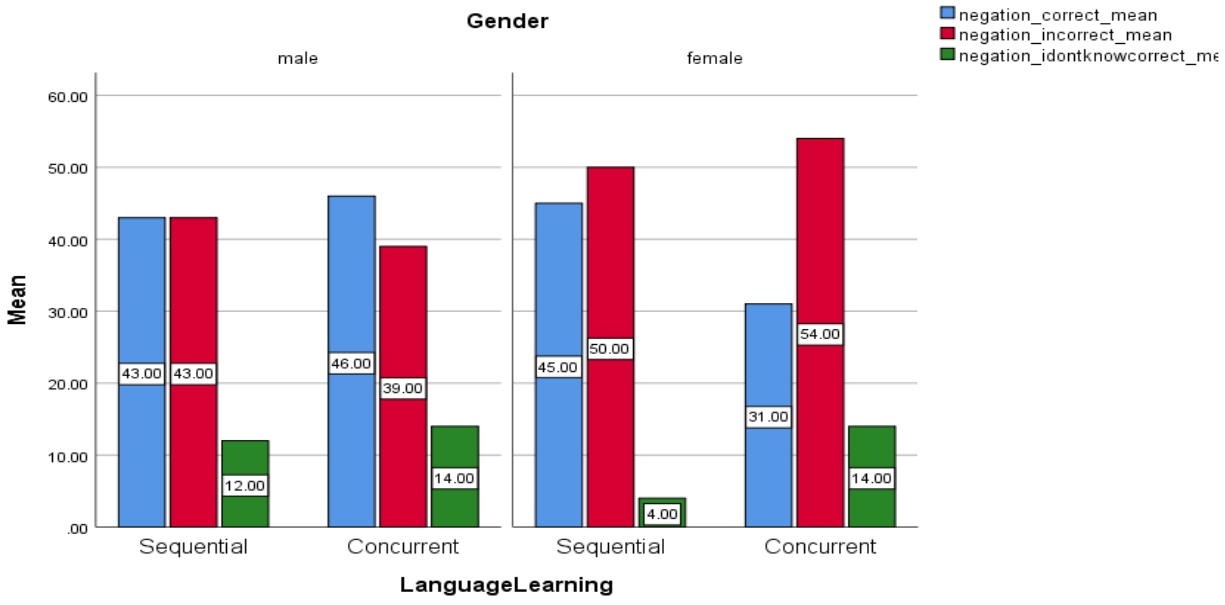


Figure 8

Mean GFT Scores for Each Group, Categorized by Response Type

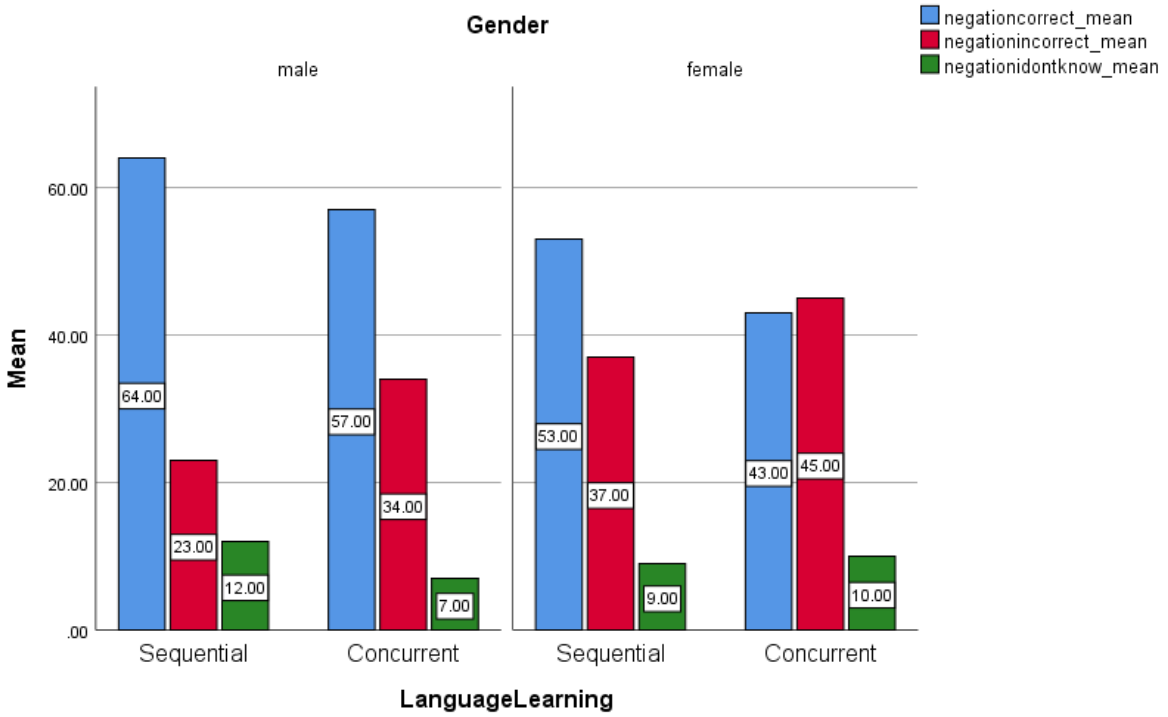
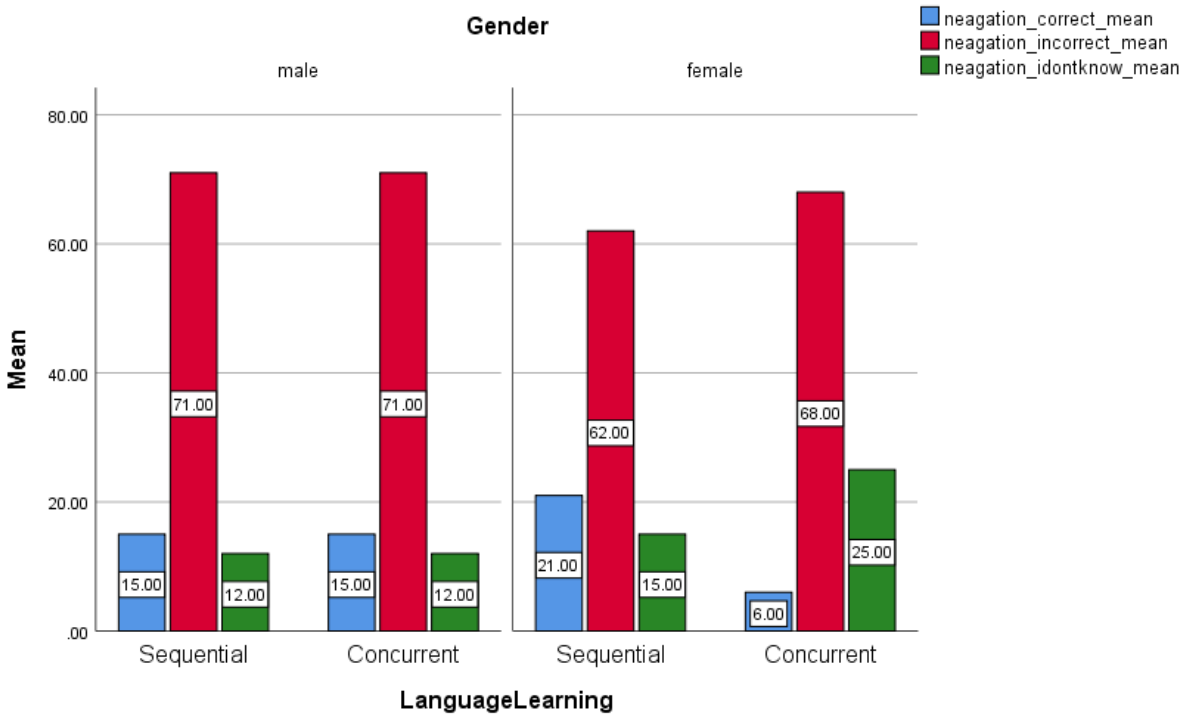


Figure 9

Mean SST Scores for Each Group, Categorized by Response Type



Two-way Between Subjects ANOVA

A two-way between-subjects ANOVA was conducted to examine the effects of gender and language learning method (sequential vs. concurrent) on negation marker accuracy in the GJT. Levene's test confirmed equal variances (F (3, 60) = .213, p = .887). Descriptive statistics (Table 7) revealed that sequential learners outperformed concurrent learners overall, with females scoring higher in the sequential group and males scoring slightly higher in the concurrent group. However, the ANOVA results (Table 8) indicated no significant main effects for learning method (F (1, 60) = .789, p = .378), gender (F (1, 60) = 1.305, p = .258), or their interaction (F (1, 60) = 1.950, p = .168) on "negation marker" accuracy. This means that, in this study, neither language learning method, nor their gender, nor the interaction of both, significantly impacted their accuracy with negation markers. For the GFT, Levene's test indicated equal variances across groups (F (3, 60) = 1.844, p = .149). Descriptive statistics (Table 7) showed higher mean scores for sequential learning groups compared to concurrent groups, with males tending to score higher in both. A two-way ANOVA (Table 8) found no significant main effects for language learning method (F (1, 60) = 1.064, p = .306, ηp2 = .017) or gender (F (1, 60) = 2.723, p = .104, ηp2 = .043). Furthermore, the interaction between these factors was not significant (F (1, 60) = .043, p = .837, ηp2 = .001). Therefore, neither learning method, gender, nor their interaction significantly affected negation accuracy in this study. On the SST, Levene's test (F (3,60) = 4.157, p = .010) indicated that the assumption of equal variances was violated, so the following two-way between subjects ANOVA results should be interpreted with caution. Descriptive statistics (Table 7) showed that the sequential group had higher mean scores than the concurrent group. While males scored similarly in both groups, the sequential female mean score was higher than that of concurrent females. However, the two-way between subjects ANOVA (Table 8) found no significant main effects for language learning method (F (1,60) = 1.415, p = .239, ηp2 = .023) or gender (F (1,60) = .057, p = .813, ηp2 = .001). There was also no significant interaction between them (F (1,60) = 1.415, p = .239, ηp2 = .023). This suggests that neither the learning method, gender, nor their interaction significantly impacted "negation" accuracy in this study.

Table 7

Performance Overview by Task, Group, and Gender

Task	Group	Male	Female	Male	Female	Male	Female
		M	*M*	*SD*	*SD*	*N*	*N*
GJT	Sequential	43.75	45.31	23.27	27.71	16	16
	Concurrent	46.87	31.25	23.95	23.27	16	16
GFT	Sequential	64.06	53.12	25.76	37.500	16	16
	Concurrent	57.81	43.75	25.36	30.95	16	16
SST	Sequential	15.62	21.87	23.93	31.45	16	16
	Concurrent	15.62	6.25	30.10	17.07	16	16

Note. *M* = Mean(correct); *SD* = Standard Deviation; *N* = Number

Table 8

Findings from the Two-way ANOVA

Task	Source of Variance	*df*	*F*	*p*	Partial η^2
GJT	Language Learning (A)	1	.789	.378	.013
	Gender (B)	1	1.305	.258	.021
	A B Interaction	1	1.950	.168	.031
	Residual (Error)	60			
GFT	Language Learning (A)	1	1.064	.306	.017
	Gender (B)	1	2.723	.104	.043
	A B Interaction	1	.043	.837	.001

Task	Source of Variance	*df*	*F*	*p*	Partial η^2
	Residual (Error)	60			
SST	Language Learning (A)	1	1.415	.239	.023
	Gender (B)	1	.057	.813	.001
	A B Interaction	1	1.415	.239	.023
	Residual (Error)	60			

Note. *df* = Degrees of Freedom; *F* = F-statistic; *p* = p-value; Partial η^2 = Partial Eta Squared

Source of Transfer

Table 9 sheds light on the effects of language transfer on "negation" structures, distinguishing between sequential and concurrent learning groups. In the GJT where Persian was the first language (L1), both the sequential and concurrent groups performed identically, with a mean score of 46.87 (SD = 23.54 for sequential, SD = 24.38 for concurrent). However, a notable difference emerged in their English scores. The sequential group scored significantly higher (M = 44.53, SD = 25.18) in English compared to the concurrent group (M = 0.00, SD = 0.00). These results suggest that the sequential group experienced both non-facilitative transfer from their L1 (Persian) and facilitative transfer from their L2 (English). In contrast, the concurrent group only exhibited non-facilitative transfer from their L1.

In the GFT with Persian as the first language, the sequential group's score (M = 30.46, SD = 26.74) was lower than the concurrent group's (M = 39.84, SD = 27.57). However, the sequential group demonstrated a higher English score (M = 58.59, SD = 32.13) compared to the concurrent group (M = 0.00, SD = 0.00). These findings indicate that for the sequential group, the facilitative transfer from their second language (L2), English (which shares similarities with Arabic, the L3), outweighed the non-facilitative transfer from their first language (L1). In the SST task, the sequential group's Persian transfer score (M = 65.62, SD = 34.63) was lower than the concurrent group's (M = 70.31, SD = 33.26). Conversely, the sequential group outperformed the concurrent group in English transfer (M = 20.31, SD = 27.99 vs. M = 0.00, SD = 0.00), replicating the pattern seen in the GFT task.

Table 9

Transfer Source in Negation Condition

Task	Source of Language	Language Learning Group	*M*	*SD*
GJT	Persian L1	Sequential	46.87	23.54
		Concurrent	46.87	24.38
	English L2	Sequential	44.53	25.18
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	39.06	24.54
GFT	Persian L1	Sequential	30.46	26.74
		Concurrent	39.84	27.57
	English L2	Sequential	58.59	32.13
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	50.78	28.73
SST	Persian L1	Sequential	65.62	34.63
		Concurrent	70.31	33.26
	English L2	Sequential	20.31	27.99
		Concurrent	0.00	0.00
	Arabic L3	Sequential	0.00	0.00
		Concurrent	10.93	24.54

Note. *M* = Mean(correct); *SD* = Standard Deviation; L1 = First Language; L2 = Second Language; L3 = Third Language.

Figures 10-12 illustrate language transfer means in sequential and concurrent groups across various tasks. While Figure 10 indicates equal Persian transfer means for both groups in the GJT, Figures 11 and 12 reveal that the concurrent group had higher Persian transfer means in both the GFT and SST tasks.

Figure 10

GJT Language Transfer: Sequential vs. Concurrent Performance

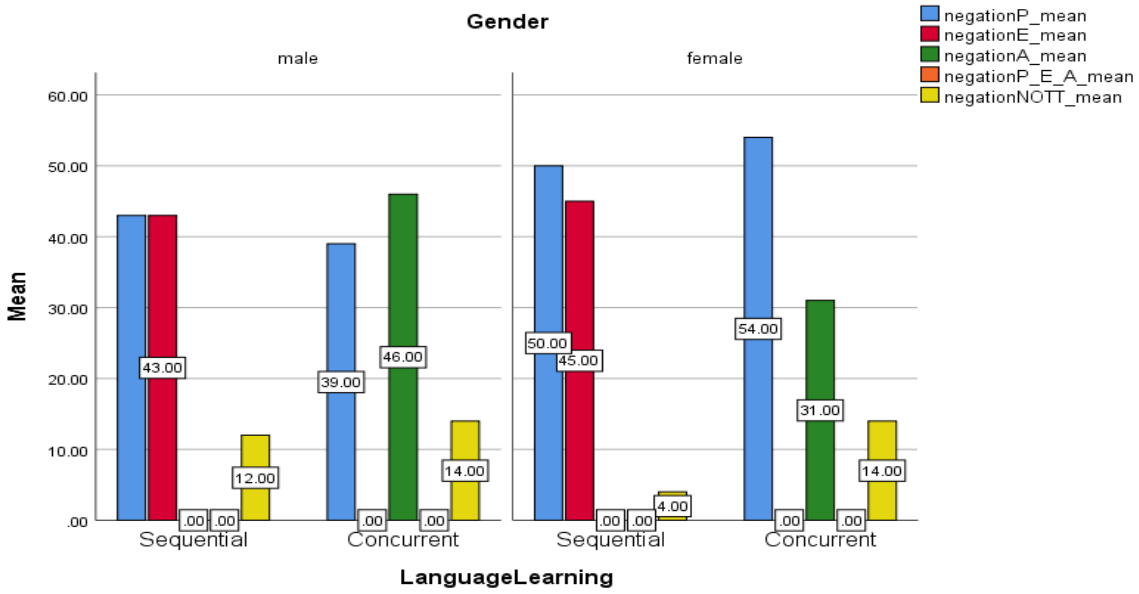


Figure 11

GFT Language Transfer: Sequential vs. Concurrent Performance

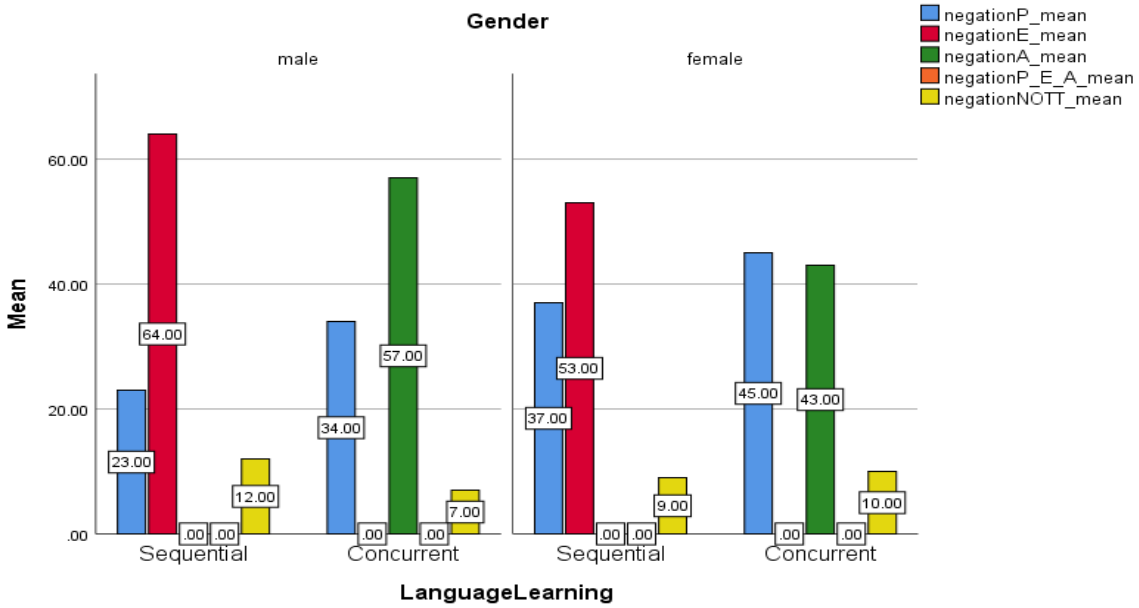
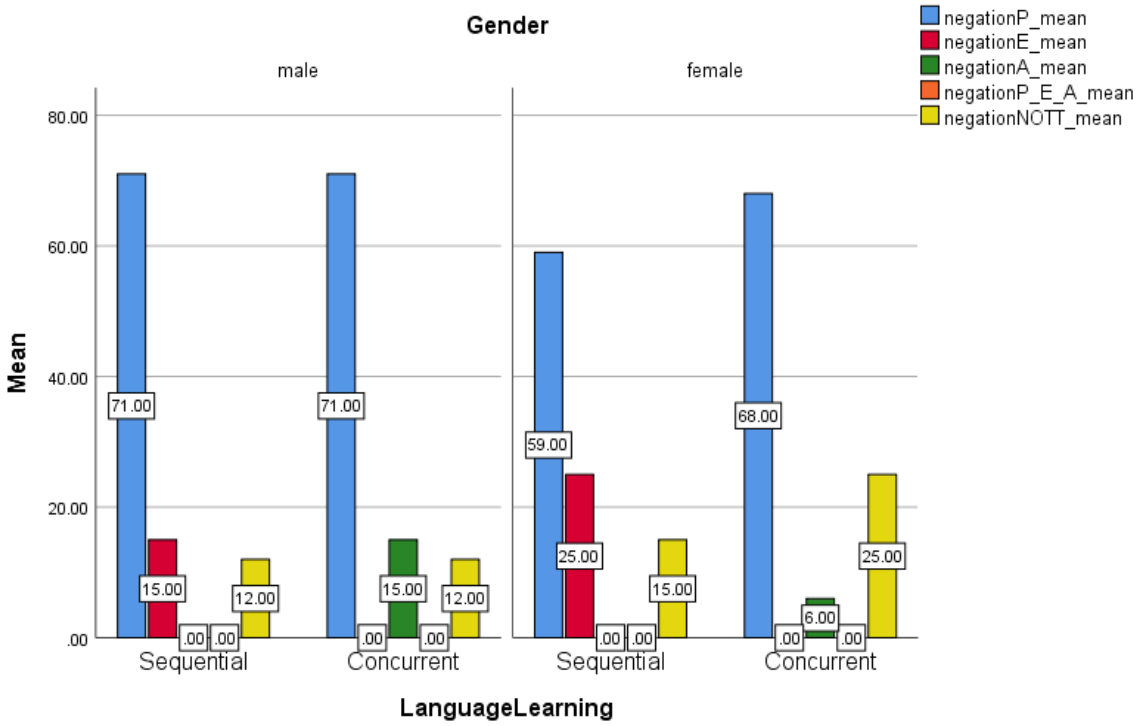


Figure 12

SST Language Transfer: Sequential vs. Concurrent Performance



Discussion

This study investigated how sequential and concurrent learners acquired "subject-pronoun deletion" and "negation marker" structures in Arabic. Although the sequential group had slightly higher mean scores in both areas, these differences weren't statistically significant. This suggests that previous language experience in sequential learning doesn't always provide an advantage**.** The lack of significant differences implies that L2 proficiency (at a Pre-intermediate level) might need to surpass a certain threshold for beneficial transfer to occur, aligning with the 'proficiency ceiling' hypothesis (Rothman, 2015; Jaensch, 2009). This is empirically supported by Puig-Mayenco and Marsden (2018), who found that L1 Catalan/L2 Spanish learners only demonstrated systematic transfer to L3 English polarity items after reaching intermediate L2 proficiency.

To address the first research question, the analysis revealed that sequential learners achieved higher mean scores than the concurrent group when only L1 transfer was considered. However, this difference was not statistically significant. In this scenario, both facilitative transfer from L1 and non-facilitative transfer from L2 were observed. It appears that the Pre-intermediate L2 proficiency contributed to this non-facilitative transfer, preventing sequential learners from outperforming their concurrent counterparts. These findings are consistent with predictions based on shared L1-L3 linguistic structures (Westergaard, 2019). Addressing the second research question, sequential learners (L2-L3 structural alignment) scored higher than concurrent learners (L1 transfer only), though this difference was not statistically significant. Despite the predicted benefits of L2-L3 similarity, Pre-intermediate L2 proficiency prevented sequential learners from utilizing shared structures, supporting the proficiency threshold hypothesis. While the Linguistic Proximity Model (Westergaard, 2019) forecasts transfer based on structural overlap, our findings show its dependency on proficiency thresholds. This aligns with the Scalpel Model's emphasis on multifactorial influences, like L2 dominance and input frequency, which can override typological proximity. These results qualify Westergaard et al.’s (2016) claim that shared features facilitate L3 acquisition, showing that

such facilitation depends on sufficient L2 proficiency—a condition unmet here. Collectively, these findings indicate that L3 acquisition involves a process where structural advantages from similarity remain latent without sufficient L2 competence, explaining why sequential learners did not significantly outperform concurrent peers despite theoretical benefits. Regarding the third research question, the findings revealed no significant gender differences in either lexical syntax (subject-pronoun deletion) or morphosyntax (negation marker) within any group. Furthermore, there was no significant interaction between gender and learning group (sequential/concurrent). These results align with Ellis's (2008) conclusion that while gender might influence learning styles and motivation, it does not significantly impact ultimate language learning outcomes. This perspective finds further support in Kheder and Rouabhia's (2023) recent work, which clarifies that apparent gender differences in language learning actually reflect sociocultural influences and learning environment factors rather than essential differences in language learning capacity between genders. Addressing the fourth and fifth research questions on language transfer, sequential learners exhibited facilitative L1 and non-facilitative L2 transfer for "subject-pronoun deletion" (L1/L3 similar, L2 different). In contrast, concurrent learners exhibited only facilitative L1 transfer, with no L2 influence due to their lack of L2 proficiency. For the negation marker structure (where L2 and L3 are similar but differ from L1), sequential learners demonstrated both non-facilitative L1 transfer and facilitative L2 transfer. Concurrent learners, however, again showed only non-facilitative L1 influence and no L2 effects, attributable to their lack of L2 proficiency.

These results highlight the distinct impacts of L1 and L2 on L3 acquisition. L1 aided "subject-pronoun deletion" learning in both groups, but the dissimilar L2 structure interfered with sequential learners. Conversely, with the "negation marker" structure, where Persian (L1) differed from English (L2) and Arabic (L3), both groups experienced non-facilitative L1 transfer; however, only sequential learners benefited from L2-L3 similarities. These findings align with the Linguistic Proximity Model (Westergaard, 2016), which proposes that language transfer, both facilitative and non-facilitative, relies on structural overlap. Nevertheless, these results collectively challenge key theoretical L3 acquisition models. Specifically, the L1 Transfer Hypothesis was not supported, as the anticipated predominant L1 influence was not observed. Instead, significant transfer from L2 to L3 occurred in both facilitative and non-facilitative contexts, aligning with Sánchez (2012). Furthermore, the L2 Status Factor was contradicted by cross-linguistic influence from both L1 and L2, consistent with Westergaard (2016). The (Psycho)Typological Proximity Model was also challenged, as transfer happened despite the genealogical distance among Persian (Indo-Iranian), English (Germanic), and Arabic (Semitic), supporting Giancarlo et al. (2015). Moreover, contrary to the Linguistic Proximity Model's predictions, sequential learners with L2-L3 similarity and concurrent learners showed comparable outcomes. The Cumulative Enhancement Model was refuted by the simultaneous presence of both positive and negative transfer phenomena, paralleling Flynn et al. (2004). These complex crosslinguistic interactions align with the Scalpel Model (Slabakova, 2017), which successfully accounts for the dynamic competition between L1 and L2 systems, the critical role of proficiency thresholds in enabling transfer, and how input frequency and language dominance can override typological predictions. These claims are further substantiated by Rothman et al.'s (2019) comprehensive analysis of transfer in third language acquisition, which empirically validates the model's predictions regarding bidirectional crosslinguistic influence and threshold effects. Crucially, the similar outcomes for sequential and concurrent learners demonstrate that simply having prior language experience doesn't guarantee an advantage in L3 learning. Instead, structural similarities between languages only become helpful when a learner possesses sufficient proficiency in the related previous language(s). These findings underscore a theoretical shift—from single-factor L3 models to frameworks that integrate cognitive and linguistic factors in multilingual acquisition."

Conclusion and Implication

This study explored the influence of L2 English on L3 Arabic acquisition in two groups: sequential learners (Persian L1 → English L2 → Arabic L3) and concurrent learners (Persian L1, English/Arabic

L2). The research specifically investigated "subject-pronoun deletion" structures (which are syntactically similar in Persian and Arabic but differ from English) and "negation marker" structures (similar in English and Arabic but different in Persian) to measure cross-linguistic influence. While sequential learners had higher mean scores in both conditions, these differences were not statistically significant. The Proficiency Ceiling Hypothesis implies that the sequential group's Pre-intermediate English proficiency might have hindered their capacity to recognize and apply similarities between English (L2) and Arabic (L3), especially in the "negation" structure. This likely led both groups to rely more on their Persian L1. These findings, therefore, support the Scalpel Model (Slabakova, 2017), which highlights the importance of factors beyond just structural similarity, such as input quality and language frequency.

However, the study also recognized several limitations. These included potential rater bias from using only one scorer and limited generalizability due to culture-specific and convenience sampling. This is a common methodological concern, as research conducted within a specific national context, such as Iran, may limit the generalizability of the results to other settings (Zavari & Zarei, 2025). Furthermore, the grammar proficiency test assessed only L2 English grammar, overlooking other skills such as speaking, listening, and writing. Additionally, the small sample size reduced statistical power. Notwithstanding these limitations, the findings underscore the need for a comprehensive approach to multilingual education with specific linguistic and pedagogical implications. The pedagogical needs and national policy are a central theme in recent research on Iran's multilingual landscape (Aghajanzadeh, 2023). Consequently, at the policy level, Iran should prioritize early L2 English instruction to develop the metalinguistic awareness needed for subsequent L3 Arabic acquisition, particularly given the observed structural relationships: (1) Persian-Arabic shared subject-pronoun optionality versus English's obligatory pronouns, and (2) English-Arabic parallel tense-sensitive negation contrasting with Persian's tense less morphology. Instructionally, teachers should implement targeted contrastive analysis, explicitly teaching these grammatical relationships while designing triadic tasks that leverage L2-L3 parallels (negation/tense marking) and L1-L3 alignments (pronoun deletion). Future research must employ multiple raters and larger samples to investigate how these structural similarities interact with varied instructional methods across proficiency levels. Longitudinal studies tracking developmental patterns will be essential to validate these evidence-based approaches to multilingual pedagogy.

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Declaration of Conflicting Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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