



The Impact of Educational Background in L1 Grammatical Attrition Among Iraqi Kurdish Migrants in the Netherlands

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Abstract: This study examines first language (L1) grammatical attrition among Kurdish immigrants in the Netherlands by analysing their responses to a grammaticality judgement task (GJT) in relation to education. Specifically, the objective is to (1) explore how L1 grammatical attrition is manifested in the bilingual group's performance on the GJT, and (2) explore how the demographic factor of education influences their performance and level of L1 attrition. Participants included 50 bilingual Iraqi Kurdish speakers who moved after the critical period alongside a monolingual control group, also 50 speakers, from Iraqi Kurdistan. A GJT with 83 sentences assessed syntactic structures, verb types, and sentence forms in both Northern and Central Kurmanji Kurdish. The results indicated that bilinguals had significantly lower accuracy scores when compared to monolinguals, suggesting a decline in L1 grammar skills. Educational achievements also influenced L1 attrition among the bilingual speakers in the Netherlands. These findings support the idea that prolonged residence in a second language (L2) dominant environment leads to L1 grammatical decline, especially affecting comprehension. Greater educational attainment was linked to reduced L1 attrition. This work addresses a gap in attrition research by concentrating on Kurdish, which has received limited attention in this field.

Keywords: First Language Grammatical Attrition, Kurdish Language, Bilingualism, Grammaticality Judgement Task, Syntactic Structure, Language Shift, Migration.

1. Introduction

1.1 The Research Problem

While language attrition has been widely studied, there is a significant gap remains in the research concerning the grammatical knowledge of Kurdish bilinguals living in diasporic contexts. In particular, empirical research examining L1 grammatical attrition among Iraqi Kurdish migrants in the Netherlands, who moved after the critical age of 17 and have lived in the host country for at least 15 years, is limited. Schmid (2011), Dostert (2009), Engstler (2012), and Pallier et al. (2004), all discuss that migrants who leave their home-country after their critical period are vulnerable to L1 attrition. Moreover, no scholarly attention has been given to the extent to which educational background affects L1 attrition among Kurdish migrants in the Netherlands.

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This study aims to systematically investigate the impact of long-term migration on the grammatical knowledge of L1, utilizing a GJT as the primary assessment tool.

1.2 Research Question

Based on the above-stated research problem, this study outlines the following research questions:

- 1: How is the L1 grammatical attrition reflected in participants' performance of the bilingual group on the GJT?
- 2: How does the demographic factor of education impact the performance and L1 attrition of the bilingual group on the GJT?

1.3 Research Hypothesis

Taking into account the above research questions, this study formulated the following hypotheses:

- 1: It is likely that the participants' performance of the bilingual group will reflect L1 grammatical attrition on the GJT if compared to the monolingual group.
- 2: It is presumed that education impacts the performance and L1 attrition of the bilingual group on the GJT.

1.4 The Rationale of the Study

This investigation delves into the largely unexplored domain of grammatical attrition in the L1 among Iraqi Kurdish migrants residing in the Netherlands. As a minority language lacking substantial institutional backing, Kurdish is particularly vulnerable to structural decline in environments of diaspora. By examining the influence of extended exposure to Dutch on the grammatical proficiency of Kurdish speakers, this study seeks to illuminate the effects of long-term migration on L1 grammatical ability and to enrich the literature concerning Kurdish language attrition. In addition, the research also focuses on how educational qualifications influence the extent of L1 among Kurdish migrants residing in the Netherlands.

1.5 The Dialects

This paper concentrates on the Northern and Central Kurdish dialects known as Bahdini and Sorani, investigating the L1 grammatical attrition of Iraqi Kurds in the Netherlands.

2. Theoretical Background and Previous Studies

2.1 Language Attrition in Migration Context

Language attrition is the opposite of language acquisition as a result of reduced or eliminated usage of a particular language (Schmid & De Bot, 2004). It is a non-pathological and temporary loss of individuals' language proficiency (Sorace, 2020), expressed as a reduced capacity to access certain grammatical features. Smeets (2024, p. 1) points out that L1 attrition happens when a potential modification in an individual's L1 grammatical representation occurs due to a prolonged period of time residing in a country



where a different language is spoken. Hicks et al. (2023, p. 145), state that L1 grammatical attrition is a possible result of cross-linguistic influence emerging in bilingual mature migrants, which is a potential modification to the grammar of the native tongue of a migrant under pressure from extensive exposure to an L2. Cherciov (2011, p. 19) informs that L1 attrition is a natural phenomenon under non-pathological migrants being in language contact situations where the L2 is the dominant language. It manifests itself as a selective, permanent, or temporary gradual decline of L1 grammatical skills.

In summary, L1 attrition is the non-pathological and often gradual or temporary decrease in a person's proficiency in his or her native language, especially regarding grammatical knowledge and skills, as a result of less frequent use and extended exposure to a predominant L2. This phenomenon frequently happens among bilingual migrants and may lead to alterations in the grammatical framework of the L1 as a result of ongoing contact with the L2.

2.2 Significance of Studying L1 Grammatical Attrition

The study of grammatical attrition of an L1 is very significant for understanding dynamic and interactive processes related to bilingual language acquisition. Researchers suggest that frequent exposure to an L2 can lead to changes in native language grammars, normally caused by decreased usage or interference from different grammatical systems. Studies of L1 attrition offer important information about how early parameter settings, which are developed initially through language acquisition, are amended or reorganized later. This process is particularly evident in syntactic domains, where native grammatical frameworks are exposed to the effect of L2 and where elements of L2 discourse can reshape prevailing standards of native grammar. Greater understanding of L1 attrition has implications beyond theories of bilingualism, illustrating how extended exposure to an L2 influences knowledge of grammar for an L1 and linking L1 attrition and L2 acquisition and thus illustrating dynamic and interactive aspects of bilingual grammatical frameworks (Gürel, 2008; Montrul, 2004; Schmid & Köpke, 2017; Smith & Van Buren, 1991; Smeets, 2024).

2.3 Education and L1 Attrition

Educational background has frequently been associated with the extent of L1 loss, as formal education can influence how individuals learn, retain, and utilize linguistic knowledge later in life. Specifically, education provides learners with conscious language knowledge, which may impact the preservation or decline of the L1 in bilingual individuals. The type of knowledge that is given through educational settings is often seen as explicit knowledge. In contrast to implicit knowledge, which is intuitive and unconscious use of language, explicit knowledge is mainly acquired in an academic setting through organized learning experiences focused on vocabulary and grammar teaching. This type of knowledge is developed in a deliberate and controlled way, enabling individuals to think about and express linguistic rules (Ling, 2015, p. 56). Paradis (1994, pp. 1-2) highlights that explicit knowledge pertains to what speakers consciously recognize and can actively verbalize when needed. Schmid (2011, p. 128) further observes that this knowledge typically builds on pre-existing implicit knowledge, being strengthened and broadened through formal education, where learners actively dissect and practice grammatical constructs. This extralinguistic element in question could influence the level of language attrition, which has been commonly examined in sociolinguistic studies. According to Schmid et al. (2004, p. 23), educational attainment should be



included when studying L1 attrition, indicating that individuals with higher educational qualifications tend to possess greater proficiency in their native language. Furthermore, studies indicate that knowledge acquired through formal education is generally more difficult to lose, suggesting that individuals with higher educational levels tend to maintain a stronger proficiency in their L1 (Keijzer, 2007, p. 14; Jaspaert & Kroon, 1989, p. 88; Cherciov, 2011). The education received in one's L1 is especially vital for its preservation, even in environments where the L2 dominates and L1 abilities usually diminish (Yağmur, 1997, p. 96). In contrast, individuals with lower educational background are more susceptible to language attrition, showing poorer performance on language assessments, whereas advanced education correlates with an enriched vocabulary, wider grammatical understanding, and enhanced cognitive and metalinguistic abilities (Herdina & Jessner, 2002, p. 104; Cherciov, 2011, pp. 27-28; Yılmaz, 2013, p. 15; Köpke & Schmid, 2004).

2.4 Educational Freedom in Iraqi Kurdistan

The Iraqi regime's refusal to grant linguistic rights to the Kurds was a key factor in the 1991 Kurdish uprising, as it incited resistance among the people (Khalid, 2015, p. 18). After the 1991 uprising, the Kurdish language in the autonomous region benefits from considerable freedom, primarily due to its recognition as an official language alongside Arabic and its role as the administrative language of the KRG. In the Kurdistan Region of Iraq, education is a key factor in promoting and preserving the Kurdish language. Since Kurdish was designated as an official language in the 2005 Iraqi constitution, it has become the main language used for instruction in schools and universities throughout the region (Salih, 2014, p. 2). The government ensures its implementation in educational contexts through Law No. 7 of 2014, which safeguards Kurdish alongside Arabic as official languages of instruction. In contrast to previous decades when Arabic was prevalent in schools, Kurdish is now firmly established as the primary language of education, bolstered by curricula, teaching resources, and local media available in Kurdish (Salih, 2014; KRG, 2019).

2.5 The Kurdish Language: Grammatical Features

Because this study investigates the L1 grammatical attrition of particularly Kurdish migrants residing in the Netherlands, it is essential to address the relevant grammatical features of the Kurdish language. The syntactic structure of the Kurdish language has been described by a Subject-Object-Verb (SOV) order (Kim, 2010; Thompson, 2016). This prevalent word order, as emphasized by Kim (2010, p. 10), applies to both the Northern (Kurmanji), also known as Bahdini, and Central Kurdish (Sorani), such that an example of, say, *kiçeke kuřeke debinêt* (The girl sees the boy). Upon reformation of this statement into an interrogative construction, there is no alteration of the constituents, through which they maintain their SOV order. This implies that the SOV order is applied not just for interrogative but equally for declarative statements, such that an interrogative like *kê kuřeke debinêt?* (Who sees the boy?). As explained above, Kurdish dialects follow an SOV order that forms their very structural outline (Mehrani & Peterson, 2017, p. 5). According to Kim (2010, p. 10), though, when an object is replaced by a pronoun, such a pronoun is omitted, and an object-verb order ensues. Moreover, a single word is enough to make a complete statement. According to Windfuhr (2009, pp. 613-615), adverbials or adverbial constructions are available to take up different locations in a statement, at the beginning of a clause, after the subject, or preceding or succeeding a verb. Mukriyani (2022, pp. 60-61) explains that, except for the subject that usually appears



in the initial position of a sentence followed by an object and then a verb, both adverbs and adjectives may occur between the subject and verb. It is interesting to mention that adverbs, depending on their categorization, are positioned either before or after the verb or, before and after a verb simultaneously.

2.5.1 Types of Verbs in Kurdish

As per Kim (2010, p. 34), Kurdish has multiple classes of verbs, and there is an important contrast between transitive and intransitive classes. Intransitive verbs are characterized by their absence of a direct object, though they can contain adverbial or prepositional phrases. In contrast, transitive verbs need an object to complete the meaning. Moreover, such classes of verbs can be divided into simple, complex, and compound, as well. A simple one is formed by one lexical item, a complex one by prefixing or suffixing the structure of the simple verb, and a compound by having two lexical meaningful components. In addition, Mukriyani (2017, p. 67) clarifies that, taking into account both semantic and grammatical aspects, an intransitive verb in the Kurdish language refers to an event that is entirely restricted to the subject, without any object expressed. A transitive verb, by contrast, refers to an occurrence in which both subject and object are clearly expressed. As for adverbs, Mukriyani (2022, p. 326) describes four major types of adverbs in the Northern and Central Kurmanji dialects of Kurdish: manner adverbs, degree adverbs, place adverbs, and time adverbs. Within the Kurdish grammatical structure, an adverb is a modifier to the verb that provides secondary information about the manner, extent, place, or time of something that has happened.

2.5.2 Types of Sentences in Kurdish

Khoshnaw (2014, pp. 30-45) outlines four basic sentence types in the Kurdish language: declarative, interrogative, imperative, and exclamatory. Structurally, the Kurdish language contains simple, compound, and complex sentence structures. A declarative sentence is used to report information or provide a description of the speaker's environment without regard to the truth value of the statement. An interrogative sentence indicates the speaker does not possess certain information, along with uncertainty concerning an object or occurrence; such sentences typically terminate in a question mark. Imperative sentences feature orders from the speaker, often expressed in the form of commands or requests addressed to the listener to perform or refrain from doing certain things. Exclamatory sentences express strong emotional reactions, positive or negative, regarding the speaker's environment. However, the different types of sentences can be expressed through different structural forms, ranging from simple to compound to complex forms. This fact is testified by Mukriyani (2022, pp. 52-57), who adds that declarative sentences can take on the form of having a simple structure or complex structure. Interrogative sentences, which are designed to obtain information, can have the ability to get either an active or passive reaction from the participants and can be divided into yes-no questions and wh-questions. Imperative sentences act as devices for giving orders and making requests, forcing the recipient to perform certain activities. Exclamatory sentences, in essence, are used to express emotional enthusiasm and to induce surprise or intense reaction from the audience. What is more, it can be seen that declarative, imperative, or interrogative sentences can take on exclamatory properties. These syntactic and functional properties can be seen in the Northern and Central varieties of Kurdish.



2.6 Migration to the Netherlands and Linguistic Effects

Mesthrie (2001, p. 11) notes that migration is driven by various factors, including economic, educational, political, and religious motives, which result in diverse linguistic demands for migrants exposed to multiple languages. Bell (2014, p. 22) highlights that migration can be voluntary or forced, such as in cases of refugees or slavery, while Davies (2005, pp. 94-95) adds colonization as another cause. However, the majority of the participants in this study have left Iraqi Kurdistan due to political reasons and warfare. The raised factors influence language outcomes, often leading to language shift, where either the host society adopts the migrants' language or vice versa. Migration also raises concerns about language maintenance and attrition. According to Schmid and Keijzer (2009, p. 83), migrants typically become bilingual, with the host language potentially becoming dominant. Opitz (2011, p. 1) observes that increased L2 acquisition reduces opportunities for L1 use, and Sebina (2014, p. 53) notes that this often results in the attrition of L1 skills, particularly in production and comprehension, due to the need to adapt linguistically to the new environment. Lucassen and Penninx (1997) explain that during the 1980s, the Netherlands became a key destination for asylum seekers fleeing violence and oppression, with many arriving from countries such as Turkey, Sri Lanka, Iran, Poland, Ghana, and Somalia. In the 1990s, most asylum seekers originated from Iraq.

According to Bjørnson (2007, p. 69), Dutch integration policy shifted from structural to linguistic marginalization, positioning the Dutch language as central to integration efforts. In 2005, the legislation came into action, where the non-Dutch family members of residents had to pass an examination focused on the Dutch language and integration in their home country before being eligible for family reunion (Callejo et al., 2007, p. 9). These rules were equally applied to the Kurdish immigrants too.

2.7 Previous Studies on the Role of Education in Grammatical Attrition in Bilingual Contexts

The most widely used instrument by previous studies that have carried out investigations on the L1 grammatical attrition of bilinguals is the GJT (Schmid, 2011, p. 151). Several studies have investigated L1 grammatical attrition using the GJT in different bilingual populations. Seliger and Vago (1991, pp. 192-196) carried out an investigation on two long-time German-English bilingual speakers using untimed GJT aimed at syntactic structures, selection restrictions, as well as morphological properties such as gender and pluralization. Findings indicated that parts of L1 grammar, specifically ungrammatical constructions, showed signs of attrition, even with frequent informal use. Similarly, Pelc (2001, pp. 1-96) investigated L1 attrition in Greek-English bilinguals through the evaluation of different domains such as lexical, morpholexical, and morphosyntactic domains. An identified lower accuracy among bilinguals occurred compared to monolinguals. Bylund et al. (2009, pp. 443-453) assessed the grammaticality of L1 in Spanish-Swedish bilinguals using GJTs and discovered that bilingual participants scored significantly lower than monolinguals, reflecting a loss in grammaticality ability. Iverson (2012) used multiple theoretical models to examine L1 word order in a Spanish speaker after lengthy contact with Brazilian Portuguese and concluded that grammatical representations had undergone attrition. Lastly, Lerner (2021) compared Spanish-speaking language professionals with non-professionals in Israel, and the findings indicated that language professionals showed less grammatical attrition, which could be due to greater metalinguistic awareness and frequent error correction in their professional fields. Overall, according to



the studies mentioned above, L1 attrition occurs in different syntactic areas. L1 grammatical skills attrite among bilinguals residing in settings where the L2 predominates.

Recent studies indicate that a person's educational history may impact the L1 attrition of an attriter. A study by Hu and Kouider (2024) focused on Chinese ESL teachers investigating whether extended exposure to English-speaking environments resulted in a decline in Mandarin. The results revealed that individuals with higher educational qualifications displayed more consistent knowledge of their L1, implying that education contributes to the reinforcement of language structures. Similarly, a conference study by Alasgarova et al. (2024) examining Azerbaijani students who transitioned from national curricula to English-medium international programs found that decreased interaction with their L1 in educational settings hastened attrition.

Though several studies examined the L1 attrition of migrant populations in the Netherlands, particularly focusing on grammatical knowledge (Ribbert & Kuiken, 2009; Schmid & Dusseldorp, 2010; Yılmaz & Schmid, 2015), it is crucial to highlight that the current literature is deficient in studies regarding L1 grammatical attrition among Kurdish migrants residing in the Netherlands. In particular, there have been no investigations into the grammatical proficiency of Iraqi Kurdish migrants concerning their native language.

3. Methodology

This study used a deductive approach because it offers hypotheses and theoretical data related L1 attrition and bilingual grammatical competence. Based on the hypotheses and general theory of this paper, a deductive method is appropriate for use because it leads to the investigation of unique observations to see if the data obtained from the GJT can confirm or falsify the hypotheses established concerning L1 grammatical attrition in bilingual Kurdish migrants in the Netherlands. Additionally, a non-probability approach was used to recruit participants for the current study. Snowball sampling approach was employed to find appropriate respondents in both the Kurdistan Region of Iraq and the Netherlands.

3.1 Participants

Bilingual Group

In the course of this study, the bilingual group consisted of 17 female speakers, representing 34% of the sample, and 33 male speakers, representing 66%, thus revealing that the sample contained more males. The average age of participants in this group was 58.24 years. The youngest participant in this group reported an age of 39, while the oldest reported an age of 77. Most of the participants, exactly 44%, held a bachelor's degree, while only 6% held a master's degree. Additionally, 26% of participants reported they were Bahdini speakers, compared to 74% who reported being Sorani speakers. Both, the Bahdini and Sorani speakers received the same GJT. It should be noted that the initial contact with participants took place through an initial questionnaire with the aim of determining their suitability for participation in the study. Such a process allowed for confirming whether or not they were native speakers who had moved from Kurdistan following their critical period (age 17 and above), and who had lived in the Netherlands for at least 15 years, and who were non-pathological speakers. It is important to confirm that the development of their L1 occurred in their native country. Schmid (2005, p. 4) suggests examining language



attrition during its most stable phase, which is why this study established specific minimum and maximum durations. It should, moreover, be added that the research process endeavoured to contribute a parity for the two groups in relation to participants' demographic characteristics, for example, education, gender, age, and dialect. Such an approach tried to limit the confounding process and to clarify differences in L1 attrition among participants.

Monolingual Group

At the time of the study, 17 monolingual females participated, corresponding to 34% of the sample. The participant males consisted of 66% of the reference group, with a total of 33 participants, revealing a prevalence of males. The average age of the participants was 59 years. The youngest member in the group was 39 years old, while the oldest member reached the age of 80. Most of the participants, that is, 52%, held a bachelor's degree, compared to only 6% having doctoral degrees. In addition, among the participants, 26% were found to be speakers of Bahdini, while 74% were found to be speakers of the Sorani dialect of Kurdish. Both speakers received the same GJT. Significantly, this demographic operates as a monolingual community, as has been revealed through the responses collected from the questionnaire, confirming their singular use of one and only one particular language in everyday discourse, that is, Kurdish. Therefore, other languages are not spoken by the members of this group. It is also crucial to state that Schmid (2011, p. 124) notes that, in the language sciences, a sample size of thirty participants is widely speaking regarded as sufficient for conducting scientific investigation (e.g., thirty monolinguals and thirty bilinguals). Additionally, Gnitiev & Bányi (2022, p. 167) discuss that studies with less than thirty informants often fail to find significant language attrition effects. For this reason, this study has included 50 informants in each group.

3.2 Instruments

The nature of L1 grammatical attrition was determined by a GJT. In the stated task, the participants were presented with a collection of sentences totalling 83 and were required to identify whether the sentences were grammatically correct or incorrect. Of the 83 sentences, 41 were intentionally constructed incorrectly by the researcher. It is necessary to state that the sentences found in the language task in question are adapted from a study by Iverson (2012) who investigated language attrition of Spanish in contact with Brazilian Portuguese. The assignment was delivered through a PowerPoint slideshow. The sentences were provided in both text and audio formats simultaneously. At the start of the test, the researcher situated the participant on a laptop and explained the entire process. The participants were instructed to evaluate each item individually. Once that was completed, the task commenced, and the first target item was displayed. The process was an offline (untimed) one, thus, the participants proceeded through the test at their own speed by pressing the spacebar. Schmid (2011) notes that offline tasks are generally used to measure the morphosyntax knowledge of attriters. The responses were recorded on a checklist (answer sheet). Only two response options were available, correct and incorrect. Correct responses received check marks on the answer sheets, while incorrect ones were marked with a cross to signify their incorrectness. Participants earned one point for each correct answer, while incorrect responses were assigned zero points.

The GJT evaluated the grammatical knowledge of various word orders in both the Northern and Central Kurmanji dialects, including S-O-V-Adv/AdvP-V, and S-V-Adv/AdvP. It also assessed different verb



categories, such as transitive and intransitive, across multiple sentence types, including declarative and interrogative.

3.3 Validity and Reliability

Concerning the validity and reliability of the tools of the study, the GJT was translated from English into Kurdish. The Northern Kurmanji version was carried out by a university professor fluent in Bahdini and knowledgeable in Kurdish linguistics. The Central Kurmanji translation was done by the researcher and later reviewed by a linguist at a university who specializes in Kurdish to ensure linguistic accuracy and make any necessary modifications. Both versions were additionally assessed by Kurdish 3 university instructors with expertise in translation studies, validating the accuracy and appropriateness of the translation and confirming their translation validity. Additionally, a Cronbach's alpha was used to evaluate the internal reliability of the GJT, which successfully assessed grammatical knowledge rather than other language skills. The reliability value of the GJT was 89% which means that the instrument is highly reliable. In addition, a pilot study with three individuals outside the main sampling process was conducted.

3.4 Ethics

The research adhered to the ethical standards set by Salahaddin University – Erbil. Furthermore, participants were clearly informed about the research objectives and its benefits, and they were guaranteed the option to withdraw at any point if they wished. They consented to participate by signing the forms. To maintain the confidentiality of personal information, all individual names were substituted with coded identifiers. These precautions also ensured that the researcher's work was free from any bias. All references were accurately cited to uphold academic integrity and prevent plagiarism. Additionally, the researcher secured formal permission from the Kurdistan Region's Ministry of Higher Education and Scientific Research to initiate the Ph.D. study and from Salahaddin University – Erbil for travelling to the Netherlands to conduct data collection for the study.

4. Results and Discussion

For the scores of the GJT, a reliability test (Cronbach's Alpha) was conducted. For the statistical tests, a t-test and an independent samples t-test were conducted using the SPSS software tool.

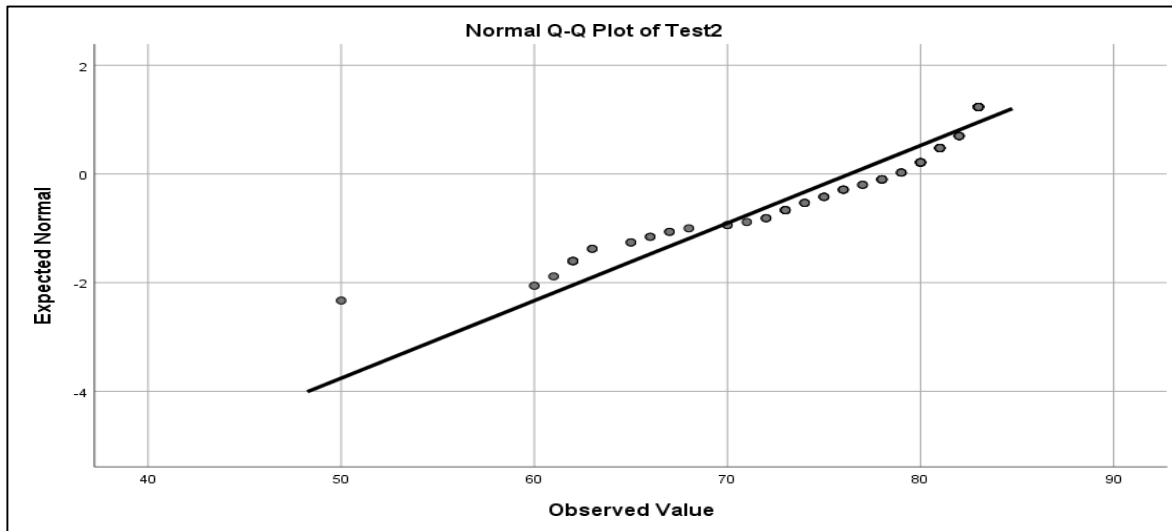


Figure 1: Q-Q Plot of GJT

The Q-Q Plot for the GJT indicates that the data is roughly normally distributed, with most points closely aligning with the diagonal line. However, a minor divergence is noted at the lower end, suggesting the existence of a few outliers. Still, the general pattern does not substantially violate the assumption of normality, rendering the data fairly suitable for parametric tests.

Table 1: Reliability of the GJT

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.890	.882	82

The Cronbach's Alpha from the reliability analysis is 0.890, indicating a high degree of internal consistency among the 82 test items. The alpha value calculated from standardized items is 0.882, which demonstrates the reliability of the measure. Although the task included 83 sentences, item 50 was excluded due to having zero variance, meaning that all participants, in both groups responded the same way to this item. The strong reliability suggests that the GJT is a very reliable instrument for evaluating the grammatical knowledge of participants in this research.

Table 2: An Overview the GJT Scores of Both Groups

	Groups	N	Mean	Std. Deviation	Std. Error Mean
GJT	Bilingual	50	73.0000	7.43955	1.05211
	Monolingual	50	79.6600	4.60528	.65128

Table 2 presents the results of a t-test aimed at determining if there is a significant difference in scores on the GJT between bilingual and monolingual participants. The findings indicate that monolingual



individuals (M=79.66, SD=4.60) achieved significantly higher scores compared to bilingual individuals (M=73.00, SD=7.43).

Table 3: Independent Samples T-Test

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
GJT	Equal variances assumed	10.854	.001	-5.382	98	.000	-6.66000	1.23738	-9.11554	-4.20446
	Equal variances not assumed			-5.382	81.745	.000	-6.66000	1.23738	-9.12166	-4.19834

An independent samples t-test was carried out to examine the difference in GJT scores between bilingual and monolingual participants. The results indicated a statistically significant difference in test outcomes, $t(81.75) = 5.38$, $p < .001$, with monolingual participants outperforming the bilingual participants. In more detail, the mean score for monolingual participants was 79.66 (SD = 4.61), while bilingual participants had a mean score of 73.00 (SD = 7.44), resulting in a difference of -6.66. Levene's Test for Equality of Variances revealed a significant difference ($F = 10.85$, $p = .001$), suggesting that the assumption of equal variances is not valid, and thus a version of the test that does not assume equal variances was utilized. The 95% confidence interval for the difference ranged from -9.12 to -4.20, notably excluding zero, which further supports the finding of statistical significance. These results imply that monolingual participants performed significantly better than bilingual participants on the GJT.

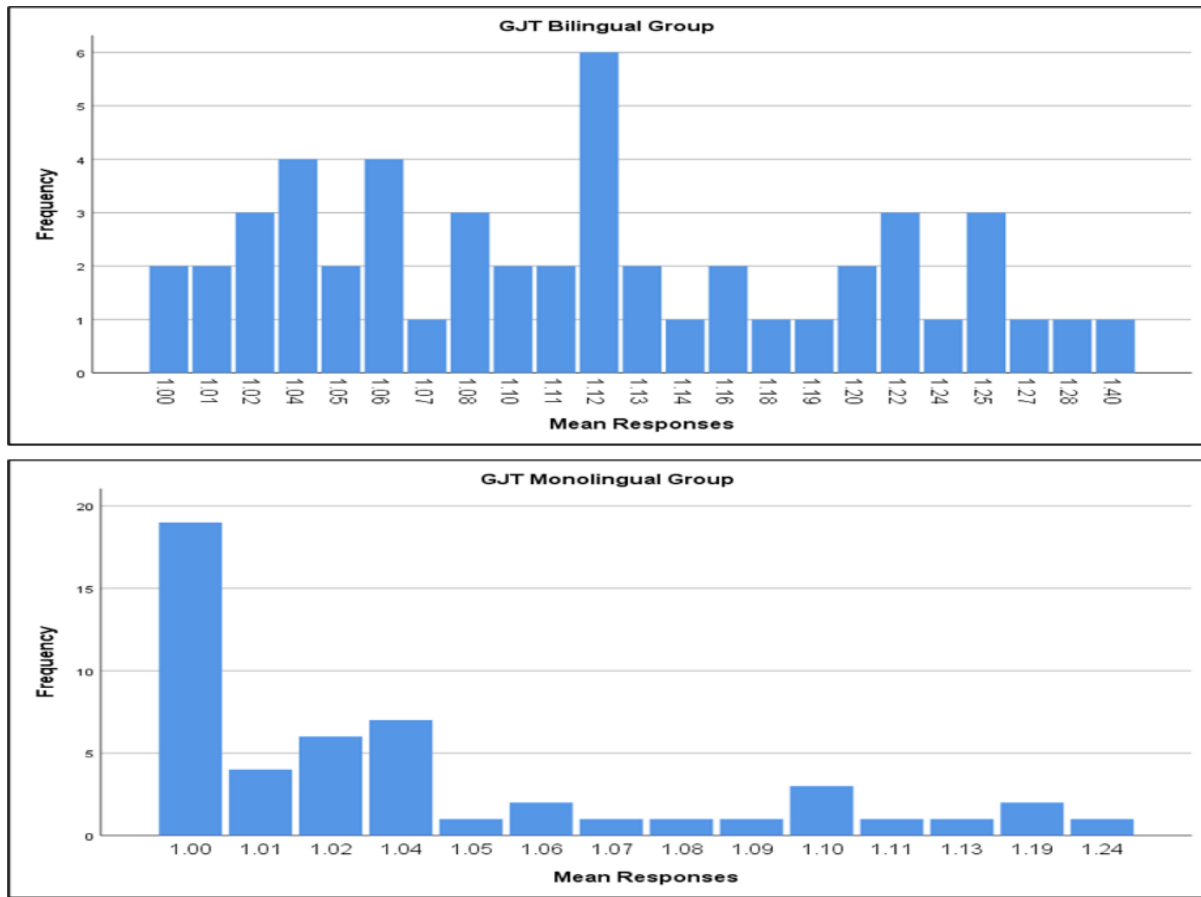


Figure 2: GJT Means of Accuracy of Both Groups

The assessment of the GJT means scores indicates clear differences in grammatical judgement accuracy between bilingual and monolingual speakers. The late bilinguals exhibited a wider and more varied distribution of responses, reflecting a broader spectrum of grammatical accuracy. The most common score in this group was 1.12, hinting at a slight decline in grammatical accuracy relative to the baseline. Moreover, a variety of other moderately frequent scores (e.g., 1.01, 1.06, 1.10, 1.20, and 1.24) further demonstrate the variability in their answers. This distribution suggests greater inconsistency within the group and points to possible attrition in grammatical knowledge among the bilingual participants.

On the other hand, the monolingual counterparts displayed a significantly different trend. Their responses were predominantly clustered around the score of 1.00, which appeared nearly 20 times, reflecting nearly flawless grammatical judgement and minimal variability. While there were some higher scores, like 1.02, 1.04, and 1.10, these were much less frequent. The limited presence of scores such as 1.19 and 1.24 highlights the general uniformity in grammatical judgements within the monolingual participants. This close grouping near the lower end of the range indicates a strong retention of L1 grammatical knowledge if compared to their Kurdish bilingual counterparts from the Netherlands. Thus, the comparison reveals that while monolingual participants show consistent and precise L1 grammatical competence, bilingual participants demonstrate more variable performances, which suggests grammatical attrition.

The results of this study indicate that monolingual participants achieved a higher average score (79.66) compared to Iraqi Kurdish late bilinguals residing in the Netherlands (73), leading to a difference of 6.66 points in the GJT. Previous studies suggest that a score difference between 5 to 10/15 percentage points is significant and can be academically justified in the context of studies on L1 attrition (Schmid, 2011; Montrul, 2002; Polinsky, 2011; Keijzer, 2007). This performance gap indicates that monolingual participants have a stronger understanding of their L1 grammatical rules relative to the Kurdish late bilinguals from the Netherlands, supporting the idea that the bilingual participants experience L1 grammatical attrition, which aligns with the study's hypothesis: *It is likely that the participants' performance of the bilingual group will reflect L1 grammatical attrition on the GJT.* Furthermore, the monolinguals demonstrated superior grammatical accuracy in the GJT when compared to the bilingual group. The performance of the bilinguals shows a broader range of scores, suggesting more variability in their grammatical knowledge of L1. Additionally, the findings from the GJT conducted with both groups are consistent with earlier research by Seliger and Vago (1991), Pelc (2001), Bylund et al. (2009), Iverson (2012), and Lerner (2021). All of these studies observed similar trends, where bilingual participants performed worse than monolinguals on the same linguistic tasks, indicating L1 attrition within the bilingual group. A possible reason for monolinguals achieving better results than bilinguals in the Netherlands could be attributed to their consistent and ongoing exposure to their L1, whereas bilinguals frequently communicate in an L2, which might affect their Kurdish language.

This study further delves deeper into the bilingual participants through an analysis within the group, particularly focusing on how educational background may influence the proficiency in their L1. Although all participants have Kurdish as their L1 and significant exposure to Dutch as their L2, variations in formal education could affect their retention of grammatical knowledge. By evaluating performance on the GJT, this analysis seeks to ascertain if higher levels of education are linked to more precise recognition and processing of L1 grammatical structures. This methodology enables a detailed understanding of the interplay between educational experience and prolonged L2 exposure, affecting the preservation of grammatical competence in L1.

Table 4: An Overview of Education Distribution of the Bilinguals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary	1	2.0	2.0	2.0
	Secondary	7	14.0	14.0	16.0
	college	10	20.0	20.0	36.0
	university	32	64.0	64.0	100.0
	Total	50	100.0	100.0	

The table above provides a description of the statistics regarding the highest educational attainment among the participants. By analysing the educational achievements, there is a strong trend towards higher levels of educational attainment. Of the 50 participants surveyed, 64% (n=32) acknowledged that their highest level of educational achievement was at the university graduate level, including bachelor's, master's, and doctoral degrees. In the following category, 20% (n=10) of the respondents had a college-level education, whereas 14% (n=7) acknowledged the highest level of achievement being secondary school. Only a single participant (2%) identified primary school as the highest educational attainment.

Table 5: Descriptive Statistics of the Demographic Factor of Education and the GJT

Education	Mean	Std. Deviation	N
Primary	66.0000	.	1
Secondary	71.5714	7.76439	7
College	70.8000	7.67101	10
University	74.2187	7.32091	32
Total	73.0000	7.43955	50

The descriptive statistics for the GJT show a clear trend in which participants' performance improves with higher educational levels. Mean scores rose progressively from primary education (66.00) to college (70.80), secondary education (71.57), and university-level participants (74.22). This pattern indicates a positive relationship between educational attainment and L1 grammatical competence, suggesting that higher education may support more accurate recognition and processing of grammatical structures in the bilingual participants.

4. Conclusion

The current study investigated the incidence of grammatical attrition in the L1 among late bilingual Kurdish migrants to the Netherlands, in relation to education, through the use of a GJT made to study structural aspects relevant to both Northern and Central Kurmanji dialects. The results of the analyses indicated that the Kurdish bilingual speakers residing in the Netherlands achieved significantly poorer results on the GJT compared to their monolingual counterparts, thus offering empirical evidence in favour of L1 grammatical attrition. In addition, the findings have also indicated that lower educational background is more vulnerable to attrition if compared to higher educational attainment. The findings confirm the hypotheses that it is predictable that the participants' performance of the bilingual group will reflect L1 grammatical attrition on the GJT if compared to the monolingual group. And, it is presumed that education impacts the performance and L1 attrition of the bilingual group on the GJT. In addition, the results also have important theoretical implications for the fields of education, bilingualism, and language attrition. Specifically, they offer empirical support for the dynamic interaction model of bilingual grammatical structures, which argues that contact with an L2 affects the structural integrity of L1 grammatical representations. The observed attrition in syntactic domains, including word order and verb placement in Kurdish, confirms earlier research that predicts that grammatical ability, once thought to be stable, becomes unstable in environments where L2 is dominant. Additionally, the findings seen in bilingual individuals residing in the Netherlands, when taking into account their educational levels, are consistent with earlier studies that suggest a correlation between higher educational attainment and an increased chance of preserving one's L1.

From a practical standpoint, this study defines the linguistic barriers faced by late bilingual migrants and argues that linguistically-focused methods to maintain languages should aim not only at improving lexical competence but also grammatical competence. The study has important implications for policymakers, planners, and teachers involved in minority language preservation in diasporic communities. Policymakers, planners, and teachers could adopt L1 maintenance policy, fund heritage language courses, apply L1 into bilingual curricula, and so forth.

Nevertheless, this study has its limitations. The target group consisted solely of Kurdish late bilingual speakers living in the Netherlands, so future studies should broaden this demographic to include other types of bilinguals or combine findings across various host nations. Additionally, future works should adopt longitudinal methodologies to monitor the development of grammatical attrition over time.

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