

# Investigating the Impact of L2 Attainment on L1 Attrition: The Case of Saudi Children Studying in International Schools in Saudi Arabia

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**Abstract**—Despite the significant body of research in linguistics, there has been limited exploration of the attrition or retention of the first language in a homeland after a person ceases to use or learn it. However, this phenomenon has become apparent in the Saudi community, particularly in the younger generation who are losing their mother tongue (L1) despite living in their homeland. To address this issue, the present study focuses on L1 attrition and examines lexical disfluency in the oral production of Arabic among 36 Saudi children living in Saudi Arabia. They are L1 Arabic speakers who learned English as their second language L2 while studying in international schools from grade one to six. The study compares the level of their Arabic proficiency to that of other Saudi children studying in national schools. The latter group speaks Arabic as their L1 and English as a foreign language. The aim of the study is to identify the extent to which exposure to English as L2 affects the oral production of Arabic among L1 Arabic speakers. This study is significant because the loss of L1 can result in the erosion of cultural identity and the weakening of social ties within a community (Genesee, 2008). The study provides insights into the factors that contribute to L1 attrition. This can inform efforts to preserve Arabic language and culture in Saudi Arabia, particularly among younger generations who are at risk of losing their L1. The results showed high level of attrition in the attritor group.

**Index Terms**—attrition, attainment, picture naming task, bilingualism, lexical oral production

## I. INTRODUCTION

The impact of L2 attainment on L1 attrition has been a topic of research interest in the field of language acquisition. In the case of Saudi children studying in international schools in Saudi Arabia, there may be a potential impact of L2 English on L1 Arabic proficiency. Several studies have shown that second language acquisition can have an impact on first language proficiency, particularly in cases where the second language is used more frequently or where the individual is more proficient in the second language than the first. In the context of Saudi Arabia, where English is widely used in international schools and business settings, there may be a risk of Arabic language attrition among Saudi children. To investigate this phenomenon, researchers could conduct a longitudinal study that tracks the language development of Saudi children over time, comparing their Arabic language proficiency to their English language proficiency. The study could involve administering standardized language tests in both languages at regular intervals, as well as conducting interviews and observing the children's language use in naturalistic settings.

Researchers could also consider factors that may contribute to L1 attrition, such as language use patterns at home and in social settings, attitudes towards the two languages, and the role of formal language instruction in both Arabic and English. This could help identify potential areas where language support or intervention could be provided to prevent or mitigate L1 attrition among Saudi children. Overall, investigating the impact of L2 attainment on L1 attrition among Saudi children studying in international schools in Saudi Arabia could shed light on the complex relationship between first and second language acquisition, as well as provide insights into how language policies and practices can support bilingualism and biliteracy in multilingual contexts.

It is not uncommon for individuals living abroad to notice changes in their speech or receive feedback from native speakers about their foreign-sounding language. However, it is unusual for individuals to receive such comments while living their entire lives in their homeland. The loss of one's first language can result in feeling like a foreigner in their own culture, despite being immersed in it. According to Schmid and Kopke's (2007) research, second language (L2) speakers can become integrated into using their second language to such a degree that they become native-like in their L2 but foreign to their L1. Consistent use of L2 on a daily basis can lead to a reduction in L1 use and input, which can lead to attrition of L1 knowledge over time, making it challenging to access the previously stored knowledge of the first language.

In Saudi Arabia, there is a high prevalence of teaching children in international schools, where English is the primary language used for learning. With 43 international schools in the capital alone, the question remains as to how much Arabic, the first language of these multilingual Saudi children, they will acquire and retain. The phenomenon of first language attrition is still being studied by scholars and parents in society. To contribute to filling this research gap, this

paper examines the lexical oral production of Arabic, the first language, in the homeland of multilingual Saudi children after enrolling in international schools. The study focuses on the mental lexicon, as it is the most vulnerable area of linguistic knowledge in language attrition.

#### *A. Defining Language Attrition*

Language attrition is a phenomenon where a speaker's language skills in their first language deteriorate due to reduced use or exposure, while they learn and use a second language. It can result in a loss of fluency, accuracy, and complexity in the first language, making it more difficult for individuals to express themselves or understand others using their native language. This phenomenon can occur in individuals who move to a foreign country, but it can also occur in individuals who continue to live in their home country while primarily using a second language.

Research in language attrition started as the study of societal language loss and death. However, in more recent research, the focus shifted to the study of decrease in proficiency of previously acquired languages either as a first language or a second language (Kopke & Schmid, 2004). Language attrition or loss is described as a negative change in language abilities for an individual over time. De Bot and Van Els (1985) defined attrition into many types, one of them is loss of L1 in an L1-environment. Ecke and Hall (2013) defined attrition as the reduction or impairment to the access of language systems for a bi- or multilingual speaker. Attrition is an interdisciplinary topic that has linguistic and extralinguistic factors (Bardovi-Harling & Stringer, 2010). Most recent research study language attrition in bilinguals of two languages or two language systems in interaction (Jessner et al., 2021). This phenomenon is referred to as "attrition" which is an erosion of L1 knowledge (Schmid, 2008). Huffines (1991) believes it is a shift or convergence towards L2. Moreover, Cook (2003) thinks it is an L2 interference that leads to an unconscious change in an individual's language.

#### *B. A Bilingual Approach to Language Growth and Decline*

Traditionally, language acquisition studies concentrate on increase and ignore decline. A human's bilingual system consists of nested systems rather than separate systems for each language (Herdina & Jessner, 2002). Those systems are in interaction with each other and with their environment in an ongoing process that leads to language development in both positive growth (acquisition) or negative growth (attrition) (Jessner & Megens, 2021). The main driving factor is individual's communicative needs which are a mixture of internal and external factors. The conscious or unconscious effort to maintain language is known as language maintenance effort (LME) can be composed of the language use factor and the linguistic hypothesis verification or corroboration factor. The absence of LME is the core of attrition. In bilingual and multilingual speakers, the systems compete negatively for cognitive capacities in processing and recalling (De Bot, 2004). The change observed in the native language of second language learners is considered according to some scientists as a case of incomplete L1 acquisition rather than language loss because those kids may have failed to acquire the required linguistics properties of L1 in their childhood due to early exposure to L2 on the expense of L1 (e.g., Montrul, 2008; Polinsky, 1997).

A bilingual approach to language growth and decline involves studying both the first language (L1) and the second language (L2) of bilingual individuals to understand how their language skills develop and change over time. Bilingualism can have both positive and negative effects on language growth and decline. On the one hand, being bilingual can enhance cognitive abilities and lead to better language proficiency in both languages. On the other hand, the use of one language at the expense of the other can lead to attrition of language skills in the language that is not frequently used. To effectively manage language growth and decline in bilingual individuals, it is important to encourage and maintain active use of both languages. Bilingual language programs and language maintenance programs can help individuals maintain and enhance their language skills in both languages. Additionally, it is important to provide opportunities for language use in both personal and professional settings to promote continued development and use of both languages.

#### *C. Incomplete Acquisition and Attrition in the L1*

Incomplete acquisition and attrition are two related concepts that describe the ways in which a person's first language (L1) may be affected by changes in their language use and environment. Incomplete acquisition refers to situations where a person has not fully acquired all aspects of their L1 due to a lack of exposure, insufficient input, or other factors. For example, a child who grows up in a bilingual home may not acquire full proficiency in both languages if one language is used much less frequently than the other. Attrition, on the other hand, refers to the loss or decay of language proficiency in the L1 due to changes in the individual's language use or environment. This can happen, for example, when a person moves to a new country where their L1 is not spoken as frequently or when they stop using their L1 for an extended period of time. Both incomplete acquisition and attrition can have significant impacts on an individual's language abilities and may affect their overall communication skills. However, research suggests that language proficiency can be regained through continued exposure and use, particularly in childhood when the brain is most flexible and adaptable.

Many studies have investigated linguistic divergence in the L1 of immigrants due to incomplete or reduced L1 input (Schmidt, 2013). Among the factors that are believed to play a role in attrition are interrupted and insufficient L1 input, exposure to a simplified reduced version of L1 input, language shift between L1 & L2 and lack of schooling in L1. Such

investigation might explain the case of L1 attrition for kids in their homeland since they pass through similar circumstances (Köpke, 2002; Montrul, 2008).

Research on incomplete acquisition and attrition has also highlighted the unique challenges and benefits of bilingualism. For example, studies have shown that bilingual children may exhibit incomplete acquisition in one or both of their languages, depending on the amount and quality of input received (Genesee, 2008). Additionally, research has shown that bilingualism can impact language processing and cognitive flexibility, with bilingual individuals exhibiting enhanced cognitive control and executive function (Bialystok, 2007). The research on incomplete acquisition and attrition has highlighted the complex and dynamic nature of language acquisition and use. Understanding these phenomena is essential for developing effective language interventions and promoting language maintenance and development.

#### *D. The Age of Onset*

The age of onset for acquiring a first language (L1) in Saudi Arabia is typically in infancy or early childhood, when children begin to develop their language skills through exposure to their parents and other family members who speak the language at home. In terms of learning a second language (L2), the age of onset can vary widely depending on individual circumstances and educational opportunities. English is often taught as a second language in schools in Saudi Arabia, and many students begin formal English instruction in primary school, around the age of six or seven. However, some students may not begin learning English until later in their education or may have opportunities to learn other languages such as French or Spanish.

The age of onset for L2 acquisition can have an impact on language proficiency, with some research suggesting that younger learners may have an advantage in terms of developing native-like proficiency in their L2 (Luk et al., 2011). However, many factors beyond age can also influence language learning success, such as the quality of instruction and opportunities for language use outside of the classroom.

The age of onset of reduced L1 input seems to be one of the determined factors in the degree of incomplete acquisition since those individuals are exposed to L2 at an early childhood before they fully developed L1 lexical system (Montrul, 2008; Polinsky, 1997). Incomplete acquisition of L1 in immigrants is found to be affecting all aspects of language including grammar and lexical retrieval (Kohnert & Bates, 2002; Kohnert et al., 1999).

#### *E. Language Use and Contact*

In Saudi Arabia, Arabic is the official language and is used as the first language (L1) of the majority of population. However, due to the country's economic and political relationships with other countries, English is widely used as a second language (L2), especially in business and education. The use of L2 English in Saudi Arabia is primarily a result of the country's modernization and globalization efforts. English language instruction has been a part of the Saudi educational system since the 1950s, and today it is a mandatory subject in all public schools from grade 1 to grade 12. Additionally, many private schools also offer English-medium instruction. In addition to formal education, English is widely used in the media, particularly in news broadcasts, and it is also used in the workplace, particularly in multinational companies and in the oil and gas industry. As a result, many Saudis have a high level of proficiency in English, and it is often used as a lingua franca between speakers of different dialects of Arabic.

Despite the widespread use of English in Saudi Arabia, Arabic remains the dominant language in most spheres of life. Saudi Arabic is the language of daily conversation, and it is used in formal settings such as government, legal proceedings, and religious discourse. However, there are concerns among some language experts and educators that the increasing use of English may have negative effects on the preservation and development of the Arabic language and its dialects in Saudi Arabia.

Recall of lexical items depends on rapid and effective access to language stored in memory (particularly lexis) which follows productive skills (Hansen, 2011). Attrition is influenced by linguistic and extralinguistic factors. The most prominent factor is usage in which there is a negative correlation between them.

According to the activation threshold hypothesis (ATH), the item in the memory requires a certain level of neural impulses to activate it, however the activation threshold goes down each time the item is recalled (Paradis, 2004). The raises of the activation put equivalent item in different languages in competition which leads the little-used item to be stored in the memory in a more effortful and less accessible location that requires high threshold due to lack of use. Some studies proved that the infrequent usage of L1 leads to attrition (De Bot et al., 1991).

## II. LITERATURE REVIEW

### *A. Language Maintenance and Language Loss*

The acquisition of the host society's language is often given more attention by policymakers than the maintenance of the first language among immigrant children. However, in the case of Saudi student's children who are temporarily immigrating, it is important to address the potential loss of their first language. When children are not given opportunities to use their first language, they may feel less confident in their abilities and may struggle with identity formation. Research suggests that children are more vulnerable to losing their first language, especially at a young age, and parents may not always be able to prevent this from happening. As Verdon and Winsler (2014) note, parents may

not realize that their children's English proficiency has surpassed their first language until several years after living in the host country. At this point, children may begin to ignore or avoid using their first language, which can lead to language loss.

Despite the potential challenges, it is crucial for families and communities to develop a respectful attitude towards the first language to prevent language loss. Parents may need to be proactive in encouraging their children to use and learn their first language, while also acknowledging the importance of the host society's language. Additionally, communities can play a role in creating opportunities for children to use their first language, such as language classes or cultural events. Policymakers and educators must prioritize the maintenance of the first language among immigrant children. Specifically, in the case of Saudi students' children who are temporarily immigrating, parents and communities should encourage the use and learning of the first language to prevent language loss and promote confidence and identity formation.

### *B. Critical Period Hypothesis*

According to Lenneberg's (1967) critical period hypothesis, children are more capable of learning a second language than adults. This emphasizes the importance of introducing a second language at an early age. However, some researchers argue that learning a second language as a foreign language at an early age may not be as advantageous as learning it as a first language. This raises the question of the optimal age for language learning. There are differing opinions on the optimal age for language learning, with some researchers supporting early second language acquisition, while others suggest that older learners may achieve higher levels of proficiency (Richards & Yamada-Yamamoto, 1998). For example, Stern (1975) study on 17,000 British children learning French over five years found that older children outperformed younger children.

The optimal age for language learning remains a complex and debated issue among researchers. While some argue for early second language acquisition, others suggest that older learners may achieve higher levels of proficiency. Language learning is influenced by a range of factors, and individual differences which must be considered when determining the best approach to language learning.

## III. THE STUDY

### *A. Research Questions and Predictions*

The study was guided by the following research questions:

1. Is there statistically significant difference between the national school and international school students in terms of attrition?
2. Are there statistically significant attrition differences among international school students' group in relation to personal related variables (gender and age)?
3. Is there a significant correlation between attrition in the experimental group and personal background?

### *B. Method*

#### *(a). The Research Design and Settings*

Jaspaert et al. (1989) proposed a quasi-experimental design as the most effective method for studying first language attrition. This design involves two groups, an experimental group and a control group, where treatment is not applied by the researcher. The two groups are similar in all other variables except for the factor under investigation, which in this case is language loss. In a comparative study, both qualitative and quantitative research methods were used to investigate first language attrition. Qualitative data were collected through oral tests, while quantitative analysis was used to analyze the binary responses (correct or incorrect) obtained from the tests. The study involved two groups of participants: the experimental group, comprising international school students (ISS), and the control group, comprising national school students (NSS).

The study was conducted in various primary international and general schools in Saudi Arabia, and the data were collected using the imaging technique. This technique is effective in highlighting changes in language representation and processing. To assess the mental lexicon, a picture naming task was administered as suggested by Schmid and Kopke (2011). Basically, the study utilized a quasi-experimental design with an experimental and a control group to investigate first language attrition. Qualitative and quantitative research methods were employed to collect and analyze data, respectively. The imaging technique was used to highlight changes in language representation and processing, while the picture naming task was used to assess the mental lexicon. The study was conducted in primary international and general schools in Saudi Arabia. The data were analyzed statistically using *t*-test.

#### *(b). Questionnaire*

To investigate the participants in the experimental group (ISS), a questionnaire was applied to get data regarding their language history, background and amount of contact with L1. It is an adapted version of Yilmaz (2013) that is based on the test battery proposed by Schmid and Kopke (2011). It consists of several binary or yes/no questions (such as gender), a set of ordinal variables (such as education level), 13 items on 5-Point Likert- Scale preference or frequency

indications (such as Language used in daily life, among friends, language preferences, media). The questionnaires were filled in by the researcher during the interviews before applying the lexical test.

The items in the questionnaire were divided to test the following variables:

- Items number 2-3-6 question the frequency of L1 within family and friends
- Items number 1-4-5 question the frequency of L2 within family and friends
- Item number 8 questions the frequency of L1 in school and community.
- Items number 7-10 question the frequency of L2 in school and community.
- Item number 13 questions the frequency of L1 in media
- Items number 11-12 question the frequency of L2 in media
- Items number 9 questions the language used in digital communication.

(c). *Picture Naming Task (PNT)*

The Picture Naming Task (PNT) is a widely used tool in language research to assess language proficiency, particularly in the areas of lexical access and semantic processing. In Saudi Arabia, the PNT has been used in both L1 (Arabic) and L2 (English) to study language development and to compare the two languages. Several studies have investigated PNT performance in Arabic-speaking children and adults. For example, a study by Al-Hayek (2016) examined the effect of age on PNT performance in Arabic-speaking children between the ages of 4 and 7 years. The study found that younger children had more difficulty naming pictures accurately, but their performance improved with age.

Another study by Al-Tamimi (2017) investigated the effect of bilingualism on PNT performance in Arabic and English among Saudi children. The study found that bilingual children performed better than monolingual children in both languages, suggesting that bilingualism may have a positive effect on language proficiency. In terms of PNT performance in English, several studies have investigated the language proficiency of Saudi learners of English. These studies suggest that the PNT is a useful tool for investigating language proficiency in both L1 and L2 among Saudi speakers, and may be used to study the effects of age, bilingualism, and other factors on language development. Picture naming task is a psycholinguistic experiment. To gain informative comparable data the researcher compared the experimental group to a control group (monolingual) of the same characteristics (all other variables are matched across samples) who study in general schools.

In this case, the task is an offline task in which time pressure is not applied. The participants have the opportunity to consciously reflect on their answers. It measures both implicit and explicit knowledge. According to Schmid and Kopke (2011), it is advantageous to remove the time pressure to allow participants to consciously retrieve the required items. The purpose of this task is to establish access to lexemes in L1. The study focuses on mental lexicon since it is the most vulnerable area of linguistic knowledge in language attrition.

According to Pavlenko PNT is the most suitable method to present evidence of the changes in the mental lexicon of language attriters. Lexical-semantic domain is very susceptible to attrition (Schmid & Kopke, 2011). Language is a very complex set of functions; however, production is more measurable, testable and susceptible to attrition than comprehension. This study operated on lexical representation hence it is highly prone to attrition (Bardovi-Harling & Stringer, 2010). To test the lexico-semantic system, picture naming task (conceptual access and lexical retrieval processes) is applied. The most popular method for testing the lexico-semantic system is picture naming task. The task is used to determine the existence of L1 on both the conceptual and the production level (Howard, 2016).

The selection of lexical items for the study was based on the International Corpus of Arabic (ICA), which contains the most commonly used Arabic words. The aim was to choose high-frequency daily items, particularly nouns, which are familiar to children. To ensure that the selected words were within the knowledge of children, those that were typically understood by children were retained, while those that were not commonly used by children were excluded. The study involved a pilot test conducted on six Arabic-speaking children who confirmed that the selected words were familiar to them and commonly used in their daily lives. To ensure that the selected words were easily recognizable, pictures were chosen from a free copyright source (<https://pixabay.com/>) and were presented in a PowerPoint presentation format. The pictures were simple and easy to understand, making it easy for the children to guess the meaning of the word being presented.

To conduct the study, the children were shown pictures one at a time and were asked to name each picture in Arabic. They were allowed to move between pictures at their own pace by clicking on the keyboard. The researcher recorded the children's responses, and the data was later analyzed. To ensure that the study was conducted using pure Arabic language, cognates were excluded from the list. The final list consisted of 115 words, representing the most common and easily recognizable Arabic words for children.

(d). *Participants*

The study was conducted on a sample of 72 Saudi children, with an even distribution of 36 males and 36 females. The sample was further divided into two groups: an experimental group consisting of international school students who were studying in Saudi Arabia, and a control group made up of national school students. The participants in both groups were between the ages of 6 and 12 years old and attended primary school. To ensure that any potential effects of variables such as size, age, and gender were controlled, the study employed a stratified sampling method where 6

students, consisting of 3 females and 3 males, were randomly selected from each grade in both the experimental and control groups. This ensured that both groups were comparable in terms of their demographic characteristics, and any differences observed between the groups could be attributed to the independent variable under study.

The experimental group, consisting of 36 international school students who had only studied in Saudi Arabia and never lived abroad, were selected for testing attrition. The control group, consisting of 36 general school students who also studied in Saudi Arabia and had never lived abroad, were used as a comparison group. The native monolingual responses of the participants were used as a baseline for testing attrition. The median age of the participants was calculated to determine the central tendency of the sample. The descriptive statistics for the control group is as following: grade's mean (M=3.5) and standard deviation (SD= 1.73205), age's mean (M=9.08) and standard deviation (SD= 1.91796). Additionally, the experimental group had been using English as a medium of knowledge in schools for a period ranging from 1 to 6 years, with a mean of (M=3.5) and standard deviation of (SD=1.73205). The age's mean for the experimental group (M=9.1667) and (SD=1.68284). The study was carefully designed to ensure that the sample selected was representative and that any potential confounding factors were controlled to obtain reliable results.

#### IV. RESULTS

Descriptive statistics was used to determine any differences in the means of the row scores of the subjects. The SPSS Statistical Package Program version 26. for windows was used to run the analysis. Microsoft Excel was also used for the analysis. Various statistical methods were employed to analyze the data, and a significance level of  $p$ -value <0.05 was considered as statistically significant. Two statistical techniques used by the researcher are the independent sample  $t$ -test and Pearson correlation coefficient. The independent sample  $t$ -test is a parametric test that is used to compare the means of two independent groups, while the Pearson correlation coefficient is a measure of the strength and direction of the linear relationship between two variables. The choice of these statistical methods was appropriate for the research question and the type of data collected. These techniques were used to test specific hypotheses and answer research questions related to the variables under investigation.

To answer the first question, an independent variable  $t$ -test is applied. According to Table 1, there is a statistically significant difference between the national school and international school students in terms of attrition. There is statistically significant difference at level (0.05), between the national school and international school students in terms of attrition, as ( $t$ ) value is (9.086) with level of significance (0.000) and this value is statistically significant at level of significance (0.05); the difference is in favor of national school. The first research question aimed to investigate whether there were any significant differences in language attrition between national school and international school students. To address this question, an independent variable  $t$ -test was conducted.

The results of the analysis indicated that there was a statistically significant difference in language attrition between the two groups, with a higher rate of attrition observed among the international school students. Specifically, the (T) value obtained from the analysis was 9.086, which was statistically significant at a level of significance of 0.000. This suggests that the difference in language attrition between the two groups was not due to chance and is likely to be meaningful. Furthermore, the results indicate that the difference in attrition was in favor of the national school students, meaning that they experienced less language attrition than the international school students.

TABLE 1  
FINDINGS OF (T) TEST FOR THE STATISTICALLY SIGNIFICANT DIFFERENCE BETWEEN THE NATIONAL SCHOOL AND INTERNATIONAL SCHOOL STUDENTS IN TERMS OF ATTRITION

Dependent Variable	Types of school	N	Mean	Std	" t " Value	P. Value
Attrition	National school	36	112.33	4.41	9.086	0.000
	International school	36	84.42	17.90		

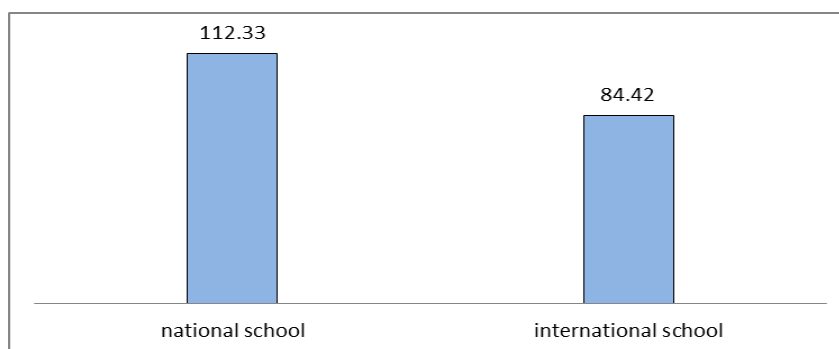


Figure 1. Attrition Results Among National School and International School Students

To answer the second question, the independent variable  $t$ -test was applied to find any statistically significant attrition differences among international school students' group in relation to personal related variables (gender, age). According

to the results, there was no statistically significant attrition difference among international school students' group in relation to personal related variables (gender, age) (Table 2), which proves that the only affecting variable is attrition.

The analysis conducted using the independent variable *t*-test aimed to determine if there were any significant differences in attrition rates among international school students based on personal variables such as gender and age. The findings from the analysis revealed that there was no statistically significant difference in attrition rates between the groups of students based on these variables, suggesting that attrition was the primary influencing factor in the study. In other words, the results suggest that the attrition rates observed among international school students were not significantly influenced by their gender or age. Instead, it is likely that other factors such as academic performance, social support, or personal circumstances were more relevant in explaining why students dropped out of the program. Therefore, further research is necessary to identify these underlying factors and develop strategies to mitigate attrition rates among international school students.

TABLE 2  
FINDINGS AMONG INTERNATIONAL SCHOOL STUDENTS' GROUP IN RELATION TO PERSONAL RELATED VARIABLES (GENDER, AGE)

Dependent Variable	Independent Variables	N	Mean	Std	" t " Value	P.Value
Attrition	Gender:					
	Male	18	86.44	17.03	0.674	0.505
	Female	18	82.39	18.99		
	Age:					
	10 years<	19	82.26	21.42	0.759	0.453
	≥10 years	17	86.82	13.16		

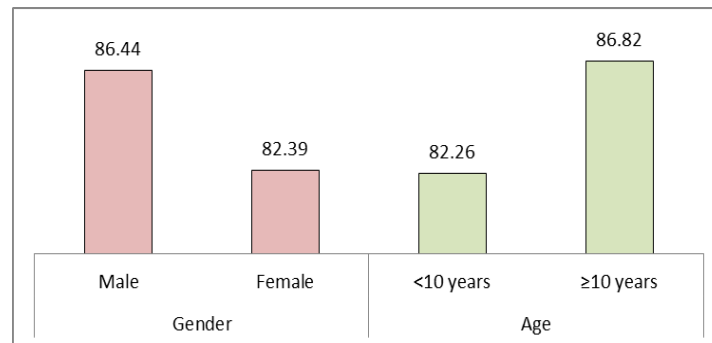


Figure 2. Findings Among International School Students' Group in Relation to Personal Related Variables (Gender, Age)

The third research question aimed to investigate the relationship between language attrition in the experimental group and personal background variables, using Pearson Correlation Coefficient analysis. The results indicated that there was a statistically significant positive correlation between language attrition and one of the personal background variables, namely Variable B, which represents the frequency of L2 usage within family and friends. This suggests that individuals who had higher levels of L2 use within their social circles were more likely to experience language attrition. However, there was no statistically significant correlation found between language attrition and the other personal background variables studied, including age and gender. These findings suggest that factors related to social exposure and use of L2 may have a more significant impact on language attrition than demographic factors.

TABLE 3  
PEARSON CORRELATION COEFFICIENT BETWEEN ATTRITION IN THE EXPERIMENTAL GROUP AND PERSONAL BACKGROUND

Variables	R & Sig	Personal background							
		A	B	C	D	E	F	G	Total
Attrition	R	-0.097	<b>0.426**</b>	-0.033	-0.041	0.065	0.118	-0.080	0.144
	P. Value	0.574	<b>0.010</b>	0.848	0.814	0.704	0.493	0.643	0.403

\*Bold value means statistically significance

## V. DISCUSSION

The study aimed to investigate whether there were any significant differences between the control group and the experimental group participants in their test scores. The results revealed that there was a statistically significant difference between the two groups, with the control group performing better than the experimental group. The (*t*) value of 9.086 with a level of significance of 0.000 indicates a very significant difference in test scores between the two groups. Furthermore, the study also highlighted a significant level of attrition in the experimental group's results. This attrition was attributed to the fact that the experimental group participants were enrolled in international school systems, which could have contributed to a variety of factors affecting their test performance. These factors may include differences in teaching methods, cultural and linguistic backgrounds, or curriculum variations. The findings of this study suggest that there are significant differences in test scores between control and experimental groups, with the control group outperforming the experimental group. Additionally, the results indicate that enrollment in international

school systems may contribute to significant attrition in test scores, which needs to be taken into consideration when interpreting research findings.

The second research question focused on examining whether there was a relationship between attrition among international school students and their personal characteristics such as gender and age. The study findings indicated that there was no significant effect of gender and age on attrition within the international school student group. This implies that neither gender nor age had a statistically significant impact on the attrition rates among international school students. These findings suggest that other factors, such as cultural differences, language barriers, or educational backgrounds, may play a more significant role in influencing attrition rates among international school students. The lack of a significant relationship between gender and age and attrition in the international school student group highlights the importance of considering multiple factors that may contribute to attrition rates. This information is valuable for educators and policymakers in developing strategies to address and reduce attrition rates in international school systems.

However, an interesting result appeared in the analysis of the correlation between attrition in the experimental group and personal background. Only the variables related to the frequency of L2 usage within family and friends are affecting attrition positively. The frequency of L2 usage within family and friends is playing the most affecting variable in the personal background. In the analysis of the correlation between attrition in the experimental group and personal background, a significant result emerged that highlighted the impact of the frequency of second language (L2) usage within family and friends on attrition rates. This variable was found to have a positive correlation with attrition, indicating that higher levels of L2 usage within family and friends were associated with increased attrition rates in the experimental group.

This finding suggests that social and familial factors may play a crucial role in shaping the experiences and outcomes of international school students. Students who have limited opportunities to use their second language outside of school may face greater challenges in adjusting to the academic and social demands of an international school setting. On the other hand, students who have more opportunities to use their second language in informal settings may have a greater sense of linguistic and cultural integration and therefore may be less likely to drop out of school. The frequency of L2 usage within family and friends emerged as the most significant variable in the personal background analysis, indicating its crucial role in predicting attrition rates among international school students. This information is essential for educators and policymakers in developing interventions and support systems that can enhance students' opportunities for L2 usage within social and familial contexts and improve their chances of academic success in international school systems.

Signs of L1 attrition, obtained in comparison to monolingual controllers, increased as a function of L2 use even in the case of active contact to L1 (through family and friends). The study findings suggest that signs of language attrition were more prevalent among bilingual individuals, as compared to monolingual controls. Furthermore, the extent of language attrition appeared to increase with higher levels of L2 use, even in cases where there was active contact with the first language (L1) through family and friends. These results highlight the complex and multifaceted nature of language attrition, which is influenced by a variety of social, linguistic, and cognitive factors. They also suggest that active exposure to L1 through family and friends may not necessarily prevent or mitigate the effects of language attrition in bilingual individuals. These findings contribute to a better understanding of the factors that contribute to language attrition and highlight the need for further research in this area. By better understanding the nature and consequences of language attrition, researchers and educators can develop more effective interventions and support systems for bilingual individuals and help promote positive outcomes in language acquisition and maintenance.

The performance of L1 attritors decreases over time due to the decrease of L1 exposure and contact and increase of L2 exposure and use. The study findings suggest that individuals who experience L1 attrition may experience a decline in their performance over time, as a result of decreased exposure and contact with their first language (L1), as well as increased exposure and use of their second language (L2). These results highlight the complex nature of language development and suggest that exposure and use of language can have a significant impact on an individual's linguistic abilities and performance. They also suggest that the effects of language attrition may become more pronounced over time, as individuals become increasingly immersed in their L2 environment. These findings have important implications for educators and policymakers in the field of bilingualism and language acquisition. They underscore the importance of promoting and supporting L1 maintenance in bilingual individuals, particularly in situations where exposure and contact with L1 may be limited.

## VI. CONCLUSION

In conclusion, the findings from the studies discussed above provide valuable insights into the complex nature of language acquisition, attrition, and the factors that influence academic performance and attrition rates among international school students. The studies highlight the importance of considering multiple factors that may contribute to academic outcomes, including cultural differences, language barriers, educational backgrounds, and social and familial factors. The results emphasize the need for educators and policymakers to develop interventions and support systems that enhance students' opportunities for language use and cultural integration, as well as promote L1 maintenance in bilingual individuals. These findings have significant implications for the field of bilingualism and

language acquisition, as well as for the development of educational policies and practices that foster positive outcomes in diverse student populations. Further research in this area is necessary to deepen our understanding of the complex interactions between language, culture, and academic performance and to inform evidence-based interventions and support systems for diverse student populations.

## VII. FUTURE DIRECTION

In light of the rapidly changing Saudi society, the phenomenon of attrition among international school students represents an issue of great concern that cannot be ignored. The implications of attrition on the identity of society highlight the need for further research to better understand this phenomenon and develop effective strategies to address it. One proposed direction for future research is to explore the neural underpinnings of language processing in individuals experiencing attrition. This could be achieved through the application of neuroscientific methods with high temporal resolution, such as event-related potentials (ERPs), which can provide insights into the neural mechanisms involved in language processing. Such research could help identify specific cognitive processes and neural circuits that may be affected by attrition and shed light on the potential consequences of attrition on language processing and cognitive development.

This information could be invaluable for educators and policymakers in developing interventions and support systems that target the specific cognitive and neural processes affected by attrition. Ultimately, such research can contribute to a better understanding of the impact of attrition on language and cognitive development and inform the development of effective strategies to mitigate its negative effects in the context of international school systems.

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