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Investigating the Relationship between Age and Speaking Strategies of Adults in German (Language Learning (elementary level

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ABSTRACT
A review of theories and research background on the factors affecting foreign language learning shows that speech strategies are affected by three factors: gender, age and level of knowledge of learners. The aim of this study was to investigate the relationship between age and adult speech strategies in learning German (introductory level A1). In order to better understand this issue, it is necessary to examine the effect of age on language elements (learning process, pronunciation, grammar and vocabulary learning) and language skills (spoken-written comprehension and spoken-written production). In this article, the average use of language learning strategies for each strategy was calculated and compared based on the age of the participants. Also, the overall average score of language teaching strategies for all strategies was calculated and compared based on the age of the participants. ANOVA statistical test was used to compare participants' scores. This test is used to compare test scores between several age groups of participants independently. Speech strategies according to the Oxford model include: emotional, social, cognitive, metacognitive and compensatory strategies. The results show that the effect of age on language learning and learning through interpretation and speech skills of participants at different ages is different so that the highest score belongs to the lower age group and the lowest score belongs to the upper age groups. Also, the difference in speech skills score between participants was statistically significant (P <0.05). This means that it can be said that the increase in the score obtained in the speech skills of the participants decreases with age and people at younger ages can be more successful in language learning. In this study, the test scores of the age group of 17 to 27 years showed a statistically significant difference with the age groups of 45 years and above and the age group of 28 to 35 years (P <0.05). Also, the score of the age group below 17 years with the age group above 45 years was statistically significant (P <0.05).

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1. Introduction

Before developing the ability to speak, human beings have used speech sounds and signs for their communication. Years later, they invented the written language after going through the steps of marking and painting on the walls of residential caves (Amoozgar, 2007). At that time, the writing and speaking scripts were close to each other. However, gradually and with the passage of long years, due to the faster change and evolution of spoken language compared to the written one, the spoken languages of that time disappeared while the written languages remained intact and continued to survive with changes at different time periods. Today, the written languages survived from those periods are our sources of study about the communication tools of ancient times. However, from linguists' perspectives, the use of spoken language as a means of communication takes precedence over the written script, and this order and precedence can also be observed in human life in practice. The reason is that children first learn to speak, then go to school, and learn to write. Writing is more stable than speech, and speech is more dynamic than writing (Bagheri, 2007). Hertzler (1945) assets that although speech alone is not everything, it is in fact a principled social event upon which all events of society rest. On the other hand, speaking is necessary to create all social bonds so that, according to Hertzler (1945), without speech, there would be no shared motivation and reciprocal reaction, guiding actions, conscious and educational invitations, invention, recording, gathering and transmitting information related to social order, design, and reconstruction (pp, 26-28). Therefore, by acquiring the necessary speaking skills, a person can quickly recognize the spoken code he/she has already learned as soon as he/she hears words containing communication messages and then manifest appropriate speaking responses to the extent of the acquired skills. Although experience has shown that visual work is accomplished faster than auditory work in humans, the coordination of eye and ear movement requires special skills to better transmit visual and auditory waves and images to the human brain, which need to be acquired through education. The reason is that a person sees and hears not by his eyes and ears but by his brain just like the movement of a camera; therefore, the amount and speed of eye movement to follow the source of the message result from the absorption capacity of the human brain. Hence, it would be useless to move the eye quickly without understanding the codified content carefully. In fact, the human eye, in contrast to his/her ear functions, samples the messages only when it pauses not when it is moving or jumping. Nevertheless, it is clear that reading without understanding is not reading at all; likewise, speaking without perception is never speaking. That is, if learners are encouraged to use a form of speech limited to the pronunciation of sounds and the expression of words without a proper understanding of their practical concepts, such an action will prevent the timely emergence of speaking skills, and such habits will not be considered as skill (Blyanov, 1989, p. 20). Therefore, in order to develop speaking skills, it is important to acquire some abilities so that better conditions can be provided for the rapid and timely transfer of human information and ideas to language learners. Indeed, since, despite taking the special and university courses which are accompanied by increased skills, an individual always moves in a direction that leads to improving special skills (e.g., refining speech, emphasizing conclusions, various inferences, critical and applied thinking, learning the rules of word formation, combining the meanings of new words, and the like) in their speaking to accomplish the required competencies for his/her educational goals (Lotfabadi, 1999, p. 53).

Many studies have been conducted on the relationship between different factors and language learners' speech strategies in language learning, some of which are summarized below: Over the past fifteen years, a rich body of experimental literature has emerged on the subject of language, but given the variety and multiplicity of these studies, only a few are mentioned in this section.Crichton (2021) examined German teaching and learning in the early years and

elementary schools in the United Kingdom and also discussed the state of German teaching and learning. It was concluded that there should exist a systematic teacher training program (i.e., curriculum, methods, materials, and assessment objectives), which is founded on the basis of a specific financial commitment, to support German language teachers and elementary learners. In a study, Pfenninger (2021) addressed the effect of starting age on L3 acquisition across different learner populations by combining two major disciplines of multilingual research. Findings revealed that the starting age for learning a foreign language (EFL) affected different populations of learners (monolinguals, simultaneous bilinguals, consecutive bilinguals). Tomos (2021) in a study examined the second language (L2) development of young students and the understanding of peer-to-peer interactions in blended classes. The results indicated that both S-A and M-A interactions contributed to the development of L2. Although S-A pairs outperformed M-A pairs in the post-test, the results were not statistically significant. In anothe study, Volodinavolodina, Weinert, and Mursin, (2020) explored the development of academic vocabulary across primary school age, differential growth, as well as effective factors for German monolinguals and minority language learners. The results of simple and complete conditional growth curve models emphasized the significant impact of family history (e.g., parent education, books at home) and children's nonverbal cognitive abilities on the comprehension and development of academic vocabulary. Pfenninger and Singleton (2017) conducted a study on the beyond age effects on instructional L2 learning. They demonstrated that the starting is not important for many aspects of language learning, and for various reasons a later start can be useful. This book plays a major role in terms of teaching an L2. Paying special attention to methodological issues, this book goes beyond the age effects to show multitude ways in which internal and external factors may affect learners' processes and outcomes. In a study, Singleton and Pfenninger (2018) explored L2 acquisition in childhood, adulthood, and old age by taking misreported and under-researched dimensions of the age factor into account. incorrect and little researched dimensions of the age factor. They addressed some misunderstandings regarding the age factor in L2 learning which result from relying on the incomplete interpretations of the relevant research findings. They also summarized the results of the experimental studies conducted in this area so far and recommended that further attention be paid to this area in the future. Schimke and Dimroth (2018) carried out a study entitled "The influence of finiteness and lightness on verb placement in L2 German: Comparing child and adult learners". The results revealed that similar developmental stages can be observed in child and adult learners. Specially, contrary to previous findings, child L2 learners who had not yet fully acquired finiteness (subject–verb agreement) preferred to place lexical verbs to the right side of negation instead of a raised position to the left of negation. This pattern was observed for finite and nonfinite lexical verbs, but not for finite auxiliaries. This suggested that, like adults, children can go through a phase where lightness influences verb placement preferences more considerably than does finiteness. In their investigation, Mistar et al., (2014) examined writing and speaking learning strategies among high school students in Indonesia. The results suggested that successful language learners used more strategies than unsuccessful language learners (Mistar et al., 2014). Haddadi and Meysamy (2021) in an article examined the effect of "linguistic interference" on learning the correct pronunciation in German for Iranian language learners at the elementary level. The results show that one of the most important factors affecting the quality of pronunciation in a foreign language is the interference of common pronunciation patterns in the mother tongue. Nader and Maleki (2018) in an article entitled Analysis of German language learning in Iran based on the theory of "second language self-motivation" selected 370 Iranian language

learners of the German Language Institute of Tehran (DSIT) and their motivation based on the theory of self-motivation The second language (L2 Motivational Self System) was examined. Studies of this study based on possible selves and comparing it with the results of research conducted in English show that the motivation to learn German has a significant relationship with the components of the above theory, namely, "the ideal of a second self-language should be." Has a second language (L2 Ought-to Self) and a second language (L2 Learning Experiences). Meanwhile, the "role of instrumental motivation" among German language learners in relation to this theory is more prominent than other motivational factors. Barzegar and Alborzi (2019) in a research article entitled The effect of language age of learners on learning German pronunciation based on data from Iranian students, based on the hypothesis of a critical period that makes full learning of any language impossible after a certain age, has been done. Two groups of Iranian students who have learned German at different ages were studied. Their pronunciation was assessed by reading three German texts by five native German evaluators. The aim was to find a native speaker of the German language among the two groups of learners. According to numerous studies on the age of language learning, students under the age of 12 are more likely to acquire pronunciation skills than native speakers. Given that most of the first group of language learners grew up in a German-speaking environment from birth, it was expected that some of them would be recognized as native speakers. The question was whether there was a native speaker with a native pronunciation of a native speaker. Finally, not only could none of the second group of learners be identified as native speakers, but in the first group, no language learner could be identified as native speakers in all three texts according to the evaluators. The results of this research are in line with the critical period hypothesis. Rouhi and Turki (2017) in an article entitled "Assessing the motivation of German language learners in Iran and its educational consequences", by measuring the motivation of Iranian learners have answered the following two questions: First, is the motivation of learners to learn German in choosing a language institute? plays a role? Second, what are the implications and motivations of language learners for learning German in the teaching process? in this research; With a descriptive-survey approach and with the help of "Likert" scale, 150 Iranian learners (German language); In two target groups - one of which was studying in Iranian institutions and the other group participated in a German institution in Iran. Preliminary findings indicate differences in learning motivations and the reason for choosing the institution in the two groups; Therefore, the role of "motivation difference" in choosing the place of language learning is obvious. Another important result was that German language textbooks in Iran are all written in Germany and are suitable for language learners who intend to immigrate to those areas, so to meet the needs of native learners, it is necessary to design and compose native content. Starmi and Ghodoosi (2013), in an article entitled The Role of Testing in Assessing Language Learning in German Language Teaching, reviewed and introduced the features of each German language test for each skill, along with examples, so that the language teacher could fully assist and familiarize them. Easily assess the level of learning and learning of language learners and thus teach German to students and researchers in this field. Parvan and Hassan Khani (2011) in an article entitled "Study of the general difference between grammatical terms in Persian and German in German language teaching", tried to reflect some examples of common mistakes in German grammar written in Persian, Examine the general contrast of grammatical terms in the two language systems. The results of the research indicate that grammatical terms alone do not help much in learning a foreign language, but it should be noted that if the grammar is written in Persian for any reason, the differences between the grammatical terms of the two languages should also be considered. So that readers do not slip. Most German grammar writers in Iran are German-speaking Iranians who sometimes make mistakes in translating grammatical

terms, which can be examined in the category of semantic error and used in language teaching.

2. Methodology

In terms of data collection, the present study is a field study that used a questionnaire and review of documents for data collection. This is a Survey study regarding the research topic, which investigates the relationship between independent and dependent variables, and regarding the purpose, it is an applied research. The results of the study were obtained from examining the relationship between age and speaking strategies of adult males in learning German (introductory level A1). The questionnaire included 50 items with six main scales of L2 learning strategies in which each scale contains 6 to 14 items. These strategies include:

1) Memory strategies,

2) Cognitive strategies,

3) Compensation strategies,

4) Metacognitive strategies,

5) Emotional strategies,

6) Social strategies.

Students answered a five-point Likert scale questionnaire. The questionnaire was administered among language learners who had passed the first level of German language training. It took 15 to 20 minutes to complete the questionnaires.

In the present study, we have dealt with the reliability and validity of the SILL questionnaire; accordingly, we briefly describe the methods of estimating reliability and validity. Reliability was estimated using Cronbach's alpha. The higher alpha value (above 0.7) indicates a more stable research tool. Cronbach's alpha is a good way to estimate the internal reliability of a questionnaire.

2.1. Reliability of SIIL questionnaire

The alpha obtained for this questionnaire is higher than 0.7 (0.84), indicating an extremely high reliability. After that, the reliability coefficient of all groups was calculated, which is presented in Table 2.

Table 1. Reliability coefficient of SILL constructions

Strategies	Memory	Cognitive	Compensation	Metacognitive	Emotional	Social
Alpha	0.77	0.81	0.85	0.82	0.81	0.83
No. of items	9	14	6	9	6	6

The alpha for compensatory and social strategies was estimated to be 0.85 and 0.83, respectively, indicating a high reliability coefficient. The other four structures, namely, memory, metacognitive, cognitive, and emotional strategies, enjoyed a good reliability coefficient which were 0.77, 0.82, 0.81, and 0.8, respectively.

In many previous studies, the reliability of the SILL questionnaire was high in situations where English was a second language or a foreign language. Young (1992) who offered the Chinese edition of the questionnaire to 590 Taiwanese English students found an alpha of 0.94. Watanab (1990) who implemented the Japanese version of this questionnaire on a sample of 255 individuals achieved an alpha of 0.91. Oh (1992) administered the Korean edition of the SILL questionnaire to 59 Korean English students. The alpha of this questionnaire was calculated to be 0.91. Park (1994) modified SILL at his own discretion, translated it into Korean, and then executed it on a sample of 332 participants. The alpha coefficient of this questionnaire was estimated to be 0.93. In cases where the untranslated edition of SILL has been implemented, the alpha level has slightly decreased, but it has still remained at an acceptable level. Phillips (1990, 1991) with 141 participants, Russi (1989) with 159 subjects, and Anderson (1993) with 95 students achieved an alpha level of 0.87,

0.86, and 0.91, respectively. Oxford all the constructs of the SILL questionnaire. Convenient and has high reliability. Oxford (1997) examined all constructs of SILL questionnaire; the overall alpha level was estimated to be 0.84 which indicates that the questionnaire enjoys a high level of reliability and overlapping.

Table 2. Oxford (1990) criterion for analyzing the mean scores of the questionnaire

Strategy use	1 -1.4	1.5-2.4	2.5-3.4	3.5-4.4	4.5-5
items	Never or almost never used	Not usually used	Sometimes used	Usually used	Always or almost always used

2.2. SPSS and PRISM statistical tests

The data related to the participants of the present study were analyzed using SPSS and PRISM statistical softwares which are employed to analyze statistical data. In this study, the mean of language learning strategy use was calculated for each strategy and then compared in terms of the age of participants. Furthermore, the overall mean score of language learning strategies for all strategies was computed and compared based on the age of participants. ANOVA test was employed to compare the participants' scores. It is used to compare the scores of several age groups independently. The result of this test is reported to be between 1- 100, and the value above 95% is regarded as an acceptable significant level in the statistics. Accordingly, *P*-value should be less than 5% in order to be acceptable. In this study, an unacceptable *P*-value was shown as NS or Non-significant, while an acceptable *P*-value was marked with an asterisk (*) on the figures.

3. Research findings

3.1. Language learning strategy use

The frequency of use of each L2 learning strategy by foreign language learners has been presented using descriptive statistics. In the analysis of the results of the questionnaire (Oxford, 1990), the mean of 1 to 1.4 indicates that the person never or almost never uses language learning strategies, and the mean of 1.5 to 2.4 indicates that the person does not usually use language learning strategies. The mean of 2.5 to 3.4 suggests that the person sometimes uses language learning strategies, while the mean of 3.5 to 4.4 indicates that the person usually uses language learning strategies, and the mean of 4.5 to 5 shows that the person always or almost always uses language learning strategies.

3.2. Checking the sub-scale scores based on gender

The data of the participants in the present study (n = 120) were statistically analyzed using SPSS software. The mean of overall strategy use for all participants was 3.01. Further, the mean of strategy use for all participants was discrete for the SILL subscales, and the standard deviations of the subscales are presented in the Table 3. The lowest mean is related to the use of emotional strategy subscale (females = 2.6 and males = 2.49). Moreover, mean scores and standard deviation of two gender groups were calculated.

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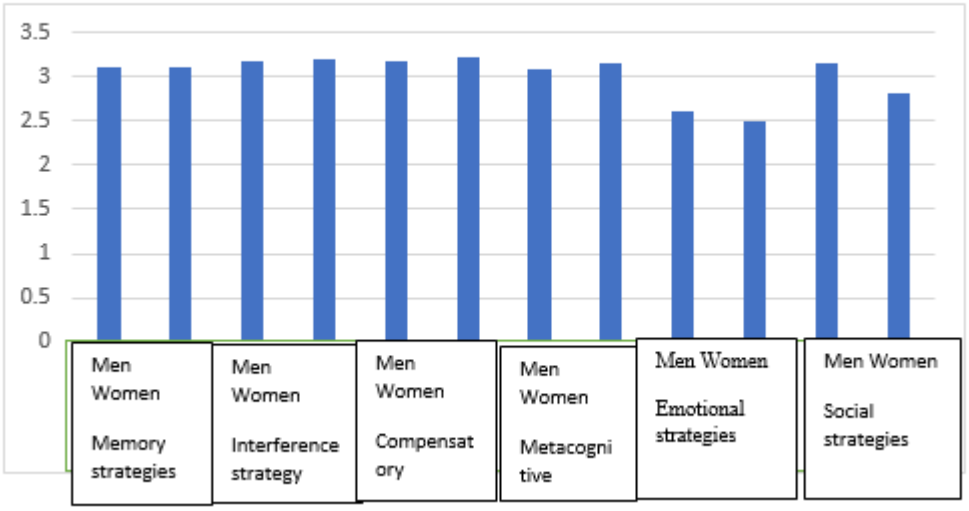

Fig. 1. The relationship between age and German language learning strategies

Significant differences between the mean scores of the subscale were assessed based on the difference in course levels using standard independent samples t-test methods. The mean scores of the subscales for six subscales were accurately calculated. Regarding gender, it is observed that the mean score obtained in the males' and females' group is 71.9 and 81.2, respectively. Statistical analysis revealed that there was a statistical difference between two groups of males and females in the obtained score obtained so that females secured better scores in the German language learning course, and males scored lower (P <0.05).

Table 3. Mean score of constructions based on gender

Strategies	Gender	Mean	Std. Deviation	Std. Error Mean
Memory	females	3.1019	.96234	.13890
	males	3.1034	.96619	.11387
Cognitive	females	3.1696	.84485	.12194
	males	3.1944	.78349	.09234
Compensation	females	3.1736	.96141	.13877
	males	3.2292	.99821	.11764
Metacognitive	females	3.0949	.87579	.12641
	males	3.1451	.78093	.09203
Emotional	females	2.6042	.92868	.13404
	males	2.4954	.87708	.10265
Social	females	3.1632	.72158	.10415
	males	2.8059	.90652	.10610

Table 4 . Descriptive statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Females	48	81.2498	6.18018	.89203
	Males	73	71.9264	6.20278	.72598

Table 5. Results of independent samples t-test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Sig.(2-	Mean	Std. Error	95% Confidence Interval

						tailed)	Difference	Difference	of the Difference	
									Lower	Upper
Score	Equal variances assumed	.508	.477	8.100	119	.000	9.32335	1.15099	7.04427	11.60243
	Equal variances not assumed			8.106	100.966	.000	9.32335	1.15012	7.04182	11.60488

3.3. Descriptive statistics for the German language learning strategy use

1) Memory Strategies: Figure 2 indicates that, among the items related to memory strategies, learners usually use the strategy related to item 2 (I use the new German words I have just learned in the sentences so that I can learn them). Three strategies related to items 3, 5, and 7 are moderately used, and the two strategies in items 6 and 9 are rarely used.

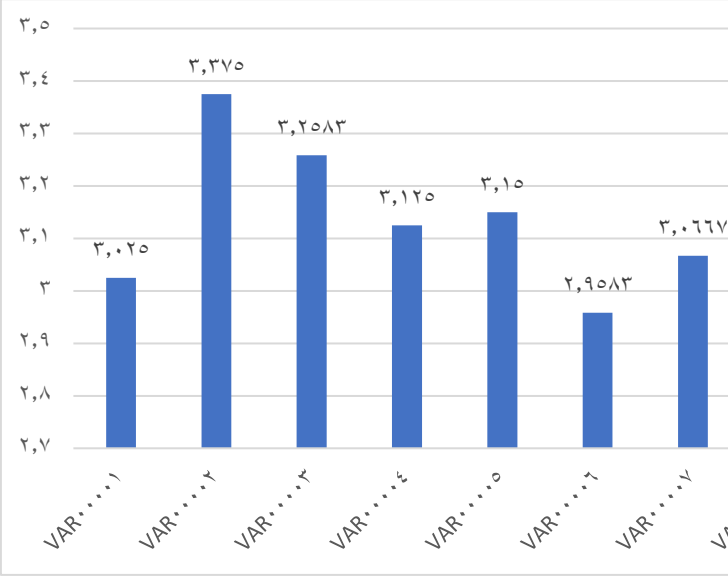

Fig. 2. Memory strategy use

2) Cognitive Strategies: As demonstrated in Fig. 3, the mean score of half of these items is between 1.3 to 3.3. In addition, item 19 was most frequently used by learners (I usually look for German words similar to Persian words), while item 14 (I often speak German for better learning) was less frequently used.

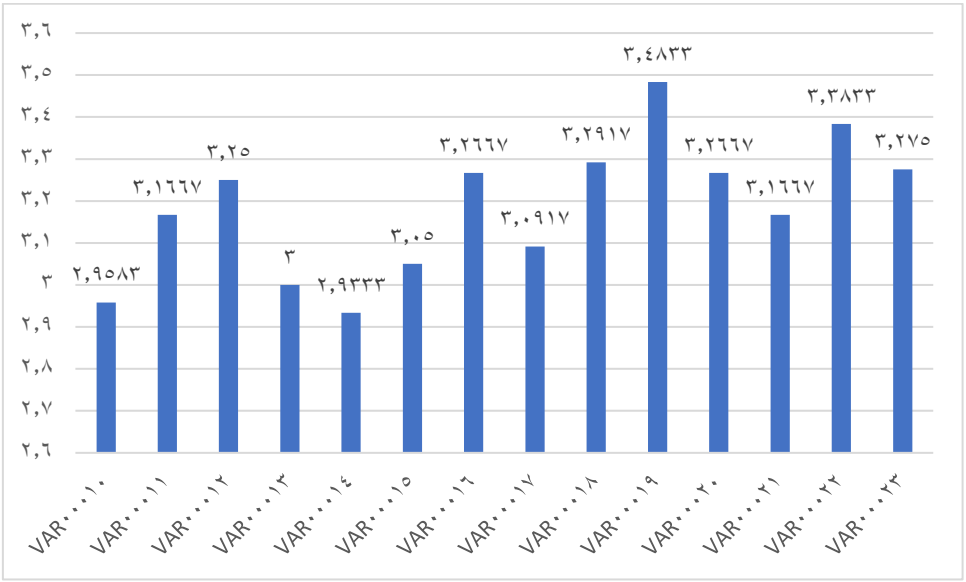

Fig. 3 Cognitive strategy use

3) Compensation strategies: Figure 4 demonstrates that item 27 (I can read

German text without looking for new words in the dictionary) was most frequently used strategy by learners, and item 25 (when I do not know the meaning of a word in conversation I communicate the meaning to the interlocutor by using gestures) was less frequently used strategy.

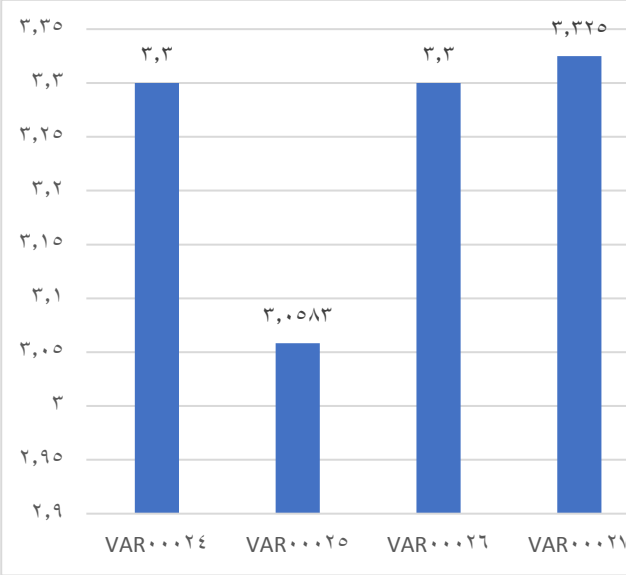

Fig. 4. Compensation strategy use

4) Metacognitive strategies: According to Figure 5, language learners normally use metacognitive strategies. Except for item 37 (My goal is to learn German better) which had the least frequency of use, the rest of the items were frequently used on average.

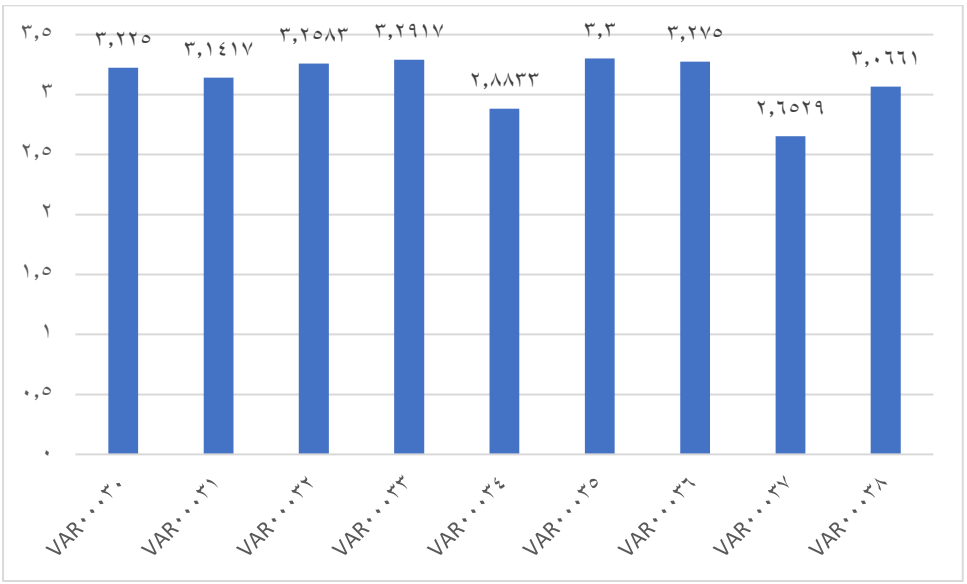

Fig. 5. Metacognitive strategy use

5) Emotional Strategies: As illustrated in Fig. 6, item 39 (I try to stay calm when I am afraid to speak German) had the highest frequency of use among the items related to emotional strategies. In contrast, item 42 (I know I may get nervous or stressed when I study German) had the least frequency of use among the items, and the rest of items were at an intermediate status.

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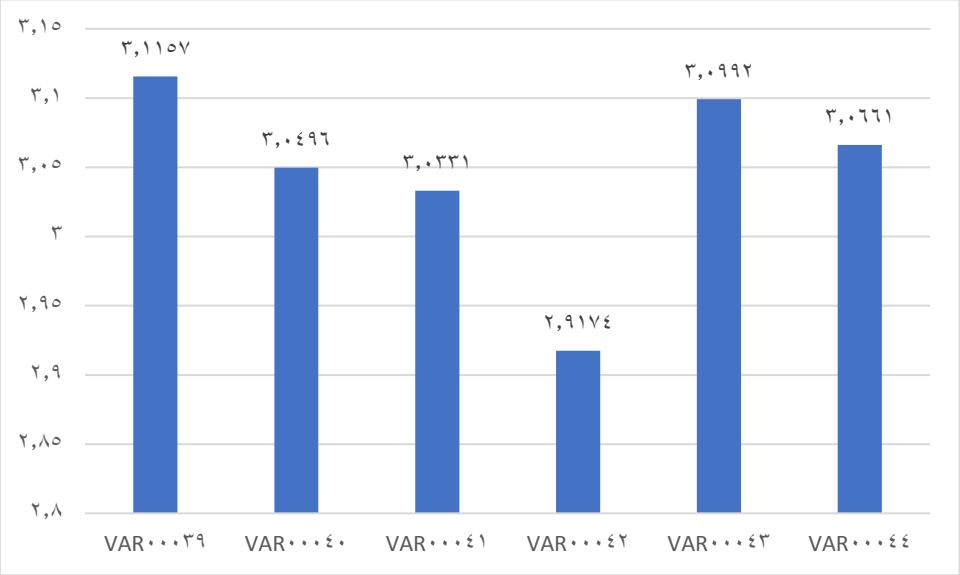

Fig. 6. Emotional strategy use

6) Social strategies: The mean of items related to social strategies (between 2.85 to 3.03) indicated that foreign language learners usually learn German from each other.

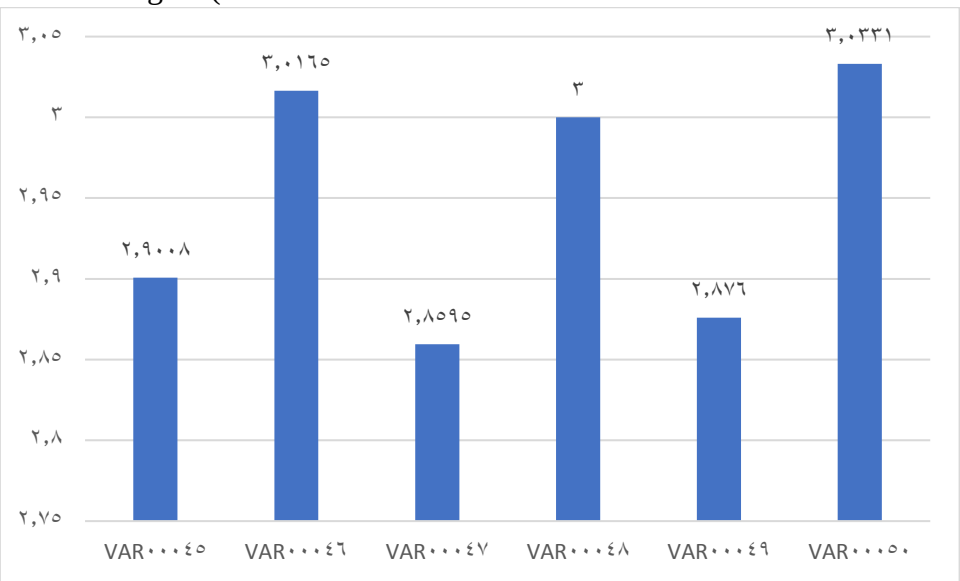

Fig. 7. Social strategy use

The mean scores of language learners in each group of strategies as well as the overall mean of all strategies used by language learners in this study are presented in Table 6.

Table 6. Descriptive statistics of the mean of all strategies

Strategies		Memory	Cognitive	Compensation	Metacognitive	Emotional	Social
	Valid	120	120	120	120	120	120
Mean		3.1028	3.1845	3.2069	3.1250	2.5386	2.9477
Std. Error of Mean		.08769	.07350	.08946	.07458	.08142	.07756
Std. Deviation		.96060	.80518	.97996	.81695	.89566	.85311
Variance		.923	.648	.960	.667	.802	.728
Range		3.22	3.00	3.67	3.22	3.33	3.33
Minimum		1.22	1.50	1.17	1.56	.83	1.33
Maximum		4.44	4.50	4.83	4.78	4.17	4.67

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a. Multiple modes exist. The smallest value is shown

Table 7. The mean of all language learning strategies

Strategies	Memory	Cognitive	Compensation	Metacognitive	Emotional	Social
Mean of each strategy	3.1028	3.1845	3.2069	3.1250	2.5386	2.9477
Overall mean of strategies	3.01					

Given the overall mean of the use of strategies (3.01) in Table 7 and considering the Oxford (1990) criterion for analyzing the means, it can be said that generally foreign learners sometimes use German language learning strategies. According to the descriptive statistics, the use of German language learning strategies (as an L2) can be ranked as follows:

Table 8. Prioritization of language learning strategies from the of learners' perspective

strategy	emotional	social	metacognitive	cognitive	compensation	memory
Importance of strategies	1	2	3	4	5	6
emotional > social > metacognitive > cognitive> compensation > memory						

As observed in the above table, learners used memory strategies more than other strategies and applied emotional strategies less than other strategies.

In any educational system, the age factor is of critical importance for learning a foreign language. On the other hand, throughout the history of foreign language learning, the relationship between age and learning has attracted the attention of language experts. Today, the effect of age on the educational process and its relationship with rate of learning is the focus of much research in the field of foreign language education. The results of numerous research revealed that various factors such as age, gender, and motivation are effective in learning a foreign language (Oxford, 1990, p. 36). Among these, age as an influential factor has attracted the attention of language learners and experts, and has always appropriate age to learn a foreign language since knowing the right age facilitates the learning process and improves the quality of foreign language teaching. According to psychological age refers to a period with a complete set of interrelated characteristics for performing various activities. Therefore, learning as an activity takes place at any age, but it should be noted that language learners learn foreign languages faster and better at a younger age. According to Slinker' (1972) theory, language learning takes place in two ways. In the first stage, language is learnt through the natural abilities (latent linguistic structure) that are necessary in learning language and applicable up to a certain age, and in the second stage, it is learnt through the superior logical abilities (latent psychological structure). This superior psychological dimension does not allow the adolescent or young learner to learn by nature; as a result, he/she learns a foreign language differently from the mother tongue. This belief that children are faster and more efficient in learning a foreign language has induced a great motivation to teach a foreign language in kindergartens and primary schools. Based on the above considerations, the effective role of age in the process of learning a foreign language can be understood.

The results of other studies have demonstrated that the negative impact of mother tongue on foreign language learning is higher among adolescents and young people compared with the children; thereby; therefore, there is an inverse relationship between the speed of foreign language learning and aging. In what follows, we will examine the relationship between age and factors such as language elements and skills as well as physiological factors.

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3.4. The effect of age on language elements and skills

Age plays an important role in learning foreign languages and exerts a significant impact on the learning process; as a result, it has led to the formation of different theories. The learning process in children is faster and more efficient so that considers the first stage of life as the optimal stage for language learning, after which a kind of internal biological clock records the missed learning opportunities in an inflexible way, and subsequent attempts at learning foreign languages are not very successful In this regard, a third theory has been put forward by Sear and German, 1998, p. 76) stating that the quantity and quality of learning also increase with age. To better understand this issue, therefore, it is essential to examine the effect of age on language elements (e.g., learning process, pronunciation, grammar, and vocabulary) and language skills (reading/listening comprehension and speaking/writing production).

Based on the analysis of variance of data related to different ages in the present study, it was found that there was a significant correlation between German language learning and age. The nature of this relationship was in such a way that no significant relationship was observed between similar age groups but, there was a significant difference between the age groups with a large distance in the learners' score.

The age groups in the present study were as follows:

Table 9. Age groups of the present study

17 or less
18-27
28-35
36-45
Above 45

According to the ANOVA table (Table 10), there is no significant relationship between language learning in the age group under 17 years old and the age group of 18 to 27 years old, but there is a significant difference between the learning of the age group under 17 and other groups ($p < 0.05$) . In the case of the age group between 18 and 27 years old, it is observed that the learning process is significantly different for all age groups, except for the age group under 17. It can be observed the age group of 18 - 27 years is different from all groups, except the age group of 36 to 45 years old. Furthermore, there were differences between age group of 28 -35 and all other age groups, except the groups of 36 to 45 and above 45 years old. In addition, the 36 to 45 years old group only differed from the under 17 group and the 18 to 27 years old group. The age group above 45 differed from all other groups in terms of learning, except for the 36-45 and 28-35 age groups.

Table 10. ANOVA analysis for determining the significance of mean scores in terms of age

Mean	df	F	Significant level
881.13	5	37.85	0.00
23.27	115	-	-
-	120	-	-

language learning based on different age groups

Table 11. Results of Tukey test for comparing the mean scores of German

Age group	Under 17				
Age group	17-22	23-27	28-35	36-45	Above 45
Statistical significance	0.521	0	0	0	0
Age group	17-22				

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Age group	Under 17	23-27	28-35	36-45	Above 45
Statistical significance	0.521	0	0	0	0
Age group	23-27				
Age group	Under 17		28-35	36-45	Above 45
Statistical significance	0		0.022	0.613	0.002
Age group	28-35				
Age group	Under 17		23-27	36-45	Above 45
Statistical significance	0		0.022	0.522	1
Age group	36-45				
Age group	Under 17		23-27	28-35	Above 45
Statistical significance	0		0.613	0.522	0.216
Age group	Above 45				
Age group	Under 17 17-22		23-27	28-35	36-45
Statistical significance	0 0		0.002	1	0.216

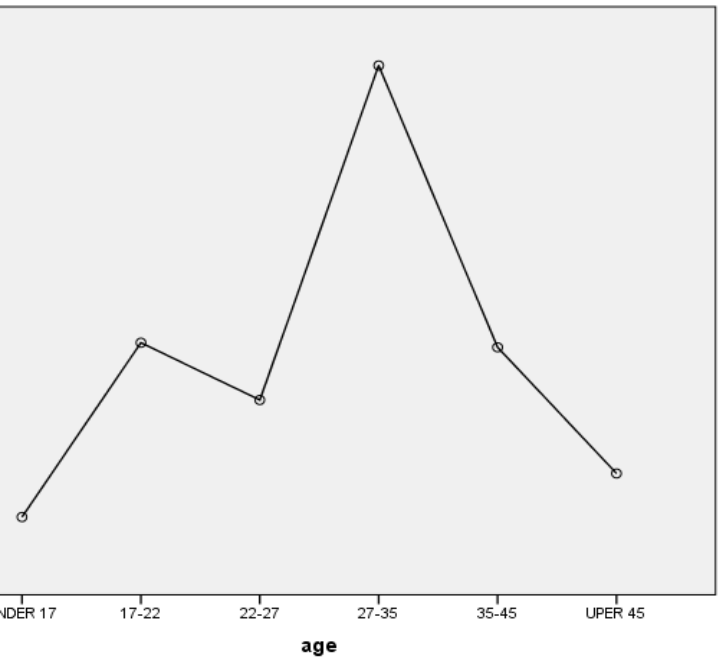

Fig. 8. Learners' score based on age

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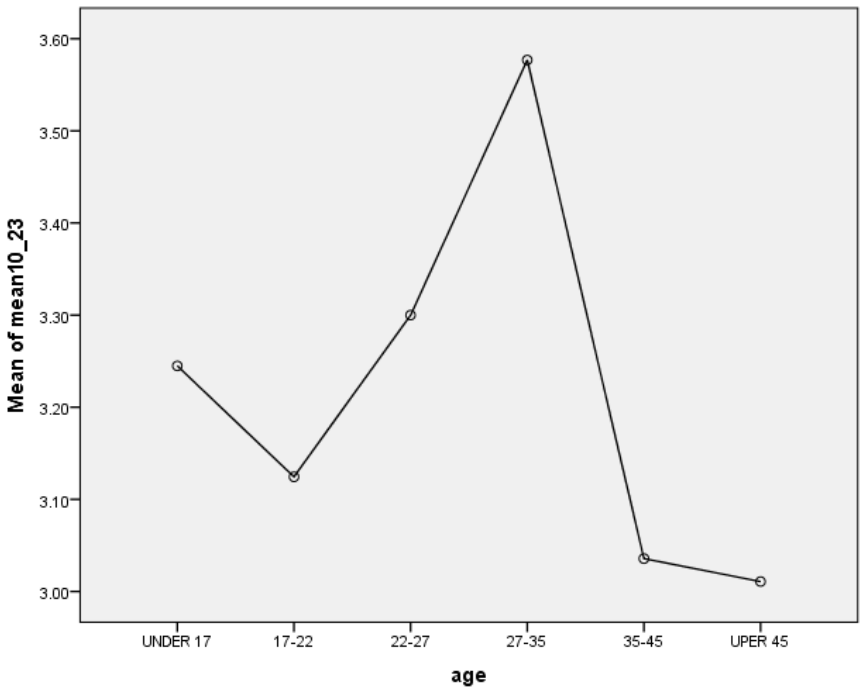
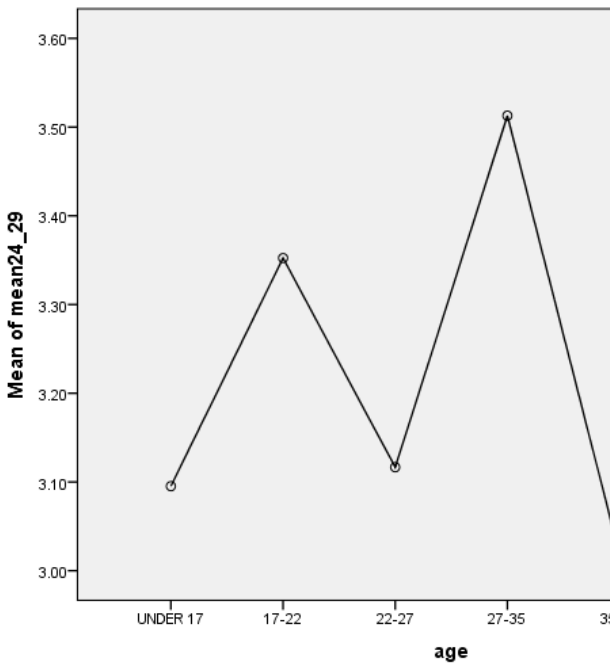


Fig. 9. The trend of cognitive strategy score based on age

Fig. 10. The trend of compensation strategy score based on age



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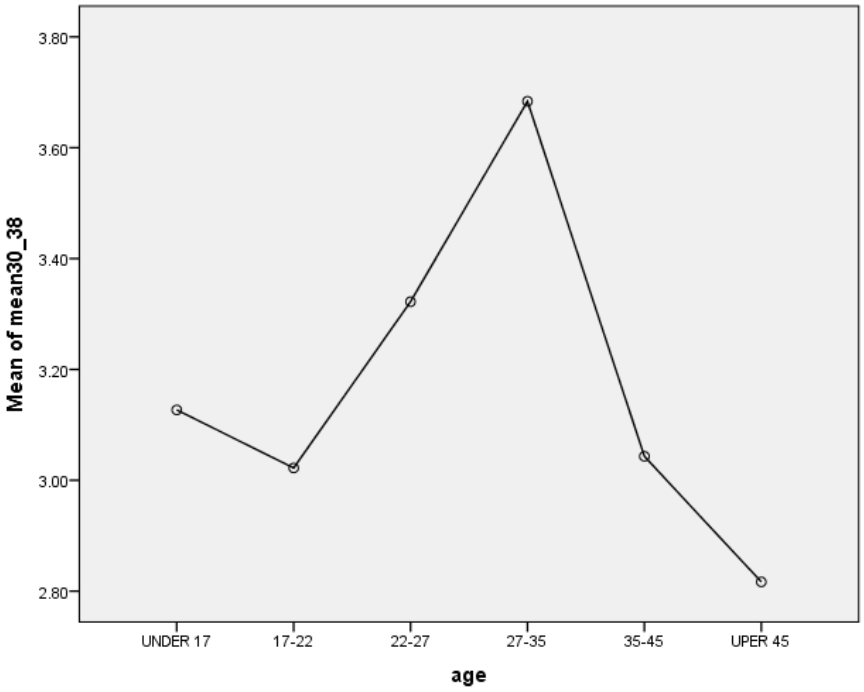

Fig. 11. The trend of metacognitive strategy score based on age

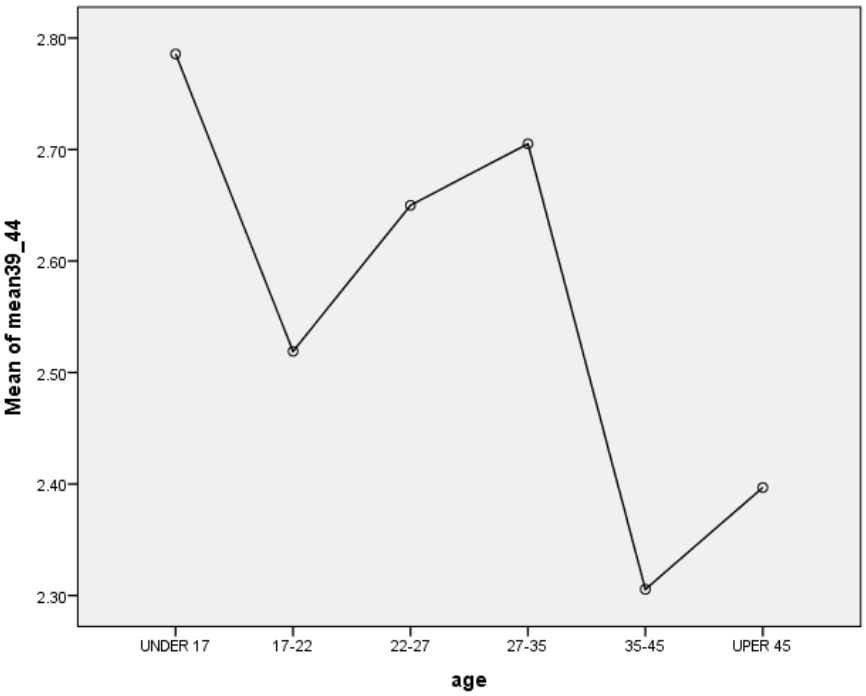

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Fig. 12. The trend of emotional strategy score based on age

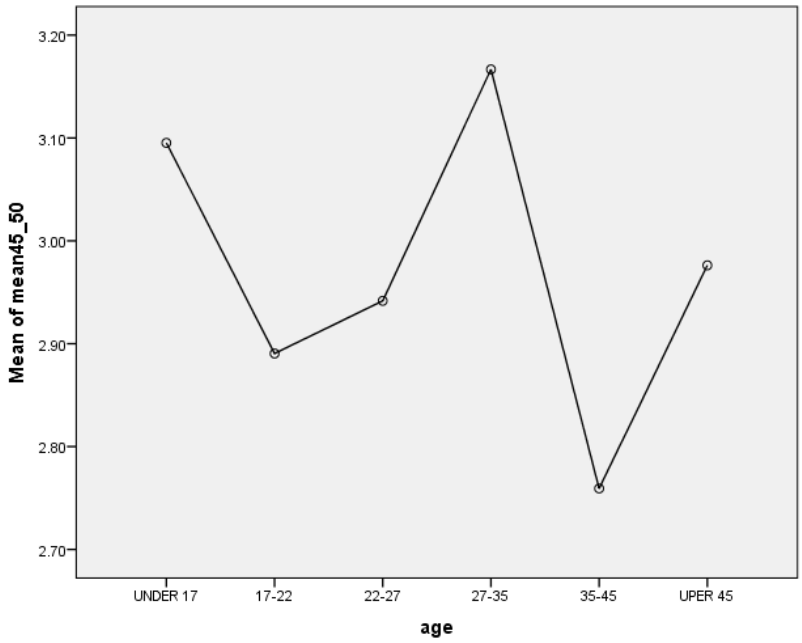

Fig. 13. The trend of social strategy score based on age

4. Summary and conclusion

Many factors such as age, aptitude, motivation, the degree of proximity of the mother tongue to German, and the like can affect the speed, quality of L2 learning, and the acquisition of native-like proficiency. However, before examining the effect of age on L2 learning, you need to know the difference between learning and acquisition. The main difference between learning and acquisition lies in the degree of concentration and level of consciousness of this process. Acquisition is generally used for the mother tongue because, in the process of learning the mother tongue, the child makes no attempt to receive or use the information. He/she never learns anything in the classroom via practice and concentration. However, learning is usually used for an L2, in which a person consciously tries to learn German or any other languages apart from his or her mother tongue and devotes a certain amount of time to the process of learning an L2. Nevertheless, when acquiring the mother tongue, a person is constantly confronting new information and subconsciously doing the act of repetition and exercising throughout the day. In the end, he/she tries to use the mother tongue only to meet his/her own needs and communicate not to obtain a language certificate and the like.

There is a theory about the impact of age on L2 learning called the Language Mediation Theory, in which language acts as a mediator between human thoughts and the surrounding world, creating a connection between the two. This theory identifies two basic components for language to explore the effect of age on L2 learning and meticulously examines the effect of age on L2 learning through these two components. Using these two components, we can learn an L2 or any other languages, and if one of them does not exist or we can not use it for any reason, learning will not happen; In the following section, we will provide some

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explanations regarding these two components.

The effect of age on learning German and the effective psychological and physical factors

The effect of age on learning German and the effective psychological factors in people's minds as well as some physical factors are divided into several categories. The effect of age on L2 learning and intellectual processing, in which the use of language is a cognitive process, not a physical one, and is the product of intellect and reasoning power. Additionally, as we have pointed out, it happens as a process that is divided into two parts. With regard to the effect of age on language learning and learning through interpretation (explication / deduction), learners use examples to understand the overall meaning of a subject themselves, and the teacher does not explain the rules to them. Hence, this teaching method is better for adults due to their reasoning and intellectual capacities. Regarding the effect of age on learning an L2 and learning through induction, the L2 is taught to learners just similar to the mother tongue, and if learners are placed in the right conditions and environment, they can easily learn L2. The method is more suitable for children. Regarding the effect of age on learning an L2, another theory, that is, transfer theory, states that the mother tongue always interferes with the process of learning an L2, which can be positive or negative. This means that language learners (mostly adults) are constantly comparing the mother tongue and its features with L2, and by taking advantage of the positive effect, the teacher can teach the language better and faster. With respect to the effect of age on language learning and memory, apart from long-term and short-term memory, there are two types of memory. The first is rote memory, which works automatically and naturally, in which a person sees or hears something and easily commits it into his/her mind. This type of memorization mostly occurs in children because they have a cleaner and more secluded mind that is like a tabula rasa and ready to record new information due to lack of experience and mental preoccupations. Using this memory, children can easily memorize a lot of new information easily. For example, to learn new words, they only need to be given the word with the meaning. The second is episodic memory which is more commonly used by adults, and the act of learning occurs through engaging the mind in the intended setting and context since the adults' mind and memory are occupied by relatively large amount of experiences, preoccupation, and knowledge. Accordingly, it requires the use of learning strategies to insert new information. For example, to learn new words, the learner's mind needs to be prepared using an attractive text, flash card, and so on.

The effect of age on second language learning and motor skills

Physical abilities refer to the amount of language flexibility and physical components involved in the pronunciation of L2 words and sounds. As you know, children are physically more flexible; hence, they can produce German sounds much more easily and accurately. However, adults take advantage of another factor which can help them pronounce sounds, and it is using and referring to mother tongue experiences and comparing them with L2. With regard to motivation, there are generally two types of motivation: intrinsic and extrinsic.

Intrinsic motivation and the effect of age on language learning

This type of motivation is generally present in adults. Most adults, for example, start learning a language due to interest in language, immigration, a better job position, and so on.

Extrinsic motivation and the effect of age on language learning

This type of motivation is more common in children and is attributed to an external factor. For example, "If you get a good grade in a language class, I will buy you a bike." However, in the end, extrinsic motivation in children can turn to an intrinsic motivation and interest through the proper use of creative methods and methods

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of teaching an L2 via playing and entertainment. The effective social factors, just like the effect of age on language learning and psychological factors, consist of several parts.

The first factor is related to the learning situation and environment. As it is known, the immigrants can learn language much faster. This only is due to the impact of age on language learning and learning environment, which is generally divided into two categories: narrow and broad. Narrow situation, which is indeed the same classroom situation, limits the ability to do creative activities and exercises when teaching an L2, and learners cannot use the L2 outside the class. On the other hand, broad situation refers to the learning of L2 in the natural environment and outside the classroom, which provides more time to practice in the natural language environment. Nevertheless, if the language teacher applies the appropriate teaching methods for each person at any age, he/she can reduce the effect of age on language learning and learning environment as much as possible, and both adults and children can relatively learn an L2 in both environments with the same speed.

With regard to the social strategy, if it is possible to use language outside the class environment for social interactions such as work, study, and the like, there will be no difference between adults and children language learning. However, due to the personal, academic, and social experiences of most adults, they are more willing to learn the language and communicate with people in the society since children often only go to school, but adults have to do activity in a social environment (e.g., working, shopping, and so on).

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