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The Effects of Age of Exposure on Knowledge of English Grammar in English-medium Instruction

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Abstract

The current study examined differences in morphosyntactic knowledge of Arabic learners who had significant exposure to English as a medium of instruction at the primary and tertiary educational levels. The study involved a grammaticality judgment task, an editing task, and a background questionnaire. Based on the background questionnaire, the participants (n = 84) were divided into early and late learners – those first exposed to English medium instruction in the primary and undergraduate levels, respectively. The results of the multivariate analysis revealed a main effect for the age of first exposure to English medium instruction. The post hoc univariate analysis confirmed these effects in favor of early learners only for the grammaticality judgment task; no such effects were observed for the editing task. Theoretical, methodological, and pedagogical implications of the study are discussed.

Keywords: Age of exposure; English medium instruction; grammar judgment task; editing task

The influence of the age of exposure on second language acquisition is a widely debated topic in Applied Linguistics. It is generally believed that there is a restricted "window of opportunity" early in life when human beings exhibit increased sensitivity to learning a language (Singleton & Munoz, 2011). If the exposure to a target language happens beyond this phase – termed as the Critical Period – the ultimate attainment in the target language will remain deficient. Among several factors that enrich this debate over the effects of age of exposure on second language acquisition (i.e., types of knowledge, types of tasks, types of stimuli, language features), the issue of context – second or foreign – holds a pivotal position. Researchers generally believe that age effects are limited to naturalistic second language settings, where the target language is used as the first language in the society, for example, English in the US. Hence, if learners are exposed to English as a second language (SL) at an early age (e.g., 2 years) in a context like the US where there are unlimited opportunities to be exposed to and practice English, they will

achieve a higher proficiency in English as compared to those who are exposed to it at a later age (e.g., 16 years; DeKesyer, Alfi-Shabtay & Ravid, 2010; Granena, 2012). For foreign language (FL) settings, however, these results have not been confirmed. Research conducted in FL environments, where the target second language is mostly restricted to instructed environments like schools, generally do not support an early-start superiority (e.g., Muñoz, 2011; Qureshi, 2018). Instead, some of these studies show late starters exceeding early learners on some proficiency tasks, such as productive vocabulary task (Cenoz, 2002) and editing task (Qureshi, 2018).

However, not all societies can be categorized as SL or FL. There are contexts where, although the target second language is not the first language, it is widely present and commonly used as the main language of communication by residents in their daily social and professional interactions. One such example is the United Arab Emirates (UAE), where English has the status of a lingua franca and, hence, it is employed for everyday interactions in society. The previous research investigating age effects on second language proficiency have explored these effects in the typical second or foreign language contexts. FL settings where English is used as a lingua franca, generally remain under-explored. The current study fills this gap by examining the effects of the age of the first significant exposure to English medium instruction (AoEMI) on early and late learners' grammatical knowledge. The following section first reviews previous literature exploring age effects in SL and FL settings, and then it describes the language situation in the UAE.

Literature Review

Age of Onset of Exposure and Second Language Acquisition in SL Settings

Previous research in SL settings generally supports the restraining effects of age on second language acquisition of grammar. In a prominent study, Johnson and Newport (1989) investigated 46 Korean and Chinese speakers' ultimate proficiency in English as a second language (L2). Participants' age of exposure (AoE) to English ranged from 3 to 39, and they had spent 3 to 26 years in the US. Based on a grammaticality judgment task (GJT), they found a negative correlation (-.77) between participants' AoE and their ultimate grammar knowledge. This negative correlation indicated that the learners who were exposed to English earlier had better morphosyntactic proficiency as compared to those who were exposed to it at a later age. Findings by Johnson and Newport (1989) have been replicated by later research with L2 learners from a range of first language (L1) backgrounds, for example, DeKeyser (2000) also found a negative correlation ($r = -.63$) for Hungarian learners, Birdsong and Molis (2001) reported the same ($r = -.71$) for Spanish L1 speakers, and Seol (2005) reported likewise ($r = -.84$) for Korean L1 speakers. These findings have been further confirmed by later research (e.g., Abrahamsson, 2012; DeKeyser et al., 2010; Granena, 2012). In a relatively more recent study, Hartshorne, Tenenbaum, and Pinker (2018) adopted a radically different method of data collection by using a Facebook grammar quiz. Their study, with an extraordinary sample size of 669,498, revealed that L2 learners exposed to an L2 show a relatively consistent performance until the age of 12 and 9 in immersion and non-immersion-contexts, respectively. After these ages, a decline in learners' grammatical ability is much steeper.

Despite a general consensus on the negative effects of age on second language acquisition, several studies report variations in the outcomes. For example, Hartshorne, Tenenbaum, and Pinker (2018) do not support a leveling off in grammatical ability around puberty. Rather they suggest a constant decline without a discontinuity at any particular age. Moreover, when learners are split into younger and older age groups, previous research shows contrasting findings. For example, AoE does not predict L2 performance for late starters in DeKeyser (2000) and Johnson and Newport (1989). Both studies observed a low and non-significant

correlation between the AoE and late learners' test scores. On the contrary, in Birdsong and Molis (2001), AoE strongly predicted late starters' L2 performance.

Age of Onset of Exposure and Second Language Acquisition in FL Settings

Contrary to the general support reported for early learners in SL contexts, studies conducted in FL settings do not always support an early start advantage. Muñoz (2008) does not accept maturation as a constraint to FL learning. In her study, generally called the Barcelona Age Factor (BAF), Muñoz (2008) examined the effects of long-term instruction (i.e., eight years) by employing a battery of tests. This project compared learners from four different age groups (i.e., 8, 11, 14, and 18+) after they had received instruction for 200 hours (short-term), 416 hours (mid-term), and 724 hours (long-term). Early learners did not surpass late learners in any of the test scores over all three instruction periods.

Similar to the findings of Muñoz (2008), several studies conducted in FL contexts reject an early advantage (c.f., for Germany, Jaekel, Schurig, Florian, & Ritter, 2017; for Pakistan, Qureshi, 2018; for Saudi Arabia, Al-Thubaiti, 2010; for Spain, Cenoz, 2002; and for Switzerland, Pfenninger, 2014). Confirming the lack of early start advantage in FL-contexts through a meta-analysis, Qureshi (2016) reports an effect size of (d – .09) for six studies with a group comparison design, and (r = .02) for four studies with correlational design. These effect sizes are negligible, indicating no early advantage in FL settings. Generally, research in typical FL contexts does not support age effects for grammar knowledge in a second language. Instead, age is considered only one of the several indicator variables that could influence language learning, including learners' socio-economic status, their agency, their cultural interest in the target language, and teaching methodology, among several other factors (Pfenninger & Singleton, 2016).

However, exceptions to the general lack of early advantage in FL-settings have started to appear for learners who are immersed in an FL at a very young age (i.e., in Kindergarten). For example, Lee (2019) examined early kindergarteners and late classroom learners (i.e., those exposed to EFL at the age of 8) on a GJT and reaction time task. The participants were university students at the time of data collection. Although no significant differences were observed on the grammatical items and reaction time, the results revealed a main effect of age on ungrammatical sentences in favor of the early learners. The researcher attributed this outcome to the greater exposure to native-like input and an augmented "opportunity to interact using the L2 in an immersive setting" at an early age (p. 14). Although encouraging, Lee's findings need validation by future studies, which can be done in FL settings that offer more opportunities for immersive experiences in learners' target language. Moreover, age effects may also be moderated by the type of instruments used for data collection. For example, in Qureshi (2018), while no difference was observed on a GJT, late learners outperformed the early learners on an editing task. Qureshi (2018) attributed the late-learners' advantage on the editing task to the nature of the task, which, unlike the GJT, required greater use of cognitive resources for identifying and correcting grammatical inconsistencies. Previous research posits that adult learners depend on their cognitive skills in resolving linguistic incongruities (Gutiérrez, 2013). The current study uses an editing task along with a GJT to determine the effects of type of tasks on second language grammar assessment.

Overall, the distinct outcomes in SL and FL contexts have been attributed to the amount of exposure to a second language and the meaningful engagement with the language that has an impact on SL students performing better later in life due to constant exposure to the target language since childhood. In most cases, L2 learners have 15 to 20 times more exposure to the target language in SL contexts (35-40 lessons/week) than FL settings. In addition, they are also exposed to the target language outside of school. In FL settings, on the other hand, learners are

not exposed to a target language as extensively. The typical exposure to a target language is mostly restricted to instructional exposure (i.e., number of hours, typically 2-4/week, semesters, or years of instruction; Singleton & Muñoz, 2011). They also do not have the opportunity for informal exposure to the target L2 in social contexts, which puts FL learners at a disadvantage as compared to those acquiring a second language in SL settings, where the target language is readily available outside the classroom. Several studies have found that the most successful L2 learners are those who are both formally and informally immersed in the L2 (Moyer, 2009), a condition generally absent from the typical FL settings. The United Arab Emirates, although an FL setting, offers greater opportunities for informal exposure to the target language outside the classroom; hence, the age effects on second language learning need to be investigated in this context. The language situation in the UAE is described in the next section.

Context: United Arab Emirates (UAE)

Similar to the typical FL-settings, two media of instruction – Arabic and English – are present for K-12 education in the UAE. Those attending Arabic schools study English as an FL for a few hours per week while attending all other courses in the Arabic language. In contrast, those enrolled in the English medium schools receive all instructions in English except for Arabic and UAE social studies courses. Although these two educational streams in the UAE appear similar to other FL settings (e.g., Pakistan; Qureshi, 2018), the UAE presents very diverse demographics and social use of language. In the UAE, a major portion of the population (i.e., 90%; Lewis, Gary, & Charles, 2016) is expatriate, and for the daily official, social, and personal purposes, such as shopping or obtaining health services, they use English (Siemund, Al-Issa, Leimgruber, 2020). Even among the Arabic speaking population with different dialects, English is commonly used for fluent communication (Al-Issa & Dahan, 2011). This prominent use of English affords it a key position, being "used as a foreign language, a second language, and a lingua franca" (Siemund, Al-Issa, Leimgruber, 2020, p. 1). Hence, English is widely available in society and practically used every day. Moyer (2009) and Pfenninger and Singleton (2016) posit social exposure to the target language as supportive of second language development. Considering the unique language situation present in the United Arab Emirates, which is different from the typical SL and FL contexts previously focused on in research exploring age effects on second language acquisition, the current study explores the following research question.

To what extent does the difference in the age of first exposure to English medium instruction lead to differential outcomes in learners' grammar knowledge as assessed through a grammaticality judgment task and an editing task?

Methodology

The current study investigated early and late learners' proficiency in English grammar using a quantitative approach. A convince sampling method was adopted for the participant selection. After data collection, the participants were divided into early and late learners based on the information they provided in a background questionnaire. Details about participants selection, data collection procedures, and analysis follow.

Participants

Before recruiting participants for the current study, a priori power analysis was conducted to ascertain the number of participants needed for the study. The G*power application by Erdfelder, Faul, and Buchner (1996) was used for computing the a priori power analysis. This application suggests the number of participants required for correctly rejecting the null – that

there is no difference between the early and late learners' grammatical knowledge based on their AoE. The analysis is based on three things: (a) a power level, usually .80, a reference effect size based on previous research, and a significance level of .05. For the current analysis, the reference effect size (d = .7) was taken from a meta-analysis of age effects on grammar acquisition in an L2 (for details, see Qureshi, 2016). The results suggested a sample size of 68, with 34 participants in each group. To meet the minimum sample size requirement, students from four undergraduate classes, with typically 24 students in each, were requested to participate in the study. It was hoped that a large enough participants' pool would provide the needed number of participants for each group. The four classes were randomly selected from a university in the UAE, where the researcher worked. Later on, using a background questioner, the participants from these classes were divided into early and late learners. It is important to note that before data collection, the required ethical clearances were obtained from the university. The students were informed that their participation was voluntary, and their responses would be anonymized.

Background Questionnaire

To collect participants' background information, a questionnaire was used. The background inquired about participants' prior education, age at testing, gender, language use at home, and English learning history. Information obtained from the background is presented in table 1.

Table 1. Background Information for Early and Late English Learners.

Characteristics	***n***	***Age at Testing M (SD)***	***Male***	***Female***	***LangCent***	***IELTS***	***English Arabic***
Grammar							
Early Learners [Grade 1]	61	20.60 (*3.94*)	30	31	5	6.16	1
Late learners [Undergrad]	23	20.70 (*1.83*)	9	14	3	5.93	1
Educational level							
1st Year	35						
2nd Year	45						
3rd Year	4						

A total of 88 students participated in the study. After screening and cleaning data, 84 participants' responses were included in the study. Participants were divided into early and late learners based on their age of first exposure to EMI. The obtained sample size for late learners was smaller than the size suggested by the a priori analysis. However, steps were taken to ensure that this smaller size does not influence the outcome. Details about these procedures are provided in the analysis section. The early learners received instruction for all subjects, except for Islamic and Emirati studies, in English since they started primary school. In contrast, the late learners received Arabic medium instructions (AMI) throughout their K-12 education for all courses except English, which was taught as a foreign language class for 45 minutes every

day. Upon entering college, all the late learners attended one year of required intensive English classes as part of an English foundation program. At the time of data collection, most late learners were enrolled in the second semester of the second year of their undergraduate program. Participants' proficiency in English, as represented by their IELTS scores was quite identical, averaging 6-bands. Two students reported using both English and Arabic at home, while the rest stated that Arabic was the only language spoken at home. Eight early learners and three late learners reported attending English language center. No data about participants' socioeconomic status were collected.

Grammaticality Judgment Task

The GJT by DeKeyser (2000) was used in the current study. The number of items contained in the task was reduced from 196 to 114 by deleting one pair of grammatical and ungrammatical item for each structure. All the items were randomized. The instrument contained twelve grammar rules, which included past tense, plural, third-person singular, present progressive, determiner, pronominalization, particle movement, infinitives, gerunds, yes-no questions, wh-questions, word order. A paper based GJT was administered to participants who were given the following instructions and examples.

Directions: Please identify a sentence as correct or incorrect by marking **(✓)** in the boxes provided next to each each sentence.

S. No	Practice Items	Correct	Incorrect
1	A snake bit she on the leg.		✓
2	Susan is making some cookies for us.	✓	
3	The baby bird has fall from the oak tree.		✓
4	The little boy was counting all his pennies last night.	✓	

Figure 1. Example of Grammaticality Judgment Task

The reliability of the instrument was checked by measuring its internal consistency using International Business Machines: Statistical Package for Social Sciences (IBM-SPSS) version 24. The GJT obtained a reliability coefficient is .85 (KR-20) for the current study.

Editing Task

The editing task was taken from Qureshi (2018). The instrument consisted of 229 words and contained violations of the same twelve grammatical rules as contained in the GJT. Two errors corresponding to each grammatical feature were entered in the text, making a total of 24 errors. To complete the editing task, the participants were provided with the following directions and example:

Directions: *Correct/edit the following text for grammatical accuracy. While editing/correcting the errors, you might need to do one of the following: (a) cross an error and replace it with the correct form, (b) rearrange word order in few sentences (which could also involve crossing out a word/phrase), and (c) insert a missing word. During editing/correcting, please provide the correct form in the empty space provided below each sentence.*

Example:

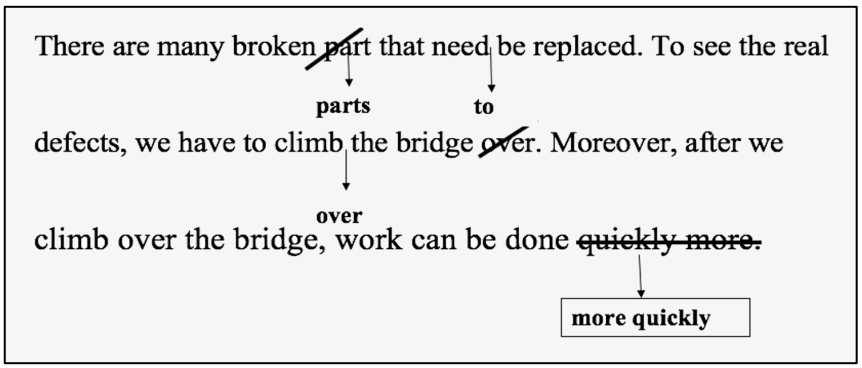

Figure 2. Example of Editing Task

The editing task obtained a reliability coefficient (KR-20) of .89 for the current study.

Data Analysis

Participants' correct responses on the two tasks were assigned 1 point for each correct answer and a 0 point for every incorrect response. Details about scoring participants' responses are provided in table 2.

Table 2. Instruments, Number of Items, Scoring Criteria, and Total Possible Scores.

	GJT	**Editing Task**
Number of items	114	24
Scoring	1 = ✓ 0 = ☒	1 = ✓ 0 = ☒
Total possible score	114	24

As the current study involved two levels of age (i.e., early and late) for the independent variables and two grammar tasks (i.e., GJT & ET) for the dependent variables, a MANOVA was considered as the most suitable option. A MANOVA is used for comparing groups with multiple dependent variables (Tabachnick & Fidell, 2007). When necessary, post hoc univariate analyses were run. Statistical procedures were run using the IBM-SPSS, version 24.

Results

The current study explored the effects of AoEMI on grammar knowledge as depicted through learners' performance on the grammaticality judgment and editing tasks. Table 3 presents descriptive scores on the GJT and the editing task.

Table 3. Descriptive Scores for Early and Late Learners on the GJT and Editing Tasks.

Age of Exposure	*n*	*M*	*SD*
GJT			
Early Learners	61	81.23	07.75
Late Learners	23	73.80	10.86
Editing Task			
Early Learners	58	57.63	24.00
Late Learners	26	49.96	22.88

*The GJT *and the ET had 114 and 24 items, respectively. Scores for both were normed out of 100.*

According to Table 3, both, the early and late learners scored relatively higher on the grammaticality judgment task as compared to the editing task. To statistically assess the effects of AoEMI on grammar knowledge, a MANOVA was run. Before running the analysis, statistical assumptions for the test (e.g., multivariate normality and variance) were checked using SPSS 24 (IBM Corp, 2016). Data on the dependent variable were bell-shaped; hence, normally distributed. Skewness and Kurtosis values for the GJT were -.79 (*SE* = .25), .06 (*SE* = .49), while for the editing task, these were -.67 (*SE* = .26) and -.15 (*SE* = .52), which were less than the Z value of $\pm$ 3.29 ($p < .001$, two-tailed test; Tabachnick & Fidell, 2007); hence, data were considered normally distributed. The assumption of absence of multicollinearity was checked by computing Pearson's correlations, which obtained an *r* value of .15, $p = .16$, indicating fulfilment of the assumption. The homogeneity of variance was checked by examining the *Box' M*, which resulted in a value of 6.26 ($p = .11$), which was not significant; hence confirmed the assumption. Since the early and later learners had unequal sample sizes, which could affect results due to the presence of multivariate outliers, the Mahalanobis distance was computed, which produced values ranging between .21 to .61. These values were higher than the Chi square *p* of .001; therefore, these confirmed the absence multivariate outliers. The results of the MANOVA are provided in Table 4.

Table 4. Results for the Effects of Age of Exposure on Grammar Knowledge.

	λ	F	df_1	df_2	p	η_p^2
AoE	.857	6.752	2	81	.002	.143

A one-way MANOVA revealed a significant multivariate main effect of AoEMI for grammatical knowledge. Power to detect the effect was .908. Thus, the results confirmed a significant effect of AoEMI on L2 learners' grammar knowledge, showing that 14.3 % variance

in learners' responses could be accounted for by their AoE. As the overall test was significant, the univariate main effects were examined.

Before running the ANOVA, assumptions of independence, normality and homogeneity were checked. The resultant data were bell-shaped; hence, normally distributed. The skewness and kurtosis values were -.79 (*SE* = .25) and .06 (*SE* = .49) for the GJT, while -.67 (*SE* = .26) and -.15 (*SE* = .52) for the ET; thus, data were considered normal. The Levene's test was not significant for the ET ($p = .53$), while for the GJT, it was found significant ($p < .01$). To check a non-parametric alternative, *Mann-Whitney U* analyses were computed along with ANOVA. As an ANOVA is considered robust to the violation of homogeneity, the following section presents results of the ANOVA, while findings of the non-parametric examination are provided in the prose following table 5.

Results of the analysis are presented in Table 5.

Table 5. Results of Univariate Follow-up Tests.

Source	***df***	***SS***	***MS***	***F***	***P***	***η2***
GJT						
Between Groups	1	922.48	922.484	12.181	.001	.13
Within-groups	82	6210.06	75.733			
Total	83					
Editing Task						
Between Groups	1	1365.56	1365.565	2.454	.121	.03
Within-groups	82	45635.17	556.526			
Total	83					

The univariate analysis showed a significant difference in favor of early learners on the GJT task. This finding was also confirmed by the outcome of a non-parametric alternative test (Mann-Whitney-U = 486.0, Z = -3.66, p = .00). For the editing task, no significant difference was observed F (1,82) = 2.454, p = .121, η2 = .03. As the univariate analysis showed learner differences only on the GJT, it was decided to further examine early and late learners on the twelve features contained in the GJT. An independent sample t-test was run to examine the within-group differences. The results of the t-test are presented in Table 6.

Table 6. Comparison of Early and Late Learners on Individual Features on the Grammaticality Judgment Task (N = 84) (Independent Sample T-Test).

Morphosyntactic features	*Early learners M (SD)*	*%*	*Late learners M (SD)*	*%*	*t*	*p*	*d*
Word Order (out of 20)	16.12 (2.22)	81	14.39 (3.61)	72	2.81	.00	.57
Present Progressive (out of 8)	7.43 (.88)	82	6.55 (1.55)	82	3.66	.00	.69
Past Tense (out of 12)	10.07 (1.30)	83	9.48 (1.27)	79	2.08	.04	.46
Infinitive (out of 4)	3.01 (.72)	75	2.48 (1.05)	62	2.46	.01	.58
Gerund (out of 2)	1.01 (.74)	50	.79 (.86)	39	1.20	.23	.27
Third Person (out of 8)	6.71 (1.46)	84	5.46 (1.55)	69	3.71	.00	.83
Particle movement (out of 8)	6.45 (.95)	82	5.86 (1.24)	76	2.47	.01	.53
Plural (out of 12)	10.14 (1.40)	84	9.31 (1.96)	78	2.16	.03	.48
Auxiliaries (Y/N) (out of 16)	12.90 (1.90)	81	11.31 (3.47)	71	2.28	.02	.56
Pronominalization (out of 8)	6.70 (1.12)	84	6.10 (1.11)	76	2.48	.01	.53
Determiner (out of 8)	6.54 (1.13)	82	6.00 (1.38)	75	2.10	.03	.42
Wh-Questions (out of 8)	6.84 (1.59)	85	5.64 (1.87)	70	3.35	.00	.69

Note. df = 91 for all features except gerunds (df = 47.78), infinitives (df = 40.36), plurals (df = 39.39), and auxiliaries (df = 39).

* Degree of freedom dropped for these features because equal variance was not assumed. The *p*-value is based on exact significance (2-tailed); *d* is based on means and SDs.

The within-group analysis revealed a significant difference between the early and late learners on all the grammatical features except gerunds. The median effect size Cohen's d was (X̃d = .56, range = .41 -.83). This analysis reveals that AoEMI has a significant effect on L2 learners' grammatical knowledge in contexts where they are expected to assess the grammaticality of a sentence only. On the other hand, the results of the editing task show that AoEMI does not have a significant impact on L2 learners' ability to identify and correct grammatical errors in a written passage. Both early and late learners were statistically similar in their editing ability in this context.

Discussion and Implications

The current study investigated the effects of AoEMI on early and late learners' grammatical knowledge. The results revealed that learners who were exposed to EMI at the primary level appeared to have better grammatical proficiency as compared to those whose exposure started at the tertiary levels. However, this difference was significant only when learners were required to judge the grammaticality of a sentence, without necessarily pointing out an error or providing

a correction. The findings of the current study have theoretical, methodological, and pedagogical implications for research on AoEMI and second language acquisition.

In terms of theory, this research makes an original contribution to our understanding of age effects in the UAE. This investigation examined age effects in an FL context, which is dissimilar to other FL settings explored in the past; hence, the findings might have implications for the theory of age effects on second language learning in similar environments. In the current study, for the omnibus outcome, the AoEMI accounted for 14.3% to grammar knowledge. This finding does not confirm the previous research that rejects AoEMI as a constraint for grammar in FL contexts (e.g., Muñoz, 2011; Cenoz, 2002). This early start advantage in the UAE might have been affected by informal exposure to English in society. UAE has a large population of expatriates (90% approximately), which might have provided young learners with an immersive experience similar to what learners might have in SL settings that show early learners outperforming late learners. However, the early start advantage was limited only to the GJT; it disappeared on the editing task. This divergent outcome on the two tasks might mean one or both of the two things. One, as the GJT required intuitive judgments without specifying errors and their possible corrections, it might have provoked learners' implicit knowledge. Previous research supports early learners' superiority on tasks that measure implicit knowledge (Ellis, 2005; Gutiérrez, 2013). Two, the late learners', due to their better cognitive and problem-solving skills, might have caught up with early learners on the editing task, which seemed to elicit explicit knowledge. Indeed, in some cases, adult learners outperform native speakers on measures of meta-linguistic awareness and grammatical knowledge. Previous research supports late learners' advantage over early learners on the measure of explicit knowledge (Qureshi, 2017). However, both of these speculations need further inquiry.

As for the methodology, the editing task in the current study complemented the GJT. The univariate analyses on these tasks revealed a significant difference only for the GJT, indicating that the AoEMI affects grammar knowledge when L2 learners are asked to judge the grammaticality of a given sentence, while when learners are required to identify and correct an error, which appears more authentic to language learning context, early and late learners do not appear to differ from each other significantly. This finding may implicate the validity of the typical GJTs that are presented as standalone without accompanying any contextual information, or that require a reflexive access to errors, without involving error identification, explanation for such identification or any corrections. In a meta-analysis of 302 studies that used some type of GJTs, Plonsky et al., (2019) report that in 81% cases, these tasks are administered with no contextual information, and in only 23% cases, participants are required to identify or explain errors. The decontextualized GJTs and absence of explanations or corrections from the judgment tasks is problematic. A validity study (Qureshi, 2020) that compared L2 learners' performance on a typical GJT with three types of responses on an editing task: (a) identified but not corrected, (b) identified but corrected wrongly, and (c) identified and corrected, revealed that in 20% cases learners were unable to rectify an error they correctly identified. Based on these findings, it can be argued that the 'identified but corrected wrongly' category on the editing tasks was a source of measurement error, which was mixed in the GJT but could be excluded by using the editing task (p. 358). Nonetheless, as indicated by Larsen-Freeman (2002) that "language, or grammar, is not about having; it is about doing: participating in social experiences" (p. 42), the editing task in the current study provided more reliable knowledge of what learners could or could not actually achieve with their grammatical knowledge in a meaningful context.

On the pedagogical level, this study indicates weakness in the EMI or the limited FL instructions provided to students in this particular context. The study revealed that despite varying lengths of exposures – in case of early learners, more than ten years – both early and late learners' ability to identify and correct errors in a written passage was limited; their mean

scores were 58 and 50, respectively. Among several factors, a lack of proper teacher training, teacher-centered teaching methods (Fareh, 2010), unavailability of proper resources, and imbalance in student-teacher ratios (Hussain, Nasseef, & Shah, 2013) are suggested as the major causes of students' low language proficiency. Moreover, learners' limited ability with grammar might also have implications for self- and peer-revisions. Several studies confirm that L2 learners face difficulty in the use of grammar irrespective of their proficiency level and professional status (Cho, 2009; Ene, 2008). These errors might involve use of articles, tenses, gerund, voices, singular and plurals (Cho, 2009); verb conjugations (Chiang, 1999); and errors in the use of possessive morphology, and agreements (Ene, 2008). Notwithstanding any benefits that self- and peer-reviews might have, in contexts where learners' grammatical proficiency does not allow students to identify 50% errors in a short-written passage (i.e., 229 words), some type of teacher intervention might be necessary.

Limitations and Conclusion

The length of exposure in the current study was uncontrolled because this depicted the actual context more authentically. Learners in real life will generally end up with different amounts of exposure to a target language if they are exposed to it at different educational levels. In the current study, late learners had a shorter exposure to EMI, as they were exposed to it for merely three years – one year in the foundation program and two years in college. Nonetheless, late learners attended an English class of 45 minutes every day throughout their primary and secondary schooling and also had informal exposure to English in society, which might have compensated for the lack of formal exposure to the target language in schools. Besides, no specific threshold is suggested for the formal length of exposure to FL in instructed contexts. Moreover, this study did not extract detailed information about participants' background variables, which might have bearing on their performance. Future research might explore this in more detail.

The findings of this study support an early start advantage on tasks that might only require the judgment of grammaticality. However, results based on GJTs should be taken with caution as several studies point out their limitations (e.g., Plonsky et al., 2019; Qureshi, 2020). In contrast, for the tasks that require more active participation and reflect the academic contexts more authentically (e.g., editing task), the findings of this study do not support a significant advantage in favor of either group – the early or late learners. The results on the editing task support complementing language assessment tasks with other measures so that their outcomes can be compared. Finally, but perhaps more importantly, this study signifies a need for attending to contextual variations of different second language contexts instead of grouping these into only two general and broader categories of second and foreign languages. This is probably the first study exploring the effects of age of exposure on language acquisition in the UAE – a unique context where EMI exists in a lingua franca environment. To better understand age effects, more studies need to be repeated in the UAE and other similar settings. Besides, previous research exploring the effects of EMI in societies with English as a lingua franca dispute the nature of the proficiency expected from the L2 learners; the researchers argue whether the ultimate attainment expected should be based on the native proficiency models or some degree of inaccuracies can be tolerated (Macaro et al, 2018). Future research exploring this aspect should enhance our understanding of age effects in an EMI context with English as a lingua franca situation, a context less explored and poorly understood (Jenkins, 2018).

About the Author

Muhammad Asif Qureshi is an assistant professor in the Language Studies department at Zayed University. Dr. Qureshi's main research interest is second language acquisition with a particular focus on the effects of age of first exposure on second language grammar and

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