

A Psycholinguistic Investigation of English Article Acquisition

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Abstract

The area of English article acquisition remains underexplored. The use of an article requires the language user to understand the semantic context of article use. This research article aims to explore the rate of substitution and omission errors by Urdu L_{1ers} in their L₂ use of English articles while writing compositions. Written compositions data was collected from (public and system) schools as well as from universities. Four age groups were included to ensure inclusion of both children and adults. Hence, there are four independent variables, viz., school type and learner's age. The dependent variables include omission and substitution of the indefinite article 'a'; omission and substitution of the definite article 'the'. The errors in article use were identified, and SOC, TLU and UOC percentages were calculated. For post hoc analysis, a t-test was conducted to determine the extent to which the variation in article usage can be attributed to the independent variables in isolation and/or in combination. The results indicated that public school participants acquire definiteness before indefiniteness, whereas system school participants acquire indefiniteness before definiteness, as indicated by their SOC, TLU, and UOC error percentages. The study includes children and adults from two school types (representing different language inputs) and thus fills a gap in the current body of knowledge. In the current study, the significance of the independent variables, viz., system and age, is least significant in the age brackets 15-17 and 18-20. This may be attributed to insufficient language input during students' language classes. The study may be extended into a longitudinal study to examine the impact of language input and age over time.

Keywords: Psycholinguistic Investigation, Article Acquisition, Semantic Context.

Introduction

Second language acquisition is challenging (Abdi Tabari et al., 2025). Numerous studies have been conducted in second language acquisition, and the English language is no exception (Han et al., 2023). Second language acquisition occurs in two main contexts: the classroom and the outside classroom (Bardel et al., 2023). In a classroom environment, the language-learning situation may be controlled (Bälter et al., 2023). Besides, there are two more requisites for language learning: the learner's exposure to L2 and the learner's inner mechanisms for language learning (Ellis, 1989).

In recent years, two notions have been dominant in the discussion of the article system: definiteness and specificity (Zdorenko & Paradis, 2008). Ionin et al. (2013) argue that specificity differs from definiteness, with specificity truly based on the speaker's intent regardless of the hearer's knowledge status. Specificity may be defined as "a semantic feature that makes reference to the knowledge state of the speaker concerning a uniquely salient discourse referent" (Ko et al., 2008). The English article system encodes the contrast of definiteness rather than that of specificity (Ionin et al., 2004; Ionin et al., 2013; Li, 2000). There are a few definitions of what it means for a noun to be definite or specific (Zdorenko &

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Paradis, 2012). For the present study, Ionin et al.'s definitions for definiteness and specificity have been adopted:

Ionin et al. (2016) argue that definiteness and specificity are the two contrasts encoded by articles. In languages with a two-article system, article choice is governed by a binary parameter. Ionin et al. (2004) define definiteness and specificity as follows:

Definiteness and specificity: informal definitions:

If a determiner phrase and the form [D NP] is...

1. [+definite], then the speaker and hearer presuppose the existence of a unique individual in the set denoted by the NP.
2. [+specific], then the speaker intends to refer to a unique individual in the set denoted by the NP and considers this individual to possess some noteworthy property.
3. It was the poverty-of-stimulus hypothesis, on which Chomsky proposed his idea of a Language Acquisition Device (LAD) and the hypothesis of the presence of a UG with its principles and parameters (Raut, 2023). Vivian Cook (2003) and others point out that there remains a logical problem in second language acquisition: how do second language learners learn more than they have received in language input from their environment? The implication of this argument is that UG must be available to second language learners. Other linguists have argued that UG must be available to the learners; its nature has been slightly altered (Lightbown and Spada, 2003).
4. Researchers working within the UG framework also differ in their hypotheses about how formal instruction and/or the availability of error feedback will affect learners' knowledge of the second language (Walter, 2023). It has been argued that formal instruction and feedback do not alter the underlying knowledge system of the second-language learner. Rather, it alters the learner's knowledge only superficially. The availability of language in the natural environment is sufficient to trigger the learner's underlying knowledge system. It has also been argued that meaningful use of language in natural interactions leads to the acquisition of grammatical structures (White, 2021). They have also suggested that explicit information about what is grammatical or ungrammatical may be needed by learners, since, according to them, the acquisition of the first language has already altered UG (Čook, 2023; Walter, 2023). If this information is not provided to these learners, they may assume that some structures in the second language are equivalent to those in their first language (Li et al., 2016).

There are two broader categories of schools in Pakistan: system and public. In system (associated with organizations included only) schools, the medium of instruction is English, whereas the medium of instruction in public schools is Urdu and at times a mix of regional languages and Urdu (Fareed et al., 2022). Teachers play a pivotal role in addressing the problem of English-language input in schools. Competent teachers are a rare asset, as they can effect tangible change in schools regarding the use of English as the sole medium of instruction. Given the opportunity, they can also make valuable contributions to policymaking (Mahboob, 2002). Students enrolled in public schools are from low socioeconomic backgrounds; therefore, they are unable to understand English when it is used as the exclusive medium of instruction. Public school teachers, despite receiving salaries almost four times those of system teachers, find English-language teaching challenging. The reason for this is their own schooling in an Urdu-medium school (Andrabi et al., 2008). Public schools, due to limited funds, are unable to afford more skillful teachers (Andrabi et al., 2008).

Intermediate students have difficulty communicating in English. The reasons for their poor communication skills are the absence of qualified teachers, limited facilities, lack of motivation, and a negative attitude among students towards the English language (Hassan & Ahmed, 2015). The availability of qualified teachers, the adoption of appropriate teaching

methods, the application of the same standards in teaching, and the provision of instructional materials can help improve students' performance (Abdullahi, 2003; Sa'ad, 2014).

The current research investigates English article acquisition using Compositions as a tool. Performance data of students (children and adults) from Public and System schools were gathered.

Research Objectives

To explore the relationship between the age of the Urdu L₁ learners and the L₂ acquisition of the English article.

To explore the relationship between the language input received by Urdu L_{1ers} and L₂ acquisition of the English article.

Research Questions

To attain the research objectives, the following research questions have been formulated:

- What is the accuracy rate (frequency of correct answers) in the use of English articles by Urdu L₁ (child and adult) speakers during the L₂ acquisition of the English article system?
- What is the rate of occurrence of substitution-type and omission-type errors?
- What is the sequence of acquiring definiteness and specificity?
- How does the accuracy rate vary with the age of the learner?

Literature Review

The acquisition of the English article system in child L₁ learners and adult L₂ learners follows a pattern of continuity in all age groups (Zdorenko & Paradis, 2011). Like child L₁ learners, adult L₂ learners also fluctuate and commit errors of omission and substitution (Zdorenko & Paradis, 2011). The L₂ learners of article-less languages have been reported to omit articles (Huebner, 1985; Lardiere, 2004; Parrish, 1987; Robertson, 2000; White, 2003). The difficulty of such learners was attributed to the absence of a functional category D. Moreover, L₂ learners of [-article] languages have been found to have difficulty in choosing articles and therefore committed greater substitution errors than L₂ learners of [+article] languages such as French (Sarko, 2008), Greek (Hawkins et al., 2006), or Spanish (Ionin et al., 2008; Snape et al., 2006). Amongst L₂ learners, omission and substitution errors have been reported to occur in L₂ learners of all proficiency levels, even those who have reached the final state of L₂ development (White, 2003; Lardiere, 2004). It has also been observed that L₂ learners are generally more accurate in their use of the definite article as compared to the indefinite article (White, 2003; Lardiere, 2004; Robertson, 2000). It has been suggested that the reason for this is that the definite article is featurally less complex (Lardiere, 2004). However, if this were the reason, then the same pattern (that they overuse the definite article) should be exhibited by all L₂ learners, regardless of their L₁ background (Zdorenko & Paradis, 2011). It has also been observed that child L₂ learners converge on target structures more quickly (Zdorenko & Paradis, 2011) than adults do (Ionin et al., in press).

For learners of a second language, it is quite common for them to experience L₁ transfer. However, it is also known that learners of any language do have access to Universal Grammar (UG) (Ionin et al., 2004). In the context of the article, it may be stated that language learners have been documented to misuse and/or omit articles, and they have also been reported to display differential accuracy in the use of articles. The L₂ learners misuse the article 'the' in [+specific, – definite] places interchangeably for the article 'a' as well as they misuse the

article ‘a’ in [+definite, –specific] positions interchangeably with the target article ‘the’ (Pervaiz & Bukhari, 2016).

Written Compositions

Compositions provide learners with opportunities for free writing. Writing compositions provides learners with opportunities to manifest their potential as language learners. In addition, their shortcomings as language learners are expressed unconsciously. Hence, a systematic investigation of article development amongst learners across age groups may yield useful insights into the causes of errors and their solutions. The development of English articles among Urdu L₁ speakers can be examined through the analysis of composition writing.

The L₂-Acquisition of English Article by Urdu L₁ Speakers

In the context of the acquisition of the English article system by Urdu L₁ speakers, Pervaiz (2016) conducted a study with child (L₂) learners of English, beginning with those with at least 10 years of formal English education. Learners of the lower age group were not included in this study. Another study conducted by Qudsia (2018) focuses on the role of L₁ transfer in the same. Qudsia (2018) investigated the errors in the use of various grammatical structures, including the English article, with no inclusion of educational backgrounds of learners. Therefore, no research on article acquisition inclusive of both children and adults has been conducted. A comparison between child and adult L₂ acquisition processes may prove revealing regarding the role of age in the acquisition process (Zdorenko & Paradis, 2011). A comparative study of simultaneous inclusion of child and adult L₂ learners may yield conclusive findings regarding language input as represented by their schooling backgrounds.

The present study, therefore, attempts to investigate the problems L₂ learners of the English article system. The present study focuses on the extent to which the findings of a simultaneous investigation of child and adult L₂ acquisition of English article: support ‘Fluctuation Hypothesis’ proposed by Ionin et al. (2004, p. 14); and the relation between the age of the learners and their proficiency levels in the context of the acquisition of English article system by Urdu L₁ speakers in a study that is inclusive of children and adults both, from system and public schools.

Previously, most studies on the L₂ acquisition of English articles were conducted with sequential bilinguals. Ionin et al.’s (2004) study, although sequential bilinguals were investigated for article use, however it was not clearly mentioned whether the participants received any explicit instruction in English after arriving in the US and their age of arrival was not known (Zdorenko & Paradis, 2012). Similarly, Abudalbuh (2016) conducts research on Arabic-L₁ speakers acquiring English as a second language, taking adults as participants whose responses to forced choice elicitation task form the data of his study. Paradis and Zdorenko (2011) conducted longitudinal research with four groups of children with different L₁ backgrounds, viz., Mandarin/Cantonese Chinese, Hindi/Urdu, Arabic and Spanish. The researchers reported that children in all L₁ groups had difficulty with acquisition. It was also observed that children with no L₁ article tend to omit articles. Based on the findings of this study, compared with previous studies on child L₁ and adult L₂ acquisition, the researchers conclude that the predominant trends in children were developmental rather than transfer-based. The age range of these children is 5 to 6 years. It was observed that children with [-article] L₁ omitted articles. Furthermore, children with [+article] L₁s also fluctuated. This observation contrasts with findings in which adults with [+article] languages have been reported to perform like native speakers in L₂ acquisition (Zdorenko & Paradis, 2011).

Only an exhaustive study that investigates English article acquisition in child L₂ learners and compares child and adult L₂ acquisition patterns can yield new cognitive insights into the article acquisition process. L₂ children do fluctuate; however, the exact degree of difficulty and/or the

rate of accuracy in children's performance is not known amongst Urdu-English child bilinguals. However, since no study that includes both child and adult L₂ learners has been conducted to date, it is not known what role the learner plays in this context (Pervaiz & Bukhari, 2016).

The latest trends in SLA research emphasise the interaction of first language, cognitive processes and language input samples. The present research focuses on the cognitive processes in learners' minds to explore and unravel the relationship between learners' age and L₂ acquisition of English articles by Urdu L₁ speakers.

In the context of using compositions as a tool for investigating various morpheme types and their development, Qudsia's (2016) research is significant, as it demonstrates the acquisition of different morpheme structures. The researcher examines two sets of elicitation data, viz., written compositions and spoken texts. This study reveals that the English article is the most problematic for Urdu L₂ers of English. For compositions' analyses, Qudsia employs Huebener's semantic wheel to analyse the semantic contexts in which learners have used articles. The identification and classification of semantic contexts is followed by the classification of errors in article uses. The classification categories devised by Chakaron and Richards have been adapted by Qudsia (2016). The errors, after classification into the categories, have been further investigated by Qudsia to determine the percentages of occurrence of these errors in the data obtained from Urdu L₂ers.

Another study investigating the order of accuracy of English articles among Arab EFL learners (Muftah, 2023). The order of accuracy has been determined for Arab L₂ English learners. For this purpose, participants were investigated for their use of articles in a cloze test. The articles supplied by the learners were analysed. The measures for analysis were SOC, a procedure devised by Brown (2011), TLU, a procedure devised by Pica (1983), and UOC, a procedure devised by Master (1987).

The present study seeks to explore the acquisition process in child and adult Urdu-English bilinguals, focusing on performance accuracy (compositions) and its relationship with age. The percentage errors of substitution and omission types were investigated in compositions. The resources made available to the learners during their classroom instruction, in the two school systems, were also considered.

Research Methodology

Compositions were collected from students attending public and system schools. In the current study, there are 04 dependent and 06 independent variables. The dependent variables, viz., omission of 'the'; omission of 'a'; substitution of 'the'; substitution of 'a', were investigated, and their relationship with the independent variables was determined. The independent variables, viz., 10 to 14, 15 to 17, 18 to 20, and 21 to 25 years (04 age groups considered), and the language input, manifested as the type of schooling (02 school types, viz., system and public), were taken into consideration. Hence, 04 independent variables for age and 2 independent variables for school type (to see language input): public and system. The variable of language input has been represented by the two types of schooling.

Theoretical Framework

The fluctuation hypothesis (FH) makes predictions about the performance of learners with [-article] L₁ languages. It is of special significance in L₂-acquisition of the article by Urdu-L₁ speakers, since Urdu is a [-article] language. Hence, the present study seeks to explore the relationship between learners' age and L₂ acquisition of English articles by Urdu L₁ speakers, based on the percentage of errors in their compositions. It also investigates the relationship between language input and learners' performance. The second-language acquisition situation differs from first-language acquisition in many respects, the most important being the amount

of language input available to the learner. Despite being less in amount, as the poverty-of-stimulus hypothesis suggests, it is continuously available to the first-language learner. For second language learners, however, it is only available in classroom situations. Language acquisition occurs within learners' minds hence innatism perspective has been taken in the current study. A psycholinguistic investigation can best explain the acquisition process.

Sampling Plan

In the present study, students of various institutions in Islamabad were included as participants.

Sampling Details

A purposive sampling method was used to include participants from various schools and universities in Islamabad, Pakistan.

Table 1: Sampling Plan

			Age		Total No of Students
			10 to 14 Yrs	15 to 17 Yrs	
Group 1 Children	Public Schools	1	60 Students	60	120
		2	60	60	120
		3	60	60	120
	Total No of Students		180	180	360
	System Schools	1	60	60	120
		2	60	60	120
		3	60	60	120
Total No of Students		180	180	360	
Grand Total of Child L2 Learners					720
			Age		
			18 to 20 Yrs	21 Yrs to 25 Yrs	
Group 2 Adults	Universities	1	120	120	240
		2	120	120	240
		3	120	120	240
		Total No of Students	360	360	720
Grand Total of Adults L2 Learners					720

The sampling comprises of two main groups: children and adults. The participants' personal information (age, gender, school type) was also recorded. The grand total for children (including public and system schools) was 720 students. The next two age groups (viz., 18 to 20 years and 21 to 25 years) comprised of 720 participants belonging to either of the two aforementioned school types.

Criteria for Sampling

The sampling of students was based on students enrolled in formal settings in various institutions. The cognitive development of the students for English language was taken as that indicated by their class performances. Therefore, no additional tests for determining proficiency levels were conducted.

Rationale for Sampling

- i. The present study aims to explore the relationship between the age of the L₂ learner and the acquisition of the target structures. To expand the range of the sampling in terms of age, two age groups for children and adults each were taken.
- i. The two types of school systems (public schools and system schools) were taken to isolate the language input variable and to see its impact on the process of acquisition of English article.

- ii. The language input in public schools of rural areas is distinctively less as compared to that in system schools. The significance of its impact therefore is understandable. The development of receptive and productive skills of the students suffers the impact of the meagre input given in public schools of rural areas.
- iii. The impact was measured by using writing compositions as tools for the collection of data from all participants.

Table 2: Distribution of Compositions

Child L ₂ Learners (Students)	Public Schools	360
	System Schools	360
Total of Child L ₂ Learners		720
Adult L ₂ Learners (University)	From Public Schools	360
	From System Schools	360
Total of Adult L ₂ Learners		720

All the participants in all groups were asked to write compositions on (any one of the) topics given to them. The students were given such topics that check for their language skills, such as an unforgettable incident/ journey/ experience. The compositions written on the given topics were checked to see their use of article. The compositions were checked using Corder's (1974) procedural analysis as cited in Ellis (1997).

Data Analysis

The obtained data was analysed and percentages of errors in article use were recorded. The errors were identified and classified into categories proposed by Richards and Chakaron (2005) except the last one. The rationale for choosing Richards and Chakaron's (2005) list of errors in article use was the premise that they have listed all the errors committed by L_{2ers} of English language while using English article.

The data analysis was carried out at two levels: Descriptive analysis; Post hoc analysis. In the descriptive analysis the percentages of omission and substitution errors were calculated. The obtained results were then subjected to t test.

Descriptive analysis: The entire data comprising of 1440 compositions was fed into SPSS. The (dependent) variables viz., substitution and omission errors, were separated for each school type and age group. The percentage of occurrence of errors were calculated. Apart from errors, correct uses were also recorded.

To determine the accuracy order of English articles a, the, and ø the article uses were analysed. The measures adopted by the researcher are SOC (Brown, 1973), TLU (Pica, 1983) and UOC (P. A. Master, 1987).

SOC =
$$\frac{\text{Number of Correct Suppliance in Obligatory Contexts}}{\text{Number of Obligatory Contexts}}$$

SOC used extensively for morpheme studies (Andersen, 1978); (Hakuta, 1976); (Freeman, 1975); (Lu, 2001); (P. Master, 1997); (Parrish, 1987); (Thomas, 1989); (Upor, 2021); (Wong & Quek, 2007) has however been criticized for an over estimation of accuracy rate (Andersen, 1978; Hakuta, 1976); (Hatch, 1978; Pica, 1983). It was pointed out that accuracy rate should also include over generalization of a specific morpheme (Lu, 2001). Therefore, another measure was devised by (Pica, 1983) which is TLU (Target-Like Use). This procedure serves to inflate the effect of SOC.

TLU =
$$\frac{\text{Number of Correct Suppliances in Obligatory Contexts}}{\text{Number of Obligatory Contexts}}$$

(Number of Obligatory Contexts) + (Number of Suppliances in Non-Obligatory Contexts)

(P. A. Master, 1987) devised a procedure UOC (Used in Obligatory Contexts) which serves to measure the overuse or under use of an article. (Muftah, 2023a) used these procedures to investigate the accuracy order of English articles a, the, and ø by Arab EFL learners.

$$\text{UOC} = \frac{\text{Correct Suppliances Obligatory Context} + \text{Over Suppliances Non-Obligatory}}{\text{Total Suppliances}}$$

Post Hoc Analysis: For post hoc analysis the obtained results were subjected to t test. This test established the statistical significance of the results obtained by applying the afore-mentioned formulae and validated the findings of the study.

Results and Discussion

The percentages of occurrences of these errors were calculated. The aggregate table of percentages of errors for all age groups within public schools is as follows.

Table 2: Age-Wise-Aggregate-Public School Compositions

	10-14 Years (n= 98)			Age Group 15-17 Years (n= 82)		
	SOC	TLU	UOC	SOC	TLU	UOC
Errors in Uses						
1. Omission the	6.12 %	4.23 %	50.96 %	5.82 %	3.80 %	58.99 %
2. Substitution the	22.9 %	15.81 %	67.74 %	3.42 %	1.65 %	110.26 %
3. Omission a	16.45 %	11.35 %	61.29 %	4.05 %	2.64 %	57.22 %
4. Substitution a	5.48 %	3.77 %	50.32 %	47.62 %	20.83 %	176.29 %
	18-20 Years (n= 56)			Age Group 21-25 Years (n= 51)		
	SOC	TLU	UOC	SOC	TLU	UOC
Errors in Uses						
1. Omission the	3.61 %	0.84 %	40.20 %	2.50 %	1.66 %	59.52 %
2. Substitution the	4 %	1.97 %	107 %	4.46 %	01.57 %	200.0 %
3. Omission a	1.50 %	1.08 %	40.53 %	1.08 %	1.05 %	3.89 %
4. Substitution a	26.66 %	11.42 %	160.0 %	38.46 %	19.23 %	138.46 %

Table 2 indicates that the scores decrease with students' progress. This indicates that the language input being provided to the students is effective. The scores in public school students are higher (Table 2) than those for system school students (Table 3). (Scores indicate errors, a higher score indicates more errors and vice versa).

Table 3: Age-Wise-Aggregate-System School Compositions

	10-14 Years (n= 148)			Age Group 15-17 Years (n= 146)		
	SOC	TLU	UOC	SOC	TLU	UOC
Errors in Uses						
1. Omission the	1.23 %	0.80 %	54.44 %	1.05 %	0.71 %	49.74 %
2. Substitution the	2.37 %	1.55 %	55.58 %	3.31 %	1.65 %	104.74 %
3. Omission a	0.87%	0.57 %	54.19 %	1.35 %	0.91 %	49.53 %
4. Substitution a	0.44 %	0.28 %	53.65 %	1.25 %	0.84 %	49.43 %
	18-20 Years (n= 173)			Age Group 21-25 Years (n= 84)		
	SOC	TLU	UOC	SOC	TLU	UOC
Errors in Uses						
1. Omission the	1.66 %	1.27 %	31.87 %	1.92 %	1.33 %	46.08 %
2. Substitution the	1.02 %	0.48 %	114.36 %	3.42 %	1.65 %	110.26 %
3. Omission a	1.06 %	0.82 %	31.28 %	0.8 %	0.55 %	44.96 %
4. Substitution a	4.35 %	1.58 %	65.07%	30.77 %	14.81 %	138.46 %

Table 3 clearly indicates a decrease in the substitution and omission rates from age groups 10 to 14 and 15 to 17 years which means improvement. As students make progress and advance in their studies, they commit less errors. Increased language input leads to an improvement in their article use. In the age bracket 18 to 20 years, there is a slight increase in the substitution

and omission percentages. In the age bracket, 21 to 25 years, errors increase still further. This may be interpreted as an observed improvement in the initial two age brackets.

t- Test: The above findings were subjected to t test. The following null hypothesis was formulated: -

H_0 : Performance in article use is independent of system.

The results of t test have been presented age-wise for both the systems together, in the tables below: -

Table 4: t-Test: Two Sample Equal Variances- SOC System Public- Age 10 to 14 Years

	SOC Systems	SOC Public
Mean	0.012275	0.127375
Variance	6.84425E-05	0.007117389
Observations	4	4
Pooled Variance	0.003592916	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-2.715606251	
P(T<=t) one-tail	0.017422764	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.034845528	
t Critical two-tail	2.446911851	

The SOC values for both the systems were subjected to t test. The mean value for public schools is greater than that for system schools. A higher value for errors indicates that public school students' performance consists of more errors than system schools (as the scores measure the errors made by participants). The value for t critical in the table is smaller than the value for t stat. Therefore, the null hypothesis is rejected and its alternate hypothesis that, 'performance in article use is dependent on system' is accepted.

Table 5: t-Test- Two Sample Equal Variances- TLU in System- Public- Age 10 to 14 Years

	TLU Systems	TLU Public
Mean	0.008	0.0879
Variance	2.95267E-05	0.003394267
Observations	4	4
Pooled Variance	0.001711897	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-2.731008199	
P(T<=t) one-tail	0.017070163	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.034140326	
t Critical two-tail	2.446911851	

Table 5 indicates results for t test. The results in table 5 reject null hypothesis as t critical is smaller than t stat ($2.44 < 2.73$). Also, the performance of public-school participants lags those from system schools. Hence, performance is shown to be dependent upon system.

Table 6: t-Test: Two-Sample Equal Variances- SOC in System-Public; Age 15 to 17 Years

	SOC Systems	SOC Public
Mean	0.0174	0.152275
Variance	0.000111107	0.046737623
Observations	4	4
Pooled Variance	0.023424365	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-1.246271163	
P(T<=t) one-tail	0.129558113	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.259116225	
t Critical two-tail	2.446911851	

Table 6 shows results for age group 15 to 17 years. The results in table 6 fail to reject null hypothesis as t critical is larger than t Stat ($2.44 > 1.24$). The alternate is true, i.e., Performance is independent of age and system. Also, the mean scores for public schools are greater than those for system school ($0.15 > 0.017$), this indicates that public school participants commit more errors in the use of the article than system-schools' participants.

This age group fails to reject null hypothesis. The results for this age group defy the contributions of the system. The ineffectiveness of language input in this age bracket is indicated by another study in which, the participants' performance is indicated as insignificant by regression analysis results (Qureshi & Yousaf, 2025).

Table 7: t-Test: Two-Sample Equal Variances - TLU in System-Public; Age 15 to 17 Years

	TLU Systems	TLU Public
Mean	0.010275	0.0723
Variance	1.79092E-05	0.008297647
Observations	4	4
Pooled Variance	0.004157778	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-1.360351459	
P(T<=t) one-tail	0.111302293	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.222604586	
t Critical two-tail	2.446911851	

Table 7 indicates, the results of the test fail to reject the null hypothesis. As t critical is $> t$ stat ($2.44 > 1.36$), therefore in this age group, performance does not depend upon system. In other words, the impact of these two variables is not significant in this age bracket.

Table 8 t-Test Two Sample Equal Variances- SOC Public System- Age 18 to 20 Years

	SOC Systems	SOC Public
Mean	0.020225	0.089425
Variance	0.000249336	0.014072149
Observations	4	4
Pooled Variance	0.007160743	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-1.156490485	
P(T<=t) one-tail	0.145721317	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.291442634	
t Critical two-tail	2.446911851	

Table 8 indicates that t critical is larger than t stat therefore the results fail to reject null hypothesis. Therefore, the null hypothesis ‘performance is independent of age and system’ is accepted. In other words, the impact of language input is statistically insignificant. In this age group, students are at college level, at which they do not have ample time to practice or to understand article use. They rely, most of times, on their previous understandings which they have gathered at school. The understanding gathered during school years is indicated by their performances. Hence, the mean scores of public-school participants are higher than those for system-school participants, which means more errors in their use of definite articles.

Table 9: t-Test Two Samples Equal Variances- TLU System Public- Age 18 to 20 years

	TLU Systems	TLU Public
Mean	0.010375	0.038275
Variance	2.35492E-05	0.002585676
Observations	4	4
Pooled Variance	0.001304613	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-1.092391805	
P(T<=t) one-tail	0.158285153	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.316570307	
t Critical two-tail	2.446911851	

Table 9 fails to reject null hypothesis as the value for t critical is larger than that for t stat.

Table 10: t- Test Two Samples Equal Variances- SOC Public System- Age 21 to 25 years

	SOC Systems	SOC Public
Mean	0.092275	0.11625
Variance	0.020740956	0.032197237
Observations	4	4
Pooled Variance	0.026469096	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-0.208403044	
P(T<=t) one-tail	0.420904407	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.841808813	
t Critical two-tail	2.446911851	

Table 10 indicates that the value for t critical is larger than t stat ($2.44 > 0.20$), therefore null hypothesis is accepted.

Table 11: t- Test Two Samples Equal Variances- TLU Public System- Age 21 to 25 years

	TLU Systems	TLU Public
Mean	0.04585	0.058775
Variance	0.004668037	0.007931196
Observations	4	4
Pooled Variance	0.006299616	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-0.230297118	
P(T<=t) one-tail	0.412756008	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.825512015	
t Critical two-tail	2.446911851	

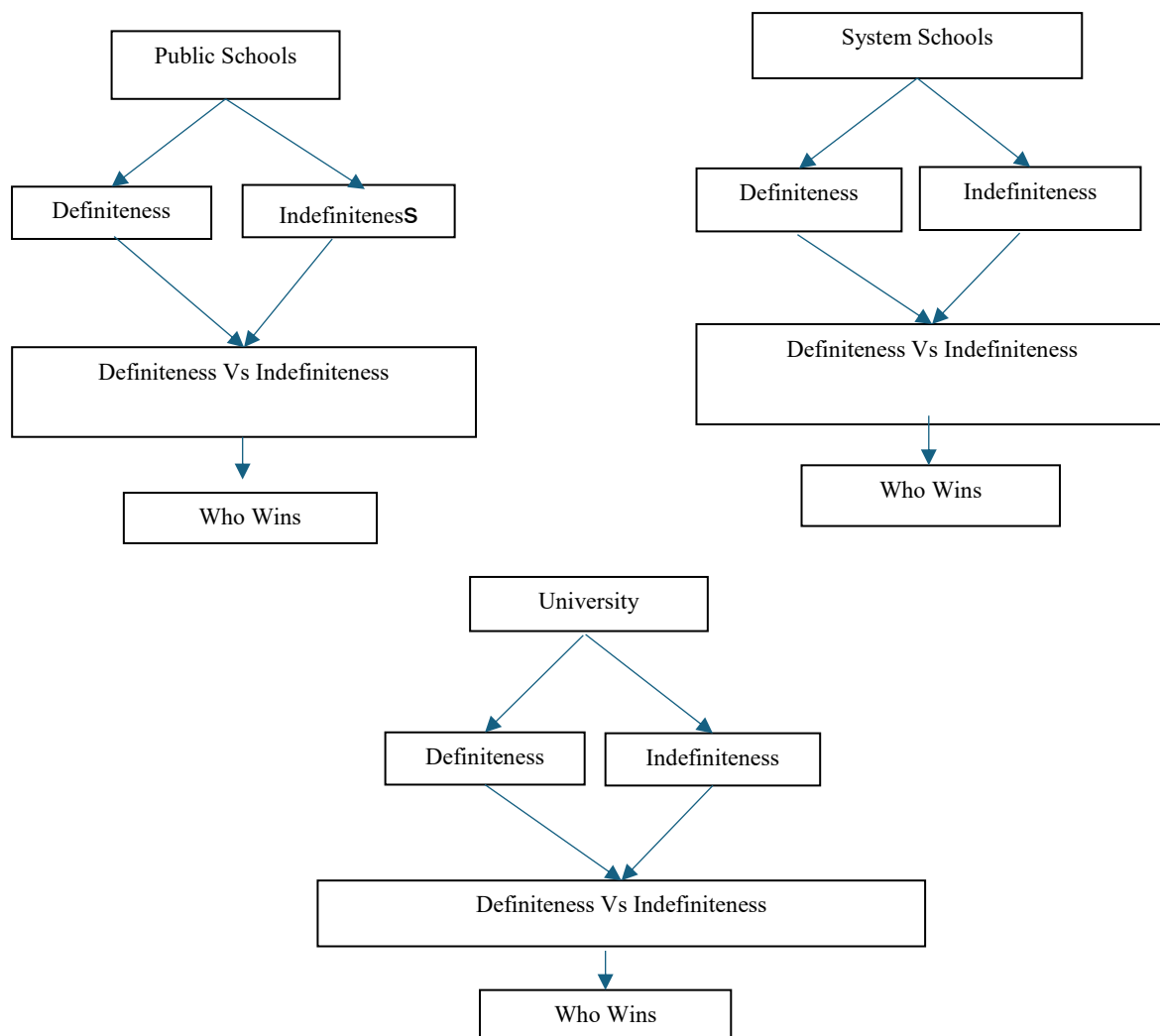
Table 11 shows the same details for TLU scores as that for SOC. Hence, article use in system-schools participants' performance is better as they score lower in errors whereas that of public schools' participants lag system-schools. The mean SOC scores for system and public schools across age groups (in ascending order) are shown in the table below.

Table 12: System-Public Mean Scores: SOC; TLU Values, Across Age Groups				
	SOC		TLU	
S. No.	System	Public	System	Public
1.	0.012	0.127	0.008	0.087
2.	0.017	0.152	0.01	0.008
3.	0.02	0.08	0.01	0.003
4.	0.09	0.11	0.04	0.05

Table 12 indicates that the SOC values for public schools are on a constant rise in the first two age groups, whereas they fall to 0.08 in the age groups 18 to 20 years and rise again in 21 to 25 years. As the scores indicate errors, therefore it may be established that public-schools commit more errors, therefore, System-School-Participants' performance is better as they score less in errors.

Acquisition Order Across Systems: To further explore acquisition order, definiteness and indefiniteness across systems (samples in entirety) was investigated. Definiteness scores (errors) across all age groups of system and all age groups of public-schools were examined. Indefinite scores (errors) across all age groups of system and public schools were examined.

Figure 1: Definiteness Vs Indefiniteness Across Systems



The null hypothesis formulated for this purpose is as follows.

H_0 : Performance in article use is the same for definite articles in both the Systems.

To check this hypothesis results for definiteness in public-school (all age groups) were compared to those in system-schools (all age groups).

Definiteness Across Public and System Schools

Definiteness across individual systems (public and system schools) was examined one by one. The results for definiteness across all age groups of public schools are as follows:

Table 13: Definiteness- Public- All Age Groups

	Omission the	Substitution the
Mean	0.198541667	0.45065
Variance	0.060286908	0.405961335
Observations	12	12
Pooled Variance	0.233124122	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-1.278996099	
P(T<=t) one-tail	0.107112634	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.214225269	
t Critical two-tail	2.073873068	

Table 13 indicates that participants in public-schools substitute definite article more than they omit definite article ($0.45 > 0.19$) as the mean scores for substitution ‘the’ are greater than those for omission ‘the’. Again, the data obtained failed to reject the null hypothesis after t tests ($t_{critical} > t_{stat}$: $2.07 > 1.27$).

Table 14: Definiteness- Systems- All Age Groups

	Omission the	Substitution the
Mean	0.160083333	0.333658333
Variance	0.050138427	0.236119299
Observations	12	12
Pooled Variance	0.143128863	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-1.123826293	
P(T<=t) one-tail	0.136600276	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.273200551	
t Critical two-tail	2.073873068	

Table 14 indicates that the results of t-test failed to reject the null hypothesis as $t_{critical}$ is $> t_{stat}$ ($2.07 > 1.12$).

Tables 13 and 14 indicate mean scores for omission and substitution of definite articles. Public-schools-participants’ responses are greater than those of system school- participants’ responses. Hence, the use of definite article is more accurate in system-schools participants’ responses, therefore, definiteness is acquired before indefiniteness in system schools.

Indefiniteness across public and system schools: Indefiniteness was examined across all age groups of both the systems.

H_0 : Performance in article use is the same for indefinite articles in both the systems.

Table 15: Indefiniteness Public All Age Groups

	Omission a	Substitution a
Mean	0.168441667	0.582116667
Variance	0.051928877	0.392310851
Observations	12	12
Pooled Variance	0.222119864	
Hypothesized Mean Difference	0	
S	22	
t Stat	-2.150013572	
P(T<=t) one-tail	0.021403289	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.042806579	
t Critical two-tail	2.073873068	

Table 15 indicates that there is a greater mean score for substitution of 'a' as compared to omission 'a' ($0.58 > 0.16$). It also indicates that t critical is smaller than t stat ($2.07 < 2.1$), therefore null hypothesis is rejected. The converse of null hypothesis, the performance of participants, (from public and system schools) in their uses of articles is not the same. Hence, by implication, it is established that performance is dependent upon age and system. In another R study, this has already been proven by the application of regression analysis, with increase in years, performance scores increase and participants from the two systems have different rates of accuracy percentage (Qureshi & Yousaf, 2025).

Table 16: Indefiniteness Across System- All Age Groups

	Omission a	Substitution a
Mean	0.155741667	0.300775
Variance	0.049867563	0.173283089
Observations	12	12
Pooled Variance	0.111575326	
Hypothesized Mean Difference	0	
Df	22	
t Stat	-1.063553575	
P(T<=t) one-tail	0.149533072	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.299066144	
t Critical two-tail	2.073873068	

Table 16 indicates that t critical is greater than t stat therefore the results of t test fail to reject null hypothesis is rejected. The null hypothesis is therefore accepted. It may also be noted that the mean score for substitution 'the' is greater than that for omission 'the'.

Tables 15 and 16 indicate that the mean scores for omission 'a' and substitution 'a' in public-school-participants' responses are greater than those in system-school-participants' responses (omission 'a' $0.16 > 0.15$; substitution 'a' $0.582 > 0.300$). Hence, it may be established that the performance in indefiniteness is better in system-school-participants.

Definiteness vs Indefiniteness Across Public-Schools: Definiteness performance in all age groups was compared with indefiniteness scores in all age groups of public-schools.

H_0 : Performance in the use of both the articles is the same in public-system.

Table 17: Comparison: Definiteness vs Indefiniteness- in Public-Schools All Age Groups

	Omission/ Substitution (a)	Omission/ Substitution (the)
Mean	0.375279167	0.324595833
Variance	0.257104306	0.239568798
Observations	24	24
Pooled Variance	0.248336552	
Hypothesized Mean Difference	0	
Df	46	
t Stat	0.352318517	
P(T<=t) one-tail	0.363104257	
t Critical one-tail	1.678660414	
P(T<=t) two-tail	0.726208513	
t Critical two-tail	2.012895599	

Table 17 indicates the results for t test. The results in table 17 fail to reject null hypothesis as t critical $> t$ stat ($2.01 > 0.35$). Hence, performance is not the same for definite and indefinite articles in public-school-system. Here the scores are higher for the use of indefiniteness, this indicates that public-school participants commit more errors in their use of indefinite articles (mean scores: $0.37 > 0.32$). Therefore, public-schools participants acquire definiteness before indefiniteness. In other words, definiteness is acquired at a faster pace than indefiniteness.

The mean scores indicate greater values for definite article. It may be seen that public school participants score higher percentages in their use of definite article than in Indefinite article.

Definiteness Vs Indefiniteness in System-Schools: Definiteness performance in all age groups of system-schools was compared with indefiniteness scores in all age groups of system-schools. H_0 : Performance in both articles is the same in system-schools.

Table 18: Comparison: Definiteness vs Indefiniteness- All Age Groups- System

	Omission/ Substitution (a)	Omission/ Substitution (the)
Mean	0.228258333	0.246870833
Variance	0.112211529	0.14476542
Observations	24	24
Pooled Variance	0.128488475	
Hypothesized Mean Difference	0	
Df	46	
t Stat	-0.179871869	
P(T<=t) one-tail	0.429021599	
t Critical one-tail	1.678660414	
P(T<=t) two-tail	0.858043199	
t Critical two-tail	2.012895599	

Table 18 indicates the results for t test. The results in table 18 fail to reject the null hypothesis, as the t critical is greater than t stat ($2.01 > 0.17$). The mean score is more for definite article, since we are dealing with errors, therefore a higher score indicates worse performance. The mean score is higher for definite article than that for indefinite article ($0.24 > 0.22$), it means that there are more errors in the use of definite article than that of indefinite article. Hence, indefinite articles are acquired before the definite article in system schools, hence, it may be established that in system-schools, the 'indefinite' article is acquired before the 'definite' article whereas in public-schools, definiteness' is acquired before indefiniteness.

Indefiniteness is Acquired before Definiteness in Public-Schools

The acquisition order for article use in terms of their mean scores of errors may be determined on the basis of their error percentages as in other studies. For public schools $a > the$, therefore it may be established that public-school participants acquire definiteness before indefiniteness.

Definiteness is Acquired Before Indefiniteness in System-Schools

For system schools $the > a$, since the scores are those of errors system-school participants perform better in their use of indefinite article. Hence it may be established that system schools participants acquire indefiniteness before definiteness. System-school students do not omit indefinite article.

Results and Discussion

The results obtained by the application of t test established the acquisition order of English article based on error percentages in composition writing.

The Rate of Accuracy in Article Use as Indicated in Compositions Data

The percentages for omission and substitution errors were calculated for research participants. The overall rate of omission and substitution in system-school participants' performances is lower than that of public-school participants. The participants from both the systems fluctuate and their performance rises and falls in terms of percentages as may be seen in tables 2 and 3.

The Rate of Omission of Definite Article in Compositions from Public- and System-School Participants

The SOC (Suppliance in Obligatory Context) values for omission of definite article in public-school participants fall from age bracket 10-14 years to 21-25 years. This indicates that public-school participants improve in their use of definite articles, as they advance in their levels of learning and in years. The UOC (Use in Obligatory Context) values indicate overuse and/or underuse of a variable. The values indicate that public-school participants have a greater tendency to omit articles as compared to those of system-school participants. Except for the UOC values in age bracket 10 to 14 years, where they are lower (50.96 %) in public schools and higher (54.44 %) in system schools, it is vice versa in the rest. The rate of omission (UOC), for age bracket 15-17, is higher in public (58.99 %) and lower in system school participants (49.74 %). It is 40.20 % in public which is > 31.87 % in system-school participants. It is 59.52 % in the age bracket 21-25 years in public, whereas for system-schools it is 46.08 %. It may therefore be established that scores of definiteness in system schools indicate a higher performance than in public schools.

The Rate of Omission of Indefinite Article in Compositions from Public- and System-School Participants

The SOC values for the omission of indefinite articles are higher than those for system schools. In the age bracket 10-14 years, it is 16.45% whereas that in system-schools is 0.87 %. The SOC values for omission rate in the age bracket 10-14 years decreases in the age bracket 15-17 years to 4.05 % in public-school participants' compositions whereas in the age bracket 18-20 years it falls to 1.50 %. In 21-25 years, it falls to 1.08 %. This indicates that public-school participants improve as they advance in their level of learning as well as in their age in years. A comparison, age-wise, of public and system-school SOC values indicates that the performance of system-school participants is higher as the percentages indicate errors, therefore, the greater the number, the less the performance. However, within system-schools, it is observed that the percentage of omission of indefinite articles increases with age from 10-14 years (0.87 %) to 15-17 (1.35 %) years. It fluctuates from the age bracket 18-20 years (1.06 %) to the age bracket 21-25 years as it rises a bit but falls to 0.8 %. This indicates that as per fluctuation hypothesis, the learners fluctuate between correct and incorrect responses and ultimately improve in their understanding.

The Rate of Substitution of Definite Article in Compositions from Public- and System-School Participants

The SOC values indicate that the rate of substitution for definite article by indefinite article in public-school participants falls from 22.9 % (in age bracket 10-14 years) to 3.42 % (in 15-17 years). It rises to 4 % in the age bracket 18-20 years and rises again in the next age group, that is, 21-25 years. Substitution of definite by indefinite article improves only in the age bracket 15-17 years.

It may therefore be established that in public-school participants, there is less improvement as far as the substitution of definite article is concerned. In system-school participants, SOC values fluctuate from low to high. It is also noteworthy that SOC values for system-school participants' rate for substitution of definite article are lower than that for public-school participants. Hence, it may be established that system-school participants acquire definite article before public-school participants.

In another research conducted on a similar pattern, that is, with an equal number of participants from public and system schools of the afore-mentioned four age groups, however using Forced Choice Elicitation Tasks (FCETs) as introduced by (Ionin, Montrul, & Crivos, 2013), the performance of system school participants falls drastically to percentages lower than all other

age groups (Qureshi & Yousaf, 2025). Regression analysis in the study also indicates the extent to which the independent variables impact dependent variables, indicating the 15-to-17-year age group as the one which had the least impact of the independent variables for both the systems. In the current study also, the SOC results for the age bracket 15 to 17 years fail to reject the Null hypothesis and therefore the impact of independent variables is not significant.

The Rate of Substitution of Indefinite Article in Compositions from Public- and System-School Participants

The SOC values for substitution of indefinite article in public-school participants' compositions indicate fluctuation. The public-school SOC values however are higher than those for system-school participants, which indicates that system-school participants' performance is better as the lower the score, the better the performance (the percentages indicate errors).

To establish intra rater reliability, Intraclass Correlation Coefficient (ICC) was conducted.

Table 19 Intra-Rater Reliability, Compositions: ICC Values for Public and System

Age-Groups	Public	System
10-14	72.04 %	79.52 %
15-17	72.64 %	59.39 %
18-20	72.49 %	70.6 %
21-25	72.59 %	71.79 %

The study also demonstrates intra rate reliability as indicated in Table 19.

Acquisition Order: Definiteness vs Indefiniteness

To determine acquisition order, t test was applied to the results of omission and substitution percentages for article-use-errors in compositions. The results of t test indicate: In public schools' definiteness is acquired before indefiniteness; in system-schools indefiniteness is acquired before definiteness. The acquisition order has been determined on the basis of error percentages as in other studies (Fen-Chuan Lu, 2001; Muftah, 2023b; Trenkic, 2009; Wong & Quek, 2007).

Conclusion & Recommendations

The conclusions of this study, as per research questions are as follows: -

- i. The accuracy rate of substitution and omission errors amongst students from public and system schools, as shown in table 3, indicates that public schools show improvement in students' performance amongst students belonging to the initial two age brackets. Whereas their performance falls in the latter two age brackets.
- ii. Definiteness is acquired before indefiniteness by the students at public schools, whereas system school students acquire indefiniteness before definiteness.
- iii. With increase in age, performance in the use of article improves however, the impact of age and school types is less significant for age groups: 15 to 17 years; 18 to 20 years.

It may therefore be argued that an increase in language input may lead to an improvement in the understanding of English article use. The years of high school and college are more crucial than the time spent during university education. The exposure to target language during higher studies at university level education cause an improvement in language skills and hence in the use of articles. The improvement in performance hence may be attributed to an increased exposure to target language. It may also be attributed to the time spent in classrooms, with every increase of time in terms of years, spent at institutions, there is an expected improvement in the use of English article.

These findings imply the importance and pivotal role of language input in the improvement of article usage. For Urdu Learners and other second language learners, the target language is only provided in classroom situations. Although in case of first language acquisition the availability of target language might as well be minor, however, it is present continuously in the environment of the learners. The real importance of the availability of target language input may be felt more when it is totally absent in the environment. Article use improves with age as with advancement in years, the amount of language input is expected to increase. This implies that an increase in language input occurs as learners add on in years, hence language input increment leads, both in terms of (duration of) the time during which the input is being provided (6.4.8.) and in terms of years (the age of the learner) to improvement in article use. However, as may be seen in results of regression analysis the age group 15 to 17 years, the impact of either of the variables remains statistically insignificant, indicating the ineffectiveness of both or either of the independent variables. This reveals the psycholinguistic aspect of the study: the provision of sufficient language input enables subconscious absorption of English article use.

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