Dyslexics' Acquisition of the Derivational Noun Morphology in the Greek Language: A Follow up Study

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***Abstract*—The present study explores dyslexic children's ability to identify orthographic violations in the ultimate and the penultimate syllable of derived nouns and pseudo –nouns when they were attending grade 6, as well as their progress18 months later in words and pseudo-words respectively. The first two tasks involved identification of derived nouns with the violation or no violation in the penultimate or ultimate syllable in a paper and pencil task.. The third condition examined the use of derived nouns in a sentence completion close test. Subjects used the nouns and the verbs given in blankets to formulate the appropriate derived nouns. Errors in suffixes were coded as orthographic processing, phonological processing, combined type and stress omission/misplacement. Eighteen months later the follow up test revealed a significant improvement on the orthography of the derived nouns with consonant change at morpheme boundaries, as well as, on the orthographic rules of the ultimate syllable of the pseudoword tasks. Dyslexic children were also improved in their ability to produce phono-ortographic correct responses on the sentence completion task.**

***Index Terms*—Greek language, dyslexia, derivational morphology, orthography.**

I. Introduction

Derivational morphology gives a good account on how words are formulated to express new meaning using a familiar base morpheme and the appropriate suffixes. In the Greek language 28 noun classes (types) are described as derived forms of verbs and other nouns [1]. These noun suffixes are differentiated on relative and absolute frequency of use. General orthographic rules describe the representations of the /e/ and /o/ allomorphs in all noun classes. Specific phonological and orthographic rules predict the way vowels in the penultimate syllable are represented and the consonant change at morpheme boundaries. Morphemes are the indivisible word units that convey a meaning and (or) have syntactic properties [2]. According to linguists, morphology sets up the rules for word formation. In this account inflectional morphology deals with the syntactic properties of words, whereas derivational morphology is used to create new lexical items [3]. Given that derived words may belong to another grammatical class than original words derivation suffixes are classified as neutral and non neutral according to wheather changes of stem morphemes are required to formulate the new words. [4]. It was demonstrated that children as young as the age of two and a half years produce syntactically complex words using inflections to note plural number and past tense. Whereas ability to produce grammatically correct derived word is not fully mastered by the end of primary school for normally developing children and by eighth grade for dyslexic children [5], [6].

The aforementioned phenomena drew linguists' and psychologists' attention, since 70s, who described language acquisition in terms of epilinguistic abilities which are unconscious and metalinguistic abilities which presuppose conscious awareness and cognitive control. This theoretical account led researchers to define morphological awareness "as children's conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure" [7], a construct particularly useful for vocabulary growth, as it enables children to differentiate the meaning of homophone morphemes found in words[8]. For example the word "flowerpot" is related to the word "flower" and not to the word "flour", in a way that the word pairs "corn" and "corner" are not semantically related [9]. This aspect of morphological awareness is identified as relational knowledge and it's contrasted to syntactic morphemic awareness and to distributional morphological awareness [10]. The former refers to children's ability to produce new derived words in order to comply with syntactic and semantic rules. The later takes into account a constellation of linguistic constraints such as, grammatical category, language of origins of stem morphemes as well as phonological and graphotactic rules, in order to formulate a derive word e.g. quietness is a real word in English, but playness is a nonword.

The relational morphological awareness is assed primarily by the "Comes from Task" introduced primarily by Derwing and Baker [11] and modified latter by Carlisle [6] and Windsor, [12]. In the original version children are asked questions like "does dollar comes from doll?" or does teacher comes from teach?" When the derived word is embedded in the sentence children are asked to verify the information provided e.g. "The chairman is a man who makes chairs", or are asked to analyse the derived word in the morpheme components, as in the example "is a little word in the airplane that means air?" Other variations of the same task include nonwords or low frequency words [13] (Freyd & Baron, 1982; as sited in Wysocki and Jenkins, [14]. More recently a homophone resolution task was used to assess relational morphological awareness. In this task children are asked to identify the correct stem morpheme when a derived word is given in sentences like 'The letter T and the word teacup' which do you think contains the meaning of "tea as in tealeaf?" Although, the aforementioned task tags the relational morphological awareness, exact wording in presentation presupposes various degrees of cognitive demands. As a result, acquisition of the relational

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derivational morphology is regarded a process, completed in early adolescence [15].

Syntactic morphological awareness is assed primarily by the word completion task. Children are presented an initial word which they had to transform in order to fit the meaning of an incomplete sentence, e.g. "my uncle teaches, he is a teacher (teach) 16] [17]. Adoption of this task is the four choice task in which the proper word is presented with other three competent words with similar meaning and common orthographic and/or phonological structure. Children choose the correct word type, after oral or written presentation e.g. «He had to put his ……on the contract (sign, signature, name, mark). This aspect of morphemic awareness is regarded more sophisticated as it provides information about the syntactic role of suffixes [9], [18], [19]. Finally, the distributional morphological awareness is a more demanding process as it requires explicit knowledge of the allowable stem –suffix combinations taking into account semantic information, syntactic role and phonological constraints of language [19]. A number of studies examined the relationship between derivational morphological awareness and reading ability [19], [7], [16] and demonstrated a significant relation between children's ability to produce derived words orally and in writing forms and their decoding ability and reading comprehension. To the same token Singson and colleagues [20], [21] used syntactic morphological awareness tasks and relational morphological awareness tasks to explore the effect of M.A. to decoding ability. In both studies researchers reported a significant contribution of the former to the latter after controlling the phoneme awareness, the STM and the age effect. Moreover the MA improved with age [19], [22], [23]. It has been proposed that analysis of polymorhematic words facilitates decoding ability especially in languages with rich morphology, such as Italian [24], German [25], Dutch [26], French [22], Hebrew [27], and Chinese [19]. With regard to morphematic word structure many studies addressed the question of the timing and mechanism which underlie the process of writing polymorphematic and derived words [28]. It was shown that children as young as the age of eight are able to infer spelling of a derived words e.g. signature from root word (sing), but overall spelling of derived words have been proved more difficult than rule-governed words, in which spelling is predicted by phonological-orthographic rules. [29]. Other researchers, explored spelling of derived words with regard to generation rules from the root words. Words that required phonological and combined (ph & orthographic transformations) proved more difficult even for 13 years old [30], [31]. Moreover, derived words were more probable to be spelled correctly when the root word was also correct, a phenomenon known as a consistency effect. Those findings were further extended and it was shown that units of coding can influence conclusions about children's morphemic structure awareness [32]. Specifically when only the initial word part (either a morpheme or an orthographic unit) was coded the morphological effect was observed, with words like turning spelled more frequently correctly than in monomorphematic words like turnip [33].

2.1 Participants Twelve Dyslexic students at the end of sixth grade participated in the study. There were all native speakers of Greek language with no history of hearing or neurological problems; and they have received a monolingual education. They came from urban areas and all parents are reported to have completed at least a twelve-year education. Parents of Dyslexics were informed about the study at the local Diagnostic, Evaluation, and Support Centre, after completing the evaluation procedure. The inclusion criteria for all three groups were: 1) full scale I.Q.>90 as measured by the Weschel Intelligence Scale III and 2) Reading Comprehension Score>85, as measured by the Reading Ability Test [34]. Moreover, the criteria for dyslexics' group included an inferior performance on three phonological awareness task of the Athina Test. Reading and spelling ability was also tested with two tests constructed for the purpose of the present research project. Each test comprised of a 92 word and a 92 nonword list with all possible combinations of consonant-vowel (CV), consonant cluster-vowel (CCV, CCCV), vowel-consonant (VC) of the Greek Language. Particular interest was given to include allophones and letter strings that result in phonological processes observed in spoken language. Test –retest reliability, for the reading tests, after a two months period, was reported 0.94 (word list reading) and 0.95 (nonword list reading). Reliability of the spelling test was somewhat higher 0.96 (word spelling) and 0.97 (nonword spelling).

Procedure all students were tested by the author in the Diagnostic, Evaluation, and Support Centre. The material was presented in a random order.

TABLE I: DYSLEXICS' PERFORMANCE ON ATHENA TEST

Phoneme awareness tasks		
Table column subhead	Phase 1	Phase 2
	Mean (S.D)	Mean (S.D)
Phoneme Blending	102.17 (18.23)	106.08 (17.32)
Phoneme Discrimination	90.58 (17.13)	94.83 (24.2)
Grapheme Discrimination	123.17 (19.16)	118.75 (22.59)
Word Completion	117.75 (15.30)	122.08 (5.82)

TABLE II: DYSLEXICS' PERFORMANCE ON READING AND WRITING TEST

		Literacy Measurements	
		Phase 1 (S.D) Mean	Phase 2 (S.D) Mean
Spelling of Nonwords	Phonetic Implausible errors	12.33 (5.1)	10.08 (3.99)
	Phonetic Implausible errors	6.00 (3.43)	5.00 (5.1)
Spelling of Words	Orthographic Processing errors	18.58 (5.58)	16.25 (7.5)
	Grammatical errors	8.42 (7.40)	4.67 (3.87)
Reading Time	Words	95.58 (34.24)	80.83 (27.93)
Reading Time	Nonwords	123.33 (43.52)	133.67 (28.01)

II. MATERIAL

In order to evaluate dyslexics' cognitive ability, a battery of tests set up the inclusion criteria and aimed to elaborate the cognitive processes involved in reading and spelling. Students completed the four tasks of phonological sensitivity and phonological awareness from the ATHENA test [35]. In

the phoneme blending, a 32-item task, subjects have to combine the orally presented phonemes, ranging from 4-7, to a word. The phoneme sensitivity task involves a same/different identification of phoneme strings comprising a pair of nonwords. The grapheme identification is a paper and pencil task in which a pair of nonwords is presented in written form and the subjects had to cross out the different spelling stings without to read the nonwords. Finally, in the word completion task, the subjects listen to a word missing an initial or intermediate phoneme and they have to pronounce it in the correct form. The Reading Ability test is a sentence completion test in which subjects have to choose between four candidates the proper word, to fit the meaning and the syntax. The spelling and reading tests were developed for the purpose a larger project and the criteria used were discussed in the former section. The reading time and the spelling errors were included as best predictors of reading and spelling ability among dyslexics according to the double deficit theory [36]. In order to evaluate dyslexics' ability to use the correct derived noun three tasks were used. The first task involved identification of exemplars and homophone foils of nouns in various cases in a paper and pencil task. Subjects were to decide whether the word in the second column was the correct derived noun of the verb presented in the first column. The verbs have been always in the 1rst person of simple present in the singular number. The articles preceding nouns guided subjects to decide on the case and the number appropriately. In the same token, the second task involved identification of pseudonyms resulting again from the pseudoverbs given in the 1rst person of the present simple. Articles again were guided the subjects. The third condition examined derivation morphological awareness in a sentence completion close test. Subjects used the verbs presented at the end of a sentence to formulate nouns in appropriate cases and number so as to fit the meaning. All conditions contained 32 items. The word and the pseudo word condition presented in the second column were derived noun or pseudonouns whith orthographic violation either in the ultimate syllable (*N*=4) or in the penultimate syllable (*N*=11) of the suffix which they had to identify, or contained consonant change at morphematic boundaries between stem of nouns or stem of pseudonouns and the suffix (*N*=6).

4 Results. Table I and Table II portray phoneme awareness and literacy measurement results for phase 1 & 2 at the end of 6th and 8th grade respectively. Phoneme blending and phoneme discrimination were the two tasks in which dyslexics met the inclusion criteria with performance below the 85 percentile. In contrast, dyslexics' profile in the grapheme discrimination task, the word completion task and the Reading Ability Test were similar to the normally developing children's expected standards. With regard to sentence completion test errors coded were as follow: 0 when children did not produced correct derived noun, 2, when children produced a derived noun with orthographic and phonological errors, 3 when only orthographic errors were observed, and 4 when children failed to give correct punctuation. The item score 5 was given for correct responces. Items in the word and the nonword identification test were coded as 0 when children gave a wrong answer and 1 when children's response was correct.

TABLE III: DYSLEXICS' PERFORMANCE ON SENTENCE COMPLETION TEST PHASE 1

Inability to produce derived nouns

Number of items	Frequency	Persent	Culminative persent
0	1	8.3	8.3
1	1	8.3	16.7
2	1	8.3	25.0
3	5	41.7	66.7
4	3	25.0	91.7
8	1	8.3	100
Total	12	100	

Orthographic &phonological errors

Number of items	Frequency	Persent	Culminative persent
0	9	75.0	75.0
1	1	8.3	83.3
2	1	8.3	91.7
4	1	100.00	100

Orthographic errors in suffixes

Number of items	Frequency	Persent	Culminative persent
0	2	16.7	16.7
1	2	16.7	33.3
2	3	25.0	58.3
3	3	25.0	83.3
4	1	8.3	91.7
6	1	8.3	100
Total	12	100	

Pancuation errors

Number of items	Frequency	Persent	Culminative persent
0	1	8.3	8.3
1	3	25.0	33.3
3	1	8.3	41.7
4	1	8.3	50.0
6	1	8.3	58.3
7	1	8.3	66.7
12	1	8.3	75.0
16	1	8.3	83.3
17	1	8.3	91.7
25	1	8.3	100
total	12	100	

As can be seen in Table III, 66.75 of children left out at least 3empty sentences whereas 91.7% of children did not respond at 4 cases or produced erroneous answers. With regard to combined type of errors 75% of children did not produced this type of errors, whereas they was individual cases of children (representing the 8.3.% of sample) who produced 1, 2 and 4 times this type of errors.

The punctuation errors were the most frequent type of errors. There was a child who produced 0% or very low, up to 4 times, this type of error, whereas at the other end of the continuum, one child misplaced or forgot the word main stress in 25 cases. Orthographic errors were also at low levels. Moreover, 58.3% of children produced up to 2 orthographic errors and majority of children (97.1%) produced up to 4 orthographic errors During phase 2, as it can be seen on Table IV, dyslexics' performance was improved. Six children

(50.0%) left out one sentence empty and five children (41.7%) left out only two sentences empty. Similarly 9 children (75%) produced combined type of errors and up to 75% of children produced 2 orthographic errors. The most prominent type of errors was the punctuation errors. 91.7% of children produced 11 words without or with wrong main word tone. One sample kolmogorov-Smirnov Test was used to test normally distribution of data for phase 1 and 2. The only variable that did not met the normally distribution criteria was the orthographic and phonological change combined on phase 2. Moreover, a series of t tests were applied in order to explore any progragress on dyslexics' performance. Children's' progress reached statistical significance only on their ability to produce derived noun without leaving out sentences $t(11)=3.189$, $p<0.5$.The other variables did not reach statistical significance (*W* test, $N=12$, $Z=-0.141$ $p>0.05$ for orthographic & phonological errors, $t(11)=0.52$, $p>0.5$ for stress omission or misplacement), $t(11)=1.22$, $p>0.5$, for orthographic errors. In order to explore the most prominent type of errors for each phase a series of wilcoxn test was used. On phase 1 the correctly spelled words reached statistical significance compared to punctuation errors and to combined type of errors (*W* test $z=-2.4$ $p<0.05$, and *w* test $z=-2.31$ $p<0.05$, respectively). The orthographic violation errors were more prominent than punctuation errors and combined type of errors (*W* test $z=-2.3$ $p<0.05$, and *W* test $z=-2.95$ $p<0.05$, respectively). There was no statistical difference between correctly spelled words and orthographic misspelled suffixes. In phase 2 similar procedure were followed. The correctly spelled words reached statistical significance compared to punctuation errors and to combined type of errors (*W* test $z=-3.1$ $p<0.05$, and *W* test $Z=-3.084$ $p<0.05$, respectively). Comparison of orthographic misspelled words and punctuation errors were also statistically significant (*W* test $Z=-3.07$ $p<0.05$) as well as comparison of the aforementioned type of errors when compared to combined type of errors *W* test $Z=-3.08$ $p<0.05$). Similar procedure was followed for the word identification task with normally distribution data to be tested by the kolmogorov-Smirnov Test, results of which are shown in Table V and Table VI. The Wilcoxon test did not reveal statistical difference between phase 1 and 2 for words with consonant change at morphematic boundaries.

TABLE IV: DYSLEXICS' PERFORMANCE ON SENTENCE COMPLETION PHASE 2

Orthographic & phonological errors			
Number of items	Frequency	Persent	Culminative persent
0	9	75.0	75
2	3	25.0	100
Total	12	100	
Inability to produce derived nouns			
Number of items	Frequency	Persent	Culminative persent
0	1	8.3	8.3
1	6	50.0	58.3
2	5	41.7	100
Total	12	100	
Orthographic errors i			
Number of items	Frequency	Persent	Culminative persent
0	2	16.7	16.7
1	3	25.0	41.0
2	4	33.0	75.0
3	3	25.0	100
Total	12	100	
Pancuation errors			
Number of items	Frequency	Persent	Culminative persent
0	2	16.7	16.7
1	2	16.7	33.3
2	1	8.3	41.7
3	1	8.3	50.0
8	1	8.3	58.3
9	2	16.7	75
10	1	8.3	83.3
11	1	8.3	91.7
28	1	8.3	100
Total	12	100	

TABLE V: STATISTICAL CONTROL ANALYSIS FOR THE SENTENCE COMPLETION TASK PHASE 1 & 2

Phase 1			
	M. (SD)	K-S	P
Orthographic & phonological errors	3.17 (1.95)	0.87	0.44
Inability to produce derived nouns	0.58 (1.24)	1.5	0.23
Orthographic errors	2.25 (1.71)	0.57	0.90
Pancuation errors	7.75 (8.1)	0.71	0.7
Orthographic & phonological errors	1.33 (65)	0.967	0.013
Phase 2			
Inability to produce derived nouns	10.50 (9. 05)	1.59	0.308
Orthographic errors	1.67 (1.07))	0.711	0.69
Pancuation errors	6.83 (7.5)	0.747	0.633

TABLE VI: STATISTICAL CONTROL ANALYSIS FOR THE WORD IDENTIFICATION TASK PHASE 1

Word identification phase 1			
	M. (S.D).	K-S	p
Penultimate_	6.83 (1.89)	0.86	0.46
Ultimate_	4.5 (0.9)	1.2	0.12
NoChange	0.,46 (0.94	0.82	0.42
ConsChange	0.27 (0.47)	1.5	0,024

A series of t test failed to differentiate dyslexics' performance for phase 1 and 2 ($t(11)=0.834$, $p>0.422$, for orthographic violation in the penultimate syllable, $t(11)=-1.383$, $p>0.5$ for orthographic violations in the ultimate syllable and $t(11)=-0.875$, $p>0.05$ for correct words). Moreover the wilcoxon test was used in order to differentiate the most prominent types of errors in each phase. In phase 1, comparison of the orthographic violation in the penultimate syllable with other types of errors reached statistical significance (*W* test $Z=-2.364$, $p<0.05$ for penultimate

orthographic violation versus ultimate type of orthographic violation), (*W* test *Z*=-2.55, *p*<0.05 for penultimate orthographic violation versus correctly spelled words), (*W* test *Z*=-2.85, *p*<0.05 for orthographic violation in the penultimate.

TABLE VII: STATISTICAL CONTROL ANALYSIS FOR THE WORD IDENTIFICATION TASK PHASE 2

Word identification phase 2			
	M. (S.D).	K-S	P
penultimate_	6.0 (2.63)	0.52	0.96
ultimate_	5.25 (1.2)	0.86	0 45
NoChange	5.0 (1.5)	0.92	0.380
ConsChange	1.83 (0.94)	1.46	0..024

TABLE VIII: STATISTICAL CONTROL ANALYSIS FOR THE NON-WORD IDENTIFICATION TASK PHASE 1

NonWord identification phase 1			
	M. (SD)	K-S	p
Penultimate_	7.8(3,6)	1.01	0.26
ultimate_	4.42 (1.97)	0.69	0.77
NoChange	4.42 (0.99)	0.,88	0.42
ConsChange	1.92 (0,67)	1.04	0.23

TABLE IX: STATISTICAL CONTROL ANALYSIS FOR THE NON-WORD IDENTIFICATION PHASE 2

NonWord identification phase 2			
	M. (S.D).	K-S	P
penultimate_	8.2 (2.7)	0.840	0.48
ultimate_	7.00 (6.1)	1.05	0.22
NoChange	4.73 (1.1)	0.96	0.31
ConsChange	2.73 (0.47)	1.49	0.024

Syllable versus the orthographic violations in the penultimate syllable versus the orthographic violations in words with consonant change at morhematic boundaries). Statistical significant differences were also found between orthographic violation in the ultimate syllable compared to correctly spelled words (*W* test *Z*=-22.913, *p*<0.05). In phase2 comparison of the orthographic violation in the ultimate syllable and the orthographic violation in words with consonant change in morphematic boundaries was statistical significant (*W* test *Z*=3.07 *p*<0.05) as well as comparison of orthographic violations in penultimate syllables and words with consonant changes (*W* test *Z*=2.94, *p*<0.05).

The nonword identification test was constructed to test dyslexics' acquisition of derivational morphological awareness in written Greek language. Again 32 nonwords were used with correctly spelled suffixes and suffixes with orthographic violations Normal distribution of data were tested by the kolmogorov-Smirnov Test, results of which are shown in Table VII, Table VIII and Table IX. Ho hypothesis were accepted for all type or errors except for consonant change in phase 2. Comparison of phase 1 and 2 in words which necessitate consonant changes at morphematic boundaries reached statistical significance (*W* test, *N*=12, *Z*=-2.07, *p*<0. 5). The orthographic violations in the ultimate syllable of suffixes for phase 1 & 2 for nonwords were compared with t test and were also statistically significant *t*(10)=0.029, *p*<0.5. No other statistically significant difference was observed (*t*(10) =-1.34 for the correctly spelled words phase 1 & 2 and *t*(10) =-0.29 *p*<0.5 for the orthographic violation in the penultimate syllable for phase 1 & 2) In order to find the most prominent errors in nonwords in phase 1 & 2 the Wilcoxon test was used. The penultimate syllable errors in phase 1 were grater in number than errors in ultimate syllable (*W* test, *Z*=2.35, *p*<0.05), as well as errors in consonant changes at morhematic boundaries *W* test *Z*=2.96, *p*=0.05). The correctly spelled nonwords were identified more often that nonwords with orthographic violation in the penultimate syllable (*W* test *Z*=2.81, *p*<0.05) and than words with orthographic violation in the ultimate syllable w test (*Z*=-0.120 *p*<0.05). In phase 2 the most prominent type of errors was the orthographic violation in the penultimate syllable (*W* test *Z*=-1.88, *p*<0.05 for orthographic violation in the penultimate syllable versus orthographic violation in ultimate syllable, *W* test *Z*=-2.94, *p*<0.05 for orthographic violation in the penultimate syllable versus identification of nonwords with consonant changes at morphematic boundaries, and *W* test *Z*=-2.82 for orthographic violation in the penultimate syllable versus the correctly spelled words). The next most prominent error was the orthographic violation in ultimate syllable comparison of which reached statistical significance to consonant change *W* test *Z*=-2.95, *p*<0.05, and to correctly spelled words *W* test, *Z*=-2.4, *p*<0.05.

III. DISCUSSION

With regard to sentence completion test dyslexics were improved in their ability to formulate the derived nouns from verbs in phase 1 and 2, whereas numbers of other types of errors remained constant. The number of correctly spelled derived words was similar to the number of orthographic misspelled words. In this account the latter type of errors were more profound than punctuation errors and than orthographically misspelled derived words with wrong place of main word tone. Similar pattern of results were fount for phase 2 in the sentence completion test. The orthographic violations in the derived word suffixes were more frequently than stress omission of the main word (punctuations error). The number of correctly spelled words were grater in number than words with phonological and orthographic violations.

In the word identification test, the orthographic violations in the penultimate syllable were more frequent compared to orthographic violations in the ultimate syllable, and to words with orthographic violation in suffixes which necessitate consonant change at morhematic boundaries. The orthographic violation in the ultimate syllable, were more easily detected than words with consonant change at morhematic boundaries. In the second phase orthographic violations in the ultimate and the penultimate syllable were detected to a lesser degree than words with orthographic violations when consonant change were required in order to

formulate a derived word.

With regard to the nonword test the correctly spelled suffixes were more frequently detected than orthographic violations in the penultimate syllable. The later types of errors were more prominent than orthographic violations in the ultimate syllable and the words with consonant changes. The phonological misspellings were more prominent than ultimate syllable orthographic errors. Lastly, in phase 2 orthographic violations in penultimate syllable were again more prominent errors than that in ultimate syllable, as well as than words with phonological changes in morphemic boundaries of derived words.

These findings demonstrate that dyslexic children had reached the maximum of their ability to produce derived words at 8th grade. They are able to identify the correctly spelled words but they are unable to analyse words in suffixes and lexemes. The orthographic violations in penultimate syllables in derived words are more difficult to be identified by dyslexics compared to orthographic spelling errors of the ultimate syllable. They have mastered the grammatical rules which guide them to check the article in order to write the correct suffix, but they are unable to remember the disyllabic suffixes and remain focused in the phonological structure only.

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