

THE INFLUENCE OF SOME COGNITIVE STRATEGIES ON THE ACQUISITION OF DERIVATIONAL MORPHOLOGY

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Although word (morphological) derivation in languages is usually highly irregular and is not the object of systematic teaching, L2 (second language) learners use derivational morphology knowledge in L2 production and comprehension.

K. Haastrup (1991) in her research project on vocabulary learning strategies provided the participants of the experiment with texts and asked them in pairs to negotiate on possible meanings of the unknown words. The analysis of the dialogues demonstrated that the learners quite often relied on their knowledge of derivational morphology when trying to analyse the unknown words into separate morphemes in order to decide what the potential meaning of these words could be.

In the study on compensatory strategies by N. Poulisse (1990) the participants – the Dutch learners of English – used derivational morphology knowledge in speech production. They coined new derivatives in their spontaneous speech (such as "ironise") in order to fill lexical knowledge gaps they had.

Other evidence of language learners' knowledge of derivational morphology and their willingness to engage actively in derivation comes from the studies of J. Vizmuller-Zocco

(1987), M. Rogers (1984), D. Sandra (1988), E. Olshtain (1987).

Though the fact that L2 learners are able to acquire and use derivational morphology of the target language creatively is widely acknowledged, very little is known about the development of the derivational morphology knowledge or the factors of the language input and acquisition process potentially influencing this development.

In this article some results of the study on adult learners' production of English derivational affixes are presented. The primary purpose of the study was to investigate possible influence of some cognitive strategies on the acquisition of derivational morphology.

In the field of SLA (second language acquisition), cognitive-functional theories of Andersen's Operating Principles (1990), McWhinney and Bate's Competition Model (1984), Pienneman's Multidimensional Model (1989) analyse changes that take place over time in the mental lexicons of children and adults and thus, by extension, provide general principles that hold in language acquisition irrespective of the age or language background of language learners. According to R. Ellis (1994, pg. 369-388), all these theories postulate that:

1. The learning of all languages is functionally driven and involves gradual acquisition of form – function mappings existing in the target language. The

L1 learner learns the functions and the forms that express them. In L2 acquisition the learner already knows the universal functions and thus has to learn new forms and discover specific form-function mappings available from the input of the target language.

2. The capacity for language learning is non-specific, but results from general cognitive strategies and perceptual factors that human beings use for acquiring other perceptual information. These strategies enable learners to segment items of the input, and govern the organisation and storage of new information.

3. Developmental sequences in language learning are the result of general cognitive processes and such factors as "perceptual saliency" of the information, the continuity of the elements, and semantic consistency, etc. Elements of the language that are easily attended and processed are learned and produced first.

A more detailed description of the cognitive principles that might govern the acquisition of different items of languages was presented by I. Slobin (1973) and later by R. Anderson (1990) and E. Clark (1993), who studied the acquisition of L1 by children.

Three of the principles that the above-mentioned authors claimed to hold in the acquisition of the target language are as follows:

1. Because of the processing strategy to identify the word from the sequence of segments that precede the affix carrying some

syntactic function, any grammatical realisations in the form of suffixes or postpositions are acquired earlier than prefixes or prepositions (Cutler et al., 1985).

2. The use of any linguistic element should make semantic sense: (a) Errors in choice of functor are within the given functor class. (b) When selection of an appropriate item among a group of items performing the same function is determined by arbitrary formal criteria, the learner initially tends to use a single form in all environments, ignoring formal selection restrictions. Therefore the expression of a certain function may be semantically appropriate but formally deficient (Slobin, 1973, pg. 207).

3. At the initial stages of language acquisition, the form which is acquired and used first is the element which is more frequent in the language than other elements expressing similar function (Clark, 1993, pg. 138).

Having in mind that the acquisition of derivational morphology should inevitably involve mapping of form and function of different affixes, and assuming the universality of the above-mentioned principles, the present study of derivational morphology knowledge of Lithuanian learners of English tested the following hypotheses:

1. Adult learners of English at the pre-intermediate language proficiency level acquire suffixes more easily than prefixes.

2. Adult learners of English at the pre-intermediate language proficiency level know best the most frequent English affixes.

3. Adult learners of English are able to acquire the main functions of affixes: at the pre-intermediate level of the English language they know what part of speech affixes form

and overgeneralize the use of the most frequent ones in order to express the meaning

of other affixes of the same functional category.

Method

Subjects

The subjects of this study were 40 adult Lithuanian-speaking students of Vilnius Pedagogical University. They were drawn from the sample of 89 students who completed Grammar (part 1) and Listening tests of Oxford Language Proficiency Placement Test a week before the experiment. As the aim of the experiment was to test learners of

pre-intermediate language proficiency level, only 40 students that scored between 93 and 70 were included in the experiment. Summary statistics of the placement test – the mean and median of the subjects' scores, the standard deviation (S.D.), the maximum score (Max.), the minimum score (Min.) – are presented in Table 1.

Table 1. Summary statistics of the placement test.

<i>Maximum possible test score</i>	<i>Mean</i>	<i>Max.</i>	<i>Min.</i>	<i>S.D.</i>	<i>Median</i>
150	85.1	93	70	5.65	86

The group's mean score is quite high, as it was assumed subjects with lower scores would not be able to provide data relevant to the aims of the study.

All subjects included in the experiment received their secondary school certificate, which is awarded at the end of the 12th year of school. By the end of secondary school, the subjects have studied the English language for 8 years. At the moment of the experiment, the subjects were enrolled as first-year students at the faculties of Geography (10 subjects), and Pedagogics (30 subjects). The participation in

the experiment of students from different non-linguistic faculties allowed more random subject selection and the exclusion of the possible influence of specific linguistic training on the results of the experiment.

To raise motivation, the researcher told the subjects that the results would not be considered as part of their classwork; hence, they would be doing a favor to the researcher and would have a good chance to practice their English. The researcher thinks that the subjects were very co-operative and felt free of pressure.

Stimuli

The test consisted of 64 Lithuanian words-stimuli and their English equivalents that were given incomplete – without suffixes and prefixes. It was assumed that the participants should be able – with the help of the provided Lithuanian words – to complete the given partial English words by adding English affixes

that they knew and thought would most appropriately and fully express the whole meaning of the Lithuanian words.

As the purpose of the experiment was to investigate the participants' derivational morphology knowledge and not their knowledge of English vocabulary, in order to prevent the

participants from retrieving ready-made derivational words from their mental repositories, the words that had to be completed during the experiment were tested on their level of difficulty. In a pre-test, a list of 115 derivationally complex English words was given to 21 fourth-year students majoring in English. They were asked to translate the given English words into Lithuanian. Only words that were not known by the majority of the students were included in the test proper, assuming that pre-intermediate language learners of English would not know

the words as ready-made units and would have to use derivational morphology knowledge attempting to recreate their full form and meaning.

All 64 words chosen to be included in the test-proper were derivationally complex and contained the most productive affixes of different categories that were enumerated by Quirk et al. (1994). 39 of them contained suffixes, 25 – prefixes. The target meanings, the word class of interest, and the target affixes are summarised in Table 2.

Table 2. Target derivational meanings.

<i>Meaning</i>	<i>Word class</i>	<i>Affixes</i>
Abstract entity	abstract noun	ness, ity, tion, al, age, ment
Aggregate of X	abstract noun	dom, hood, age, cry, ing, ship
The amount contained in X	abstract noun	ful
Result of the action X	concrete noun	ing
Performing the action X	concrete noun	er, ster, ant
Skilled in X	concrete noun	eer, ist
Supporter X	concrete noun	ist
Feminine X	concrete noun	ess
Diminutive X	concrete noun	ette, let, ling
Character of X	adjective	ous, ful, y, al, ed, ian, ish, ive
Without X	adjective	less
Can be Xed	adjective	able
To make X	verb	ify, ize, en, ate
In a X manner	adverb	ly
Again X	verb	re
Before X	verb	fore, pre
Number X	verb	tri
Number X	adjective	uni, bi
Jointly X	verb	co
Too little X	verb	under
Surpassing X	verb	out
Excessively X	verb	over
Supreme X	noun	arch
Below X	noun	sub
Reverse X	verb	un, dis, de
Not, the converse of X	verb	un, dis
Not, the converse of X	adjective	im, ir, in, il
Badly X	verb	mis
Badly X	adjective	mal
Against X	adjective	anti
Against X	noun	counter

Frequency data for each English derivational affix was obtained analysing 2,000 the most frequent types of items that contained the necessary affix in the electronic COBUILD word corpus. On the basis of a widely acknowledged assumption that only items' type

frequency might influence the acquisition of word formation (van Marle (1988), Baayen (1991)), frequency numbers of affixes used in the study refer only to affixes' type frequency but not their token frequency.

Procedure

Before the test distribution, the subjects were instructed on how to carry out the task. They were asked to study Lithuanian words and give endings or beginnings to the provided partial

English words so that they would most completely express the meaning of Lithuanian words. The participants were allotted 35 minutes to complete the task.

Results

Initially, all the responses were evaluated for their correctness. Responses were scored as correct if the participants completed English partial words with the affixes which adequately expressed the meaning and part of speech required by the stimuli words e.g. used -er to form an agent, -y to express diminutive meaning or un- to express negation. Table 2 gives the summary statistics – the mean, standard deviation, the maximum and minimum of the correct responses in both data samples – suffixes and prefixes.

Table 2. Summary statistics for correct responses in suffix and prefix samples.

	<i>Suffix sample</i>	<i>Prefix sample</i>
Mean	22.93	13.9
Standard deviation	13.8	8.68
Minimum	1	0
Maximum	23	8

The percent distribution of the adequate responses is presented in Chart 1.

Two data samples – numbers of correct responses for suffixes and prefixes – were also

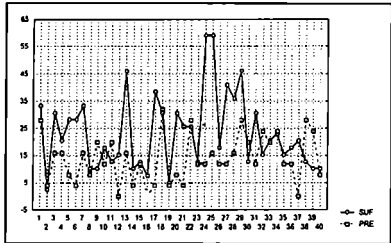


Chart 1. Percent distribution of correct responses.

tested for normality of distribution. The obtained $\chi^2=5.21$, 3 D.F., $p=0.15$, for suffix data sample $\chi^2=10.43$, 3 D.F., $p=0.01$ show that the observed data comes from a normal distribution.

To test the first hypothesis – that adult learners of English know suffixes better than prefixes – two samples of correct responses for suffixes and prefixes were compared. The obtained value $t=3.504$ ($p=0.05$, 39 D.F) demonstrates that there is a significant difference between responses for prefixes and suffixes, and confirms our hypothesis that the subjects know suffixes much better than prefixes.

The second hypothesis – that learners of the pre-intermediate level of language proficiency acquire the affixes that have the highest type frequency in the language first – was tested calculating correlation coefficients between two data samples: affixes' type frequencies obtained from COBUILD word corpus and frequencies of affixes used in the test. Correlation coefficients obtained separately for suffixes and prefixes were significant ($r=0.676$, $N=30$, $p=0.05$ for suffixes; $r=0.8507$, $N=31$, $p=0.05$ for prefixes): in the test the subjects used affixes of high-type frequency more often than affixes of low-type frequency. The most frequent suffixes used correctly to form abstract nouns were **-ing**, **-tion** and **-ness**, concrete nouns – **-er**, **-ist**, **-ant**, and **-ing**, adjectives **-y** and **-ed**, verbs – **-ate**. The occurrence frequency of **-ing** with abstract nouns was much higher than with concrete nouns (65 and 24 respectively).

The third hypothesis – that at the initial stages of language acquisition, learners know what part of speech the affixes form though may not fully differentiate between their semantic features – was tested analysing the distribution of suffixes¹ among different parts of speech. As the number of stimuli that required suffixes forming different parts of speech in the test was different, each suffix' s frequency with each part of speech was transferred to percentages. As there was only one stimulus requiring the use of suffix **-ly**, category "Adverb" is excluded from the calculations. Table 3 presents the percent distribution of suffixes which occurred in the responses with the frequency $x>5$ and were used to form nouns, adjectives and verbs.

Table 3. Percent distribution of suffixes used to form different parts of speech.

Suffixes	N	Adj	V
ing	7,94	6,76	11,38
tion	3,75	1,32	1,25
ness	1,51	0,73	0,27
ment	0,53	0,14	0,13
ery	0,35	0,29	0,55
er	13,21	2,5	2,91
ist	2,05	0,73	0
ant	1,51	0,44	0,69
ed	1,78	5,58	7,22
y	1,78	4,55	2,77
able	0,53	1,61	0,13
less	0,8	1,47	0,97
ful	0,26	1,32	0
ish	0	0,44	0,13
ous	0,44	0,29	0
ate	0,35	0,44	0,55
ly	1,6	5,44	0,55

In most cases the occurrences of suffixes cluster around adequate parts of speech – the ones that in English are usually formed with the help of these suffixes ($\chi^2=51.66$, 32 D.F., $p=0.01$), thus the assumption that even at the initial stage of learning affixes are acquired as possessing some concrete grammatical function is confirmed.

However, certain suffixes that have the highest frequencies in the sample either do not demonstrate clear preferences of the participants to associate them with a particular part of speech, or are used to make a wrong part of speech. These suffixes are **-ing**, **-ed**, **-y**, and **-ly**. Their full dispersion among different parts of speech, including category "Adverb", is presented in Table 4.

Several characteristics may potentially explain the high frequency and wide dispersion of these suffixes in the sample.

First, **-ing**, **-ed**, and **-ly** have the highest cumulative frequencies in English.

¹ As prefixes usually do not change the part of speech of the base only the use of suffixes was analysed to test the third hypothesis.

Table 4. Percent distribution of -ing, -ed, -ly, and -y among different parts of speech.

	<i>Noun</i>	<i>Adjective</i>	<i>Verb</i>	<i>Adverb</i>
-ing	7.94	6.76	11.38	12.5
-ed	1.78	5.58	7.22	7.5
-ly	1.78	4.55	2.77	5
-y	1.6	5.44	0.55	5

Therefore, the fact that -ing, -ed, and -ly account for 42,48% of the total responses that contained suffixes in the test could reflect suffixes' frequency distribution in English. -y, however, is only of a medium frequency among adjective suffixes and all affixes in general, thus its general frequency in language can not account for its high frequency of occurrence in the sample. Here, the notion "relative input frequency" may help to understand the learners' preference to use -y rather than other adjective suffixes. According to Derwing (1976), -y is one of the first suffixes to appear in the speech of first language learners thus for the language-learning beginners it must have the highest relative input frequency in comparison to other adjective suffixes – they hear more adjectives containing -y than other adjective suffixes, as the absolute majority of complex words containing suffix -y are relatively simple in structure and, as noted by Quirk et al. (1994, pg. 1553), are often of colloquial tone or express some diminutive meaning. Possibly these factors may also account for the high frequency of -y in the responses of L2 learners.

CONCLUSIONS

The study has demonstrated that, as it was hypothesised, adult learners of English at the pre-intermediate proficiency level of English know suffixes much better than prefixes. The acquisition of affixes of both categories is highly cor-

Second, wide dispersion of -ing, -ed, -y and -ly may be the reflection of the polyfunctionality of these suffixes in English. -ed and -ing are used not only as derivational suffixes, but are also employed as inflections to form gerunds and participles. The percent distribution of -ing and -ed among different parts of speech demonstrates that the participants do not differentiate between their inflectional and derivational functions, but are aware of the polyfunctionality of the suffixes and even of some restrictions on their use – the percentage of -ed used to form nouns is less than the percentage of -ed used to form other parts of speech.

The same argument of polyfunctionality could be applied in order to explain the occurrence of -ly and -y in the sample – both suffixes -ly and -y can be used as adjective-forming suffixes. Orthographic and/or phonetic similarity of suffixes -y and -ly may burden the task of the acquisition of the suffixes' functions even more. On the other hand, in the sample both -y and -ly are used to form adjectives and adverbs more frequently than nouns or verbs.

related with affixes' cumulative type frequency in English. In cases when affixes' frequency distribution in language is not even, at the initial stage of language learning, affixes' relative input frequency may have greater influence on their

acquisition than cumulative frequency. More frequent affixes are known better and often overgeneralized to express the meaning of less frequent affixes. Although overgeneralizations are

usually constrained within the functional classes of affixes, affixes' polyfunctionality, orthographic or/and phonetic similarity may raise difficulties ascribing functional categories to them.

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KAI KURIŲ KOGNITYVINIŲ VEIKSNIŲ ĮTAKA DERIVACINĖS MORFOLOGIJOS ĮSISAVINIMUI

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Reziumė

Ištirti kai kurie kognityviniai veiksniai, galintys nulemti anglų kaip užsienio kalbos derivacinių morfemų įsisavinimą. Atlikus eksperimentą nustatyta, kad morfemų įsisavinimui turi įtakos: (a) morfemos padėtis žodžio šaknies atžvilgiu – priegamos įsisavinamos daug geriau nei priešdėliai; (b) morfemų bendrasis ir santykinis dažnumas kalboje – dažnos morfemos įsisavinamos geriau nei morfemos, tu-

rinčios nedidelį dažnumą; (c) morfemų funkcinės bei fonetinės/ortografinės ypatybės – jau pradiniam kalbos mokymosi etape derivacinės morfemos įsisavinamos kaip elementai, turintys tam tikrą semantinę ir gramatinę funkciją, tačiau jų daugiafunkcionalumas bei fonetiniai/ortografiniai panašumai šį procesą gali ap sunkinti.

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