



# **MULTI-LEVEL STUDENT ESSAY FEEDBACK IN A LEARNER CORPUS**

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**Dialog 2017, June 03**

# Russian Error-Annotated Learner English Corpus

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The screenshot displays the REALEC (Russian Error-Annotated Learner English Corpus) web interface. The browser address bar shows the URL: `realec.org/hse/#/data_4_staff/IELTS/IELTS2015/AAliutova_10_1`. The interface features a list of seven sentences, each with various linguistic errors highlighted by colored boxes and labels. The labels include:

- Choice of articles
- Choice of lexical item
- Agreement - Number
- Absence of necessary explanation or detail
- Choice of tense
- Punctuation
- Form of articles
- Redundant component in clause or sentence
- Word choice
- Wrong choice of referential device
- Formational suffix

The sentences and their associated error labels are as follows:

- Given diagram visualize the proportion of population aged 65 and over in Japan, Sweden and the United States from 1940 to 2040. (Choice of articles, Choice of lexical item, Agreement - Number)
- In all of the countries, the proportion was growing rapidly during the century, with Japan being an exception , where it was stable from 1940 to 1980, decreasing slightly from 5% to about 3% in 1960. (Absence of necessary explanation or detail)
- After a stable period , we see a huge incline that would occur in Japan from 2020 to 2040. (Choice of lexical item, Choice of tense)
- About a third of a population would be aged 65 and over in 2040, compare that to below 5% part in 2000. (Choice of articles, Absence of necessary explanation or detail, Choice of tense, Punctuation, Redundant component in clause or sentence)
- USA, however, had bigger part of old people throughout the century , having 10% in 1960 and even 15% in 1980, but the overall part would be below Japanese in 2040, whew 25% would be 65 and older. (Form of articles, Choice of lexical item, Absence of necessary explanation or detail, Choice of tense, Spelling, Choice of tense)
- Sweden chart is almost equal to the US one, only big discrepancy is 20% in 2020 in Sweden versus below 15% in the US. (Word choice, Wrong choice of referential device, Choice of articles)
- Overall, we can see a strong tendention that population is getting older at a whole with time in these countries. (Formational suffix, Choice of articles, Redundant component in clause or sentence)

# Objectives

- Error statistics across the ‘best’ and ‘worst’ essays
- Selection of lexical and syntactic complexity features as indicators of a successful / unsuccessful text

**Ultimate goal:**

**Automatic essay feedback that a student can get after uploading his / her essay in the corpus**

# Experiment setup

## Collection:

- 1000 essays describing graphs
- 1000 argumentative essays

## With focus on:

- ‘best’ (graded 75% and over)- 33 essays
- ‘worst’ (graded 30% and lower) - 43 essays

# Error analysis

	Essays scored 75% and higher	Essays scored lower than 30%
Average number of all error tags in one essay	19	19.5
Minimum and maximum number of all error tags	3 to 60	10 to 66
Average number of syntactic errors	2	3
Average number of discourse errors	3	3



# IELTS

- the number of words, relevance to the topic in the question, and coverage of all parts of the question (Task Achievement/Task Response)
- organisation, connection of sentences and paragraphs with logical links and referential tools, no or little repetition (Coherence and Cohesion)
- use of appropriate academic words and collocations, use of paraphrase to avoid repetition, correct spelling (Lexical Resource)
- use of a variety of grammatical forms, combination of short and complex sentences, and not too many grammatical mistakes (Grammatical Range and Accuracy)

# Lexical evaluation with REALEC-Inspector

1. Number of words in the essay
2. Average length of a sentence in the essay
3. Length of the longest sentence in the essay
4. Average length of word in the essay
5. Length of the longest word in the essay
6. Number of words of each level of CEFR in the essay
7. Number of words from the COCA frequency lists
8. Number of academic words in the essay (with/without repetitions)
9. Number of repetitions of words used in the essay.
10. Number of linking words and expressions in the essay

# Lexical evaluation with REALEC-Inspector

**Number of words:** 290

**Average sentence length:** 18.875 words.

**Max sentence length:** 32 words.

**Average word length:** 5.10104529617 letters.

**Max word length:** 18 letters.

**CEFR**

A1: 49

A2: 16

B1: 11

B2: 7

C1: 1

C2: 0

Unclassified: 38

Stopwords: 36

**Frequency:**

1-500: 39

501-3000: 36

>3000: 47

**Academic words:** 71 (51 unique)

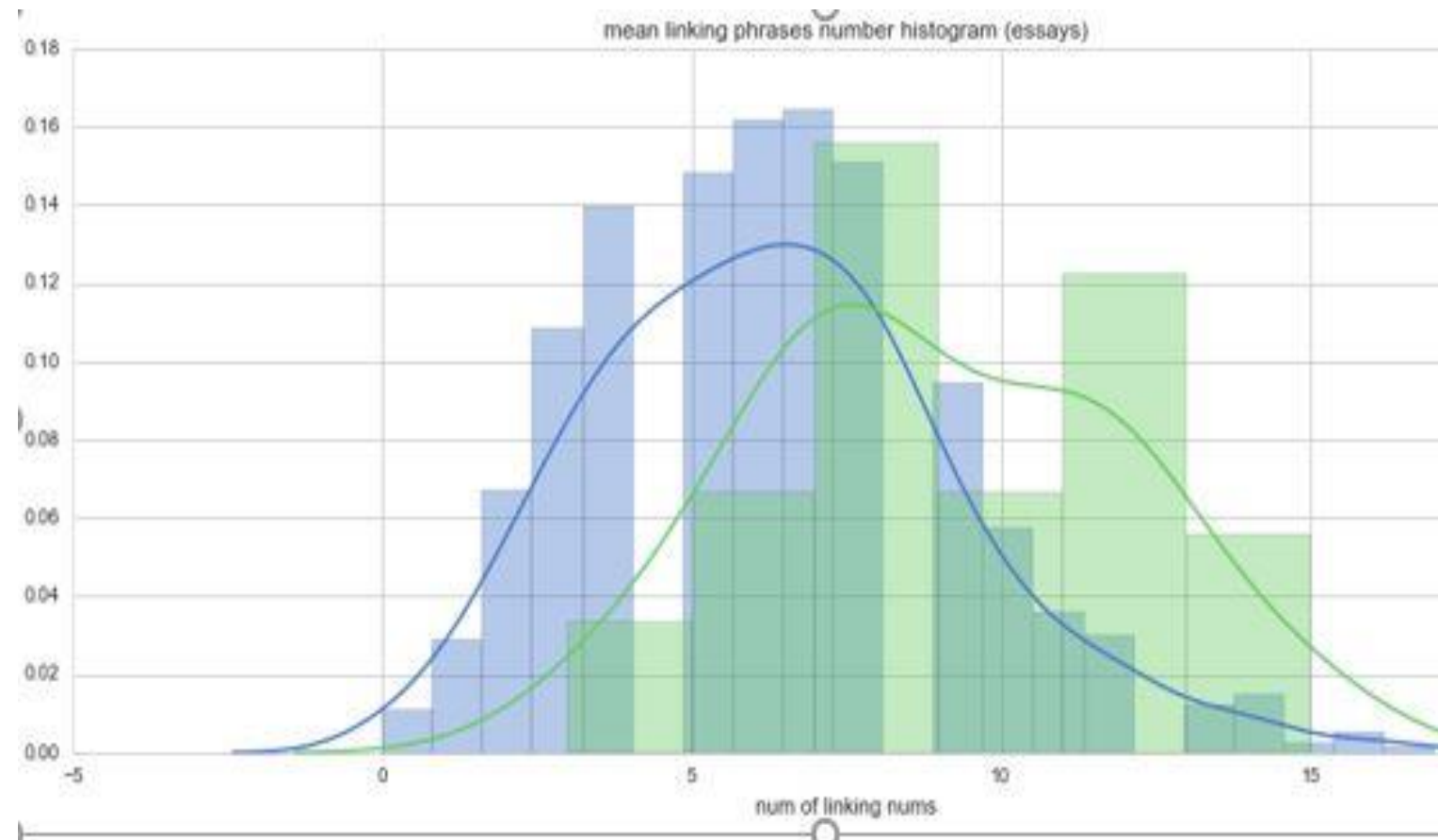
**Word repetitions:** 44 (('children', 6) is the most repeated)

**Linking phrases:** 12

**Pearsons collocations:** 7 (5 unique)



## Distribution of linking tools number: good essays vs bad essays



# Linking tools statistics

## **Linking Phrases**

There are 12 introductory phrases.

*Comparison:* 0

*Time and sequence:* 5

then: 2

now: 2

nowadays: 1

*Addition:* 4

also: 3

moreover: 1

*Cause and Effect:* 0

*Conclusion and summary:* 1

in conclusion: 1

*Examples:* 1

for example: 1

*Concession:* 0

*Repetition:* 0

*Giving reasons, explanations:* 0

*Contrast:* 1

however: 1

# Collocations statistics

## **Pearsons Collocations**

There are 7 collocations, 5 of which are unique.

nuclear family; dominant position; closer look; wide range; modern society;

# Lexical complexity parameters: ‘best’ vs ‘worst’

Parameters for automated lexical inspection	Essays scored 75% and higher		Essays scored lower than 30%	
	Task 1	Task 2	Task 1	Task 2
1) Average number of words in the essay	203	292	174	161
2) Average length of a sentence in the essay (N words)	21	20	17	16
3) Length of the longest sentence in the essay	37	39	33	30
4) Number of academic words in the essay (with/without repetitions)	41/28	69/51	33 /18	42/29
5) Number of linking words and expressions in the essay	5	7	3	4
6) Number of collocations from the Pearson ACL (with/without repetitions)	0,8/0,8	0,73/0,73	0,38/0,35	0,38/0,38

# Syntactic complexity

Parsed with UD-Pipe (Straka et al. 2015)

Input Text

Input File

It is an example.

↓ Process Input ↓

Output Text

Show Table

Show Trees

Save Output File

```
# newdoc
# newpar
# sent_id = 1
# text = It is an example.
1  It  it  PRON  PE  Number=SinglPerson=3lPronType=Prs 4  nsubj  _  _
2  is  be  AUX  VA  Mood=IndlNumber=SinglPerson=3lTense=PreslVerbForm=Fin 4  cop  _  _
3  an  a  DET  RI  Definite=IndlNumber=SinglPronType=Art 4  det  _  _
4  example  example  NOUN  S  Number=Sing 0  root  _  SpaceAfter=No
5  .  .  PUNCT  FS  _  4  punct  _  SpaceAfter=No
```

# Syntactic complexity

## Syntactic depth

Calculated as max path length to the root (2-10)

## Subordination

# adverbial clauses (advcl): when, where, why..

# relative clauses (acl:relcl)

# other adnominal clauses, incl. participle groups  
and which-clauses



# POS and syntactic parsing

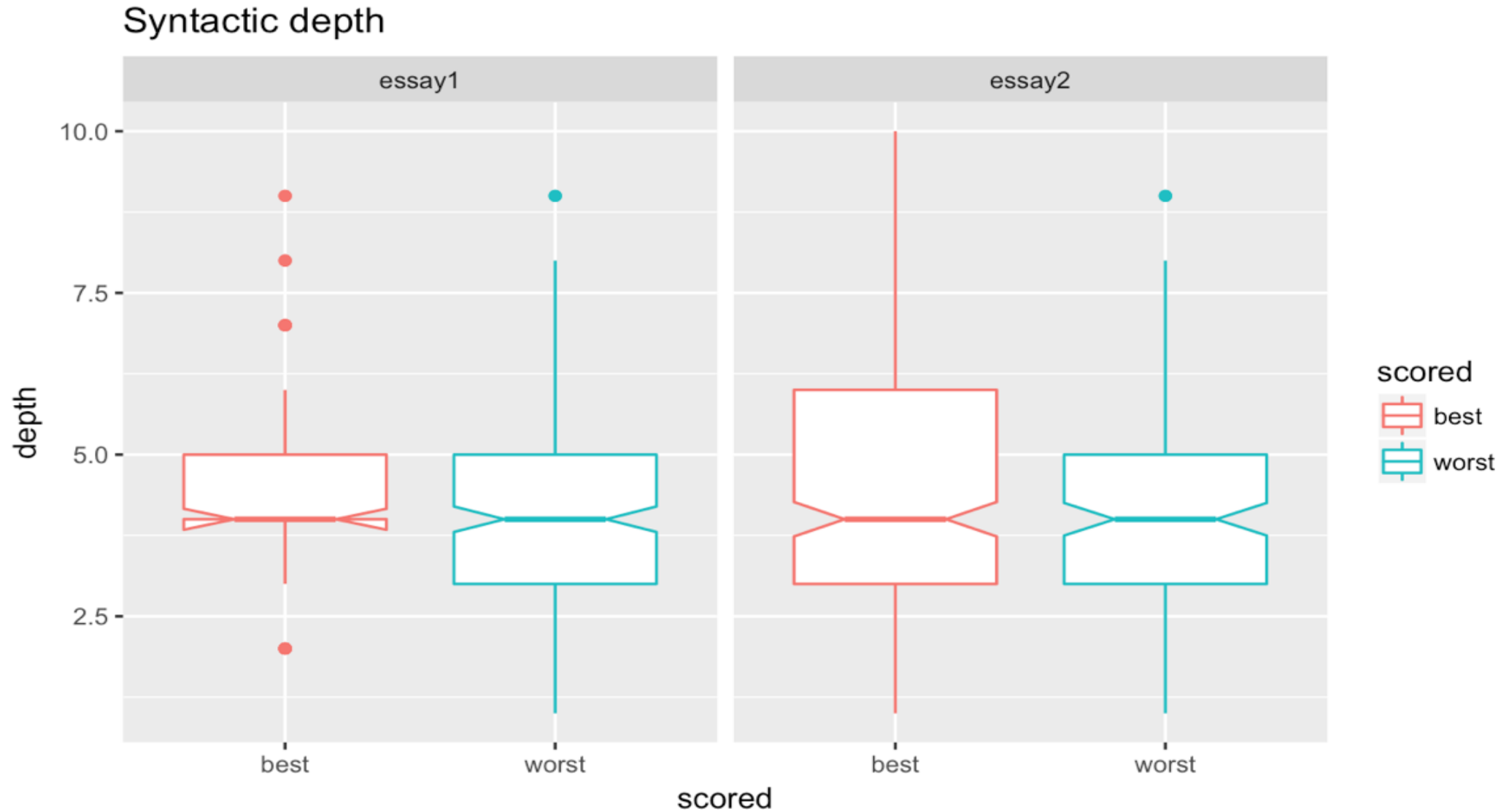
## Subordinate clause types per essay

Grade Cat	mean.acl	mean.acl:relcl	mean:advcl
best	$3 \pm 0.82$	$3.25 \pm 0.85$	$5.41 \pm 1.07$
worst	$1.21 \pm 0.42$	$1.43 \pm 0.38$	$1.86 \pm 0.5$

## Correlation of the syntactic features

	MeanDepth	N_acl	N_acl:relcl	N_advcl	N_AllSubordCl
Grade	0.203	0.397	0.462	0.599***	0.630
MeanDepth		0.375	0.311	0.179	0.346
N_acl (adnominal clauses)			0.355	0.383	0.698
N_acl:relcl (relative clauses)				0.548	0.785
N_advcl (adverbial clauses)					0.867

# Mean syntactic depth of sentences by essay type and grade category



# Conclusions