



Why is English so difficult to learn? A study of Latin and Anglo-Saxon words in English

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BACKGROUND

- We see that the age of acquisition when learning words with Anglo-Saxon influence is earlier than when learning Latin influence words. This is interesting because most of the academic words in English are based on Latin background or Greek.
- Previous research has shown that word frequency is the strongest predictor of visual words recognition and it is considered the most influential factor in models of language processing. On the other hand, some current solutions are insufficient because there are some inconsistent findings in the literature and important theoretical implications.
- We also know that age of acquisition effect plays a significant role in word processing and should be used as a control factor in experiments in which different word stimuli are used.
- Our hypothesis is that Latin words will have a higher age of acquisition, a higher prone to error and a high complexity.

	Latin origin	Anglo-Saxon origin
Age of acquisition	higher	lower
Prone to error	higher	lower
Complexity	higher	lower

METHODS

Data Influence methods:

- The data that is being used for this study comes from a study by Washington University done by Cohen-Shikora, Emily.
- The data was collected from 127 participants this participants were native-English speakers and they had 80% better accuracy when naming.
- The words for this study were selected from multiple sources some words were taken from Andrews and Heathcote.

1st look at the screen → reading aloud → word naming task
2nd use keyboard → identify if is a word or a non-word



How we used the data collected:

- Using this data we categorized each word as having Latin or Anglo-Saxon origin using online etymology dictionary for 461 number of words.
- From this data collected from Washington University we analyzed this specific categories:
 - Frequency
 - Rating Mean: Average Age Acquired
 - Number or Syllabus
 - Mean RT: Lexical Decision Response Time
 - Mean Accuracy: Lexical Decision Accuracy
 - NGM Mean: Naming Task Response Time Average
 - NGM Mean Accuracy: Naming Task Accuracy

- We also analyzed results from a naming task, accuracy and response time and in regards to lexical decision we analyzed accuracy and response time as well.
- Vocabulary was also analyzed to compare the frequency of each word whether it was Latin or Anglo-Saxon based.

RESULTS

- We analyzed 461 words which 253 come from Latin origin words and 187 came from Anglo-Saxon/Germanic origin words.
- Descriptive Statistics were analyzed to compare the mean and standard deviation of each category (Table 1)
- 1. Lexical Decision Response Time Average:** refers to time taken to response if stimuli presented was a word or non-word.
- 2. Lexical Decision Accuracy Average:** refers to accuracy of correct selection when stimuli (word or non-word) was presented.
- 3. Naming Task Accuracy:** accuracy when participant needed to read the stimuli aloud.
- 4. Naming Task Response Time:** time taken to respond to reading words presented aloud.
- 5. Average Age Acquired:** age that the word was learned
- 6. Frequency reported from the word:** how many times each certain word is used in the English vocabulary.
- 7. Number of Syllables:** how many syllables are in the word presented to the participants

Table 1. Descriptive Statistics

	Latin Origin			Anglo-Saxon/Germanic Origin		
	N	M	SD	N	M	SD
Frequency	253	36.67	111.86	187	30.63	192.39
Average Age Acquired	253	6.20	1.19	187	5.74	1.48
Number of Syllables	253	2.41	.84	187	1.90	.72
RT (Lexical Decision)	253	666.67	79.05	187	680.60	80.82
Accuracy (Lexical Decision)	253	.96	.04	187	.95	.06
RT (Naming Task)	253	648.48	60.12	187	639.84	49.94
Accuracy (Naming Task)	253	.98	.03	187	.98	.03

Note: RT= Response Time

Table 2. Results of Independence Samples T-Test for Equality of Means

	t	df	p
Frequency	-.38	277	.70
Average Age Acquired	-3.54	348.53	.00
Number of Syllables	-6.904	429.12	.00
RT (Lexical Decision)	1.80	395.93	.07
Accuracy (Lexical Decision)	-2.87	300.78	.00
RT (Naming Task)	-1.64	432.02	.10
Accuracy (Naming Task)	.34	395.98	.73

Note: RT= Response Time

Per described on table two (2) we see do not see any significant differences for frequency $t(227) = -.38$, $p\text{-value} = .70$. Another characteristic that did not show significant differences is RT (lexical decision) with $t(395.93) = 1.80$, $p\text{-value} = .07$. In addition, RT (naming task) $t(432) = -1.64$, $p\text{-value} = .10$ does not show any significant differences either. Accuracy at naming task is also not significant with $t(395.98) = .34$, $p\text{-value} = .73$.

However we see significant differences on average age acquired, number or syllables, and accuracy at lexical decision of word from Latin origin and Anglo-Saxon/Germanic. These are being shown below:

Table 3. Significant Differences

Average Age Acquired	Significant with $t(348.53) = -3.54$, $p\text{-value} = .00$
Number of Syllables	Significant with $t(429.12) = -6.90$, $p\text{-value} = .00$
Accuracy (Lexical Decision)	Significant with $t(300.78) = -2.87$, $p\text{-value} = .00$

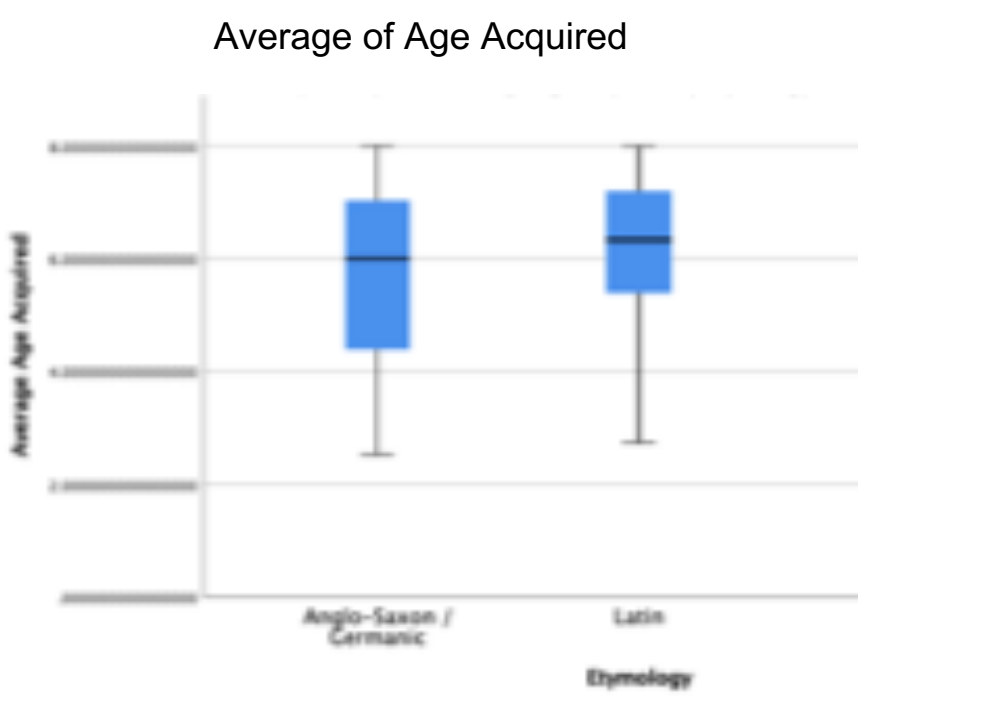


Figure 1.
Illustrates the differences between Average Age Acquired by Etymology.
In this graph, we can see that Latin words are acquired at a later time compared to Anglo-Saxon/Germanic words.

LIMITATIONS

- Limited number of stimuli (words) Latin and Anglo-Saxon/Germanic.
- Should obtain the work bank to see how many non-words came from origin Latin and or origin Anglo-Saxon/Germanic.
- Future studies should include more words to see a more significant score when analyzing for any differences between Latin origin words and Anglo-Saxon origin words.

CONCLUSIONS

- Results showed a significant difference in average age acquired, number of syllables and accuracy at lexical decision (selecting if word or non-word).
- Findings support the hypothesis that there is a significant difference in age of acquisition, this is probably because as most academic words come from Latin origin and they get more complex as the child advances with education.
- Latin origin words are learned at a later age, we have seen that words from Anglo-Saxon/Germanic origin are learned earlier in life, this is most likely because the number of syllables are smaller compared to Latin origin words.
- In addition, the accuracy at lexical decision is significant we assume that this is because since Anglo-Saxon/Germanic words usually have fewer syllables and are learned earlier in life, they are easier to identify if they are a word compared to words from Latin origin.

DISCUSSION

These results help in the development of a future study analyzing the reaction time and accuracy when doing a behavioral task, this test is being accompanied by neuroimaging produced by fNIRS. Using the data observed for this research will help develop future studies with the focus on having children learn English Latin origin words earlier in life. However, we believe that if we would have included more words of either Latin or Anglo-Saxon origin, the results might be more compelling.

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