

# Experiments in investigating sound symbolism and onomatopoeia

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## Abstract

The area of sound symbolism and onomatopoeia is an interesting area for studying the production and interpretation of neologisms in language. One question is whether neologisms are created haphazardly or governed by rules. Another question is how this can be studied. Of the approximately 60 000 words in the Swedish lexicon 1 500 have been judged to be sound symbolic (Abelin 1999). These were analyzed in terms of phonesthemes, (i. e. sound symbolic morpheme strings) which were subjected to various experiments in order to evaluate their psychological reality in production and understanding. In test 1 nonsense words were constructed according to the results of the preliminary analysis of phonesthemes and then interpreted by subjects. In test 2 subjects were instructed to create new words for some given, sense related, domains. In test 3 subjects were to interpret these neologisms. Test 4 was a lexical decision experiment on onomatopoeic, sound symbolic and arbitrary words. The results of the first three tests show that the phonesthemes are productive, to different degrees, in both production and understanding. The results of the lexical decision test do not show perceptual productivity. The methods are presented and discussed.

## Background

Onomatopoeic and sound symbolic neologisms are interesting insofar as they show productivity at the lexical level. They have a relation to the issues of phylogeny and ontogeny of language. Was onomatopoeia involved in the development of language and does it help the child to acquire language? Onomatopoeia and sound symbolism often have an iconic or indexical relation between expression and meaning (just as gestures, cf Arbib 2005). Most linguists who are specifically interested in the phenomenon of sound symbolism and who view it as an integral part of language, also regard it as productive. In traditional etymology, on the other hand, the explanation of new coinages is often just by analogy with *one* other word (which implies non-productivity). Rhodes (1994) discusses onomatopoeia and he distinguishes between wild and tame words, these being the ends of a scale. "At the extreme wild end the possibilities of the human vocal tract are utilized to their fullest to imitate sounds of other than human origin. At the tame end the imitated sound is simply approximated by an acoustically close phoneme or

phoneme combination.” Bolinger (1950) did an assonance-rime analysis of English monosyllables where the initial consonants constitute the assonance and the remainder of the syllable is the rime. He argues that assonance-rime analysis (of tame words) is morphology because assonances and rimes do not combine productively. That, however, does not mean that a construction is frozen. He introduces the term “active” for constructions that produce monosyllables continuously, at a slow rate.

The questions that were tested in the present experiments are 1) whether phonesthemes are productive, (also in the interpretation of neologisms) 2) whether some phonesthemes are more productive than others. The intermittent occurrence of new forms, which fit into a pattern – in speech, prose and fiction, especially in child literature, constitutes an argument for productivity. The opposite view would mean that new coinages would be phonetically and semantically haphazard. However, with that view, the fairly wide-spread and easy comprehension of new forms would be difficult to account for. When being presented with deliberately constructed nonsense words, listeners usually have no objections to or difficulties in assigning some interpretation to them.

### **Tests 1–3**

Test 1 is a free choice test which goes from expression to meaning in order to test the understanding of presumptive sound symbolic clusters (based on the analysis in Abelin 1999), e.g. "What would be a good meaning for the word *fnotig*?" Test 2 is a free production test, which goes from meaning to expression, to test the production of sound symbolism, e.g. "Invent a short word for somebody who is stupid". Test 3 is a matching test between the meanings and the neologisms of test 3.

### **Results from test 1–3**

Test 1: The forms and meanings that gave the highest number of expected results (according to the previous lexical analysis) were: pj– pejorative, skr– broken and skv– wetness. There was a difference in interpretability between the clusters and subjects also interpreted differently.

Test 2: The meanings that were rendered the best (according to the previous lexical analysis) were pejorative, bad mood and wetness. The meanings were encoded mostly in initial clusters. The less frequent semantic features (like dryness) produced more forms breaking phonotactic rules.

Test 3: The matching between the six meanings and columns of neologisms gave a 100% correct results.

## Test 4

Test 4 is a lexical decision test (described in Abelin, 1996). The purpose was to find out how real onomatopoeic (A), sound symbolic (B) and arbitrary words (C) and constructed onomatopoeic (D), sound symbolic (E) and arbitrary (F) words behave in a lexical decision experiment. In previous lexical decision experiments one finding is that non-words are recognized more slowly than real words. This raises the question if non-words made up from clusters which are highly onomatopoeic or sound symbolic are recognized more slowly or more quickly than nonsense words constructed from sound combinations which are normally arbitrary. Another question is: Which onomatopoeic and sound symbolic non-words (i. e. words built from onomatopoeic or sound symbolic elements) are confused for "real words"? "Real words" are (in this experiment) words that are either found in a (modern) lexicon or judged by speakers to be lexicalized, i. e. not neologisms.

The research questions concerned whether:

1. Onomatopoeic and sound symbolic words will more often be responded to incorrectly as compared with arbitrary words.
2. These words will have longer reaction times than arbitrary words.
3. Non-words constructed from consonant clusters typical for onomatopoeic and sound symbolic words will be responded to more incorrectly than nonsense words constructed from arbitrary words.
4. These words will have longer reaction times than nonsense words constructed from arbitrary words.

## Results from test 4

Subjects were fastest and most free from errors with the arbitrary words. They were slower with onomatopoeic and sound symbolic words (and made many more mistakes). They were slowest on non-words, but did less mistakes with non-words, as a whole. They made most mistakes with real sound symbolic words.

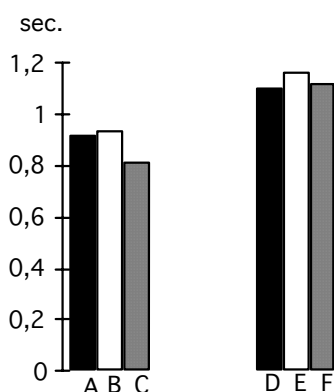


Figure 1. Mean length of reaction times for the different word groups. The differences between C and A, B are significant.

Somewhat surprising was that real onomatopoeic and sound symbolic words were judged as non-words more often than the corresponding non-words were judged as real ones. But – they were still significantly faster than the non-words. The intermediate speed gives them a status between arbitrary words and nonsense words implying an intermediate processing time.

### Discussion of tests 1–4

The test 1–3 showed productivity for both production and perception, to different degrees for different phonesthemes. The results of test 4 are not in favour of perceptual productivity, since, instead of non-words modelled on sound symbolic phonesthemes being interpreted as real words, real sound symbolic word were often interpreted as non-words. These experiments are further developed for the study of neologisms.

### References

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