

ON THE UNIVERSAL CHARACTER OF PHONETIC SYMBOLISM
WITH SPECIAL REFERENCE TO VOWELS^{1,2}

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1. Introduction

In various articles (1964, 1967, 1970, 1971) Bertil Malmberg has mentioned the fact that "l'arbitraire du signe" is never absolute in a language; there will always be layers of the vocabulary, representing a more primitive stage of the language, in which the relation between sound and meaning is partly motivated, i.e. onomatopoeic and expressive words, particularly often found in child language and in poetry. Partly inspired by Roman Jakobson, Malmberg calls attention to the need for a systematic investigation of this vocabulary in various languages, supplemented by psycho-linguistic tests in order to find out what is universal in the expressive function of these partly motivated signs. The present article is meant to give a contribution (though a very modest one) to the solution of this problem.

As far as purely onomatopoeic words are concerned, it is evident that they have a universal basis, although their form is also determined by the phonological system of the language in question. It is more problematic whether expressive words, which do not imitate sounds, have a universal basis.

1) Published in Sign and Sound, Studies presented to Bertil Malmberg on the occasion of his sixty-fifth birthday (eds. B. Sigurd and J. Svartvik), Studia Linguistica 32/1-2, 1978.

2) I am grateful to Niels Davidsen-Nielsen for improvements of my English style.

2. Westermann's description of phonetic symbolism in West African languages

In 1937 D. Westermann published an interesting paper on sound and meaning in some West African languages. In these languages (Ewe, Twi, Gã, Guang, Nupe, and Temne, which are all genetically related), expressive words (which Westermann calls "Lautbilder") play a much more important part than in European languages. The words may be old and common to related languages, but new ones can be formed any moment and are immediately understood by the listeners because they are created according to definite principles. Almost all phonetic features may have an expressive value: reduplication, vowel length, vowel quality, intensity and manner of the articulation of consonants, and pitch.

According to their expressive value the vowels of these languages can be divided into three categories: (1) e ɛ a (2) u o ɔ (3) i. In Westermann and Ward 1933 the a of West African languages is said to be most often close to Italian a, but in the cardinal vowel diagram of Ewe (the main source of Westermann's examples) it is placed very close to Cardinal vowel No. 4. This means that a in these languages may be a front or a central vowel. In Westermann's article on sound and meaning it is said that in the cases where a language has two a-sounds, the back a will belong to the u o ɔ category. The two categories e ɛ a and u o ɔ are thus generally front (and central) unrounded vs. back rounded. They are used to express opposite meanings, which are characterized very generally as "intensive" versus "extensive", but which can be divided into the following four groups (Westermann 1937, p. 166):

Runder dunkler Vokal	Flacher heller Vokal
a) massig, dick, plump, gedunsen, bauchig, hohl, rund, tief	dünn, lang gestreckt, gerade, flach, ausgebreitet, offen
b) schlammig, schleimig, lose, weich, schwach	hart, fest, steif, stark

- | | | |
|----|--|---|
| c) | schwer, langsam, unbeholfen,
lässig | leicht, rasch, behende, ge-
wandt, lebhaft |
| d) | dunkel, trübe, dumpf | hell, glänzend, heller Klang. |

Generally, in expressive words, e ɛ a are combined with high tone and u o ɔ with low tone, but it is not always the case, and besides reinforcing the expressive value of vowel quality tone differences have other expressive values; in particular low tone is used to indicate big and lax things, and high tone to indicate small and tense things, or a high degree of something. And the tone may be shifted to give shades of meaning so that, for instance, a word which indicates things that are normally big will normally have a low tone, but if in certain situations the thing indicated is small, the tone is changed to high.

It is a characteristic feature of these languages that the vowel i does not come within the category of front unrounded vowels, but has its own specific expressive values, indicating something narrow, tight, squeezed or very dark.

Westermann gives ample documentation from several languages of the expressive functions described.

3. Testing Westermann's vowel categories on Danish subjects

In order to test whether these expressive values of the vowels in West African languages are found at least as latent possibilities in quite unrelated languages as well, I undertook a very simple experiment. Two groups of Danish students (43 in 1951, and 56 in 1963), who had just started a course in elementary phonetics, were asked to match the two vowel categories e ɛ a and u o ɔ with the members of a selected set of adjective pairs taken from Westermann's description. The pairs of adjectives were for (a) thin/thick (Danish tynd/tyk), and flat/round (flad/rund); for (b) hard/soft (hård/blød), tight/loose (fast/løs), and weak/strong (svag/stærk); for (c) light/heavy (let/tung), quick/slow (hurtig/langsom), and agile/clumsy (behændig/klodset);

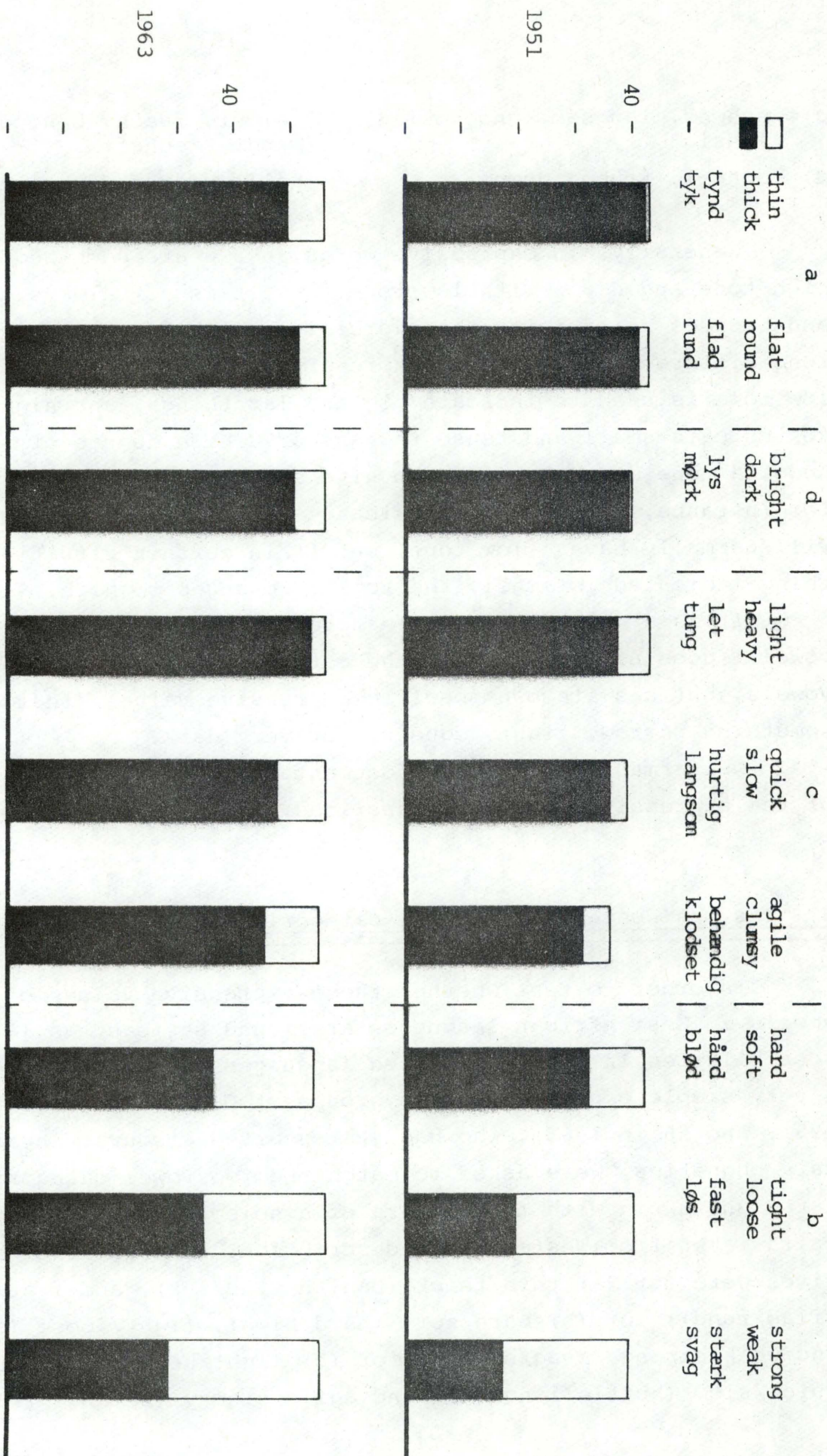


Figure 1

Two vowel categories e æ and u o ɔ matched with pairs of adjectives by two groups of Danish students.

and for (d) bright/dark (lys/mørk).

The two vowel categories were written on the blackboard in phonetic transcription, and the adjective pairs were also listed on the blackboard with the two members in random order, i.e. in some pairs the member that corresponded to West African e ɛ a was first, in some last. The students were asked to match adjectives and vowels so that the members of each adjective pair were distributed on the two vowel categories. (It should be noted that Danish a will be pronounced as a front vowel [æ] in isolation, whereas it is a relatively back vowel before and after r and, when it is short, also before velars and (for most speakers) before labials.)

This was a rather crude test since the vowels were not tested separately, and there was only a forced choice answer, so that if, e.g., "thick" was felt to match with u o ɔ, then "thin" had to be matched with e ɛ a. The answers can therefore only prove that there is a relative difference between e ɛ a and u o ɔ in this respect.

It is striking, however, how close the agreement is with the way the vowels are used in the West African languages, and there is also a very close agreement between the two groups of students. For the six pairs belonging to Westermann's groups (a) (c) and (d), 79 to 98% of the Danish students were in agreement with the West Africans. (In a few cases the students did not make any decision (the maximum is 7, for agile/clumsy in the 1951-experiment). In the calculation of percentages these few cases have been distributed evenly on the two categories.) All these answers are significantly different from chance at the 0.01% level. For group (b), however, (comprising hard/soft, tight/loose and weak/strong) only hard/soft shows a positive agreement with the use in the African languages (76 and 67%, significant at the 0.1 and 1% level), whereas the two other pairs did not give any significant difference. The answers are displayed graphically in figure 1, where they are ordered from left to right according to the degree of agreement (a,d,c,b).

It might be assumed that the vowels of the Danish adjectives have influenced the answers. In the examples *flad/rund*, *let/tung* and *behændig/klodset* the vowels support the answers given, but not in the other cases which have just as high a percentage, so this cannot be the reason. Moreover, the results are supported by other experiments on Danish vowels (E. Fischer-Jørgensen 1967). That Danish e ɛ æ are felt to be brighter than u o ɔ has been proved by various experiments with a large number of subjects, who have been asked to group vowels as bright or dark, or to evaluate their brightness on a seven point scale, or to match vowels with a grey scale or with colour charts. As for the other oppositions, experiments with seven point scales have shown e ɛ æ to be felt as thicker than u o ɔ, and experiments with a smaller number of vowels using the same method have shown ɛ to be harder, lighter, and more flat than ɔ and u. But for tight/loose the order did not correspond to Westermann's two categories (but depended on the degree of openness of the vowel), and just as in the first mentioned experiment, there was no clear distribution for strong/weak (but Westermann also had very few examples for this latter opposition). These other experiments thus support the results of the e ɛ æ / u o ɔ test in every respect. The only two pairs which have not been tested by other methods are agile/clumsy and quick/slow. (It should be noted that in these latter tests the point of view has been shifted. Westermann stated that e.g. the vowel u was used to express something dark, but in these tests the question was whether the vowel u could be called a dark sound. However, this difference is not crucial to the issue, since a dark sound must be able to symbolize something dark.)

As for the vowel i, it was not included in the test undertaken to investigate the agreement with the West African phonetic symbolism, but it was included in all the other tests, and in all cases it behaved like the other front vowels, and i even had an extreme position, being the most thin, flat, bright, light, and hard of all the vowels. As for the specific expressive values mentioned by Westermann, there is agreement in so far as i was considered to be more small, tight, tense, and compact than the

other vowels (and of these qualities only small/big showed a correlation with front/back), but i was never considered to be dark, on the contrary it was the brightest of all vowels.

4. Evidence from other languages

The almost complete agreement between the value of vowels in expressive West African words and the results of tests with Danish subjects clearly shows that these values are not dependent on specific languages or cultures. Moreover, experiments with speakers of various other languages, reported in the literature, support the hypothesis of almost universal values.

The connection of bright-dark with front and back vowels, respectively, has been mentioned very often. For instance, subjects who have associations between vowels and colours generally tend to combine front vowels with bright colours and back vowels with dark colours, and front vowels are also often combined with specifically bright hues (particularly yellow), and back vowels with specifically dark hues (particularly blue). Cases of audition colorée for single persons showing this tendency are mentioned by Roman Jakobson 1941, p. 66-67 (German and Czech), G. Reichard, R. Jakobson and E. Werth 1949 (Serbian/Hungarian), D.U. Masson 1951 (English). Collections of more extensive material comprising many persons and showing the same tendency are reported by Flournoy 1893 and A. Argelander 1927 (German, French, and English). Normally the vowel i goes with the front vowels, but there are also examples of i being felt as black. This is e.g. the case for some French subjects and a great number of English subjects.

Newman (1933) used comparisons of nonsense words and also found that front vowels were considered to indicate brightness and back vowels darkness. Similarly, 97% of Fónagy's subjects (1963) considered i to be brighter than u, cf. also Peterfalvi 1965.

As for the other oppositions it is well known that Sapir (1929) undertook some experiments on sound symbolism and found that nonsense words with relatively open vowels were considered to indicate big things as compared with words with relatively close vowels (cf. also Tarte 1974). Miron (cit. Chastaing 1964) asked American and Japanese subjects to place CVC-syllables on 7-point scales and found that syllables with front vowels were considered smaller, thinner, lighter, and quicker than syllables with back vowels. The subjects used by Fónagy (1963) found *i* to be smaller, quicker, lighter, thinner, and (partly) harder than *u*, whereas the answers to "stronger?" were less clear. In most cases front unrounded vowels have been compared with back rounded vowels, but it has generally been assumed that the front-back difference was the important one. Westermann, however, believed that the unrounded-rounded difference was the decisive one for the symbolism. The above mentioned experiments with Danish vowels, comprising rounded front vowels, showed that both rounding and backness contribute to make vowels seem darker, thicker, heavier, softer, and bigger.

The results of these different investigations are in very good agreement with each other. Taylor's assumption (1963) that people's responses in tests should be due to accidental frequencies of some sounds in semantically related words of their mother tongue can thus be refuted.

5. Expressive use of sounds in real languages

The finding of universal symbolic functions by means of tests does not mean that these potential symbolic values are utilized to any great extent in the normal vocabulary of all languages. The West African languages certainly constitute an extreme case. But studies of other languages have also revealed a certain number of expressive words. Since it is difficult to judge about expressiveness in one's mother tongue, comparative or statistical methods are preferable.

Otto Jespersen (1922) found that the vowel i was used in words for "little", and in words for small things, children and young animals, in a large number of languages much more frequently than should be expected (cf. also Thorndike 1946). Roman Jakobson (1960) interpreted the findings of Murdock concerning phonetic similarities between the words for mother and father in many unrelated languages. Chastaing (1964) studied dictionaries and frequency lists and found that in French 90% of the words for "small" contain front vowels (particularly i and y), whereas 80% of the words for "big" contain back vowels. Similarly, most of the French words for "dark" have back vowels, and most of the English words for "bright" have front vowels (but not vice versa). Thus, the symbolic values of vowels are used to a certain extent also in European languages.

It has also been attempted to test the universal character of expressive sounds in normal words by translating pairs of words with opposite meanings into a foreign language and ask subjects not knowing this language to guess what means what. Ertel (1969) gives a survey of a large number of experiments of this type, carried out by various psychologists, most of them with a positive result. He has himself undertaken such experiments with German subjects using 25 different foreign languages. In contradistinction to most other investigators he does not use single German word pairs but 8 different adjective pairs, covering the same semantic area, for comparison with each foreign word pair. He gets mostly positive results, but they are only significant for the semantic area "activity" ("Erregung"). Even with the precautions taken by Ertel this method seems rather dubious, because so much depends on the words chosen. In one case (Maltzman et al. 1956), English subjects were also asked to compare word pairs in two unknown languages (Japanese and Serbo-Croatian). This gave a negative result, which was not astonishing. Since they did not know the meaning, they could not base their guesses on relations between sound and meaning. And since the words were at best partly expressive, they could not know which sounds to compare.

Grammont, whose "Traité de phonétique" 1933 contains a long chapter on "phonétique impressive", takes his starting point in the onomatopoetic function of sounds, arguing that when e.g. i is used to imitate sounds that can be described as light and fine, it can also be used to express other light and fine objects. But this does not permit the conclusion that i is really used in this way.

6. Explanations of phonetic symbolism

Once the universal character of the expressive values of sounds has been documented, the next task will be to explain these values. This problem has been discussed in various books and papers, by Flournoy (1893), Mahling (1926), Argelander (1927), Wellek (1931), Fónagy et al. (1963), Peterfalvi (1965)¹, Ertel (1969), Karwoski and others. It will only be treated briefly here.

Some authors prefer articulatory explanations of phonetic symbolism, e.g. Westermann and Fónagy. In some cases it is quite convincing, e.g. when the consonant m is used in words for "press", "squeeze", "closed", etc. in West African languages. The same is true of the symbolic value of i in these languages ("squeeze", "press", "narrow"), and it is probable that it is this articulatory starting point that leads to the symbolic value "dark". As mentioned above, a number of English subjects also characterized the vowel i as black. This was a written inquiry, and it has been suggested that they thought of the name of the letter [ai] (but [ai] is not dark in Newman's experiment 1933), or that they have seen i as a black line, and o (which was called black) as a white spot with a black ring around it. This is not completely improbable, but in any case the symbolic value of i

1) The later and more extensive work by Peterfalvi (1970) has not been accessible to me until the moment when this paper went into press.

in the African languages cannot be explained in this way, so perhaps the English responses have also been based on articulation, cp. that Danish subjects considered i, y and u to be the most tight and compact of all vowels (E. Fischer-Jørgensen 1967). And perhaps Newman (1933) is right in assuming that the expressive value "large" of open vowels has something to do with their big mouth opening (but why, then, is u bigger than i?).

However, in many cases it is more probable that it is the auditory impression which is at the base of the symbolic value, e.g. bright-dark. Fónagy's articulatory explanation that for i the tongue is raised towards the bright world outside, whereas for u it is moved back towards the dark pharynx can hardly be taken completely seriously. The explanation of front vowels as bright and back vowels as dark cannot be separated from the explanation of the fact that in general high tones, or sounds dominated by high frequencies, are considered to be bright, and low tones, or sounds dominated by low frequencies, are considered to be dark as generally known and also shown in many experiments.

Now, this is only one step in the explanation, for why is "high" combined with "bright", and why are frequencies called "high" and "low"? Fónagy thinks it is because we stretch our neck (and raise our larynx) when singing high tones. There may be something to it, but it can hardly be the whole explanation. Fónagy has, however, a good argument for his articulatory point of view: Deaf children who have learned to articulate give the same answers as normal children: i is smaller, thinner, quicker, brighter, more cheerful and kinder than u (cf. also Ertel 1969, p. 73ff). But the same is true of Fónagy's blind subjects. How can they consider i bright and u dark?

Part of the explanation is probably that there are interrelations between the qualities designated by the adjectives. The qualities "high, bright, thin, light, small" as against "low, dark, thick, heavy, big" generally go together. If deaf persons feel i as small and thin, it will also be bright. This means that phonetic symbolism cannot be explained independently of the general phenomenon of synesthesia.

Various explanations have been given of this phenomenon. Karwoski, Odbert and Osgood 1942 emphasize the importance of a general cultural, linguistic tradition with conventionalized synesthetic relations, e.g. the normal application of adjectives to different senses (a warm room, a warm colour, warm greetings, etc.), and the metaphoric use in poetry. This is certainly important, and may influence a subject's response in a concrete test situation. And it would be of great interest to make a comparative study of the use of adjectives in different languages from this point of view (Ertel mentions such a study by S.E. Asch, which has not been accessible to me). - But what, then, is the origin of such a tradition, and why are the similarities between synesthesia in quite unrelated cultures so striking? And why do small children have more synesthesia than grown-up people? (cf. Werner 1948).

Some authors have pointed to general experiences of the outer world: Big animals have lower voices than small ones, big things are heavier than small things, the sky is high and bright, whereas it is dark down in the basement, etc. Therefore small, light, high, and bright are related and opposed to big, heavy, low, and dark (e.g. Argelander 1927, Fónagy 1963). This is certainly of importance. But it can hardly explain everything.

Others have assumed that there are some deeper interrelations between our senses, on a more or less psychological or physiological level. Flournoy talks about similarities of the emotional connotations for different senses, Karwoski et al. (1942) find more abstract parallelisms in polarities and graduation (cf. also Argelander 1927 and Peterfalvi 1965). This would explain why it is possible to equate e.g. a given tone with a given shade of grey and a given smell (cf. the experiments of Hornbostel 1931) within a given reference frame, once the orientation of the dimensions has been equated (e.g. low = dark); but this latter point is important. Ertel (1969) attempts to reduce phonetic symbolism to the three fundamental dimensions set up by Osgood for the study of connotational meaning: Activity, potency,

and valuation. But his attempt to apply these dimensions to the symbolic use of vowels is not very successful. There also seem to be some more concrete physiological interrelations, cp. that the impression of colours can be influenced by the simultaneous perception of sound and vice versa (e.g. Mahling 1926), and that the calming and exciting effects of colours have been demonstrated also in animal experiments (Argelander 1927). There is still much to be done in this field of study.

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