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Sound symbolism in deictic words

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Abstract
It is shown that pairs of demonstratives in which there is a vocalic opposition have an advantage in their struggle for existence in languages when \( F_2 \) is higher in the proximal than in the distal form. It is also shown that nasals are preferred in first person pronouns while stops and other obstruents are preferred in second person pronouns. Explanations are suggested for both findings. They involve affinities with the association of pitch with size, the proprioceptive qualities of speech sounds, and oral pointing gestures. (Summary of paper to appear in H. Aili and P. av Trampe (eds.) Tongues and Texts Unlimited, 1996)

Introduction
The bulk of the vocabulary of all languages is known to consist of conventional forms in which the relationship between sound and meaning is wholly arbitrary. Among the exceptions we find conventionalized imitations of sounds, often used to refer to the vocalization of an animal or to the animal itself, as in meow and cuckoo, or to a process that is associated with a typical sound, as in murmur, gargle, and hiss. The meaning of such words is most often just 'that which I imitate' or, as in soup, 'that which my imitation reminds one of'. The paper summarized here is only marginally concerned with such cases of onomatopoeia, dealing more with cases of sound symbolism in which the relationship between sound and meaning is less direct. The most well-known instances of this kind are words such as [mama] and [papa] (cf. Jacobson, 1960), which are produced spontaneously by infants, but whose meanings are due to the associations they evoke in adults. If there is any sound symbolism in pronouns, demonstratives and deictic adverbs of place, the relationship between sound and meaning will be even more abstract since there are no sounds to imitate in the first place.

The associations effective in sound symbolism can be linguistic or paralinguistic. In the first case, a sub-morphemic string of sounds is associated with some meaning due to its occurrence in semantically related words in the same language. However, in the present context we are only interested in the possible occurrence of universal sound symbolism, which can only be attributed to paralinguistic associations evoked by the speech sounds or by some concomitants of their production or perception.

In order to investigate this matter, we can look for similarities across languages. Such similarities can be due to (1) a common etymological origin of the forms in question, (2) universal sound symbolism, and (3) mere accident.

Among these alternatives, (1) and (2) must not be assumed to be mutually exclusive. Jespersen (1922) observed that the suggestive element in cases of sound symbolism is not necessarily original, but if the sound of a word was, or came to be, suggestive of its meaning, then this worked strongly in favour of the word, "Sound symbolism ... makes words more fit to survive and gives them considerable help in their struggle for existence". In cases of universal sound symbolism we should, then, not only expect similar forms to arise without any linguistic connection, but also that forms motivated in such a way should survive for a longer time and more easily be diffused by borrowing. Subsequently, the presence of (2) will reinforce the presence of (1) in a sample of languages.

Accidental similarities will also be more frequent among this kind of words than in vocabularies at large. Deictic morphemes often consist of just one segment, and the most frequently used segment types are over-represented among them (Willerman, 1994).

In order to exclude any bias due to this and to reduce the 'statistical noise' caused by arbitrary conventions, the present investigation has been restricted to word pairs whose difference is straightway compatible or incompatible with sound symbolism. The study focuses on the forms of the pronouns, but it includes an analogous investigation of the demonstratives, which provides a background for comparison.

Hypotheses

Demonstratives and deictic adverbs
Recently, Nancy Woodworth (1991) has shown that there is a systematic relationship between
vowel quality and distance in the forms of proximal and distal versions of demonstratives and locative adverbs. Vowels with a higher second formant, F₂, are significantly more often used in the proximal than in the distal versions.

It is well known that we associate vowels like [i], with a high "sibilant pitch" (Traunmüller, 1986), corresponding to F₂, with qualities like 'small', 'weak', 'light', 'thin', etc., while we associate vowels with a low sibilant pitch with the opposite qualities. Such a result has been obtained quite consistently in experiments in which speakers of various languages, also deaf or blind people, had been asked to attribute selected qualities to speech sounds and nonsense words (Sapir 1929, Fónagy 1963, Ertel 1969). While these experiments and some additional considerations on the communicative roles of pitch (Ohala, 1984) have given us some understanding of the association between pitch and size, it is not as clear why high pitch should be associated with 'proximate' and low pitch with 'distal' in demonstratives.

The present paper offers the following suggestions: When we point to something that is far away, it is not likely to be an ant or a pea, but rather something large. When we point to something nearby, it is more likely to be small in size. These pragmatic facts appear to support an association between small and nearby and between large and far away in demonstratives. An association of this kind could, however, also arise on the basis of purely semantic relations ('there' < 'at a small distance', 'there' < 'at a large distance').

We shall test the hypothesis that among the demonstratives of a language in which the difference between the proximal and distal form is entirely vocalic, F₂ is higher in the proximal form, which implies that among the vowels [i e a o u] the vowel of the distal form will be found to the right of that in the proximal form.

**Personal pronouns**

It has been observed that there is often a nasal in first person pronouns, while second person pronouns often contain a stop consonant (Diamond, 1959; Swadesh, 1971). However, neither Diamond nor Swadesh presented any strict statistical test of the presence of global similarities.

In trying to find an explanation, Diamond (1959) committed himself to a strictly monogenetic view of language by suggesting that "some such word ... represented the pronoun ... when language first evolved" and that the present state of languages just reflects this arbitrary initial convention. Swadesh (1971) suggested, instead, that "the nasal marks first person because of its relaxed character, while the stop is appropriate for the second person because of its relative tenseness". While this description of the character of these speech sounds appears acceptable, this does not really tell us why they should be associated with personal pronouns in this way. This part of the argument appears to be based on an obscure subjective impression, which Swadesh assumed readers to share with him.

Swadesh's (1971) hypothesis can be rationalised in the following way: A speaker's auditory proprioception of consonants in which oral closure is combined with sustained voicing, as in nasals, is dominated by transmission within his own head. In producing such sounds, a speaker has the impression that they stay within his head, which predisposes them for association with his own person.

In producing consonants in which oral pressure is built up and subsequently released in an explosion, as in voiceless stops, a speaker has the impression of suddenly projecting something outward and away from himself, and this is also what he does physically with a quantity of air. This might predispose such sounds to be associated with an entity outside the speaker's own person but within his field of view, which would apply to second person pronouns.

It might also be the case that pronouns have evolved from oral pointing gestures. The directed release of a quantity of air can be considered as such a pointing gesture, but we can also point to a conversational partner with our lips or with the tip of the tongue. In this case, dental consonants and speech sounds produced with protruded lips would be predisposed for association with the second person.

It is less clear how a speaker could point towards himself using an oral gesture, but consonants which might suggest reference to the second person should be avoided here.

**Summary of the hypotheses**

**Hypothesis 1. proprioceptive associations:**

1st person: Oral closure and sustained voicing.
2nd person: Oral pressure build-up and explosion.

**Hypothesis 2. oral pointing gestures:**

1st person: Absence of dental articulation and/or lip protrusion.
2nd person: Presence of dental articulation and/or lip protrusion.
Language sample

The set of languages to be considered was not restricted in any way, except by the accessibility of descriptions. It is, of course, often possible to trace word forms of several languages some way back to a common origin, and even if there are no historic records of previous forms it is often fairly obvious that forms are related in this way. Such relationships have been looked for, and each group of words with a common origin has been considered as just one case. Cases in which there is an irrelevant difference have not been included in the sample studied.

Results and discussion

The search for demonstratives revealed 37 etymologically independent cases in which there are distinct proximal and distal forms of demonstratives and where the difference between them is purely vocalic, allowing for glides and assimilated consonants. Among these cases, 32 supported our hypothesis and there were only 4 counterexamples. We can be highly confident in this hypothesis, since the binomial probability of observing no more than 4 counterexamples among 36 cases is only $1.1 \times 10^{-7}$. Table 1 shows the distribution of the vowels in the sample.

Among the languages which provide counterexamples, one appears to be extinct, and the other three have only a small number of speakers, about 0.1 million together. For supportive language groups, the mean number of speakers is higher, by three orders of magnitude. It is argued that this is to be expected if counterintuitive forms are less fit to survive (cf. Jespersen, 1922). They run a risk of being replaced by more intuitive forms and this risk will increase with the size of the language community.

Table 1. Frequency of vowels, i.e., letters used to transcribe them, in proximal and distal demonstratives with a 'purely' vocalic distinction. Relative use of each vowel also listed for each category as a percentage. Equal weight has been assigned to each of the 37 etymologically independent cases.

<table>
<thead>
<tr>
<th>Vowel</th>
<th>i</th>
<th>e</th>
<th>a</th>
<th>o</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal</td>
<td>22.8</td>
<td>5.2</td>
<td>5.5</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Distal</td>
<td>2.0</td>
<td>2.0</td>
<td>15.5</td>
<td>10.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Proximal (%)</td>
<td>92</td>
<td>72</td>
<td>26</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>Distal (%)</td>
<td>8</td>
<td>18</td>
<td>74</td>
<td>88</td>
<td>75</td>
</tr>
</tbody>
</table>

The search for pronouns revealed 24 cases to which either of the two hypotheses could be applied. A preliminary analysis of these, see Table 2, appeared to provide support for hypothesis 1, by 16 cases, with only 3 counterexamples, and there were 13 cases in support of hypothesis 2, but with 7 counterexamples.

Table 2. Forms of first and second person pronouns as to their agreement with the two hypotheses: '+' in agreement, '0' indifferent, '-' in disagreement.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>+</th>
<th>+</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 2</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Number of cases</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

However, there are several groups of languages which have an [m] or [n] in the first person pronoun and a [l], [f], [f], or [d] in that of the second person, in agreement with both hypotheses. Except for a South American isolate, Chimú, all these languages are spoken in a coherent region in Northern Eurasia. It is therefore highly plausible that the similarity of these forms is due to a common origin in forms containing an [m] and a [l]. The 'Hippocratic' cluster of languages, including Indo-European, Hittite, Uralic, Yugur, Atlaic, Kartvelian, Chukchi-Kamchatkan, and probably Etruscan, should, then, be considered as representing just one case.

If we exclude suspected cases of prehistoric connections of this kind, we are left with 10 cases in support of hypothesis 1, but we can still be confident in it, since the binomial probability of observing no more than 3 counterexamples among 13 cases is only 0.046.

Although hypothesis 2 is not sufficiently supported, we should perhaps not reject it altogether. The associations between second person and dental articulation or lip protrusion might be just somewhat weaker and hierarchically subordinated to those described by hypothesis 1. With this interpretation, we have still 3 counterexamples in our list, but all the remaining cases are accounted for.

If the pronouns of the first and second persons in the 'Hippocratic' cluster of language families, have a common origin, it is remarkable that they have been preserved in almost all the languages in this vast geographical region for about ten thousand years. If these forms are motivated by sound symbolism, their increased fitness (cf. Jespersen, 1922) may have contributed to their exceptional longevity. As in the investigation of the demonstratives, we notice even here that the counterexamples are provided by language groups with few speakers, so that an analogous reasoning may apply here too.
The proposal that several of the Eurasian language stocks on a par with Indo-European may be genetically related is not new, but opinions differ as to which stocks to include, and the evidence is meagre and more or less uncertain. Some linguists, notably Illich-Svitych (see Manaster Ramer, 1993, for a review) and Greenberg went even further in their attempts to recover genetic relationships, but this is a risky enterprise. There is a substantial chance of similarities arising by accident, and there is a risk of overlooking the more subtle cases of sound symbolism.

Greenberg and Ruhlen (1992) presented an impressive list of words similar to [malg] or [malq] from Afro-Asiatic, Indo-European, Uralic, Dravidian, Eskimo-Aleut, and Amerind with the meanings 'breast, suck the breast, milk, swallow, throat', and they show that the similarity of these words is very unlikely to be due to chance. They interpret this as evidence for a genetic relationship between all these language stocks, but we have to question this. Are these words not instances of sound symbolism or even simple onomatopoeia? In the first few months after birth, infants are able to breathe and to phonate while feeding, without much of a risk that milk will enter their trachea. The phonations produced under these circumstances sound something like [mlq], repeated for each gulp.

While words with forms motivated in such a way can be expected to have a long life, like the pronoun forms, they must also be expected to spring up anew in unrelated languages, which we could observe in the proximal and distal forms of demonstratives, albeit that this process is not as vigorous there as it is in words for 'mother' and 'father', for which many languages have words like [mama] and [papa], together with more formal equivalents that have arisen in the same way in the distant past.

References