

contrast *e* to *i*, ranges from about 60 per cent to 70 per cent. The last group, that of minimal psychological contrast in the *a* to *i* set, runs below 60 per cent in favor of the vowel toward *a* of the scale.

The table has been arranged chiefly from the point of view of the internal 'hiatus' between the percentages of response within each age-group. It is noteworthy that the 'configured distribution' of the responses runs fairly parallel in the four age groups both as to the stepwise discriminations which seem to be felt by many of the subjects and as to the actual order of the specific vocalic contrasts when evaluated by means of percentages in favor of the vowel toward *a* of the scale. Naturally, the reality and normal limits of these stepwise discriminations need to be tested by a careful examination of the individual records, supplemented<sup>^</sup> by further experiments.

On the whole, it will be observed that the symbolic discriminations run encouragingly parallel to the objective ones based on phonetic considerations. This may mean that the chances of the responses being to a high degree determined by actual word associations of the language of the subject are slim, the meanings of words not being distributed, so far as known, according to any principle of sound values as such; and, further, that we are really dealing with a measurably independent psychological factor that for want of a better term may be called 'phonetic symbolism.'

One vocalic contrast, however, falls out of the expected picture. This is the *a* to *e* set, which is starred in the table. Though the *a* vowel is judged prevailingly 'large' as contrasted with *e*, there seems to be present some factor of hesitation which lessens the value of the contrast. If we go by objective distances between vowels, the *a* to *e* contrast, being a '3-step' one, should have fallen into Group A, instead of which it actually either comes last in Group B or falls even as low as Group C. I believe that a very interesting and sufficient reason can be given for this curious fact. The short vowel *e*, as in French *iti*, is not native to the English language. Subjects hearing the vowel *e*, when pronounced in the proximity of *a*, which is acoustically far removed from it, would tend not to hear what was actually pronounced, but to project the characteristic long 'e-vowel' familiar to us in such words as *raise* or *lake*. In other words, the qualitative symbolism would tend to receive a revision in the opposite sense because of an intercurrent quantitative symbolism. This example is suggestive as illustrating the importance of the linguistic factor vs. the merely phonetic one, though not in the sense in which the term 'linguistic factor' is ordinarily understood. What skews the picture here is probably not the associative power of particular English words but the

*phonetic configuration* of English as such.<sup>2</sup> That even this configuration, however, is of limited importance in interpreting the experiment is shown by the fact that in word-pairs illustrating the contrast *e* to *i*, *e* to *e*, the acoustic nearness of the two vowels prevents the unconsciously imputed quantitative interference from making itself felt in the symbolic response.

These and many other similar results need interpretation. One's first temptation is to look about for some peculiarity of English speech, some distribution of sounds in actual words, that would make the results we have secured intelligible. A simple associational explanation, however, is not likely to prove tenable. The weighting of the responses is altogether too much in accordance with an absolute phonetic scale to make it possible in the long run to avoid at least some use of 'natural' or 'expressive,' as contrasted with socially fixed verbal, symbolism as an explanation. It is difficult to resist the conclusion that in some way a significant proportion of normal people feel that, other things being equal, a word with the vowel *a* is likely to symbolize something larger than a similar word with the vowel *i*, or *e*, or *e*, or *a*. To put it roughly, certain vowels and certain consonants 'sound bigger' than others. It would be an important check to amass a large number of randomly distributed meaningful words, to classify into the two groups of 'large- and 'small' those which could be so classified without serious difficulty, and to see if in sets in which equal numbers of phonetically contrasted words are found the meaning classes were or were not correlated with the sound classes and to see further, if they are so correlated, if the distributions are of the same nature as those studied in the experiments.

The reason for this unconscious symbolism, the factor of linguistic interference being set aside for the present, may be acoustic or kinesthetic or a combination of both. It is possible that the inherent 'volume' of certain vowels is greater than that of others and that this factor alone is sufficient to explain the results of the experiment. On the other hand, it should be noted that one may unconsciously feel that the tongue position for one vowel is symbolically 'large' as contrasted with the tongue position for another. In the case of *i* the tongue is high up toward the roof of the mouth and articulates pretty well forward. In other words, the vibrating column of air is passing through a narrow resonance chamber. In the case of *a* the tongue is very considerably lowered in comparison, and also retracted. In other words, the vibrating column of air is now passing through a much wider resonance chamber. This kinesthetic ex-

<sup>2</sup> For the significance in language of 'sound patterns' or 'phonetic configurations' as distinct from sounds as such, see Edward Sapir, "Sound Patterns in Language," *Language*, 1 (1925) 37-51. [This article is reprinted in this volume, pp. 33-45.]

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planation is just as simple as the acoustic one and really means no more than that a spatially extended gesture is symbolic of a larger reference than a spatially restricted gesture. In discussing some of the results with the children themselves, who seemed very much interested in the rationale of the experiment, the impression was gained that the subjects differed somewhat in the psychological basis of the symbolism, some being apparently swayed entirely by the acoustic factor, others by the acoustic factor only or mainly insofar as it was itself supported by the kinesthetic factor.

The tabulated results, of which we have given a brief sample, have the disadvantage of drowning out significant individual variations. For a preliminary report such a method of presentation is at least suggestive; but it would be important to know to what extent individuals differ significantly in their ability to feel symbolism in sound contrasts. The schedules need to be gone over from the point of view of working out individual indices of 'symbolic sensitiveness' to sounds.

Meanwhile a third experiment, intended to bring out individual idiosyncrasies, was carried out with a number of selected subjects, chiefly adults. The results were interesting.

In this experiment an artificial 'word' was taken as a starting point and assigned an arbitrary meaning by either the investigator or the subject. The subject was asked to hold on to this arbitrary meaning and to try to establish as firm an association as possible between the imaginary word and its given meaning. Some phonetic element in the word, a vowel or a consonant, was then changed and the subject asked to say what difference of meaning seemed naturally to result. The answer was to be spontaneous, unintellectualized. The process was kept on for as long a period as seemed worth while, the saturation point of meaningful and interested responses being reached very soon in some cases, very late in others. In the case of certain individuals more than 60 distinct 'words' were found to build up a constellated system in which the meanings were rather obviously the results of certain intuitively felt symbolic relations between the varied sounds. In the case of other individuals actual word associations tended to creep in, but on the whole there was surprisingly little evidence of this factor. The subjects were found to differ a great deal in their ability to hold on without effort to a constellation once formed and to fit new meanings into it consistently with the symbolisms expressed in previous responses. Some would give identically the same response for a stimulus word that had been—so it was claimed—forgotten as such. In its imaginary, constellated context it evoked a consistent response. Others lost their moorings very rapidly. It is hoped to discuss these interesting variations of sensitivity to sound symbolism, *i.e.*, to the potential meaningfulness of relations in sound sets, in the final report of these investigations.

In the present purely preliminary report we can do little more than give a few examples of the responses of two of the subjects, KP and JS.

The word *mla* was arbitrarily defined as 'brook' by the subject KP. Fifty-three responses were obtained from her, starting with this nucleus. The following excerpts from the material will be illuminating.

1. *mla*: "Brook."
2. *mla*: "Smaller brook."
3. *mla*: "Larger brook; nearer a river; swifter; no longer thought of as part of the meadow landscape."
4. *mla*: "Larger, not so flowing; large lake like Lake Superior."
5. *mla*: "Little lake for fishing."
6. *mela*: "Smaller brook than *mla*, larger than *mla*."
7. *mdla*: "Larger than brook. Perhaps water running through a ravine; mixed up with the scene."
8. *vcnna*: "Water trickling down in a ravine through the rocks scattered on the side."
9. *mena*: "A little larger but still diminutive. Water travels through a gravel pit."
10. *mlna*: "Deep, narrow, swiftly moving stream rushing through a cut in the rocks."
  
14. *mini*: "Tiny but swift stream spurting out of the rocks like a jet of water."
  
18. *mula*: "Fairly large, rather rambling .brook at night."
19. *mola*: "Ocean at night."
20. *mola*: "Ocean in the daytime."
21. *mala*: "Bright ocean."
  
- 2<sup>1</sup>. *mla*: (21st response after 2): "A little brook." (The jump back to the earlier response was made at once, without hesitation.)
  
- 14<sup>1</sup>. *mini*: (15th response after 14): "Spurt of water from the rocks, small but swift."
  
48. *wila*: "Can be wet, but water is more like dew on wet grass after rain. Belongs to the same set."
49. *wela*: "Wet trees after a rain. No feeling of a body of water. General dampness, a 'larger' feeling than *wlla*."

Not all subjects by any means were as responsive as KP; but a surprising number showed a very definite tendency toward the constellating of sound symbolisms. A few responses from JS, based on the same stimulus word, will be interesting for purposes of comparison. The meaning 'brook' was assigned by the investigator and accepted as satisfactory by the subject.

1. *mla*: "Brook."
2. *mela*: "Seems to sort of broaden out. Brook got much calmer."
3. *mla*: "Got to chattering again; smaller brook; stones visible, which make the

4. *mila*: "Brook gets stagnant with rushes growing in it. The rushes hold the water back so it forms pools. The flow is in the middle; relatively stagnant at the edges."
5. *mala*: "Almost like a lake. An uninteresting lake."
6. *mala*: "More color in it. May have been shallow before; now has greater depth of color, greener shadows; still a lake."
7. *mela*: "Pools taken out at the side from 4. Regains a little of its chattering. Sort of tiny. Less cheerful and chirpy than 3. No great difference as to size between 7 and 3. Merely has a deeper note."
- 6<sup>1</sup>. *mala* (4th response after 6): "Nice broad pool with all nice colors in it. Shadows and water rich green, as of tree shadow in pool."
- I<sup>1</sup>, *mlla* (11th response after 1): "Rather nice chattering brook."
17. *mile*: "A little splash of water. Tiny stream hit a rock and splattered out in all directions."
18. *mili*: "Water has gone. A bit of rather dense woods with lots of moisture. Water not evident, but obviously somewhere. You don't see water but you know it is there. Rather soggy to walk around."
- 6<sup>2</sup>. *mala* (23d response after 6<sup>1</sup>, with much material in between that was definitely removed from suggestions of 6): "Quick sweep of water view over a lake. Not just a pond. A few islands, but they look like dots. The sun is setting. There are nice black shadows this side of the island. The scenery is darkest where I am. I am interested in the distant brightness."

A comparison of these excerpts from the two schedules shows certain interesting resemblances and differences. Both subjects constellate their responses; but KP does so more rigidly, 'geometrically,' as it were. With JS the underlying 'geometry' of response is enriched by imaginative overtones. Incidentally, it will be observed by the attentive reader, a considerable number of the responses here quoted from the third series of experiments check some of the magnitude symbolisms independently obtained from the first and second. This is true of most of the schedules in this set and is significant because neither magnitude variations nor any other class of variations in the responses had been suggested.

It is believed that studies of this type are of value in showing the tendency of symbolisms to constellate in accordance with an unconscious or intuitive logic which is not necessarily based on experience with the stimuli in their normal, functional aspect. In the realm of articulate sounds, to take a specific type of perceptive field, it is believed that the experiments here referred to give cumulative evidence for the belief that unsocialized symbolisms tend to work themselves out rather definitely, and that the influence of specific, functional language factors need not be invoked to explain these symbolisms.