

Gesticulation has been considered as one of the evolutionary sources of vocalization and speech. There is much evidence in present behavior of both humans and animals that indicates a degree of bodily grounding in sound production. Some associations between gestural hand shaping and phonetic framework presettings of basic vowels are indicated in the experiments in **diagram 1**.

Action:

Hold the body, speech organs and neck-shoulder-arm-wrist-hand framework **relaxed**, neutral and balanced. Hold arm and hand parasagittally and while producing the various hand configurations shown in diagram 1, note what vowel articulation tract shape is automatically generated by each. Perform this alternately in **full abdominal (A)** and **full thoracic (T)** respiration modes.

Observe:

The positions distinctly generate articulatory presettings for the symmetrical front-back vowel pair /i/-/a/, and also for more central /e/ae/ə/ and it is the A/T mode that determines which alternate occurs.

Note: if normal respiration is engaged both abdominal and thoracic breathing modes play a part in varying proportions and /i/ and /a/, and /e/ae/ə/, though still no other vowels, are simultaneously preset.

Conclusion:

1. With arm and hand held in a parasagittal plane, (a) supination-pronation, extension-flexion, orientation and plane of hand, and (b) position of fingers uniquely relate to front and back (and central) vowel articulation settings.

2. In normal respiration the proportions of **abdominal** and **thoracic (A/T)** modes is determined by body and mental settings. This experiment isolates each mode and shows that when establishing either of the two as a **constant**, systematic results are obtained. If these constants are not considered the occurrence of /i/-/a/ and /e/ae/ə/ presettings vary with the A/T ratio. This notion may be of significance in certain embodiment experiments.

Discussion:

It is shown that the subframeworks of hand-wrist-arm-shoulder movement and that of the respiratory-feeding tract or **upper visceral system (UVS)** are physio-mechanically unified. There are several mechanical connections present: the hyolarynx is directly attached to the scapula, and therefore to arm movement, through the omohyoid muscle; the trapezius, the largest muscle in shoulder-arm movement, is also directly connected to laryngeal activity through its own scapular attachment. Other less obvious connections are not discussed here.

It can be supposed that the muscular action of gesturing is a component of the entire phonetic mechanism, and when effectively engaged, it physically shares the effort of shaping the sound generating tract.

diagram 1













	arm parasagittal	vocalic presettings	
	hand/finger shape	full abdominal respiration	full thoracic respiration
palm open pronate		i	a
palm open supinate		a	i
index over third		i	a
third over index		a	i
palm closed supinate		i	a
palm closed pronate		a	i
index pointing		i	a
palm pronate vertical hand		a	i
palm supine vertical hand		i	a
palm sagittal vertical		e	ə
hand pronate fingers neutral		e	æ

Diagram 2

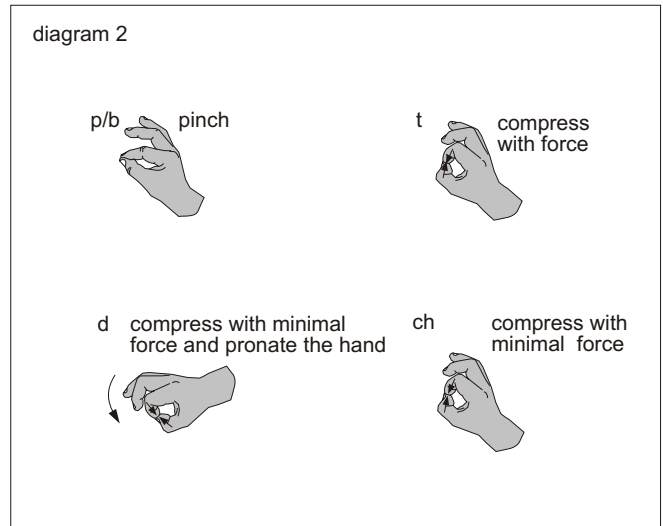
With body, appendages, speech organs maximally neutralized, consonantal speech tract presettings (not full articulations!) of hand-finger configurations include the following:

/p/b/ = pinching with thumb and index finger at an acute angle. The association of a /p/b/ tongue presetting also provides the bodily grounding for using the word “pinch”, which starts with a /p/.

/t/ = forceful compression of same the fingers with distal digits meeting as co-linearly as possible.

/ch/ = the same gesture with minimal force

/d/ = the /t/ gesture becomes the voiced variant if the hand is pronated and the force is minimized.



Note: abdominal vs. thoracic respiration is not considered in this and the following experiment; the increased forces of consonant production generate both modes. **Isolated** thoracic or abdominal respiration modes tend to favor, respectively, voiceless and voiced phonemes. That is, voicing is affected by A/T ratio.

Diagram3

Rotation of hand at the wrist in a para-sagittal plane with index finger extended generates a series of consonantal presettings ranging from none through /t/, /s/, /f,h/, /n/, /l/, /m/, and /q/.

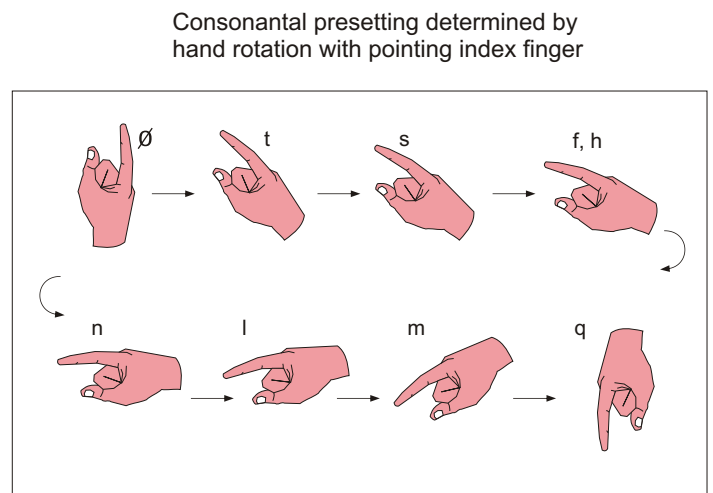


diagram 3

Diagram 4

Vertical movements of the open hand in the parasagittal plane preset for the **syllables** /hi/, /ha/ and /hu/. Horizontal movements preset for /he/ and /ho/. The choice of the syllable depends on the upward vs. downward direction of movement and on whether the mode of respiration is thoracic or abdominal.

diagram 4

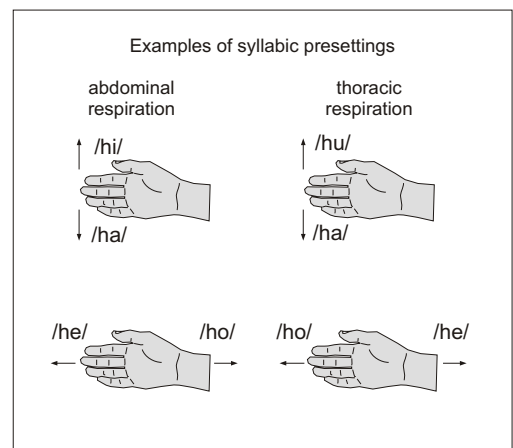


Diagram 5

A **forceful clawing** hand-finger gesture is coactive with lip and jaw behavior. With supine hand the lips and jaws close. With pronate hand the lips and jaw open to an extent. The vocal presettings are, respectively, a hiss and a low amplitude growl (figs. 1 and 2). With palm facing forward the lip corners enlarge and the jaw opens widely and the sound setting is for a full growl. This is a framework for animal threat expression: the presetting and exhibition of claws and teeth, especially the canines, and of vocalization.

diagram 5

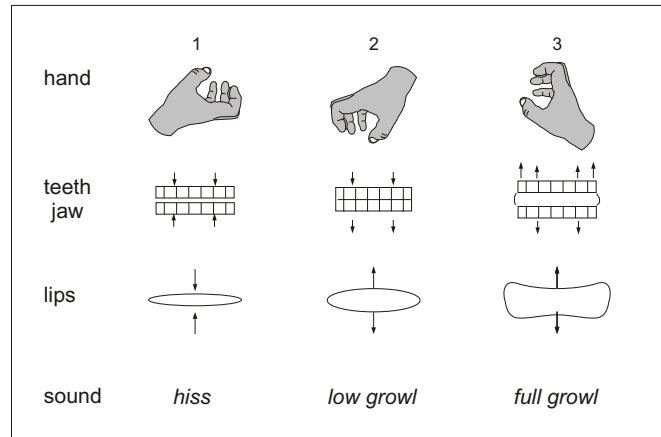


Diagram 6

Combinations of various emotional and phonetic presettings are brought about by hand-finger configurations:

(6a) Thumbs down = disapproval, disgust; /gh/, the Arabic ghain, or voiced /x/.

(6b) Moderately or widely spread extended fingers with palms up = expression of innocence, incapability, puzzlement; /n/, /d/, /ae/. Such an open supine hand but with additional wrist movement (extension) expresses the notion of "maybe", "I don't know".

diagram 6

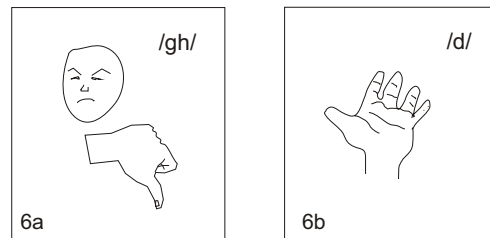


Diagram 7

Palm facing forward, hand open, fingers neutral in spread indicates calling for attention when hand plane is vertical. Gradual tilting of such hand moves from the phonetic presetting of /e/ through /a/, /h/ and /n/ and expresses increasing sense of negation ("no!"). Hand tilt just below the horizontal the presetting is for /m/. We can note that in the musical system of solfège the horizontal pronated hand stands for the note designation "mi". Further rotation yields /o/ and /u/.

