Sound Patterns in Language

Edward Sapir

General premise

- “It is my purpose in this paper […] to indicate that the sounds and sound processes of speech cannot be properly understood in […] simple, mechanical terms”
- Speech is more than a series of sensorimotor habits

Speech sound vs. similar non-speech sound

- To prove that speech is more than a manipulation of articulators, he compares the sound of blowing out a candle to the voiceless w (/ʍ/) of *when*
- Differences:

1. Function

- Candle-blowing sound: directly functional act
- Voiceless w: no direct functional value—it's a link in the construction of a symbol (a word), which in turn assumes a symbolic function only when it exists in a linguistic context

2. Equivalence

- Each act of blowing out a candle is functionally equivalent
- W has no singleness of references—it isn't linked to a single context and function (i.e., can appear in a variety of words)

3. Type of acoustic phenomena

- Candle-blowing sound and w “are norms or types of different series of variants” (aka, tokens of different kinds of phenomena)
- first, they differ in acoustic quality:
  - Candle-blowing sound can vary in place of articulation quite broadly (i.e., velar spirant or ʃ-like sound), but such broad variation is not tolerated with w (i.e., lip protusion of w sound would strike the listener as “off-color”)
  - Not only is variation less tolerably broad for w sound, but variation differs along different axes: candle-blowing sound varies chiefly along place of articulation; w, along line of voicing
- Second, they differ in intensity:
  - Candle-blowing intensity is greater than w intensity and more variable depending on factors such as muscular tone, size of flame, etc.

4. Sound associations

- The speech sound w has a large number of associations with other speech sounds
  - They combine in symbolically significant sound groups (phonological words)
- The candle-blowing sound has no sound associations/sounds it habitually co-occurs with

5. Membership in a system

- W sound belongs to a system of sounds
  - Each member of this system differs both in quality (i.e., distinctive articulation) and in 'psychological aloofness' from other members of the system
  - The relational gaps between sounds of a language are just as necessary to the psychological definition of those sounds as the articulations and acoustic images which are customarily used to define them (in other words: contrast is just as important as mechanism of articulation)
- Candle-blowing sound is not part of a system of sounds, and its relation to other sounds does not (help) define it

”It should be sufficiently clear from this one example […] how little the notion of speech sound is explicable in simple sensorimotor terms and how truly a complex psychology of association and pattern is implicit in the utterance of the simplest consonant or vowel"

“Phases” of patterning

- “It follows at once that the psychology of phonetic processes is unintelligible unless the general patterning of speech sounds is recognized”
- This patterning has 2 phases:
  - phase 1: speech sounds exist in a self-contained system, making them impossible to mistake as candle blowing-out type sounds
  - phase 2: the configuration of speech sounds in a system—sounds are “placed” with reference to one another (in modern times: sounds exist as phonemes or allophones)

The modern-day phoneme vs. allophone distinction

- Sapir describes the difference between "different points in the phonetic pattern of a language" (phonemes) vs. “variants of such a form” (allophones)
- Names 2 types of variation that obscure the difference between phonemes and allophones

Type of variation #1: Individual variation

- Everyone has an idiolect, but individuals aim to make the same sound discriminations (aka, their productions follow the same patterns):
- for example:

A:	*th*	*s*	*sh*
B:	th_1	s_1	sh_1

- A and B might have different 's' in their inventories, but so long as their s is distinct from other phonemes, and the distribution of s is consistent, then differences in idiolect are not important (i.e., b's s1 is lisped; sh1 is closer to A's s than to A's sh)
- Size of objective difference between sounds (acoustic similarities) does not correspond to the psychological 'spacing' of phonemes in the common pattern between A and B

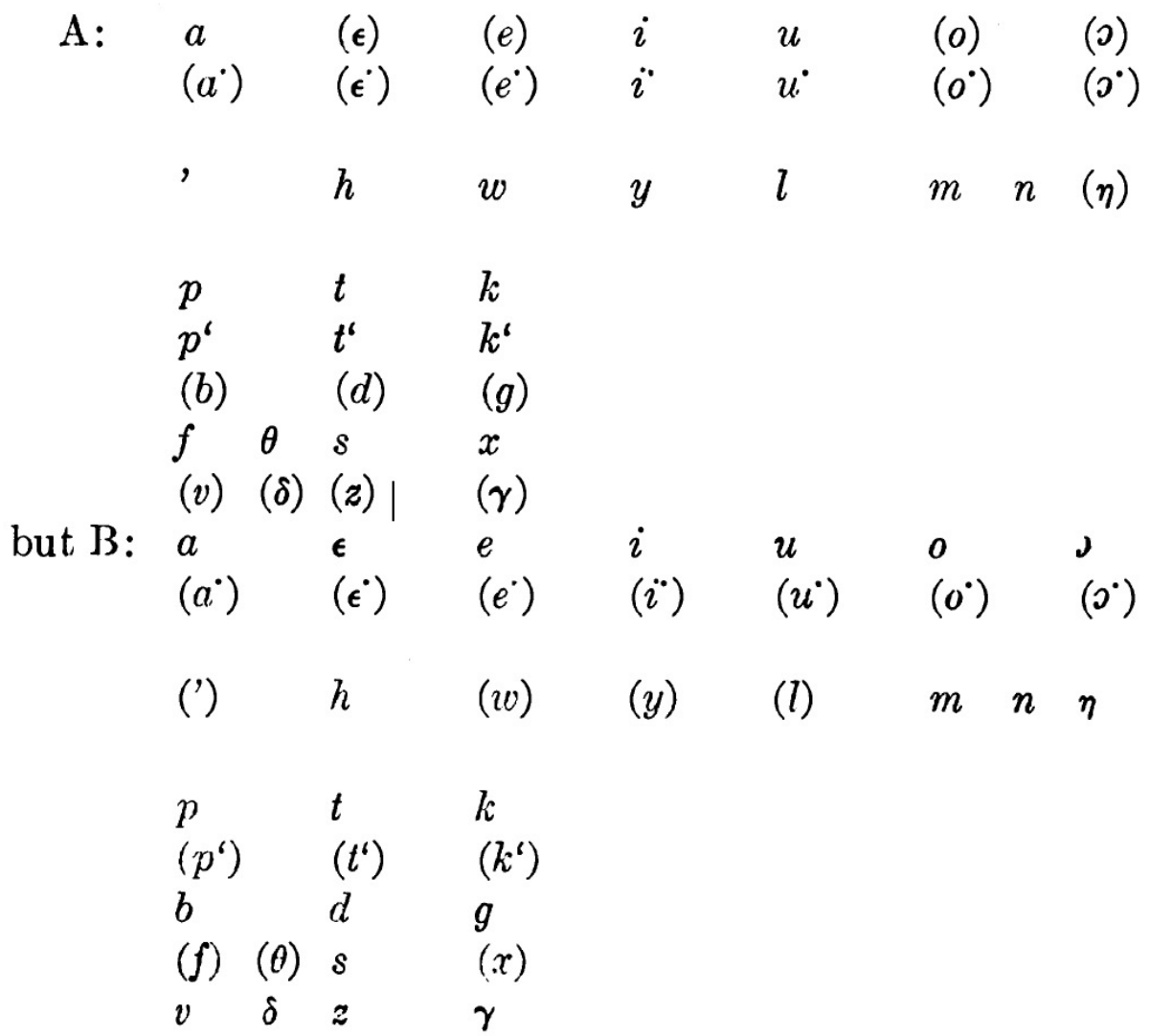
Type of variation #2: Allophonic variation

- The other type of variation that obscures phonemes: perceptibly different forms of the same sound depending on phonetic conditions
- For example: length of vowel a in 'bad' and 'bat' (shorter a before voiceless stop)
- It's not always easy to convince native speakers of this kind of allophonic variation, not because the objective difference is too slight to be perceptible, but exactly because "it corresponds to nothing significant in the inner structure of the phonetic pattern" --aka, in bad v. bat example, vowel length is not a meaningful contrast
    - BUT, in other language, it can be meaningful, underscoring that perceptibility is not a function of how 'big' the difference is
    - i.e., bad: bat minimal pair in English, t and d are allophones in Upper Chinook

“It almost goes without saying that two languages, A and B, may have identical sounds but utterly distinct phonetic patterns; or they may have mutually in- compatible phonetic systems, from the articulatory and acoustic stand- point, but identical or similar patterns "

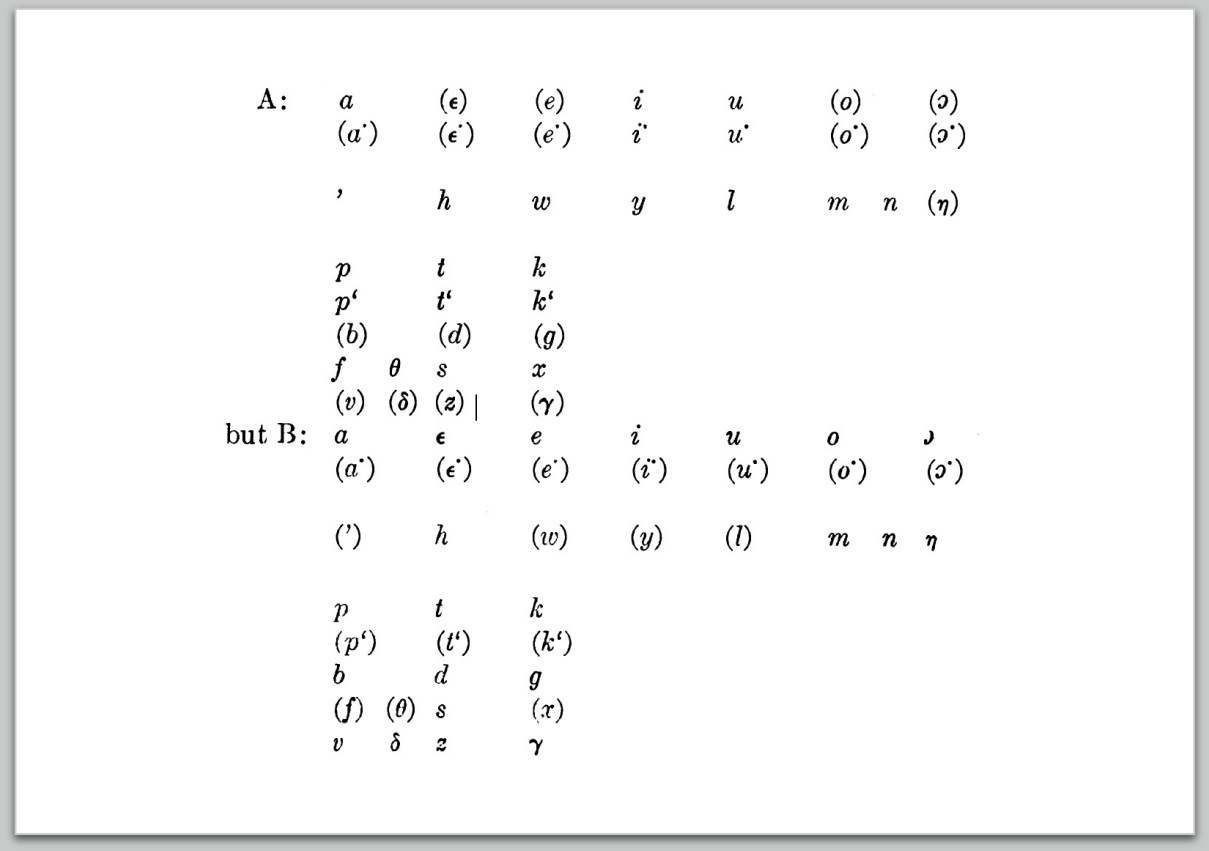
Sample phonemic inventories

- Sapir provides the sound inventories of 4 hypothetical but plausible languages
- A and B: identical sounds but utterly distinct phonetic patterns

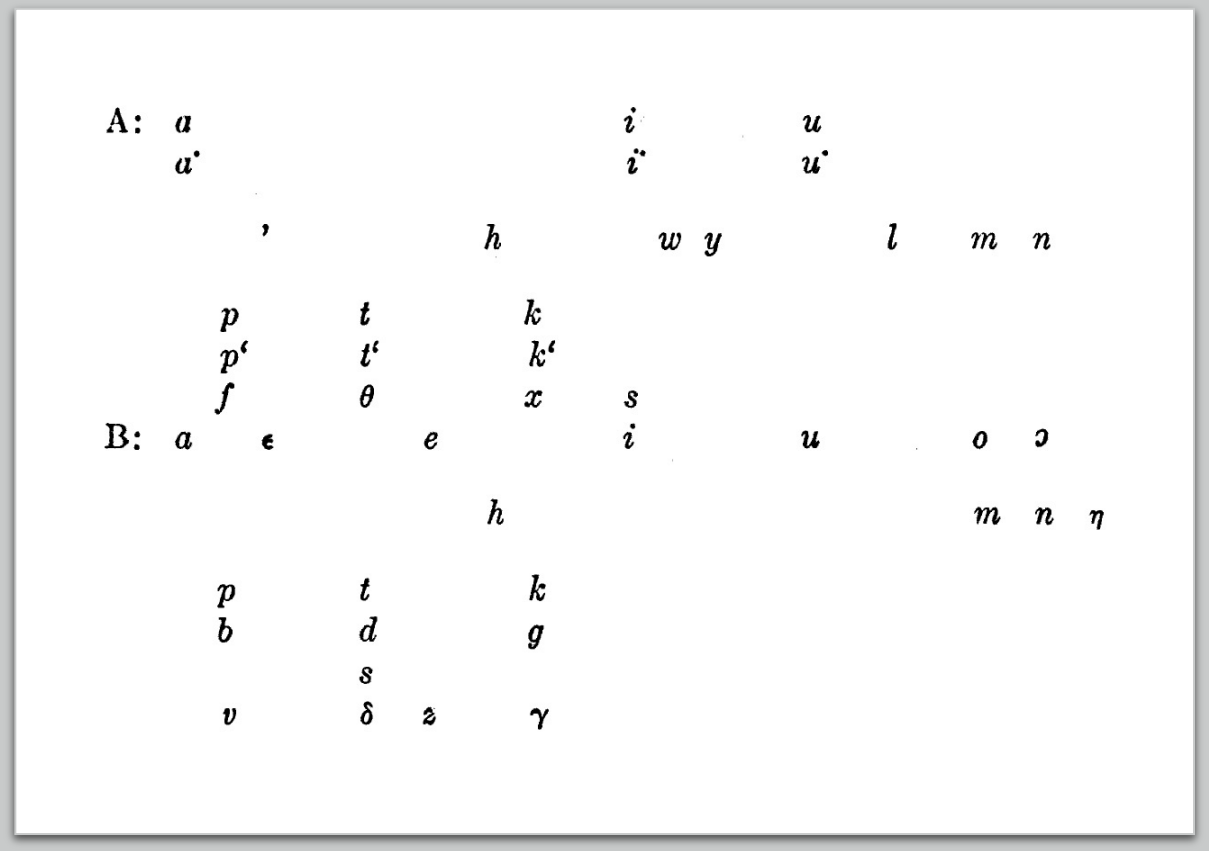


With allophones indicated and without

- With the allophones excluded, the sound systems of the 2 languages appear much more different than they did with the allophones included



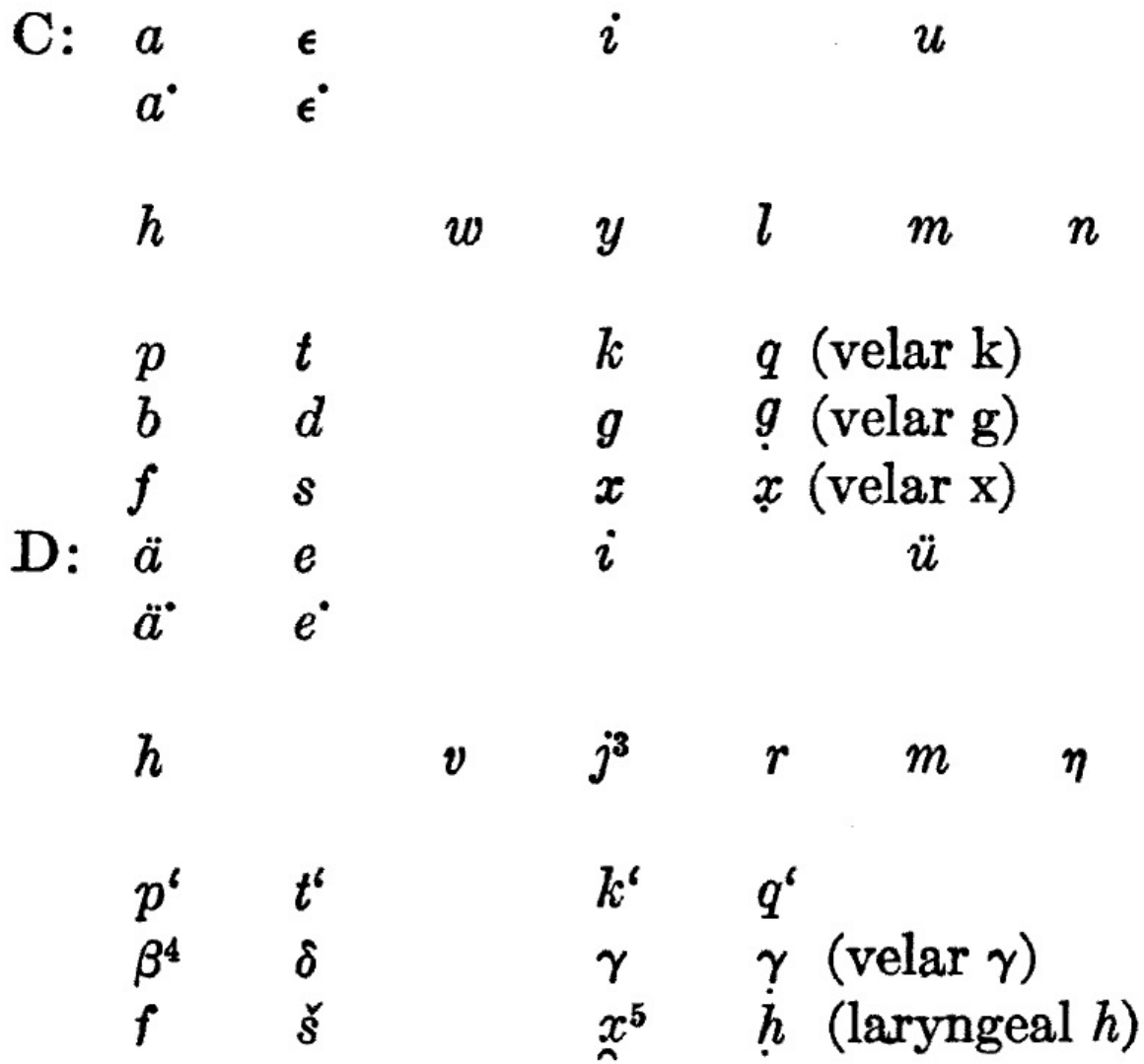
A:	*a*	(*ɛ*)	(*e*)	*i*	*u*	(*o*)	(*ɔ*)	
	(*a˙*)	(*ɛ˙*)	(*e˙*)	*i˙*	*u˙*	(*o˙*)	(*ɔ˙*)	
	ʼ	*h*	*w*	*y*	*l*	*m*	*n*	(*ŋ*)
	p	*t*	*k*					
	p‘	*t‘*	*k‘*					
	(*b*)	(*d*)	(*g*)					
	f *θ*	*s*	*x*					
	(*v*) (*ð*)	(*z*)	(*γ*)					
but B:	*a*	*ɛ*	*e*	*i*	*u*	*o*	*ɔ*	
	(*a˙*)	(*ɛ˙*)	(*e˙*)	(*i˙*)	(*u˙*)	(*o˙*)	(*ɔ˙*)	
	(ʼ)	*h*	(*w*)	(*y*)	(*l*)	*m*	*n*	*ŋ*
	p	*t*	*k*					
	(*p‘*)	(*t‘*)	(*k‘*)					
	b	*d*	*g*					
	(*f*) (*θ*)	*s*	(*x*)					
	v *ð*	*z*	*γ*					



A:	*a*				*i*		*u*	
	a˙				*i˙*		*u˙*	
	ʼ		*h*		*w*	*y*	*l*	*m* *n*
	p	*t*	*k*					
	p‘	*t‘*	*k‘*					
	f	*θ*	*x*	*s*				
B:	*a*	*ɛ*	*e*		*i*		*u*	*o* *ɔ*
			h					*m* *n* *ŋ*
	p	*t*	*k*					
	b	*d*	*g*					
		s						
	v	*ð*	*z*	*γ*				

Phonemic inventories C and D:

- Sounds in the same columns exist in the same contexts/same distribution
- Fewer phonemes in common than A and B, but those phonemes demonstrate similar patterns
- Sound similarities between A and B could be due to language contact, while the similarities between C and D could be due to genetic similarity (and differences are reflexes of the same phonemes)



Modern-day natural classes

- ”A pattern alignment does not need to correspond exactly to the more obvious phonetic one"
- In other words: though the most acoustically similar sounds may pattern together, they don't necessarily have to
- For example: ŋ doesn't pattern with m and n (i.e. can’t occur word-initially), and thus, "no naive English-speaking person can be made to feel in his bones that it belongs to a single series with m and n"
  - Although ŋ and m, n are phonetically similar, it does not pattern with them, and thus can't be psychologically grouped with them

What makes a phoneme

- Sapir asks the question: "How can a sound be assigned a 'place' in a phonetic pattern over and above its natural classification on organic and acoustic grounds?"
  - Aka: What makes a sound a phoneme?
- The answer: Its relationship to all other sounds/phonemes in the system

More evidence of the phoneme

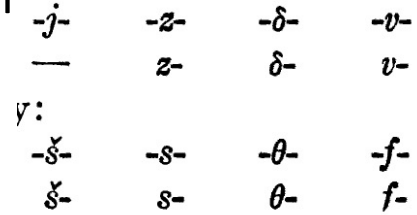
- There are certain cross-linguistic sounds changes that are common ("mechanical tendencies") ie, nb > mb, but a lot of sound change is informed and constrained by phonological patterns (he uses the phrase "phonetic patterns", but he’s talking phonology)
  - i.e., English theta doesn't feel like s, it feels like eth. spanish theta feels like s and not eth.
  - In certain Spanish dialects, theta "passes into s”
  - English theta tends to be "vulgarized" to t and eth to d, never to s.
  - Old Norse theta has become t in Swedish and Danish.
  - These facts "cannot be explained on simple mechanical principles”

Phonemes and non-native speech sounds

- “Phonetic patterning” helps to explain why people find it difficult to pronounce certain foreign sounds which they possess in their own language
- i.e., Nootka substitution of n for ŋ and l
  - has to do with their infrequency and relationship to one another in their languauge (ŋ not used in prose discourse, but common in chants, and l often substituted for n in songs)
- Argues that native language predisposes them to not "hear" English l and enmga correctly, (though I’m not sure if this is a perception or production issue, but that’s not his point here)

Phonemes and non-native speech sounds continued

- Also uses example of English j (he means ʒ fricative), ŋ and ts
  - We have them, but they don't occur word-initially, so there is variation when an English speaker is asked to pronounce a foreign word that begins with one of these phonemes
  - argues that ŋ+a- and ts+a- are less easily acquired than ʒ+a- because of our native pattern (ʒ patterns with other sibilants that can occur word-initially)



- “Is it not evident that the English speaker's pattern has all but taught him j- before he himself has ever used or heard an actual j-?”

Conclusion

“The whole aim and spirit of this paper has been to show that **phonetic phenomena are not physical phenomena per se**, however necessary in the preliminary stages of inductive linguistic research it may be to get at the phonetic facts by way of their physical embodiment. The present discussion is really a special illustration of the necessity of getting behind the sense data of any type of ex- pression in order to grasp the **intuitively felt and communicated forms** which alone give significance to such expression”