

I. Determining phonemes and allophones in other languages. In each of the sets of data below, the words have been transcribed phonetically. Examine the sounds in question and their environments, and decide whether they are allophones of the same phoneme, separate phonemes, or allophones of some other units. **Base your decisions only on the words given, not on any other information you may happen to have on the language in question.** Explain the reasoning on which you base your conclusions.

a. Hypothetical Language A. what is the status of [θ] and [ð] ?

pođat	'foot'	tuđaš	'all'
donal	'bread'	saθum	'farewell'
seθup	'seasoning'	domet	'house'
tifas	'bird'	mađud	'parent'
selud	'welcome'	saθat	'leader'

b. Hypothetical Language B. Are [t] and [d] contrasting phonemes or allophones of a single phoneme? What about [n] and [ŋ]? State the distribution to support your conclusion in each case.

toman/tomaŋka	'berry/berries'	midot/midotka	'biscuit/biscuits/
sedak/sedakka	'house/houses'	medil/sedilka	'reed/reeds'
talin/taliŋka	'tree/trees'	milot/tilotka	'fire/fires'

c. Modern Greek. The phone [ç] is a voiceless palatal stop, and [ç̣] is a voiceless palatal fricative. Which of the phones [x k c ç] are in complementary distribution, and which are contrastive? State the distribution.

kano	'do'	çeli	'eel'	xrima	'money'
xano	'lose'	ceri	'candle'	krima	'shame'
çino	'pour'	çeri	'hand'	xufta	'handful'
cino	'move'	kori	'daughter'	kufeta	'bonbons'
kali	'charms'	xori	'dances'	oçi	'no'
xali	'plight'			oci	'kilogram'

d. Hawaiian. How are [ʌ] and [a] related? (? is a glottal stop; ā is a long a)
(Hint: in this problem, it may be necessary to look beyond the immediate environment.)

pʌli	<i>precipice</i>	hao	<i>iron</i>
mʌi	<i>hither</i>	mana	<i>supernatural power</i>
kʌi	<i>sea</i>	hala	<i>pandanus</i>
mʌikʌʔi	<i>good</i>	ala	<i>road, way</i>
mʌʔi	<i>sick</i>	lā	<i>sun</i>

e. Korean. How are [s] and [ʃ] related?

səul	<i>Seoul</i>	šeke	<i>world</i>
saram	<i>person</i>	šekim	<i>taxes</i>
susul	<i>operation</i>	šesušil	<i>washroom</i>
satan	<i>division</i>	šihap	<i>game</i>
sæk	<i>color</i>	šiktaŋ	<i>dining room</i>
sæ	<i>new</i>	šilsu	<i>mistake</i>
sosəl	<i>novel</i>	šinpu	<i>bride</i>
su	<i>number</i>	yukšip	<i>sixty</i>

f. Japanese. How are [t], [tʰ], and [t͡ɕ] related? (tʰ is an alveolar affricate)

tʰunami	<i>tidal wave</i>	tatami	<i>mat</i>	čīsai	<i>small</i>
tʰuzaki	<i>proper name</i>	teriyaki	<i>type of food</i>	iči	<i>one</i>
empitʰu	<i>pencil</i>	koto	<i>stringed instrument</i>	čiči	<i>father</i>

g. Spanish. How are [d] and [ð] related?

tođo	<i>all</i>	delgađo	<i>slender</i>
verđað	<i>truth</i>	kađa	<i>each</i>
derečo	<i>right</i>	deđo	<i>finger</i>
de nađa	<i>you're welcome</i>	kwando	<i>when</i>
donde	<i>where</i>	duđa	<i>doubt</i>