Typology I: Solution to Homework for Lecture 3

(The questions marked with **(*)** are research questions you can use to deepen your understanding, the others could be exam questions.)

1. **Which other properties (linguistic or extra-linguistic) of a language (or its speaker community) have been found to correlate with the size of its phoneme inventory? Speculate about possible reasons that might cause these correlations.**

   - There is a *negative correlation between a language's phoneme inventory size and its distance to Africa*. It is assumed that this correlation is caused by the facts that i) Africa is the origin of modern humans and ii) expansion progressively reduced diversity of the phonological inventory.

   - There is a *positive correlation between a language's phoneme inventory size and the number of its speakers*. The causes for this correlation are unclear. In fact, the statistical significance and also the correctness of the calculation methods which this correlation is based on are much debated. One possible explanation is that phonological complexity tends to be maintained longer if a language community is large enough to develop many dialects.

   - There is a *negative correlation between morpheme length and size of phoneme inventory*. This is to be expected, given that every language needs to distinguish between a large number of phonemes. The larger the phoneme inventory, the more different morphemes can be formed using a fixed number of syllables. If a language has a restricted phoneme inventory, it needs to use longer morphemes to be able to distinguish enough of them.

2. **Which geometric properties do vowel systems have? Discuss possible reasons why these properties are (almost) universal.**

   In the vowel space defined by the first two formants, vowel inventories are generally peripheral and symmetric as to their position. Both properties reflect the fact that vowel systems tend to maximize perceptual distance between vowels. This is almost certainly caused by a functional bias for phonemes to be maximally distinguishable in perception.

3. **Which vowel inventory is typologically most common?**
   (*) Name ten languages with such an inventory.
   Do you expect them to be related? Why or why not?

   The most common inventory is the 5-vowel system $a - e - i - o - u$. Examples include Spanish, Italian, Latvian, Georgian, Hebrew, Nenets, Japanese, Ainu, Tagalog, and Hawaiian (sources: WALS and Wikipedia). Like these examples show, a similar vowel inventory doesn't generally tell us anything about the relationship between languages. In the lecture, we have touched upon three main reasons for that:

   - Phonological change happens relatively quickly, so that even closely related languages can diverge from each other quite fast (French has 17 vowels where Latin had 5!).

- Language contact often has strong influence on the sound inventory of neighboring languages, so that even completely non-related languages will develop similar systems regionally (examples: ejectives in the Caucasus, retroflexes in India).
- The spectrum of different phonemes is limited by humans' a) physiological ability to produce them and b) cognitive ability to distinguish them, so that similar phonemes can be expected to evolve without any relationship or contact between languages.

4. **(*) What are the basic vowels of your native language? Do they have allophones?**
Standard German distinguishes 8 vowel qualities: [a],[ɛ],[ə],[ɪ],[ɔ],[œ],[ʊ],[ʏ]. These are the short variants, which are complemented by the long vowels [aː],[ɛː],[eː],[iː],[oː],[øː],[uː],[yː]. There is little allophonic variation, except that [ə] could be treated as a variant of [ɛ] in short unstressed syllables. Many speakers pronounce [ɛː] as [eː].

5. **Here is a transliterated text in Tlingit (original by James Crippen on www.omniglot.com, attempt at IPA transliteration by me), a Na-Dené language from Alaska with 800 speakers remaining. Does this language have any phonological properties which you find surprising? Why?**

[t͡ʃ'a jéɪ kukéŋk' áwé a kaːχ ʃukʰaɬʰis'úχ, ha: t͡ɬʰaku: qʰʷaːnx'i aːté s qʰunuːku jé. ha: ɬʰíːɬʰk'ʷ hás aːdé jéɪ s t͡ʃɪneɪjɪ jé áwé, te á: awtʰuɬxaːt͡ʃɪ átʰ áwé, á: ha: waqʰkʰiːjakáː. át͡ʃʰ áwé kʰakʰawtʰuwakʰéɬʰ.
tʰeɪ kʰawtʰuːaːqúːn áwé χá, ha: t͡ɬʰá: ɬʰíːɬʰk'ʷ hás, ha: t͡ɬʰá: kʰáːkʰ hás, hastu qʰustiːjí, hastu ju: χ'atʰáŋkɪ.]

If we inventorize the consonants occuring in this sample, and sort them by place of articulation, we get a very interesting pattern:

- Glottal: [h]
- Uvular: [q] [qʰ] [χ] [χ'] [qʰʷ]
- Velar: [k] [kʰ] [k'] [x] [x'] [ŋ] [k'ʷ] [w]
- Palatal: [t͡ʃ] [t͡ʃʰ] [t͡ʃ'] [ʃ] [j]
- Alveolar: [t] [tʰ] [t'] [s] [s'] [n] [t͡ɬʰ] [ɬ] [ɬʰ]
- Labial: **none!**

Tlingit shows an extremely uncommon consonant inventory in that labials appear to be completely absent, meaning that one of the three most frequent places of articulation (labial, alveolar, and velar) remains unused. The surprising effect is that the entire language can be pronounced without ever closing the lips. At the same time, the consonant inventory is still very large, compensating for the lack of labials by employing many typologically less common places of articulation (uvulars and palatals) as well as extensive use of secondary articulations (phonemic aspiration, ejectives, and labialization).