Consider four allophones [p], [b], [v], [ʤ]

You figure out that:
- [b], [v] are in contrastive distribution
- [b], [ʤ] are in contrastive distribution
- [v], [ʤ] are in contrastive distribution

but:
- [p], [v] are in complementary distribution
- [p], [ʤ] are in complementary distribution
- [p], [b] are in complementary distribution

So, where does [p] belong?

How similar is [p] to the other phones?
- [p] and [ʤ] differ in voicing, manner, and place of articulation.
- [p] and [v] differ in voicing, and manner of articulation.
- [p] and [b] differ in voicing.

Look at the last part of the superhero distribution.

In which case does Bruce Wayne have to travel to NYC?
In which case does Bruce Wayne stay in Gotham?

Consider the status of [l] and [ḷ] (a retroflex lateral, IPA [ḷ]) in Kannada based on the following data. [:] indicates that the preceding vowel is long.

1. [kolлу] ‘kill’
2. [hulu] ‘sour tamarind’
3. [he:lʔu] ‘say’
4. [ke:lu] ‘ask, hear’
5. [illi] ‘here’
6. [huli] ‘tiger’
7. [he:lu] ‘defecate’
8. [yolo] ‘seven’
9. [ki:lu] ‘uproot’
10. [eli] ‘rat’
11. [ha:lu] ‘milk’
12. [kollu] ‘buy’

2. Do [l] and [ḷ] belong to separate phonemes, or are they allophones of one phoneme?
In the Punjabi data below, the symbols ṳ, ṳ, ᵃ (where ṳ is any vowel) represent three different tones. ṳ indicates a low tone, ṳ indicates a mid tone, and ᵃ indicates a high tone. Phonetically, Punjabi has three different tones. Your task is to determine how many phonemic tones Punjabi has. Does Punjabi have one phonemic tone with three allophonic tones, two phonemic tones (one of which has two allophonic tones), or three phonemic tones?

1. [kɔɾə:] ‘horse’ / ___________
2. [lɔːi] ‘disgrace’ / ___________
3. [cɔː] ‘peep’ / ___________
4. [kɔɾə:] ‘unused’ / ___________
5. [cɔː] ‘tea’ / ___________
6. [kəɾ] ‘chisel’ / ___________
7. [kɔɾə:] ‘leper’ / ___________
8. [kəɾ] ‘bottom’ / ___________
9. [kɔɾ] ‘boil’ / ___________
10. [lɔːi] ‘stuck’ / ___________
11. [cɔː] ‘enthusiasm’ / ___________
12. [lɔːi] ‘detached’ / ___________

2. How many phonemic tones does Punjabi have? Justify your answer by identifying contrasting environments or complementary distribution.

a. If your conclusion is that they belong to distinct phonemes, indicate the environments in which they contrast, and if possible, provide minimal pairs.

Egaugnal

1. [kuftin] run
2. [ugdoğin] will impeach
3. [šačmo] arrest
4. [dogin] impeach
5. [uktašmili] will confide
6. [ugoginji] will faint
7. [ugənjan] will solicit
8. [umu] harass
9. [esčom] succeed
10. [ugokuftin] will run
11. [ugesčom] will succeed
12. [tašmili] confide
13. [ŋan] solicit
14. [ginji] faint
15. [ukšačmo] will arrest
16. [ugumu] will harass
**Luiseno**

1. [pewum] wife  
2. [ki] house  
3. [tanam] blankets  
4. [pewumum] wives  
5. [kamay] son  
6. [tukwut] mountain lion  
7. [kamayum] sons  
8. [tana] blanket  
9. [kapim] pipes  
10. [tukwutum] mountain lions  
11. [kapi] pipe  
12. [kim] houses

**Egaugnal**

- [zumi] flash  
- [faysufk] offenses  
- [ayōduvg] pills  
- [pragæg] piles  
- [haman] overdose  
- [šomu] illness  
- [pospos] fight  
- [faysuf] offense  
- [ayōduv] pill  
- [hamaŋ] overdoses  
- [šomug] illnesses  
- [prag] pile  
- [posposk] fights  
- [mækæg] homes  
- [zumiq] flashes  
- [minap] bottle  
- [minapk] bottles  
- [mæk] home