

# Constructed Languages as a Bridge to Interdisciplinary Teaching

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# History

Since 2008, I have taught a conlang-focused course six times, twice at Williams College (for Winter Study Period) and four times at Swarthmore College (as a regular semester course).

# History

The Williams version was a four-week intensive course that served as a basis for full version at Swarthmore. The underlying concept for both courses is the same, but the scope is naturally larger in the full course.

# History

Enrollment at Williams was small, around 5, but enrollment at Swarthmore was large, 10–20 all four times. Some students reported becoming linguistics majors precisely so they could take this course!

## Course Content

**primary:** linguistic typology (no textbook, detailed handouts, various other readings including WALs and popular articles about linguistic typology)

**secondary:** history and nature of conlanging (Arika Okrent's *In the Land of Invented Languages*, Mark Rosenfelder's *The Language Construction Kit*, various other readings including portions of Marc Okrand's *The Klingon Dictionary*)

## Workload

**final project:** professional-style grammar of a developed conlang of sufficient complexity to be able to translate three non-trivial passages (Tower of Babel story from Genesis, Aesop's "The North Wind and the Sun", and "Schleicher's Fable" a.k.a. "The Sheep and the Horses")

## Workload

**weekly assignments:** written reactions to assigned readings, incremental progress toward final project (articulating design goals, choosing phoneme inventory, outlining phonotactics, constructing core vocabulary, etc.)

**monthly-ish assignments:** create a handout and give an oral presentation detailing progress made toward final project since last presentation; serves as an opportunity for students to “workshop” the design choices they made

## Goals

- learn about the diversity of linguistic systems
- learn about how linguistic typology is (often poorly) represented, even in academic literature
- learn how to navigate and interpret the WALS database
- approach linguistics from a different perspective, using different ways of thinking and working: creative/artistic versus analytical/scientific, allowing for greater tolerance for error and experimentation/innovation
- enhance interdisciplinary understanding, connections between linguistics and other fields



## Schools and Students

Why is interdisciplinarity important in this particular case?

Williams and Swarthmore are small liberal arts colleges, and students there regularly take courses from disparate disciplines, not just because they have to, but because they want to: they choose these institutions in part because of their interdisciplinary nature.

Thus, part of the attraction for students to a course like this is the opportunity to engage their interest in linking very different realms of knowledge.

# Biology Affects Phonetics

Many students want to create a conlang for some sort of alien or fantasy race (students at Williams and especially Swarthmore tend to belong to a variety of sci-fi/fantasy fandoms).

Alien biology requires re-thinking how phonetics works. What kinds of human sounds are no longer possible? What kinds of non-human sounds are now expected to be used in language? How might a human linguist interpret, describe, and represent these alien sounds?

## Case Study #1: Rock Creatures

In my first offering of this class, a student creating a conlang for a race of rock creatures. She had to contend with a number of issues about their biology.

The lack of a mobile tongue proved too restrictive, so she gave them a tongue and a roughly human-shaped vocal tract, so they had relatively normal vowel inventories, except. . .

## Case Study #1: Rock Creatures

... their lips were immobile rock! This meant that there could be no rounding contrast in vowels:

i	ɯ
e	ʌ
æ	ɑ

## Case Study #1: Rock Creatures

However, this also affected the possible consonants. With immobile rocky lips, there was no guarantee of making a full stop closure or a nice fricative opening at the lips. The usual obstruents were out. She went with percussive sounds, with the creatures banging their lips together to create transient click-like sounds (indeed, she choose click symbols to represent them).

## Case Study #2: Long-Neck Bird Creatures

A number of my students created some sort of bird-like alien race with long necks. This resulted in two issues: immobile lips (like the rock creatures') and warping of the vowel space.

Long necks have lower resonant frequencies than shorter necks, which contracts the vertical vowel space, since vowels of different heights sound more similar, and thus, make less robust contrasts.

## Case Study #2: Long-Neck Bird Creatures

Some students simply adopted this as a fact of life for their creatures, limiting them to two or even one vowel height. Some compensated for this limitation by giving them longer mouths, so they could make more distinctions in backness:

i   i   †   †<sub>+</sub>   ω

## Environment Affects Phonetics

Most students stick to creatures that inhabit earth-like land-based environments, so the propagation of sound waves beyond the body is not a concern. But a few chose to work with underwater creatures, which required thinking about what affect transmission of sound through water would have on the sounds and how that would impact the kinds of sounds sea creatures would likely make use of.



## Case Study #3: Mermaids

One student had a particular fascination with mermaids, which required consideration of underwater phonetics.

Sound travels about four times faster in water, and vowel formants are proportional to the speed of sound, so they will be much higher overall, making vowels sound lower (high F1) and fronter (high F2) than actually articulated.

## Case Study #3: Mermaids

In addition, our auditory perception is roughly logarithmic, so higher frequencies are harder to tell apart than lower frequencies, and thus, underwater vowels will overall be harder to distinguish. So an underwater humanoid language should have fewer vowels than an air-based one.

These two facts can be accounted for by essentially removing high and back vowels from the space of possible vowels:

e   ə  
a

## Case Study #4: Mountain Fairies

There's always that one student.

This particular student created a race of fairies that live along a mountainside, with fairies of a particular type generally staying at one elevation region. Elevation is a marker of social class, so each elevation region also had its own dialect.

But as elevation increases, sound generally travels slower, which has the opposite effect on vowel formants as for water: vowels sound higher and backer, and vowels are more distinctive.

## Case Study #4: Mountain Fairies

Since these fairies live at different elevations, they each have different vowel spaces. For simplicity, the student only dealt with two main dialects, the highest and lowest prestige.

Confusingly (of course), the highest prestige dialect belonged to the low-lying fairies, who had essentially a normal five-vowel system. The lowest prestige (high-lying) fairies had a richer vowel system, with no front or low vowels, but many more contrasts:

## Case Study #4: Mountain Fairies

low elevation

high prestige

i u

e o

a

high elevation

low prestige

ɨ ʉ u

ɪ ʊ ʊ

ə ɤ ɔ

ɜ ɛ ɔ

## Culture Affects Writing

Near the end of the semester, students are tasked with creating a neography (invented writing system). It can be for any language, since they may not want one for their conlang, but students usually create it for their own conlang.

## Case Study #5: Weavers

The neographies range over all types, but one of the most interesting writing systems a student created was for a culture of weavers, whose language was “written” by being stitched.

Because of how stitching works, there were limitations to what kinds of characters could be used efficiently and how they could be joined.

## Case Study #5: Weavers

The student was able to play with lines in a way that wouldn't be suitable to a written language, and the student brought their own knowledge of stitching into the neography, including stitching out a few sample sentences. (Unfortunately, I have no images to share.)

They also briefly toyed with the idea of using thread color to play a contrastive role in the neography (the writing system was a syllabary, and colors would represent vowels), but this proved impractical to stitch. It's an idea that many students over the years have tried to implement, some with more success than others.



## Culture Affects the Lexicon

As we all know, the culture of a people shapes their language, and this is an area that I encourage a lot of creativity from the students, since it doesn't need to abide by the kinds of strict linguistic rules that govern phonology or morphosyntax. There can be odd lexical gaps or culturally specific words, without requiring a larger rule to explain them.

## Case Study #6: Phony Magicians

There are a variety of ways in which students encode their concultures in their languages, the most frequent being kinship terms and honorifics, but perhaps my favorite was the result of a culture in which math was a secret known only to the elite, who used it to perform miracles. In this culture, math was magic and owned by the elite, and therefore, the language of math was powerful and taboo.

## Case Study #6: Phony Magicians

One of the most notable aspects of this was *plut* 'zero'. In order to prevent the lower classes from gaining advanced mathematical knowledge, the elite spread the lie that *plut* was an incredibly powerful spell that would cause some poor unfortunate soul somewhere to vanish from existence.

(The student was inspired by the Akkadian usage of Sumerian in their writing, which restricted writing to only those who also knew Sumerian.)

# Conclusion

Students can draw upon a variety of fields (biology, physics, art, culture, history, etc.) in order to enrich their conlangs. In many cases, the students did this all on their own! I do not explicitly require them to seek out interdisciplinary connections, and yet, most of them do anyway. In a class dedicated to interdisciplinarity, this effect should be even more pronounced.