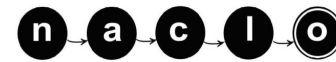# NACLO
## as an
## Introduction to Linguistics

Lori Repetti

Stony Brook University

# NACLO

The North American Computational Linguistics Olympiad is an NSF-sponsored contest for US and Canadian students.

Started in 2007, so we have had 10 Olympiads so far.



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North American Computational Linguistics Olympiad

2018
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## 2018 Student Handbook

Version 1.00, October 1, 2017
Check the web site for updates

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Open Round: January 25, 2018
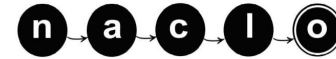Invitational Round: March 8, 2018

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# NACLO

The Olympiad consists of challenging and fun series of puzzles which students have to solve.

No previous knowledge of linguistics or computing is required since the puzzles can be solved with analytic reasoning, logic, and problem-solving skills.



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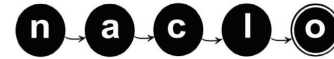
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# NACLO

While there are many science and math competitions to challenge and encourage high school students to pursue further study in these fields, there is very little available in other areas, and only ONE available in linguistics.

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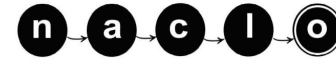
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# NACLO

The test lasts for 3 hours, and consists of 5-8 problems. Last year there were more than 1000 participants at 100 test sites, and participation is growing.

Winners of the Open Round are invited to the Invitational Round where the problems are harder.

The winners of the second Round are eligible to participate in the international competition, the International Linguistics Olympiad (ILO), one of 12 international high school science Olympiads.

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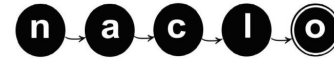Invitational Round: March 8, 2018

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# NACLO

TYPES OF QUESTIONS:

~ puzzles about English and languages other than English, including constructed languages, and made-up words in natural languages
~ systematicity of language



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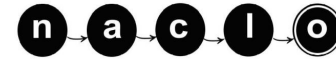
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# NACLO

TYPES OF QUESTIONS:

~ puzzles about number systems, writing systems, calendars, kinship systems
~ logic, pattern recognition

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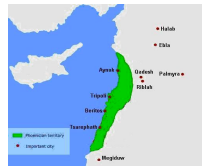Check the web site for updates

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# NACLO

NACLO 2013 Phoenician Fun: The Phoenician script can be dated at around 1050 BCE, and from it the Arabic, Hebrew and by extension Greek, Roman, and Cyrillic scripts evolved. The Phoenician civilization was centered along the Mediterranean coast in an area known as Cana'an. The map below shows a number of Phoenician cities and nearby cities that were important trading partners. The spellings reflect their pronunciation in Phoenician.



Fill in the number of the word written in Phoenician script that corresponds to the following four cities.

Beritos _____        Halab _____

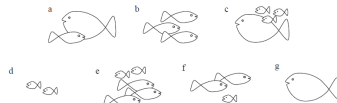Riblah _____         Tsarephath _____

This is a simplified version of the original problem. The original problem included 10 words written in Phoenician script, but two of them do not correspond to two of the cities on the map.

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NACLO 2008:

## A Fish Story

Aymara is a South American language spoken by more than 2 million people in the area around Lake Titicaca, which, at 12,507 feet above sea level, is the highest navigable lake in the world. Among the speakers of Aymara are the Uros, a fishing people who live on artificial islands, woven from reeds, that float on the surface of Lake Titicaca.

**E1 (practical).** Below, seven fishermen describe their catch. Who caught what!



___ 1. "Má hach'a challwawa challwataxa."
___ 2. "Kimsa hach'a challwawa challwataxa."
___ 3. "Má hach'a challwa má hach'a challwampiwa challwataxa."
___ 4. "Má hach'a challwa kimsa challwallampiwa challwataxa."
___ 5. "Paya challwawa challwataxa."
___ 6. "Má challwalla paya challwampiwa challwataxa."
___ 7. "Kimsa challwa paya challwallampiwa challwataxa."

Also, watch out! One of the fishermen is lying.

**E2 (practical).** Your daily catch is pictured to the right. Describe it in Aymara, and don't lie!



**E3 (theoretical).** Describe your reasoning.

---

NACLO 2007

## Rewrite me badd

You speak a little differently than your parents do. They probably say that you're speaking "bad English". Every generation of parents says this, but this is just how language works. In fact, this is where languages come from: enough generations of young people speaking "bad Latin", and eventually you have Spanish, French, and Italian!

Huishu is a language in the Tangkhulic family that is spoken in the easternmost part of India. Over time, enough changes occurred in this one village that the villagers now speak a different language than any of their neighboring villages. So, where they used to say "-lo" ("buy"), they now say "-lu", and where they used to say "-muk" ("castle"), they now say "-muʔ". (That symbol at the end represents the sound in the middle of "Uh-oh!", and the dashes in front just mean that these have to occur as parts of larger words.)
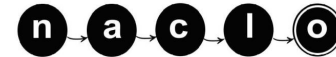
Linguists model historical sound changes as "string-rewrite rules". These are very much like a "find-and-replace" procedure in a word processor: look for one character or pattern, and replace it with another one. As the old language changed into modern Huishu, the following string-rewrite rules applied:

**K-Insertion**: When you find an [u] at the end of the word, add a [k] after it.
**Vowel-Raising**: When you find an [o] at the end of the word, replace it with [u].
**K-Deletion**: When you find a [k] at the end of a word, replace it with [ʔ].

These changes didn't just happen at once, though. They happened one after another—although not necessarily in the order above!—and we can see in which order they happened by comparing the old forms to the new forms. Only one order will work; if these changes had happened in any other order, we would have different modern words.

**G1.** Here are a few such pairs (the old form is at the top; the new one is at the bottom). From these, can you determine the order in which the above changes must have occurred? Write the names of the rules in the blanks on the left. The blanks in between each pair are for your benefit: if you write how each word changed as each rule applied, you should be able to work out their ordering in time.

| Proto-Tangkhulic form: | -ru ("bone") | -khuk ("knee") | -ko ("nine") |
|---|---|---|---|
| Rule 1: | | | |
| Intermediate form 1: | | | |
| Rule 2: | | | |
| Intermediate form 2: | | | |
| Rule 3: | | | |
| Huishu form: | -ruk | -khuʔ | -ku |

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Stony Brook University

Stony Brook University has been a test site since 2012 and has been very successful in attracting many excellent students to participate in NACLO. We have had 3 students invited to the semi-final round, and 1 made it all the way to the finals in Beijing. A couple of years ago, SBU ranked 4th in the nation for number of students participating.

FAR
BEYOND

9

We run a practice sessions in the weeks leading up to the Olympiad, but we are experimenting with hosting practice sessions locally at the high schools, rather than having the students come to SBU.

# What's in it for the students?

Students participating in this Olympiad learn about a new field of study, participate in fun games, partake in an enriching experience, and add an item to their resume which will help in the college admission process.

# What's in it for us?

This is a way to introduce high school students to the field of linguistics. Many high school students do not know about this growing field of study.