

(O) Do-This-Do-That (1/2)

O1.

- | | |
|--------|--------|
| 1. Q | 17. J |
| 2. O | 18. CC |
| 3. P | 19. S |
| 4. T | 20. AA |
| 5. B | 21. M |
| 6. EE | 22. X |
| 7. H | 23. Y |
| 8. W | 24. DD |
| 9. D | 25. I |
| 10. N | 26. E |
| 11. K | 27. G |
| 12. R | 28. C |
| 13. F | 29. V |
| 14. Z | 30. L |
| 15. BB | 31. A |
| 16. U | |

O2.

- a. neeg Hmoob neeg Nplog
- b. ua liab ua cuam
- c. muaj nyiaj muaj kub

Explanation

Solving this problem involves discovering a number of generalizations about both the meaning and the formal structure of the expressions that are given in both Hmong and English. These generalizations are sufficient to allow the solver to translate the English expressions under translation. However, as will be seen, one of these generalizations is very subtle and only the most careful linguists are likely to notice it.

One source of evidence that is likely to help investigators in the initial stages is the use of capitalization with proper nouns even in non-initial positions. One of these words, *Hmoob*, is already known to translate as 'Hmong' based on the introductory text. The remaining word, *Nplog*, has to be 'Lao'. This means that *hais lus Hmong* must translate as 'speak Hmong language', and *Neeg Nplog pe mlom* must translate as 'Lao people reverse images'. These matches with provide crucial information regarding the meaning of Hmong words. Another, related, source of information has to do with capitalization and punctuation: full sentences are



(O) Do-This-Do-That (2/2)

capitalized and terminated with periods while phrases that do not form a complete sentence are not. This allows the investigator to divide both the Hmong and English sentences into these two categories and thus makes it easier to find matches.

These constraints can help the analyst find the setting of two parameters in Hmong: the order to head-modifier constructions (like ‘Lao people’) and the word order of whole clauses (subject-verb-object, subject-object-verb, etc.). These questions can be resolved, in part, by examining the distribution of words in items that are already known. For example, *neeg* occurs in 5 items and ‘people’ also occurs in five items. This is consistent with the hypothesis that the *neeg* in *neeg nplog* means ‘people’ and that modifiers follow the nouns that they modify in Hmong. If this is the case, it appears that the subject occurs at the beginning of the sentence in Hmong. It remains to be determined whether the direct object occurs before or after the verb. There are two words left unaccounted for in the expression *Neeg Nplog pe mlom*, namely *pe* and *mlom*. Since these translate the sentence ‘Lao people reverence images,’ one of these words is likely to mean ‘reverence’ (the verb) and the other is likely to mean ‘images’ (the object). It is straightforward to note that the expression *pe mlom* also occurs in the phrase *pe dab pe mlom*.

There is only one other item that includes the sense ‘reverence images’ and this is ‘reverence images and spirits’. This must match *pe dab pe mlom*. This item has a curious structure: it has an ABAC pattern. What could the repeated word mean? There are multiple ways of reaching a conclusion on this subject. One helpful approach involves the semantics of ‘reverence images and spirits’. In this phrase, ‘reverence’ applies to both images and spirits. This is consistent with a structure where the word meaning ‘reverence’ is repeated with both ‘images’ and ‘spirits’. If so, *pe* must mean ‘reverence’, *dab* must mean ‘spirits’, and *mlom* must mean ‘images’. Note that the instructions warn that the order of words in the translations may not line up straightforwardly with the order of words in the Hmong expressions; this is a clear example where this is the case.

This kind of expression, where an ABAC pattern in Hmong lines up with an English translation of X and Y (or something similar in meaning) is crucial to solving this problem. As the techniques illustrated above are applied systematically to the remaining items, it becomes apparent that all of the three English sentences that are to be translated into Hmong must correspond to Hmong expressions of this type. An interesting property of these expressions is that they are *coordinate*. Coordinate expressions include phrases like *dogs and cats* and *red or blue*. The fact that they are coordinate means that they can be reversed without changing their meaning (as in *cats and dogs* and *blue or red*). As implied by the translation exercise, Hmong coordinate expressions are not reversible. The deepest puzzle of this problem is finding what determines the order of the parts in a coordinate expression like *pe dab pe mlom*. To do this, it is necessary to collect all of the coordinate expressions and explore hypotheses regarding what best predicts their ordering. A careful examination reveals that the tone, written as the final consonant in a word, is the best predictor of what order the parts of a Hmong coordinate expression take. For example, words with the -b tone occur before words with the -g tone but words with the -j tone occur before words with the -b tone. Note that it is not necessary, or even helpful, to know what these tones actually sound like; the crucial fact is the logical relationship among the tones.

