

IOL Brasilia 2024 P4 Dâw Explanation

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Problem

<https://ioling.org/problems/2024/i4/>

Walkthrough

Part a

Part 1

We firstly note that, among the word combinations, the word dâw is incredibly common - entries 2 to 7 (6 of them) all share dâw at the start of the phrase. There should be a corresponding meaning in English that links many of the English words; indeed, we see mouth, pinky finger, tongue, foot, and nose are all body parts, so this strongly suggests that dâw means body part or the like. (Note that we have 6 dâw but only 5 obvious body parts, so it is more than just a body part alone.)

We can break some of the English words up into our rough initial morpheme guesses.

A) ring is probably something like a circle for the finger; C) flip-flops may be containers for the feet; D) pinky finger may be small finger; E) to decrease could be something like “to make smaller”; G) can of flour could be container for flour; H) tongue is probably related to mouth.

Among the non-body parts, we think that flip-flops and can of flour could possibly have the same “container” morpheme; the only overlap here is 'aa' between 1 and 10. 1 also has

çum, and 2 is dâw çum - this matches with our idea of foot. We thus let çum mean foot, 1 be foot.container = C) flip flops, 2 be body_part.foot = I) foot, and 10 be flour.container = G) can of flour.

The only non-body parts remaining are A) ring, E) to decrease something, and F) daughter. Recall that we need one more non-body part to have dâw in it. It is very common among languages of the world for alienability to play a role; typically, inalienable things are body parts and family members. It is thus likely that dâw actually indicates an inalienable object, and our remaining dâw is F) daughter. Thus, the only remaining non-dâw words we have are now A) ring and E) to decrease something.

So far: 1C 2I 10G

Recall that a pinky finger is likely something like a small finger, which in turn could be a small part of the hand. We see 6) dâw sôb pis piis; our idea for what pinky finger could mean (having two “small” morphemes) matches with pis and piis. We thus make the connection that pis/piis means small and sôb is hand. Since sôb means hand, we guess that 9) sôb dak is A) ring. Also, since piis means small, then 8) dôo' piis should be E) to decrease (something).

1C 2I 6D 8E 9A 10G

Next, we only have B mouth, F daughter, H tongue, and J nose left. Notice that, among our remaining Dâw words, we have 3) dâw nôr and 4) dâw nôr keet; it appears that 4 is some kind of 3 or related to 3. Looking at our English pairs, mouth and tongue are the most likely pair like this; the tongue is naturally inside the mouth, so probably 3) dâw nôr is mouth while 4) dâw nôr keet is tongue.

1C 2I 3B 4H 6D 8E 9A 10G

We simply have daughter and nose left, which must be dâw tôog and dâw tôoj in some order. We are stuck at this point, but if we look at the second set of word combinations, we see that that set involves anteaters, which are known for their long noses. We see that, in Dâw, tôog does not appear again in the bottom set while tôoj does. We thus hypothesize that 7) dâw tôoj is J) nose while 5) dâw tôog is F) daughter.

1C 2I 3B 4H 5F 6D 7J 8E 9A 10G

Part 2

Now, we move on to solve the second set. We can start with our clue from before: *tôj* is nose, so we can try to find the English equivalent of 20) *yon tôj*.

There are two interpretations to continue with from here. The most immediately obvious one is that 20 is R, domesticated anteater, since the anteater must be related to its nose. However, R needs to carry two semantic meanings: domesticated and anteater, and it is unlikely that the word for “anteater” is exactly the same as the word for “nose,” so there could potentially be a problem with this approach.

The other approach is to look at the picture of the revolver. There must be a reason that we are given the picture of the revolver; comparing it with the image of the anteater we are given, the gun’s barrel looks suspiciously similar to the anteater’s nose. If we make the tentative guess that a revolver is actually called the nose of an anteater, then 20 is actually O) revolver. Proceeding, we let *yon* mean anteater, which gives us 19) *yon ’uuy* as R) domesticated anteater. This tells us that *’uuy* means domesticated, so 17) *taax ’uuy* is K) domesticated tapir, so *taax* means tapir. However, tapirs don’t appear any more in the English list while *taax* does in 16), so it appears that we are stuck and/or did something wrong. However, examining the given pictures, capybaras and tapirs actually look very similar, but we are told that capybaras live in (or near) the water. It thus makes sense to think of a capybara as a water tapir, so we match 16) *nâx taax* to L) capybara.

16L 17K 19R 20O

If *nâx* means water, we have 14) *yak nâx* and 15) *nâx pôog*; in English, the water-related word combinations are P) main river and S) *tucupi*. The word *yak* appears again in 13) *yak yaa’*, while *pôog* does not. In English, the morpheme for “main” is probably not repeated, while *tucupi* could be manioc water or the like (manioc is repeated in *macaxeira*). Therefore, we match 14 to *tucupi* and 15 to main river. If *yak* means manioc, then 13) *yak yaa’* would be T) *macaxeira*.

13T 14S 15P 16L 17K 19R 20O

We now have 11, 12, and 18 left to match to M, N, and Q. Note that, earlier, we found that 3) *dâw nôr* means mouth while 4) *dâw nôr keet* means tongue; in 11) *be keet*, we

see keet is repeated. We consider the shape of a tongue: it is like a leaf, so we tentatively guess that a leaf is like the tongue of a plant (or the tongue is the leaf of the mouth). Then, “be” would indicate something of a plant, which leaves 12) be t̄m as Q) seed. We see that 18) t̄m t̄ag must then be N) glasses (spectacles), with the repeated t̄m morpheme. What could a seed and glasses have in common? Well, since a leaf is the tongue of a plant, then a seed could be the eye of a plant, which nicely explains the overlap of t̄m. This explanation makes sense, and we are done.

11M 12Q 13T 14S 15P 16L 17K 18N 19R 20O

(Interlude) pis vs piis

As we will see in part b), there is a difference between pis and piis in D̄w. What is it? Well, we examine 6) again. The meaning is “pinky finger,” which we literally translated as little little hand. We have d̄w s̄b pis piis, which is body_part + hand + small + small; however, note that “small” is actually used in different senses: “finger” is translated as a small *part* of the hand while pinky finger is translated as a small finger (the latter being an adjective). Well, which is which (pis or piis means small part or just small)? In 8) d̄o’ piis, the translation is to decrease (something) - which is to make smaller. If we think about the indigenous culture of the speakers of this language, the only sense in which decrease should be used is partial counting (e.g. taking one rock away from five rocks gives four rocks which are a smaller part of the original five rocks) rather than actually getting smaller (e.g. a big stone shrinks into a small stone). Thus, in this case, piis is probably used to mean “a small part of” rather than “small,” so pis means “small.”

Note: Alternatively, one could also start the second set with 11) be keet. The reasoning described above using 3 and 4 is still applicable at the early stage, and this is another way to get started without the anteater-revolver reasoning.

Part b

- In 21, *dâw* tells us that we are dealing with an inalienable thing. *sôb* means hand. Finally, in the section above, we found that *piis* meant a small part of, which we translate as finger.
- 22 is the same as 21) except *pis* instead of *piis*. In the above section, the difference is that *pis* indicates an actual difference in size, so we translate this as small hand.
- Likewise to 21, 23 is simply *body_part + foot + small_part_of = toe*.

Part c

- 24 literally translates as a small part of the water (following with our example of P) main river = 15) *nâx pôog*), so our answer is *nâx piis*.
- In 25, we want to translate a tapir that is physically small; thus, it is *taax pis*.
- Likewise to tongue, for 26, our translation would be *body_part + eye/seed*, so *dâw tum*.
- Finally, we have 27. In 16), we can stack modifiers at the end, so we do so again here, too. Just like a daughter, a granddaughter is also inalienable, so we have *dâw*; then, we have daughter and daughter, so just *dâw tôog tôog*. However, we see from *dâw sôb pis piis* that the penultimate word has only one vowel while the ultimate word has two, so it is possible that our answer is *dâw tôg tôog*.