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## Problem summary



• Tshiluba, spoken by about 6 million people, is one of the official languages of the Democratic Republic of the Congo.

 Below are some sentences in Tshiluba, along with their English translations.







## Problem data



	Tshiluba	English		
1	mukaji uvwa mumona muana.	The woman saw the child.		
2	bakaji bavwa bamona muana.	The women saw the child.		
3	muluma uvwa mumona bakaji.	The man saw the women.		
4	muluma uvwa mumona bambuji.	The man saw the goats.		
5	banzolu bavwa bamona bantambwe.	The chickens saw the lions.		
6	tubambwa tuvwa tumona baluma.	The small dogs saw the men.		
7	mbwa uvwa mumona ntambwe.	The dog saw the lion.		
8	ntambwe uvwa mumona tubanzolu.	The lion saw the small chickens.		
9	kanzolu kavwa kamona tubantambwe.	The small chicken saw the small lions.		
10	tubakulu tuvwa tumona mbwa.	The small adults saw the dog.		
11	kamuntu kavwa kapeta kantambwe.	The small person found the small lion.		

- First task is to extract the vocabulary and see if we can figure out the grammar rules
- With problems like this a good place to start is to look for very similar sentences, ideally 'minimal pairs' (ie sentences that differ in only one word)



#### Problem data



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- All the sentences have the verb 'saw' except the last one, 'found'
- In the Tshiluba there is a repeated pattern of –vwa with various different prefixes (*u-*, *ba-*, *tu-*, *ka-*) in every sentence
- •And all but the last have -mong with the same prefixes; #11 has kapeta.
- The words before and after this pattern differ from sentence to sentence, and so probably represent the subject and object



## Problem data – agreement in the verb phrase



	Tshiluba	English		
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- The two words are together forming the verb
- They are showing some sort of agreement (concord) in their prefixes
- It is reasonable to assume that the first word, -vwa, which also occurs in #11 is some sort of auxiliary, perhaps a tense marker
- So we have two vocabulary items:
  - -mona 'see'
  - -peta 'find'



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- It's fairly easy to spot that the prefixes on the auxiliary and verb more or less match the prefixes on the first word
- An exception is that the expected muvwa is actually uvwa
- We will confirm later what the prefixes mean



## Extracting the vocabulary – minimal pairs



	Tshiluba	English		
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1 & 2 are a minimal pair: 'woman' vs 'women': singular vs plural The obvious difference is mukaji (sing) vs bakaji (plur) And bearing in mind that we have seen systematic agreement of prefixes, we can conclude that the verb is agreeing with the subject



# Extracting the vocabulary – vocabulary



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Stem	Meaning	Sing/plur
-kaji	woman	mu / ba
-ana	child	mu / ?
-luma	man	mu /ba
-mbuji	goat	? / ba
-nzolu	chicken	? / ba
-ntambwe	lion	? / ba

But when we get to #6 onwards, we see that there is something else going on



# Extracting the vocabulary – vocabulary



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5	banzolu bavwa bamona bantambwe.	The chickens saw the lions.	
6	tupambwa tuwa tumona baluma.	The small dogs saw the men.	
7	mbwa uvwa mumona ntambwe.	The dog saw the lion.	
8	ntambwe uvwa mumona tubanzolu.	The lion saw the small chickens.	
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- The adjective 'small' is expressed by a further prefix *tu* before plural *ba*-
- With corresponding agreement (when subject) in the verb
- But with singular the prefix ka- replaces the mu- in kanzolu and kantambwe, though not in kamuntu



# Full vocabulary list



Stem	Meaning	Sing	Plur	Small sing	Small plur
-kaji	woman	mu	ba		
-ana	child	mu			
-luma	man	mu	ba		
-mbuji	goat		ba		
-nzolu	chicken		ba	ka	tuba
-ntambwe	lion	Ø	ba		tuba
-mbwa	dog	Ø			tuba
-kulu	adult				tuba
-ntu	person	1 7		kamu	
-muntu	person	} !		ka	

There are some problems with this analysis:

- 1. Why do the words for 'lion' and 'dog' in the singular not start with *mu*-? Note that they begin with a nasal sound (m or n)
- 2. What is the word for 'person'? If it is *muntu*, then the form *kamuntu* fits the pattern. But as we will see, —ntu also makes sense. Perhaps we won't have to decide.



## Translate the following into Tshiluba:

1. Dog mbwa

2. The man saw the child. *Muluma uvwa mumona muana.* 

- 3. The chicken saw the dogs.
- 4. The adult found the goat.
- 5. The small goats found the small child.

1 is straightforward, just look it up in our vocabulary list

For 2 'The man' (singular) is *muluma* and the auxiliary and verb will both have the corresponding prefix *uvwa mumona*. And 'child' is *muana*.

Another way to do this, if you prefer, is to take sentence #3 'The man saw the women' as a model, and just change 'the women' to 'the child':

muluma uvwa mumona muana



#### Translate the following into Tshiluba:

1. Dog mbwa

2. The man saw the child. Muluma uvwa mumona muana.

3. The chicken saw the dogs. *Nzolu uvwa mumona bambwa.* 

4. The adult found the goat.

5. The small goats found the small child.

For 3, we could again find a model, or else apply our rules. In either case, we have not yet seen 'the chicken' (stem -nzolu) in the singular.

Now we are faced with a dilemma: do we prefix *mu*- as with some of the words, or have no prefix like some of the others? In fact, the rule is that because *nzolu* begins with a nasal, it does NOT require a prefix (though if you put *munzolu*, you would probably not be penalised)

The verb forms are the same as in 2, and for 'the dogs', we have seen 'the small dogs' as *tubambwa*, and we know to simply remove the *tu*-



## Translate the following into Tshiluba:

1. Dog mbwa

2. The man saw the child. Muluma uvwa mumona muana.

3. The chicken saw the dogs. *Nzolu uvwa mumona bambwa.* 

4. The adult found the goat. Mukulu uvwa mupeta mbuji.

5. The small goats found the small child.

For 4, we have first to find the singular form of 'adult', based on tubakulu 'small adults' (plural). Applying the rules that should be mukulu.

We have seen 'found' only in #11 (kavwa kapeta) with the prefix ka-. But we can assume that the correct form here is with mu-, remembering that the auxiliary is uvwa not muvwa.

For 'the goat' we need to form the singular equivalent of *bambuji*. Again *mumbuji* might seem possible, but because it begins with a nasal, it should actually be just *mbuji*.





1. Dog mbwa

2. The man saw the child. *Muluma uvwa mumona muana.* 

3. The chicken saw the dogs. *Nzolu uvwa mumona bambwa.* 

4. The adult found the goat. Mukulu uvwa mupeta mbuji.

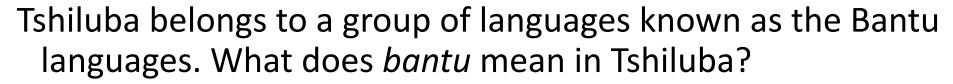
5. The small goats found the small child. Tubambuji tuvwa tupeta kamuana.

For 5, we have first to find the small plural form of 'goat', based on bambuji 'goats' (plural): we simply prefix tu- to give tubambuji.

The verb prefixes for small plural can be seen in #10: tu- giving (tuvwa tupeta).

We have seen *muana* for 'the child' and the 'small' prefix is ka- in the singular.





Recall the final rows of our vocabulary table:

Stem	Meaning	Sing	Plur	Small sing	Small plur
		mu/Ø	ba	ka	tuba
-ntu	person	1 2		kamu	
-muntu	person	} !		ka	

This question suggests an answer to that dilemma.

If we assume the ba- of bantu is the plural prefix, then the stem is indeed –ntu, and the answer is that bantu means 'the people'



The Tshiluba word for "fruit" is *cimuma*, and the Tshiluba word for "fruits" is *bimuma*. Translate the following into English:

- 1. cimuma civwa cimona ntambwe.
- 2. ntambwe uvwa mumona tubimuma.

This new piece of information appears to introduce a new noun group, where the singular marker is *ci-*, with corresponding prefixes on the verb.

1 is straightforward: 'The fruit saw the lion' [sic]

In 2 we have *ntambwe* 'the lion saw ...' and the object is the plural 'fruits' with the 'small' prefix, so 'The lion saw the small fruits'.





- Tshiluba is closely related to Swahili, one of the most widely spoken languages in Africa.
- A feature of Swahili is the extensive agreement between nouns and verbs, which also extends to adjectives, all done with prefixes which are sometimes the same, though not always.
- The examples we have seen here apart from 'fruit' all follow the same patterns; but in reality there are a large number of different agreement patterns corresponding to different noun classes, loosely based on meaning, rather like genders in languages you are more familiar with.



# And an apology of sorts



- There was one part of this question which you could not answer with certainty, because you were not given enough data:
- You had to guess which of two patterns were appropriate for nzolu 'chicken'.
- There was some logic to the correct answer (to do with nasal consonants), but the alternative answer was also consistent with the data.
- This happens (hopefully rarely) and the 'examiners' will always give credit for an incorrect but plausible answer.