

mozilla



UNIVERSITY OF MICHIGAN

MASCO



The Association for Computational Linguistics
North American Chapter

Carnegie Mellon

The Seventh Annual

North American Computational Linguistics Olympiad

2013

www.naclo.cs.cmu.edu

SOLUTIONS

Invitational Round

March 19, 2013

(I) Beja (1/2)

This problem was worth five points. The scoring rubric below includes 13 points. After the papers were scored, each score was multiplied by 5/13 so that each score was in the range of 0 to 5 points.

Translate into English: 1/2 point for getting one sentence completely right. 1 point for having at most three morphemes wrong across the five sentences (the morphemes in English are the verb tenses, singular and plural, definite and indefinite, the pronouns "he" and "she", and the main words of the sentences -- subject, object and verb). 3 points for getting at most one morpheme wrong across the five sentences.

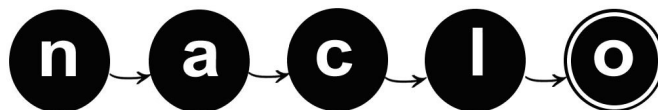
11. The camel has seen the man.
12. He did not eat a flower or A flower did not eat.
13. She can eat a horse.
14. The man can collect water.
15. She cannot see a donkey.

Translate into Beja: 1/2 point for getting one sentence completely right. 1 point for having at most three morphemes wrong across the five sentences. The morphemes in Beja are all the prefixes and suffixes and the verb forms as well as the main lexical items ("tak" for "man", "meek" for "donkey" etc.). 3 points would have been given for at most three wrong morphemes, but nobody got this score.

16. Tak oogwib kanriif.
17. Idooba katamya.
18. Uumeek oofaar tamaab kiike.
19. Uugwib win kiike.
110. Tuuyaas yooaab danbiilt kitte.

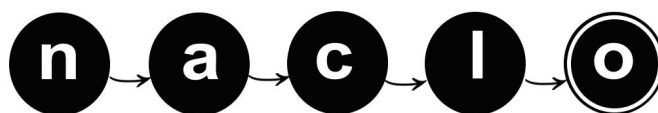
Explanation: This data in this problem illustrate many morphemes (prefixes, suffixes, and other ways of changing words). You could get up to six points (one point each) for explaining any of the items listed below. A seventh point was reserved for a particularly complete or insightful solution, and only one person got that point.

1. Noun gender: Simple observation: you can add a t- to the beginning of a noun to make it feminine. (You could get one point for the simple observation.)
1.1 How Beja really works: the initial t- is part of the definite article, and the rule is that there's only one t marker: either an article t..., or a suffix -t; e.g. tilaga (g) but m'ariit (q).
2. Noun gender: Masculine nouns can be identified by the absence of a t- or -t. (see 1.1)
3. Noun number: There is one noun that appears in both singular and plural "yoo" (ox) an "yooaab" (oxen) in this problem. "Yooaab" is the only plural noun in this problem.
4. Noun definiteness: Monosyllabic nouns have a prefix oo- (accusative) or uu- (nominative) when they are definite. Feminine nouns have a t- before uu- or oo-.
5. Noun definiteness: Disyllabic nouns have a prefix i- if they are definite. If they are feminine, there is also a t- before the i-.
6. Noun case: Monosyllabic definite nouns have the prefix -uu for nominative case and -oo for accusative case.
7. Noun case: Disyllabic definite nouns have the prefix i- for both nominative and accusative. There is only one example of a disyllabic definite noun that is accusative, t-i-m'ari (the food).



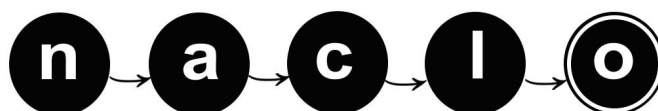
(I) Beja (2/2)

8. Noun case: Masculine nouns that end in a vowel have a -b added for accusative indefinite masculine (doobaab, bridegroom; kil'oob, shell; and yooaab, oxen). doobaab contrasts with feminine t-i-dooba (the bride) where t- is the feminine prefix and i- is the definite prefix. Other accusative indefinite nouns do not end in -b (hataay, horse; yam, water). The -b is also found in participles tamaabu (n), diblaab (o).
9. Noun case: There is one feminine indefinite noun in object position: "m'ari-it" (food) which contrasts with "t-i-m'ari" (the food). We could conclude that "-it" is a suffix for feminine accusative indefinite. However, additional data would reveal that -t is also found in nominatives.
10. Predicative nouns and adjectives, positive: (e.g., is a mouse, is big): Predicative nouns and adjectives end in -u if the sentence is positive. -u has a copula (be-verb) function, suffixed on to nouns, adjectives, verb participles (tamaabu (n)) and even finite verbs (kanriifu (r)).
11. Predicative nouns, negative: (e.g., is not a donkey): The noun is followed by "k-itte" for feminine or "k-iike" for masculine.
12. Predicative nouns, definite: the definite prefix is oo- for definite predicative nouns. Predicatives are accusative (as they are in Arabic, incidentally).
13. Suffixing verb, past, feminine subject: -ta
14. Suffixing verb, present, feminine subject: -t(i)-ni.
15. Suffixing verb, present perfect, feminine subject: no examples.
16. Suffixing verb, past, masculine subject: -ya
17. Suffixing verb, present, masculine subject: -iini or -ii-ni (compared to feminine present)
18. Suffixing verb, present perfect, masculine subject: -aab followed by -u for positive or kiike for negative.
18.1 Better still, aa + masculine accusative b + predicative
19. Suffixing verb, negative: ka-. The past tense form of the verb is used with ka- to mean present tense negative.
20. Prefixing/Infixing verb, feminine past: ti-C1 C2-i-C3. As in other Semitic languages, a verb root can consist of a skeleton of consonants (C1, C2, C3) with various prefixes and suffixes or other patterns of consonants and vowels between the root's main consonants.
21. Prefixing/infixing verb, feminine present: no example
22. Prefixing/infixing verb, feminine present perfect: no example
23. Prefixing/infixing verb, masculine past: C1 C2 i C3. This is only attested in the negative (kii-dbil, is not collecting). Negative present tense is formed with a negative prefix and the past tense form of the verb. See below.
23.1 But the model of feminine tiCCiC would suggest iCCiC for masculine. Then the negative just requires ki + phonological adjustment.
24. Prefixing/infixing verb, masculine present perfect: C1 i C2 C3 -aab plus -u for positive or kiike for negative.
24.1. Same as for suffixing verbs – see 18.
25. Prefixing/infixing verb, negative: ki-
26. Potential (can): present tense form of the verb plus -u for positive and kiike/kitte for negative.
27. The basic word order is subject-object-verb.
28. The subject and object can be omitted if they are pronouns. The verb will indicate the gender of the pronoun.
29. You could get a point for noticing that "t" marks feminine gender everywhere in nouns, verbs, and adjectives.



(J) Stockholms Tunnelbana (I/I)

Abraham's Mountain	29 Abrahamsberg	King's Garden	1 Kungsträdgården
Alder Bay	31 Alvik	Lake Mälaren Heights	78 Mälarhöjden
Alder Village	70 Alby	Manor	76 Sättra
Axel's Mountain	79 Axelsberg	Mary Market	90 Mariatorget
Band Pasture	50 Bandhagen	Meadow Village Square	26 Ängbyplan
Birch Pasture	64 Björkhagen	Mount Christine	32 Kristineberg
Channel Village Mountain Centre	7 Sundbybergs centrum	Mountain Hammer	98 Bergshamra
Charles Square	92 Karlaplan	Odin Square	36 Odenplan
Dark Mountain	24 Blackeberg	Pasture Manor	53 Hagsättra
Fathertown	61 Farsta	Rink Village	10 Rinkeby
Fathertown Beach	62 Farsta strand	Spring Mountain	74 Vårberg
Forest Church Garden	57 Skogskyrkogården	Spring Village Farm	73 Vårby gard
Gullmar's Square	44 Gullmarsplan	St Eric's Square	35 S:t Eriksplan
Hall Grove	69 Hallunda	Sture Village	49 Stureby
Hammer Village Heights	63 Hammarbyhöjden	Telephone Square	84 Telefonplan
Haymarket	38 Hötorget	Tender Village Center	100 Mörby centrum
Hazel Village Beach	19 Hässelby strand	Thorild's Square	33 Thorildsplan
Hazel Village Farm	20 Hässelby gård	Town Pasture	3 Stadshagen
House Village	17 Husby	Western Cottage	86 Västertorp
Iceland Market	25 Islandstorget	Westwood	4 Västra skogen
John's Grove	21 Johannelund		



(K) Putting the Books in Order (1/3)

Georgian	Armenian	Logical Order
I ივნისი [ivnisi]	A. Հունիս [jounis]	1. Jan. IV M
II აპრილი [aprili]	B. Նոյեմբեր [nojember]	2. Feb. X H
III ოქტომბერი [ok'tomberi]	C. Մարտ [mart]	3. Mar. V C
IV იანვარი [ianvari]	D. Սեպտემբեր [september]	4. Apr. II J
V მარტი [marti]	E. Հոկտემբեր [hoktember]	5. May IX K
VI ნოემბერი [noemberi]	F. Օգոստոս [ohgostos]	6. June I A
VII აგვისტო [agvisto]	G. Փետե [pete] wrong	7. July XII L
VIII სექტემბერი [sek'temberi]	H. Փետրվար [p'etrouar]	8. Aug. VII F
IX მაისი [maisi]	I. Դեկտემբեր [dektember]	9. Sep. VIII D
X თებერვალი [t'ebervali]	J. Ապրիլ [april]	10. Oct. III E
XI დეკემბერი [dekemberi]	K. Մայիս [majis]	11. Nov. VI B
XII ივლისი [ivlisi]	L. Հուլիս [joulis]	12. Dec. XI I
XIII აგტისლისი [avtislisi] wrong	M. Հունվար [jounouar]	

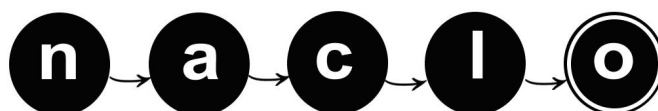
K1
IX = May, H = February

K2
Fake folders are XIII in the yellow box and G in the green box.

K3
The folders should be ordered chronologically by month, i.e., January to December.

K4
Explain your answers.

Given 12 real folders and 1 fake folder, it is logical to posit that the labels stand for the names of months, and that the folders are organized chronologically January-December.



(K) Putting the Books in Order (2/3)

Assuming some phonological correspondence between the months in the three languages (English, Yellow Box Language, Green Box Language), one can search for patterns that can inform the matching of months to words in each box, i.e.,

- months with similar endings as in January/February, and September/October/November/December.
- months with similar initial letters for January/June/July, March/May, April/August.
- word length

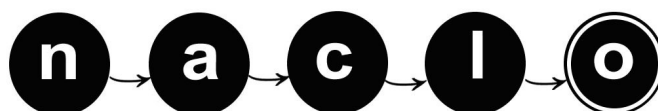
The following patterns emerge:

Yellow Box

- I, IV, XII begin with the same symbol, as do January, June, July.
- III, VI, VIII, XI share similar endings, as do September, October, November, December.
- II and VII share initial letters, and may, therefore, be either April/August or March/May.
- V and IX share initial letters, and may, therefore, be either April/August or March/May.
- Looking at I, IV, and XII closely, and assuming (a) above, one can see that the first three letters of IV likely stand for the Jan of January, and with that in mind, the second symbol in IV stands for a, which helps one conclude that II and VII, which start with the same symbol, must be the April/August pair, leaving V and IX for March/May. The third symbol in IV must stand for n (Jan), which leads one to conclude that I must be June, and XII must, therefore, be July.
- Given XII for July, and positing that the third symbol may stand for l, one can posit that of the April/August pair, II is April (it shares that symbol in penultimate position) and VII must be August (does not share that symbol since there is no l in August).
- Given that II is April, the third symbol may stand for r, and one can posit that of the March/May pair, V which shares that symbol in third position is March, and, therefore, IX must be May.
- Given that VII is August and it shares a symbol with the first symbol in VIII, likely the symbol for s, VIII must be September. VI must be November given that it begins with the symbol associated with the n in June and January. Also, Given VII for August, the symbol that likely stands for t is also the third symbol in III, which we can, therefore, posit stands for October. That leaves XI for December.
- The fake folder is, therefore, XIII.

Green box:

- Positing that September, October, November, December share endings in this language as they do in English, labels B, D, E, I must represent in some unknown order those four months.
- Positing that January and February also share endings in this language as they do in English, labels H and M must represent those months.



(K) Putting the Books in Order (3/3)

c. Positing that January, June, and July start with the same sound/symbol, we conclude (given b above) that label M must stand for January, and, therefore, label H stands for February. That leaves labels A and L as labels representing June/July. Given the similarity of the fourth symbol in labels M and A, which we can assume stands for the n shared by January and June, label A must stand for June and label L for July.

d. If label H stands for February, label G must be the fake folder since no other month shares the same first sound as February in English.

e. The last symbol in labels B, D, E, I must stand for the final r in September-December. If so, then J which has the symbol in third position must stand for April, the month with an r in third position in English. The initial symbol for that label is not shared by any other month, suggesting that only April begins with an a in this language.

f. Labels C and K begin with the same symbol, which must stand for the m in March/May. Given the third symbol in label C which we have discovered must stand for r, label C is March and label K is May.

g. That leaves label F for August which in this language starts with an o, given the data, rather than a symbol corresponding for the initial letter a in August (the initial sound is still similar, though, for August in English and this language).

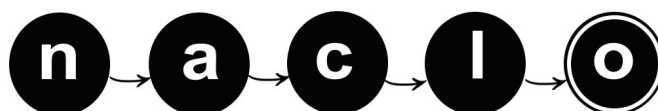
h. Last task is to determine the order of labels B, D, E, and I for September-December.

i. Label I must stand for December since no other month has a d sound and the initial symbol in I appears only in that label.

j. The second symbol in label I must stand for the e in December. That symbol appears in second position in label D, so that label must stand for September, which has an e in second position as is the case for the e in December in English.

k. B must be November since its initial symbol seems to be the uppercase of the lowercase symbol in A and M which we determined stands for n (in June and January).

l. That leaves label E for October.



(L) Yesbot (I/I)

L1. “I am the CEO of NACLO Enterprises.”

L2. “You” will sometimes cause an error – whenever the CEO is addressing Yesbot, for example – but not when the CEO and Yesbot are both talking to a third person. “We” will sometimes cause an error – such as when the CEO is speaking for a group that excludes Yesbot, like “We are not robots” – but not when speaking for a group that includes Yesbot, like “We are in this room.” Words like “now” and “here” may or may not cause errors depending on what time or location they pick out. “Now the CEO is talking” will cause an error, but “It’s 2013 now” will not; likewise “Here are the reports” may cause an error if the CEO is holding them and Yesbot is across the room, but “There is a restaurant here” may not.

Each of these words is what is called an “indexical”; they can refer to different things depending on who says them, who

L3. There are no words that Yesbot will invariably get wrong, because the troublesome words (I, you, we, now, here, etc.) sometimes have fixed references, like in “reported speech” sentences where I am describing what someone else said.

Even the very problematic I gives no trouble to Yesbot if the CEO is reporting something someone said: “George from accounting said, ‘I promise you that I’ll never do it again.’”. I and you in this sentence refer to the same people regardless; when Yesbot repeats it I it still refers to George.



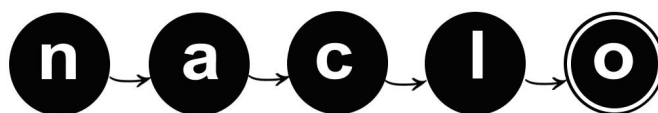
(M) Playing the Cognate Game (1/2)

M1.

English	Swahili	Indonesian
Bring me your notebook.	10	A
Bring your books to school.	9	B
He sold me a book.	1	E
His shirt is on his thigh.	17	J
I didn't have time on Friday.	19	S
I have books about Jews.	11	Q
I like the Dutch flag.	13	R
I speak Swahili.	14	O
I study biology.	12	N
In Swahili you can say what's new.	5	D
My brother's shirt is green	16	I
My sister studies chemistry.	2	H
My sister's headscarf is blue.	3	G
On Fridays I pray.	18	K
These districts are safe.	20	T
This list says that you are poor.	15	M
This neighborhood is safe.	7	L
Today is Thursday.	8	F
Tomorrow you're going to Egypt.	6	C
Yesterday I read the Bible.	4	P

M2. Some options include:

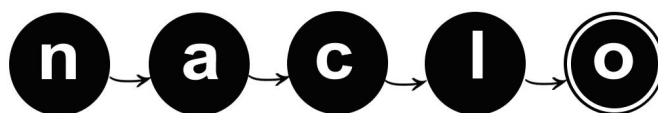
Swahili word	English meaning of Swahili word	Indonesian misleading cognate	English meaning of Indonesian misleading cognate
daftari	notebook	daftar	list
kaka	brother	kakak	(older) sister (or brother)
katika	in	ketika	on
kitabu	book	(al-)kitab	the bible



(M) Playing the Cognate Game (2/2)

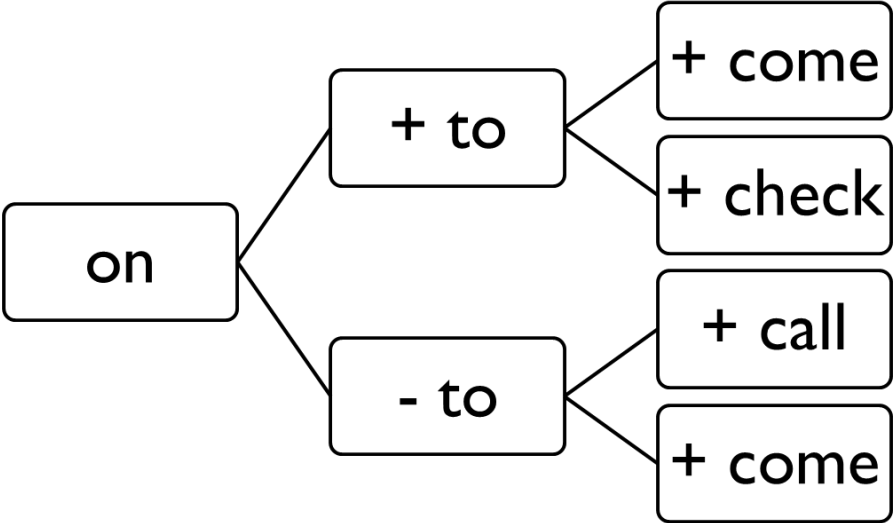
M3.

1. I speak Hebrew. S: Ninasema Kiyahudi
I: Saya bisa berbahasa Yahudi
2. I like my sister's shirt S: Ninapenda shati la dada wangu
I: Saya suka kemeja adikku OR Saya suka kemeja kakakku
3. He sold me a flag. S: Aliniuza bendera
I: Dia menjual saya bendera
4. Egypt is safe. S: Misri ni salama
I: Mesri (adalah) selamat
5. He sells me a headscarf. S: Ananiuza hijabu
I: Dia menjual saya jilbab
6. Today I am reading a book. S: Leo ninasoma kitabu
I: Hari ini saya membaca buku
7. In Swahili you can study the Bible. S: Katika Kiswahili unaweza kujifunza biblia
I: Di Bahasa Swahili Anda bisa belajar al-kitab
8. The Dutch are poor. S: Waholanzi ni meskini
I: Belanda-Belanda (adalah) miskin
9. On Thursdays I read books. S: Siku za alhamisi ninasoma vitabu
I: Ketika hari Kamis saya membaca buku-buku
10. My brother studies your book. S: Kaka wangu anajifunza kitabu chako
I: Adikku belajar buku Anda OR Kakakku belajar buku Anda

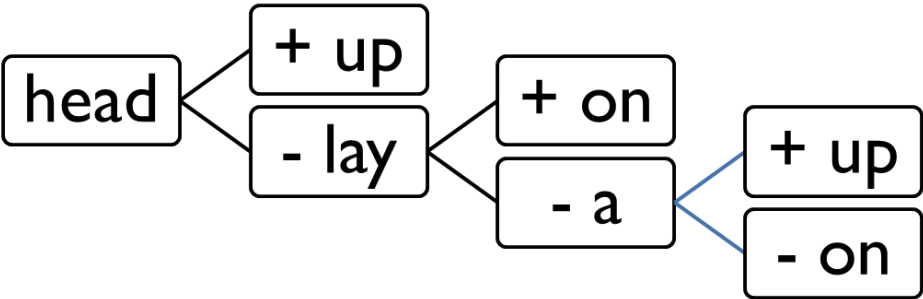


(N) A Tree by Any Other Name (I/I)

N1.



N2.



(O) Warlpiri Kinship Groups (1/4)

- 1. Nakamarra
- 2. Nampijinpa
- 3. Napanangka
- 4. Nungarrayi
- 5. Napaljarri
- 6. Napangardi
- 7. Napurrula (note: this is not a typo)
- 8. Nangala

This is just one way to solve this problem. This solution is shown here to illustrate the variety of ways in which one can approach such a problem.

Preliminary observations.

We are given that for skin number 1, the males are Jakamarra and the females are Nakamarra. The only difference between these two names is the first letter. When we look at the clues, all skin names seem to follow this pattern: to get from a female in a skin group to a male in the same group, we change the first letter from N to J. There is one exception: “Napurrula” becomes “Jupurrula.”

We already know Nakamarra is assigned to skin 1, so we just need to figure out the remaining seven:

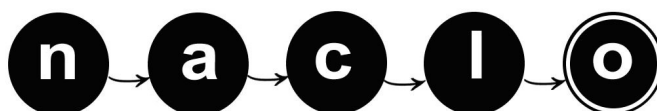
- 1. Nampijinpa
- 2. Napangardi
- 3. Napurrula
- 4. Napanangka
- 5. Napaljarri
- 6. Nangala
- 7. Nungarrayi

Basic skin relations.

As we see in the diagram in the problem, the Warlpiri people have an intricate kinship system. (In fact, so do many other Australian aboriginal groups!) Let's figure out how to navigate this system.

To get from husband to wife and vice versa, we simply move to the other side of the row. For example, the husband of someone in group 4 is in group 8. An shorter way to write this is: $8 = 4 \text{ Husb}$. The right side means to start with 4 and apply the “husband” function, which goes across the row and gives 8.

To get from mother to child, we move along an arrow. For example, the child of mother in 2 is 3. We represent this relation as $3 = 2 \text{ M2C}$, where “M2C” is the “mother to child” function.



(O) Warlpiri Kinship Groups (2/4)

Inverses.

The two functions Husb and M2C have inverses. We define a function called Wife. Note that it does the exact same thing as Husb – going across the row. We also define a “child to mother” function, C2M. To get from child to mother, we follow an arrow, against its direction. For example, the mother of 3 is 2, so we write $2 = 3 \text{ C2M}$.

Composition of skin relations.

We can apply one skin relation after another.

How do we get from father (person A) to child (person B)? We note that the relation is this: B is A's wife's child, which we write this as $B = A \text{ Wife} \cdot \text{M2C}$, where the dot (\cdot) just means do one function after the other. For example, if the father is in group 8, we have $B = (8 \text{ Wife}) \text{ M2C} = 4 \text{ M2C} = 2$, so the child is in group 2.

What is the relation in skin group between two siblings? Although it is not stated in the problem explicitly, we know that siblings must be in the same skin group. This is because they have the same mother. We'll still define a sibling function, “Sib.” It is just the identity.

Onto solving the problem!

Now that we understand the kinship rules better, we can move on to the problem. Here are the six clues, numbered so that they are easier to refer to.

1. “I am a Jangala. My daughter is Nampijinpa.”
2. “I am a Nakamarra. My brother's son is Jupurrula.”
3. “I am a Nampijinpa. My mother's grandfathers were Jungarrayi and Jupurrula.”
4. “I am a Napangardi. My husband's sister's husband's father's father's mother was Napurrula.”
5. “I am a Napanangka. Some of my good friends are Napaljarri and Nangala and Nungarrayi. Oh, you wanted me to talk about my family? Oops.”
6. “I am a Japanangka. My wife's father's mother's brother's wife's father's mother's brother's wife's father's mother's brother's wife's father's mother's brother's wife's father's mother's brother's wife's father's mother's brother's wife was Napurrula. I know my family tree very well.”

Step 1. We should start with (ii), since we know Nakamarra is 1. If the speaker is group A and the person she is describing is group B, then we have the relation $B = A \text{ Sib} \cdot \text{Wife} \cdot \text{M2C}$. Setting $A = 1$, we have

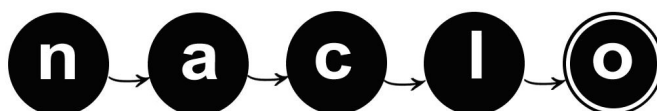
$1 \text{ (start)} \rightarrow \text{applying Sib} \rightarrow 1 \rightarrow \text{applying Wife} \rightarrow 5 \rightarrow \text{applying M2C} \rightarrow 7$

So Jupurrula is the male version of 7.

Step 2. Next, we move on to (iv). We know that B is group 7, and we want to figure out what A is. One nice way is to invert the relation: B is female and A is B's son's son's son's wife's brother's wife: so we get

$B = A \text{ Husb} \cdot \text{Sib} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M}$ (original relation)

$A = B \text{ M2C} \cdot \text{Wife} \cdot \text{M2C} \cdot \text{Wife} \cdot \text{M2C} \cdot \text{Wife} \cdot \text{Sib} \cdot \text{Wife}$ (inverted)



(O) Warlpiri Kinship Groups (3/4)

This gives

7 (start) → M2C → 6 → Wife → 2 → M2C → 3 → Wife → 7 → M2C → 6 → Wife → 2 → Sib → 2 → Wife → 6

So Napangardi is the female version of 6.

Step 3. Let's move on to (vi). It looks long but there is one key observation we can make: the relation “wife’s father’s mother’s brother’s” appears over and over again. (Each time, we start with a male.)

Is there anything special about this? Yes! The composition Wife • C2M • Husb • C2M • Sib always gets you back to where you started! In other words, it is just the identity function.

We have

$B = A \text{ (Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{(Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{(Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{(Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{(Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{(Wife} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Sib)} \cdot \text{Wife}$

but we can cross out every pair in parentheses, leaving us with $B = A \text{ Wife}$, so $A = B \text{ Husb} = 7 \text{ Husb} = 3$. Thus, Japanangka is the male version of group 3. That wasn't too bad!

Step 4. On to (iii): “I am a Nampijinpa. My mother’s grandfathers were Jungarrayi and Jupurrula.”

Let X and Y be the skin groups for Jungarrayi and Jupurrula, respectively. (We know that $Y = 7$.) A's mother's grandfather's are $A \text{ C2M} \cdot \text{C2M} \cdot \text{C2M} \cdot \text{Husb}$ (maternal grandfather) and $A \text{ C2M} \cdot \text{C2M} \cdot \text{Husb} \cdot \text{C2M} \cdot \text{Husb}$ (paternal grandfather). We don't know which is X and which is Y. Thus, we have either

$A = X \text{ Wife} \cdot \text{M2C} \cdot \text{M2C} \cdot \text{M2C}$
 $A = Y \text{ Wife} \cdot \text{M2C} \cdot \text{Wife} \cdot \text{M2C} \cdot \text{M2C}$

or

$A = Y \text{ Wife} \cdot \text{M2C} \cdot \text{M2C} \cdot \text{M2C}$
 $A = X \text{ Wife} \cdot \text{M2C} \cdot \text{Wife} \cdot \text{M2C} \cdot \text{M2C}$

Using the fact that $Y = 7$, the former gives $A = 6$, which is not possible, because we already know the skin name for 6. The latter gives $A = 2$ and $X = 4$, and this must be correct. This gives us the names for 2 and 4.

Step 5. Now, only 5 and 8 need to be determined. We can use (i), which tells us that Jangala is the male name for group 8.

Step 6. Finally, (v) tells us that the final name is Napaljarri, and this goes in group 5.



(O) Warlpiri Kinship Groups (4/4)

Hidden mathematics

The kinship system can be explained in terms of a mathematical group, which is a concept in abstract algebra. The M2C and Husb functions together generate the dihedral group of order eight! The M2C function corresponds to a 90-degree rotation, and the Husb function corresponds to a reflection.

Further reading

For more information about Australian Aboriginal kinship systems, see chapter 2 of *Language And Culture in Aboriginal Australia*, edited by Michael Walsh and Colin L. Yallop.

Source: <http://goo.gl/cmhSt>

Acknowledgments

Special thanks to Professor Rachel Nordlinger for teaching the class “LING20009: Language in Aboriginal Australia” when I was studying abroad at the University of Melbourne.



(P) Deer Father (I/I)

P1.

E1
D2
G3
A4
F5
H6
C7
B8

P2.

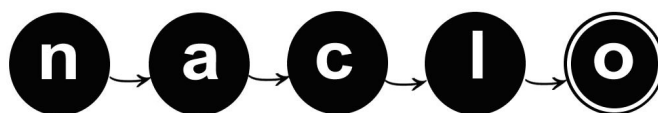
Poor:	unya	suffer:	nyak'ari (nyak'a is OK too)
Mother:	mama	deer:	taruka

P3.

-chus

P4.

God, literally "Spirit Father" or "Father of the Spirits"



(Q) Grice's Grifter Gadgets (I/I)

Q1. Quality

Relevance

Quantity

Relevance

Manner

Q2. NOTHING

Eight of diamonds

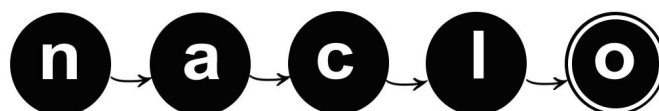
A ten of spades and a two of hearts

Q3. $1♥3♥8♥$ — anything with all hearts

$3♦3♣3♠$ — anything with identical values in different suits

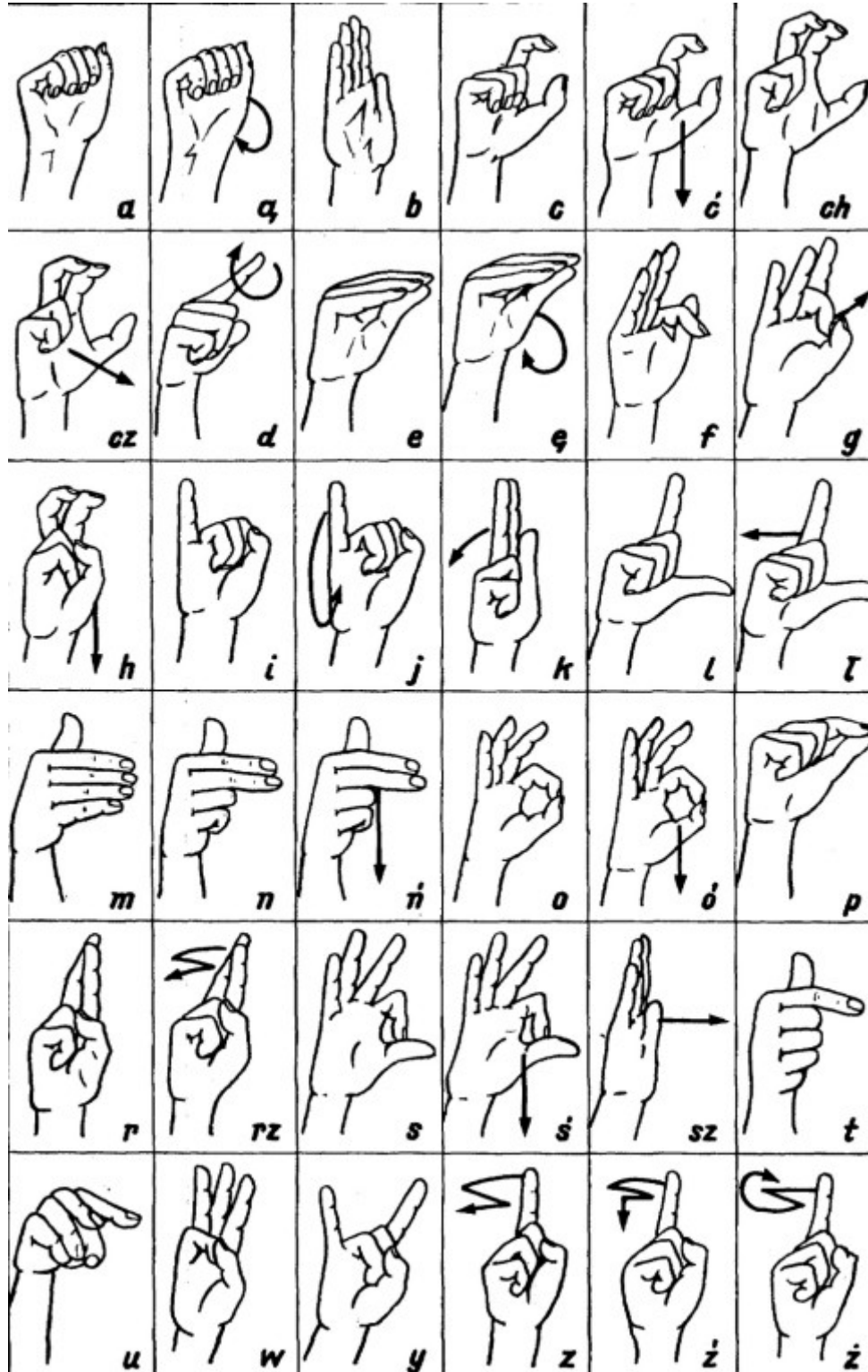
Any hand were $\max(♣) = \max(♥)$, and any other club or heart

$3♣2♠$ and one of: $1♠/2♣/1♣$



(R) Poles Apart (1/2)

http://upload.wikimedia.org/wikipedia/en/7/7f/Alfabet_palcowy2.jpg



n → **a** → **c** → **l** → **o**

(R) Poles Apart (2/2)

R1.	Selenium	XV VII V VII XXI	S E L E N
R2.	Molybdenum	III VI V XII XIV XVIII VII XXI	M O L Y B D E N
R3.	Helium	XX VII V	H E L
R4.	Xenon	IX XV VII XXI VI XXI	K S E N O N
R5.	Ytterbium	XII XVII (XVII) VII II XIV	Y T (T) E R B

1	TELLUR	15	AMERYK	29	TERB
2	TECHNET	16	KRYPTON	30	ROD
3	AKTYN	17	TANTAL	31	CHLOR
4	BERYL	18	TUL	32	RAD
5	CHROM	19	BERKEL	33	REN
6	RUTHERFORD	20	ASTAT	34	BROM
7	KSENON	21	RUTEN	35	KIUR
8	KALIFORN	22	TOR	36	BAR
9	ARGON	23	ARSEN	37	BOHR
10	ROENTGEN	24	BOR	38	KADM
11	RADON	25	CEZ	39	CER
12	TYTAN	26	KOBALT	40	CYNK
13	BIZMUT	27	RUBID		
14	CYRKON	28	TAL		

Polonization Rules

- drop the endings like "ium", "on", and "ine".
- "ch" is a single symbol instead of "c" + "h".
- use "k" + "s" instead of "x"
- replace "rh" with "r", "th" with "t" (except Rutherford), "ll" with "l"
- replace "ci" with "cy" due to the way "ci" is pronounced in Polish
- use "iu" for the 'you' sound in English
- odd ones - use "y" instead of "i" in some cases; use "z" instead of "s" in some cases

Source: <http://www.infoplease.com/ipa/A0001826.html>

