Polysynthesis and word-formation

Michelle Yuan, mmxyuan@uchicago.edu

UC Santa Cruz // Feb. 8, 2019
Introduction

An isolating language:

(1) Mandarin Chinese:

wo mei mai shu
I NEG buy book
‘I did not buy the book.’
Introduction

An *isolating* language:

(1) *Mandarin Chinese:*

wo mei mai shu
I NEG buy book
‘I did not buy the book.’

A *polysynthetic* language:

(2) *Inuktitut:*

uqalima:gaβta:qqauŋjittuŋa
uqalimaagaq-taaq-qqau-nngit-tunga
book-get-REC.PST-NEG-DECL.1S.S
‘I did not buy the book (earlier today).’
(3) **Inuktitut:**

annulaksi-\(\text{kkanni-}\)nginna-\(\text{jualu-gasu-}\)lauqsima-\(\text{guma-nngit-tsiaq-galuaq-tunga}\)
imprison-again-really-a\-lot-\(\text{try-ever-want-}\)NEG-\(\text{EMPH-}\)\(\text{EMPH-}\)DECL.1\S\S
‘I would never ever even want to try to end up in jail ever again even for a bit.’
(Johns, 2007)
“This type is called the incorporative or polysynthetic. It tends to the excessive and abnormal agglomeration of distinct significant elements in its words; whereby, on the one hand, cumbrous compounds are formed as the names of objects, and a character of tedious and time-wasting polysyllabism is given to the language.” - William Dwight Whitney, 1867
Introduction

Geography of polysynthesis:

- **North/Central America**: Eskimo-Aleut languages, Algonquian languages, Nahuatl . . .
- **South America**: Guarani, Quechua, various Amazonian languages . . .
- **Asia/Oceania**: Ainu, Chukotko-Kamchatkan languages, Gunwinjua languages, various Papua New Guinean languages . . .
Today’s goal: Develop a theory of morphosyntax (word-building/affixation and sentence-building) that accounts for languages like Mandarin Chinese and languages like Inuktitut.
Word-formation

To understand how polysynthetic words are formed, let’s first discuss how complex (\(=\) multimorphemic) words are formed more generally.
Word-formation

(4)  *French*

a. Nous *parlons* **souvent** français
   we speak.1P often French
   ‘We often speak French.’

   *Nous **souvent** *parlons* français

b. Nous ne *parlons* **pas** français
   we NE speak.1P not French
   ‘We don’t speak French.’

   *Nous ne **pas** *parlons* français
Word-formation

(4)  *French*

a. Nous **parlons** **souvent** français
   \(\text{we speak.1P often French}\)
   \('\text{We often speak French.'}\)

   *Nous **souvent** **parlons** français*

b. Nous **ne parlons** **pas** français
   \(\text{we \_NE speak.1P not French}\)
   \('\text{We don’t speak French.'}\)

   *Nous ne **pas** **parlons** français*

c. . . . **ne** **pas parler** **français**
   \(\text{NE not speak.INF French}\)
   \('\text{to not speak French’}\)

   *ne **parler** **pas** français*
How do we derive French word order, given a (simplified) D-structure like in (6)?

(5) Nous parlons souvent français
We speak.1P often French
‘We often speak French.’

(6)
```
TP
   /\     
NP  T'   VP
   /\      /\     
We  T0  AdvP  V'  
      [1P,PRS]  
      /\     /\  
AdvP  V0  NP  
  /\    /\    /
often speak French
```
Word-formation

How do we derive French word order, given the D-structure in (6)?

(5) Nous **parlons** souvent français
    we speak.1P often French
    ‘We often speak French.’

(6) TP
    T’
    NP
    We
    T^0
    V^0
    speak
    [1P,PRS]
    AdvP
    often
    V’
    VP
    V^0
    speak
    NP
    French
Word-formation

In addition to moving past the adverb, there's another consequence of $V^0$-to-$T^0$ head movement.

(7) a. Je parl-*e ‘I speak’
   b. Tu parl-*es ‘You (sg.) speak’
   c. Il/elle parl-*e ‘He/she speaks’
   d. Nous parl-*ons ‘We speak’
   e. ...
Word-formation

In addition to moving past the adverb, there's another consequence of $V^0$-to-$T^0$ head movement...

(7) a. Je parl-e ‘I speak’
    b. Tu parl-es ‘You (sg.) speak’
    c. Il/elle parl-e ‘He/she speaks’
    d. Nous parl-ons ‘We speak’
    e. ...
Word-formation

Can we extend this method of affixation to a polysynthetic language like Inuktitut?
Can we extend this method of affixation to a polysynthetic language like Inuktitut?

- To do so, we need to establish that Inuktitut morphemes are *syntactic heads*—i.e. that Inuktitut has a *clausal syntax*. 

"Word-formation"
Is the order of morphemes in Inuktitut surprising? Unsurprising?

(8) **Inuktitut:**
   a. kaapiturunnaqqauvit?
      kaapi-tuq-gunnaq-qqau-vit?
      coffee-consume-can-REC.PST-INTERR.2S.S
      ‘Were you able to drink coffee (earlier today)?’
Is the order of morphemes in Inuktitut surprising? Unsurprising?

(8) **Inuktitut:**

a. kaapiturunnaqqauvit?
   kaapi-tuq-gunnaq-qqau-vit?
   coffee-consume-can-REC.PST-INTERR.2S.S
   ‘Were you able to drink coffee (earlier today)?’

b. [ **OBJECT** ] - **VERB** ] - **MODAL** ] - **TENSE** ] - **CLAUSE TYPE** ]
Word-formation

And what do these data reveal?

(9) **Inuktitut:**

a. anigiaqaqquqtuq  
aqi-giaqaq-qquuq-tuq  
go.out-should-probably-DECL.3S.S  
‘She probably should go out.’

b. aniqquugiaqqaqtuq  
aqi-qquuq-giaqqaq-tuq  
go.out-probably-should-DECL.3S.S  
‘She should probably go out.’
And what do these data reveal?

(10) **Inuktitut:**

a. anaanatsiakuluk
   anaana-\textit{tsiaq-kuluk}
   mother-great-adorable
   ‘adorable grandmother’ (cf. \textit{anaana-tsiaq} ‘grandmother’)

b. anaanakuluttsiaq
   anaana-\textit{kuluk-tsiaq}
   mother-adorable-great
   ‘good, adorable mother’
Word-formation

Given all that we’ve said so far, can we use head movement to account for Inuktitut morpheme order? How?

(11) Inuktitut:

kaapiturunnaqqauvit?
kaapi-tuq-gunnaq-qqau-vit?
coffee-consume-can-REC.PST-INTERR.2S.S
‘Were you able to drink coffee (earlier today)?’
Word-formation

Given all that we’ve said so far, can we use head movement to account for Inuktitut morpheme order? How?

- Let’s ignore the object (‘coffee’) for now...

(11) *Inuktitut:*

a. kaapiturunnaqqauvit?
   kaapi-tuq-gunnaq-qqau-vit?
   coffee-consume-can-REC.PST-INTERR.2S.S
   ‘Were you able to drink coffee (earlier today)?’

b. \[ \text{CP} \]
   \[ \text{C}^0 \]
   \[ \text{TP} \]
   \[ \text{T}^0 \]
   \[ \text{ModP} \]
   \[ \text{Mod}^0 \]
   \[ \text{VP} \]
   \[ \text{V}^0 \]
Word-formation

Given all that we've said so far, can we use head movement to account for Inuktitut morpheme order? How?

- Let's ignore the noun (‘coffee’) for now…

(11) **Inuktitut:**

a. kaapiturunnaqqauvit?
   kaapi-\(\z\)uq-gunnaq-qqau-vit?
   coffee-consume-can-REC.PST-INTERR.2S.S
   ‘Were you able to drink coffee (earlier today)?’

b. 

```
          CP
         /   \
        C\(0\)  TP
              /   \
             T\(0\)   ModP
                   /   \  
                  Mod\(0\)  VP
                                         \(\z\)
```

‘Were you able to drink coffee (earlier today)?’
Word-formation

Given all that we’ve said so far, can we use head movement to account for Inuktitut morpheme order? How?

▸ Let’s ignore the noun (‘coffee’) for now…

(11) **Inuktitut:**

a. kaapiturunnaqqauvit?
   kaapi-tuq-gunnaq-qqau-vit?
   coffee-consume-can-REC.PST-INTERR.2S.S
   ‘Were you able to drink coffee (earlier today)?’

b. 

\[
\text{CP} \quad \text{TP} \\
\text{T}^0 \quad \text{ModP} \\
\text{Mod}^0 \quad \text{T}^0 \quad \text{Mod}^0 \quad \text{VP} \\
\text{V}^0 \quad \text{Mod}^0 \quad \text{V}^0 \quad \text{V}^0
\]
Word-formation

Given all that we’ve said so far, can we use head movement to account for Inuktitut morpheme order? How?

- Let’s ignore the noun (‘coffee’) for now…

(11) *Inuktitut:*

a. kaapitunnaqqauvit?
   kaapi-tuq-gunnaq-qqau-vit?
   coffee-consume-can-REC.PST-INTERR.2S.S
   ‘Were you able to drink coffee (earlier today)?’

b. [Diagram of word-formation process]
Inuktitut vs. French:

(12)  

French:

a. Nous parlons souvent français
   we speak.1P often French
   ‘We often speak French.’

b. Nous avons souvent parlé français
   we have.1P often spoken French
   ‘We often spoke French.’

c. *Nous -ons souvent avoir-parlé français

d. *Nous av-ons-parlé souvent français
Noun incorporation

How do we “incorporate” the noun into our analysis so far?

(13) **Inuktitut:**
kaapiturnaqqauvit?
kaapi-tuq-gunnaq-qqau-vit?
coffee-consume-can-REC.PST-INTERR.2S.S
‘Were you able to drink coffee (earlier today)’?
Noun incorporation

Do the new data in (14-b-c) help?

(14) **Inuktitut:**

   a. kaapiturunnaqqauvit?
      kaapi-tuq-gunnaq-qqau-vit?
      coffee-consume-can-REC.PST-INTERR.2S.S
      ‘Were you able to drink coffee (earlier today)?’

   b. kaapiturunnaqqauvit marruunik?
      kaapi-tuq-runnaq-qqau-vit marruuk-nik?
      coffee-consume-can-REC.PST-INTERR.2S.S two-OBL
      ‘Were you able to drink two coffees (earlier today)?’

   c. kaapiturunnaqqauvit mamaqturmik?
      kaapi-tuq-runnaq-qqau-vit mamaq-tuq-mik?
      coffee-consume-can-REC.PST-INTERR.2S.S tasty-PART-OBL
      ‘Were you able to drink a tasty coffee (earlier today)?’
Noun incorporation

(15)  CP
     /   \
   C^0   TP
     /     \
   T^0   VP
       /     \
     V^0   NP
               /   \   
              AdjP N^0
Noun incorporation

(15) CP
   /   
  C⁰  TP
   /   
  T⁰  VP
     /   
    V⁰  NP
      /   
     N⁰  V⁰  AdjP  N⁰
Like Inuktitut, Mohawk is polysynthetic and has noun incorporation. (Unlike Inuktitut, Mohawk morpheme order is not very straightforward).

Assuming N⁰-to-V⁰ head movement in Mohawk too, are these data—in particular, (16-b-c)—surprising?

(16)  **Mohawk:**

a.  wa’-k-**nakt**-hninu-’
FACT-1SG-bed-**buy**-PUNC
‘I bought a bed.’

b.  *wa’-t-ka-wir-**ahs’tho**-’
FACT-DUP-NS-baby-**cry**-PUNC
*Intended:* ‘The baby cried.’

c.  wa’-ka-wir-**ʌ’-ne’
FACT-NS-baby-**fall**-PUNC
‘The baby fell.’

(Baker, 1988)
Two classes of intransitive verbs:

(17)   Cry     Fall
       Laugh   Die
       Sing    Melt
       Smile   Break
       Dance   Freeze
       ...     ...
Some diagnostics (in English):

(18) *Causative-inchoative alternations:*

a. I broke *the door.*
b. *The door* broke.
Noun incorporation and argument structure

Some diagnostics (in English):

(18) **Causative-inchoative alternations:**
   a. I broke the door.
   b. The door broke.

(19) **Resultatives:**
   a. I broke the door open.
   b. The door broke open.
Noun incorporation and argument structure

Some diagnostics (in English):

(18)  **Causative-inchoative alternations:**
   a. I broke the door.
   b. The door broke.

(19)  **Resultatives:**
   a. I broke the door open.
   b. The door broke open.
   c. *I cried tired.
   d. I cried myself tired.
   e. *I cried myself.
Noun incorporation and argument structure

Unergative vs. unaccusative verbs:

(20)   

a. 

\[
\text{TP} \quad \text{NP} \quad \text{T}^0 \quad \text{VP} \quad \text{NP} \quad \text{V}^0 \\
\text{Michelle} \quad \text{[PST]} \quad \text{Michelle} \quad \text{dance}
\]

b. 

\[
\text{TP} \quad \text{NP} \quad \text{T}^0 \quad \text{VP} \quad \text{NP} \quad \text{V}^0 \quad \text{NP} \quad \text{the door} \quad \text{break} \quad \text{the door}
\]
Noun incorporation and argument structure

Back to Mohawk—how might we now account for this contrast?

(21) **Mohawk:**

a. *wa’-k-nakt-hni nu’-

   FACT-1 SG-bed-

   ‘I bought a bed.’

b. *wa’-t-ka-wir-ahs’tho’-

   FACT-DUP-NS-baby-

   *Intended:* ‘The baby cried.’

c. *wa’-ka-wir-ah-ne’-

   FACT-NS-baby-

   ‘The baby fell.’

(Baker, 1988)
Conclusion

“This type is called the incorporative or polysynthetic. It tends to the excessive and abnormal agglomeration of distinct significant elements in its words; whereby, on the one hand, cumbrous compounds are formed as the names of objects, and a character of tedious and time-wasting polysyllabism is given to the language.” - William Dwight Whitney, 1867
Conclusion

“This type is called the incorporative or polysynthetic. It tends to the excessive and abnormal agglomeration of distinct significant elements in its words; whereby, on the one hand, cumbrous compounds are formed as the names of objects, and a character of tedious and time-wasting polysyllabism is given to the language.” - William Dwight Whitney, 1867

Actually:

- Polysynthetic languages may be analyzed as using the same word-forming processes as found in non-polysynthetic languages.
- Polysynthetic languages also have clausal syntax—reflected in morpheme order.
- ... As well as other diagnostics, e.g. unergative vs. unaccusative distinction.


In what ways are Inuktitut and Chamorro similar? In what ways are they different? How shall we derive the morpheme order in Chamorro?

(22)  **Inuktitut:**
kaapiturunnaqqauvit?
kaapi-tuq-gunnaq-qqau-vit?
coffee-consume-can-REC.PST-INTERR.2S.S
‘Were you able to drink coffee (earlier today)?’

(23)  **Chamorro:**
Hu-na’-fan-otchu   siha
1 SG.S-CAUS-PL-eat them
‘I made them eat.’
Bonus 2: German?

Is German also polysynthetic?

(24) **German:**
generalstaatsverordnetenversammlungen
general-staats-verordneten-versammlungen
‘general states representatives meetings’

(25) **Inuktitut:**

a. uqalimaagaqarvik
uqalimaagaq-qaq-vik
book-have-place
‘library’

b. uqalimaagaqarvingmuuttunga
uqalimaagaq-qaq-vik-muut-tunga
book-have-place-go.to-DECL.1.S.S
‘I am going to the library.’