1. Introduction

Greenberg’s (1963: 87) Universal 20: In a nominal containing the three types of elements: Demonstratives, Numerals, Adjectives, if any or all of them precedes the N, they are always found in the order in (1a); if they follow the N, the order is either the same, as in (1b), or its exact opposite, as in (1c).

(1)

a. Dem > Num > Adj > N
b. N > Dem > Num > Adj
c. N > Adj > Num > Dem

Three Aspects of Universal 20

(4)

a. Every element of the set {Adj, Num, Dem} can occur either to the left or right of N;

b. If any two elements of the set occur on the same side of N, they should be ordered according to the closeness relation to N illustrated in (2).

c. N may undergo a leftward movement, but not rightward movement.

The Issue

How are the constraints & flexibilities of Universal 20 exhibited in one language?

Word orders of sign languages are flexible. In verbal domains & nominal domains

Bouchard (1997) and Bouchard & Dubisson (1995): sign languages do not have any hierarchical structure.

vs.

Neidle et al. (2000: 60-61)

The empirical issue of this talk: the word order of nominal domains of TSL.
Lai (2005) presents a comprehensive description of the possible and impossible nominal-internal word orders of TSL, i.e., the orders of demonstratives, adjectives, numerals, and head nouns.


But it remains a puzzle why certain orders are possible and others are not. The goal of this talk is to show that TSL exhibits Universal 20.

This fact indicates that like any oral language, sign languages have hierarchical structures.

How is a hierarchical structure linearized?

- If elements that are organized hierarchically can be linearized symmetrically, linear order is not part of syntax.

- If the hierarchical structure correlates with any linear order, linear order is part of syntax.

Since Reinhart (1979), it has been considered that while a hierarchy is crucial to “Narrow Syntax”, linear ordering in language is not. In this consideration, linear ordering sequentializes what is primarily only ordered hierarchically. (Marantz 1984: 7-8, Abels & Neeleman 2006)

Linear ordering might be a PF phenomenon – forced by the requirements of the articulators, or parsing. (see Chomsky 1995, 2005: 5, 2006: 7)

However, works represented by Kayne (1994, 2004), Cinque (2005) argue for the narrow syntax status of linear ordering.

Lillo-Martin (2001: 304): “future researchers may ask whether SLs may offer any new insights into the recent idea that while hierarchical structure is part of Narrow Syntax, ordering is not.”

SLs = Sign Languages
I will account for the rigidity in the TSL nominal-internal word orders in terms of purely syntactic hierarchy, and the flexibility there in terms of the freedom of constituent ordering.

If hierarchy rather than word order is part of narrow syntax, (3) can be true in some language.

(3)

a. Every element of the set {Adj, Num, Dem} can occur either to the left or right of N;

b. If any two elements of the set occur on the same side of N, they should be ordered according to the closeness relation to N.

2. Identifying possible orders of nominals in TSL

This section demonstrates the flexibility in TSL.

This is the first aspect of Universal 20.

2.1 Two layers

(4) $\alpha$

$\alpha = \{A, \text{Num, Dem}\}$

(5) a. CUTE CAT $\text{iX}_{\text{pro1}}$ LIKE. N A
   (Lai 2005: 15)
   
   b. CAT CUTE $\text{iX}_{\text{pro1}}$ LIKE. N A
   Both: “I like cute cats.”

(6) a. $\text{iX}_{\text{det}}$ AIRPLANE REACH AMERICA.
   (Lai 2005: 67)
   
   b. AIRPLANE $\text{iX}_{\text{det}}$ REACH AMERICA. N Dem
   Both: This plane is flying to America.”
The two possible orders in other SLs

**ASL**

- Neidle et al. (2000: 103) and Sandler & Lillo-Martin (2006: 308, 341) mention both A N and N A orders in ASL.
- However, MacLaughlin (1997) claims that left APs and right APs are hierarchically different (see Sandler & Lillo-Martin’s 2006: 341 for a review).

The two possible orders in other SLs

**HKSL**

- Tang and Sze (2000) mention that both Num N and N Num orders are found in HKSL.

2.2 Three layers

\[ (9) \]
\[ \alpha \rightarrow \beta \]
\[ \alpha = \{A, \text{Num}\} \]
\[ \beta = \{\text{Num, Dem}\} \]

4 possible orders if \( \alpha = A \) and \( \beta = \text{Num} \) (Lai 2005:73)

- a. IX\text{pro3s} FIVE CUTE CATS HAVE. Num A N ‘She has five cute cats.’
- b. IX\text{pro3s} TELL-ME HAVE ONE MAN GOOD INTRODUCE TO-ME. Num N A ‘She said she’d like to introduce a good guy to me.’
- c. IX\text{pro3s} RAISE CUTE CATS FIVE. A N Num ‘She raises five cute cats.’
- d. IX\text{pro3s} HIGH-HEELS BLACK TWO HAVE. N A Num ‘I have two pairs of black high heels.’
4 possible orders if $\alpha = A$ and $\beta = \text{Dem}$ (Lai 2005: 81)

(12)

a. $\text{IX~det CUTE CAT IX_{pro1s} BELONG-TO.}$
   Det A N
b. $\text{IX~det CAT CUTE IX_{pro1s} BELOG-TO.}$
   Det N A
c. $\text{CUTE CAT IX_{det} IX_{pro1s} BELONG-TO.}$
   A N Dem
   All: ‘That cute cat belongs to me.’
d. $\text{CAT CUTE IX_{det} IX_{pro1s} BELONG-TO.}$
   N A Dem
   ‘That cute cat belongs to me.’ (Hsin-Hsien Lee, p.c.)

4 possible orders if $\alpha = \text{Num}$ and $\beta = \text{Dem}$ (Lai 2005: 84)

(13)

a. $\text{IX_{det} FOUR CAR IX_{pro1s} FRIEND BELOG-TO.}$
   Det Num N
b. $\text{IX_{det} CAR FOUR IX_{pro1s} FRIEND BELOG-TO.}$
   Det N Num
c. $\text{FOUR CAR IX_{det} IX_{pro1s} FRIEND BELOG-TO.}$
   Num N Dem
d. $\text{CAR FOUR IX_{det} IX_{pro1s} FRIEND BELOG-TO.}$
   N Num Dem
   All: ‘Those four cars belong to my friend.’

2.3 Four layers

(14)

Mathematically, four elements in a “shell” structure allow 8 orders ($2^3$).

However, since $\text{Dem}$ cannot occur at the right edge, we have found only four orders ($2^3/2=2^2$).

At this moment, I can’t account for this constraint. Note that the constraint is found in ASL on all nominals (see slide 22).

2.4 Section conclusion

All possible orders stated in Universal 20 are attested in TSL.

The first aspect of Universal 20:
Every element of the set (Adj, Num, Dem) can occur either to the left or right of N

The significance of this conclusion will be discussed in section 5.
3. Accounting for the impossible orders by the hierarchical structures

This section demonstrates the second aspect of Universal 20 in TSL:

If any two elements of the set \{A, Num, Dem\} occur on the same side of N, they should be ordered according to the closeness relation to N.

3.1 Three Element Nominals

\( \alpha = \{A, \text{Num}\} \)
\( \beta = \{\text{Num, Dem}\} \)

The order of \( \alpha \beta N \) is not allowed

If we consider the N-final orders:

(16) \( \beta \alpha N \)
- a. Num A N (=10a)
- b. Dem A N (=12a)
- c. Dem Num N (=13a)

(17) *\( \alpha \beta N \)
- a. *A Num N
- b. *A Dem N
- c. *Num Dem N

3.2 Four Element Nominals

We have seen four possible orders in (15), as predicted by (14).

Mathematically, if four elements do not have a shell structure, they should have 24 orders (4x3x2x1).

However, according to Lai (2005), the orders in (15) are the only possible orders for four element nominals.

Orders like the following are not acceptable:
(18) a. *Det A Num N  
    b. *Det N Num A  
    c. *A Dem Num N  
    d. *A Num Dem N  
    e. *N Num A Dem  
    f. *N Dem A Num  
    g. *N A Dem Num  

In all of these unacceptable orders, the hierarchy requirement is violated.

3.3 Section conclusion

If the order of nominal-internal elements in TSL is absolutely free, the restrictions are unexpected.

The second aspect of Universal 20 is attested in TSL:

If any two elements of the set \{A, Num, Dem\} occur on the same side of N, they should be ordered according to the closeness relation to N.

4. Accounting for other possible orders by N-Raising

All N-initial orders are fine for three element nominals. This is the third aspect of Universal 20.

N may undergo a leftward movement, but not rightward movement.

Both Nαβ and Nβα are possible

(19) Nαβ

a. N A Num (=10d)  
b. N A Dem (=12d)  
c. N Num Dem (=13d)

(20) Nβα

a. N Num A  
b. N Dem A  
c. N Num Dem

N-Raising in the Left-Merger Constructions

(21) N β α <N>

α = \{A, Num\}  \quad β = \{Num, Dem\}
Rightward N-Raising is impossible

$$\langle N \rangle \alpha \beta \ X$$

$$\alpha = \{A, \text{Num}\} \quad \beta = \{\text{Num}, \text{Dem}\}$$

See the restrictions in 3.1.

5. Discussion

- Universal 20 and hierarchical structures of sign languages
- Representing the flexibility of Universal 20
- Intra-linguistic variation

5.1 Universal 20 and hierarchical structures of sign languages

TSL strictly follows the restrictions expressed by Universal 20.
The restrictions are formalized in Cinque (2005) and Abels & Neeleman (2006).
Bouchard & Doubisson’s (1995) theory that sign languages do not have any hierarchical structure cannot be maintained.

5.2 Representing the flexibility of Universal 20

We have seen that TSL also exhibits the word order flexibility expressed by Universal 20:
Every element of the set (Adj, Num, Dem) can occur either to the left or right of N.
This flexibility can be achieved by either of the freedom of merger directions (allowing right-merger), or movement.

Deriving the order of Dem N Adj Num (15d)

One way to reduce descriptive complexity of the derivations of nominal internal orders is to assume that the elements can be merged at either right or left positions.
This freedom suggests that syntax does not dictate the linear order of constituents.
Actually, right remerger of wh-elements in ASL has been argued for in Neidle (2002), where SpecCP is claimed to be projected rightward in the language.
The assumed freedom in merger direction in all levels of a nominal have the following two significances →
**A. Merger direction is not configuration-specific**

We have seen that Dem, Num, and Adj all can occur either to the left or right of N.

Takano (2003: 524):

adjuncts vs. non-adjuncts

subject to antisymmetry and thus their positions are fixed to the relevant selecting element (left specifiers and right complements).

Since it is generally recognized that Dem and Num are not adjuncts whereas Adjectives are, the free order of both types is not compatible with Takano’s claim.

**B. Merger direction is not category-specific**

Based on a study of word order of clauses in ASL, Romano (1991):

lexical categories: head-initial
functional categories: head-final

Since the scope of our study includes both lexical and functional cats, our conclusion of the TSL nominals is not compatible with Romano’s claim on ASL clauses.

Syntactic variation is not restricted to functional items (contra Chomsky 1995, Kayne 2005).

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**5.3 Intra-linguistic variation**

The co-existence of two settings of a parameter has been found in other cases.

**Case A:** Null argument licensing

<table>
<thead>
<tr>
<th>agreement</th>
<th>discourse reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romance lgs</td>
<td>+</td>
</tr>
<tr>
<td>East Asian lgs</td>
<td>-</td>
</tr>
<tr>
<td>English</td>
<td>-</td>
</tr>
</tbody>
</table>

=> Parameter setting

However,

Warlpiri (Legate 2003) + + (either)

ASL + + (either)

(see Sandler & Lillo-Martin 2006: 16)

**Case B:** Moved WH-phrases and WH-in-situ

In languages like English, wh-movement is obligatory.
In Chinese, wh phrases remain in situ.

=> Parameter setting

ASL has moved WH-phrases as well as WH-in-situ (Lillo-Martin 1990, Sandler & Lillo-Martin 2006: 16, ch. 23)

**Case C:** Two Types of Noun Incorporation

In compounding NI, the valence of the clause is decreased
In classifying NI, the valence of the clause is not decreased

Many languages with NI consistently use only one type

=> Parameter setting

However, some languages have both types (Hopkins 1988, Mithun 1984).
As stated by Sandler & Lillo-Martin 2006:16),

"An explanation for this tendency to ‘have it both ways’ is still to be determined."

Parameters or Feature Values?
The intra-linguistic variation studied here casts doubts on the assumption that languages themselves are the immediate locus of parametric variation (see also Newmeyer 2004, Kayne 2005:1).

- What the parameter approach tries to explain can be simply covered by values of features.
- Different values of any feature can be attested either cross-linguistically or intra-linguistically.

Kayne (2005:3)

“The parametric variation that occurs within languages is of exactly the same sort as the parametric variation that occurs across languages.

The elements subject to it are the same in both kinds of cases, and the features/properties in question are, too.”

6. Summary

- I have shown that both the flexibility and the restrictions generalized in Greenberg’s (1963:87) Universal 20 are basically attested in Taiwan Sign Language.
- Theoretically, this study concludes that like oral languages, sign languages have hierarchical structures.
- Moreover, if elements that are organized hierarchically can be linearized symmetrically, to reduce descriptive complexity, Kayne-Cinque’s correlation between syntactic hierarchical structures and linear ordering might need reconsideration.
- Furthermore, the intra-linguistic variation of the universal calls for reconsideration of our current theory of parameter setting.