Nominal-internal word order in Hong Kong Sign Language and Cantonese: A Comparative Study

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Abstract

This comparative study aims to verify if the nominal-internal word order patterns of HKSL and Cantonese are accountable based on Universal 20 (Cinque's 2005 version), just as has been discussed for other sign languages (e.g. Zhang 2007 on TSL, Mantovan and Geraci 2017 on LIS). Word order patterns of Cantonese have been documented in previous research. As for HKSL, we extracted data from 90 minutes of free conversations in HKSL to identify the patterns. The data came from 2 dyads of native Deaf signers of HKSL. Among the 4281 tokens of nominal word orders extracted, the majority are pronominals (e.g. pointing signs; 44%, 1872 tokens), bare nouns (16%, 696 tokens), bare/modified proper nouns or kinship terms (9%, 374 tokens), modified nouns (12%, 531 tokens) and other constructions (e.g. bare adjectives, bare quantifiers; 19%, 808 tokens). This study bases its analysis on the 12% of modified noun phrases with simple nominals (11%, 472 tokens), i.e. tokens with an overt head noun and at least one of any of the three modifiers: Dem, Num, Adj, excluding those involving a classifier expression. Results reveal that the word order patterns observed in HKSL as well as Cantonese align with the 14 attested patterns as stated in Cinque's 2005 version of Universal 20; they also correspond to the patterns found in TSL and LIS.

Keywords: Nominal-internal word order, Hong Kong Sign Language (HKSL), Cantonese, Universal 20, cross-linguistic comparison

1 Introduction

As stated in Woll (2003), since the 80s of the past century, the field of sign language research has entered the so-called Post-Modern Period, in which researchers have switched their attention to comparative study searching for cross-modal (signed vs. spoken languages) as

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1Abbreviations throughout include: ASL = American Sign Language, LIS = Italian Sign Language, RSL = Russian Sign Language, TSL = Taiwan Sign Language; Adj = adjective, Cl = numeral classifier, CL = classifier predicate, Dem = demonstrative, N = noun, Num = numeral, KN = kinship term, PN = proper noun, and Q = quantifier. **Notation Conventions:** Cantonese (Hong Kong variety) examples are represented with Jyutping, a romanization system. For HKSL, signs are glossed with capitalized letters (e.g. PERSON, TWO); if more than one English word are needed to gloss a sign, underscores are used (e.g. FEMALE_KID, "girl"); IX_1/_2/_3 = pointing signs directed to a locus in space to refer to the signer, the addressee, and a third person respectively; IX-a = pointing signs directed to an entity located in space; IX_loc = pointing signs directed to a locus to refer to a location (e.g. a city) in the physical world; IX_all = a pointing sign with a line/an arc path in space for denotation of plurality; 1, 2, 3 used with agreement verbs represent the 1st, 2nd, or 3rd person respectively (e.g. "1-GIVE-2" means "I give (something) to you"); "-a" in V-a means the verb is spatially marked (e.g. "LOOK_FOR-a" means the verb is signed at a locus in space).
well as cross-linguistic (among different sign languages) differences and similarities, with a purpose to increase our understanding of the nature of sign languages and human languages in general. One of the research foci during this period is how signed and spoken languages may differ in terms of typological properties. Research efforts over the last half century find that sign languages share many similarities with spoken languages: for instance, sign languages are found to be hierarchically structured at all levels of grammar, just as spoken languages. Nevertheless, typological differences are also identified such as the use of space in nominal reference, verb agreement and classifier predicates, to name but a few, which contributes to simultaneous articulation, a modality-specific property in sign languages. Due to the nature of articulatory organs, spoken languages are articulated in a linear fashion, whereas sign languages utilize two hands as main articulators, plus a collection of possible ‘non-manual markers’ (including movements of the head and body and various facial expressions). Despite the potential for simultaneous articulation, Zhang (2007) argues that signs are generally produced one by one, so the linear relation of linguistic units also plays a significant role. In fact, research to examine linearity in language organization is found for a few sign languages (Fischer 1975 and Chen Pichler 2002 on ASL, Kimmelman 2012 on RSL, Sze 2003 on HKSL, among others).

Word order flexibility in both the verbal and nominal domains of sign languages has been widely reported (e.g. Neidle and Nash 2012 on ASL, Zhang 2007 on TSL, Mantovan and Geraci 2017 on LIS, Tang and Sze 2002 on HKSL). This characteristic of sign languages had made some scholars propose that sign languages were not hierarchically structured at all. Bouchard and Dubuisson (1995) and Bouchard (1996) hold the view that sign languages have no basic order and hence no hierarchical structure. In recent research, however, there has been a large body of literature suggesting that hierarchical structuring, a fundamental property of human languages, is shared between sign languages and spoken languages. While surveys on hierarchical structure in sign languages have largely focused on the verbal domain, such as word order and grammatical relations in predicates involving agreeing verbs and classifier verbs, little attention has been paid to word order issues within the nominal domain of sign languages. Two earlier studies involving Taiwan Sign Language and Italian Sign Language support the hierarchical view (Zhang 2007 on TSL; Mantovan and Geraci 2017 on LIS). These researchers claim that in spite of flexibility in the ordering of the modifying elements relative to the head noun, the variations are derived via syntactic operations (e.g. movement rules). They invoke Greenberg’s 1963 original formulation of Universal 20 (U20) as well as revised versions of U20 from Cinque (2005) and Abels and Neeleman (2012) to account for the phenomenon.

The current paper aims to conduct a comparative study of the nominal structure in Hong Kong Sign Language (HKSL) and Cantonese, a spoken language adopted by speakers of the larger hearing community; in particular, we ask if the word order patterns found in these two languages comply with Universal 20 within the framework of Cinque (2005). The paper is organized as follows. Section 2 offers an introduction of Universal 20 in spoken and sign languages. Section 3 fleshes out the word order properties in Cantonese and HKSL in the nominal domain. Section 4 concludes the paper.
2 Universal 20 in spoken and sign languages

On the basis of an analysis of 30 spoken languages (Basque, Italian, Japanese, Thai, to name only a few),\(^2\) Greenberg (1963) attempts to propose a series of cross-language generalizations, among which is Universal 20, as stated in (1).

(1) Greenberg’s (1963) original formulation of Universal 20:

\[\text{When any or all of the items (demonstrative, numeral, and descriptive adjective) precede the noun, they are always found in that order. If they follow, the order is either the same or its exact opposite.} \quad \text{Greenberg (1963:87)}\]

Given the presence of all three modifiers (i.e. Dem, Num and Adj), Greenberg predicts that there is only one order – \(\text{Dem Num Adj } Y\) (e.g. English) – if the head noun occurs at the final position. If the noun occurs at the initial position, only two orders are possible: \(\text{N Dem Num Adj }\) (e.g. Kikuyu) and \(\text{N Adj Num Dem}\) (e.g. Thai). Note that as far as the condition “any or all of the items” in (1) goes, this universal does not require the obligatory presence of all three modifiers; rather, it allows cases in which only one or two of the three modifiers show up; therefore, orders such as \(\text{Dem } Y, \text{ Dem Adj } Y, \text{ N Num, N Adj, N Dem Adj}\) are all fine.

As pointed out in Cinque (2005), Greenberg’s universal is both too restrictive and too permissive; it excludes some actually attested orders (e.g. \(\text{N Num Adj Dem}\); see Cinque 2005, pp. 315–316) while endorses some unattested ones (e.g. \(\text{Num Adj } Y \text{ N Dem}\); see Cinque 2005, p. 316, fn 4). Cinque (2005) revises Greenbergian U20 so as to include some patterns excluded by (1). The possible permutations of word order under Cinque’s U20 are listed in Table 1 (blue ones are unattested). Furthermore, Cinque (2005) puts forward a formal account for both the attested and unattested nominal word orders. He assumes that \(\text{Dem Num Adj } Y\) is the underlying structure for all languages (Table 1, Column IV), whereas the other 13 attested orders are derived via different types of movement.\(^3\)

|   | I         | II         | III         | IV         |
|---|-----------|------------|-------------|------------|
| 1 | N Dem Num Adj | Dem N Num Adj | Dem Num N Adj | Dem Num Adj N |
| 2 | N Dem Adj Num | Dem N Adj Num | Dem Adj N Num | Dem Adj Num N |
| 3 | N Num Adj Dem | Num N Adj Dem | Num Adj N Dem | Num Adj Dem N |
| 4 | N Adj Num Dem | Adj N Num Dem | Adj Num N Dem | Adj Num Dem N |
| 5 | N Adj Dem Num | Adj N Dem Num | Adj Dem N Num | Adj Dem Num N |
| 6 | N Num Dem Adj | Num N Dem Adj | Num Dem N Adj | Num Dem Adj N |

As mentioned above, U20 was proposed and further revised by referring to spoken languages. It remains to be seen if this generalization also applies to sign languages. So far, only a very

\(^2\)Note that Chinese is absent from the list of languages that Greenberg (1963) refers to.

\(^3\)Abels and Neeleman (2012) provide an alternative formal account of U20 based on Cinque’s (2005) version (Table 1). These two accounts differ in how various orders are derived in syntax. Since it is beyond the scope of our discussion in this paper, which focuses on identifying the patterns alone, we will not go into the details of the debate. However, it should be emphasized that U20 is only a universal tendency and by no means should it be equated with a universal constraint or principle discussed within the framework of generative grammar. This may be just the drawback of the kind of attempts of giving a formal account to typological findings (see Newmeyer 2005).
few sign languages have been investigated within the framework of U20, which include Tai-
wan Sign Language (Zhang 2007) and Italian Sign Language (Mantovan and Geraci 2017), for
which evidence in favor of U20 has been reported. For example, the orders as shown in (2)
are observed in TSL. According to Zhang, they all are in line with Greenberg's original U20
(see (1) above). The orders in (2a) do not violate U20 because U20 permits modifiers to occur
either before or after the head noun.

(2) a) 2-element: \textit{Adj N, N Adj, Dem N, N Dem, Num N and N Num}

b) 3-element: \textit{Num Adj N, Num N Adj, Adj N Num, N Adj Num}, etc.

c) 4-element: \textit{Dem Num Adj N, Dem Adj N Num, Dem Num N Adj}, etc.

In LIS, the most frequent orders are \textit{N Adj Num Dem} and \textit{Num N Adj Dem}, which are covered
by Cinque's U20 (Mantovan and Geraci 2017). In addition, like TSL, modifiers can flexibly
occur either before or after the head noun. For example, the orders listed in (2a) are also ob-
served in LIS (Mantovan and Geraci 2017, p. 185), although there is a tendency for modifiers
to occur post-nominally.

Do HKSL and Cantonese have the same patterns within the framework of U20? Except
for some preliminary findings from previous research, no systematic analysis has been done
in this respect. In this comparative study, we will examine whether the nominal word or-
ders in HKSL and Cantonese belong to those attested 14 orders listed in Cinque (2005) (see
Table 1). This comparative study is conducted within the broader context of contemporary
sign language research, which emphasizes the significance of documenting cross-modal and
cross-linguistic differences and similarities in order to enhance our understanding of sign
languages and human languages as a whole.

3 Nominal-internal word order in Cantonese and HKSL

To the best of our knowledge, there has not been much comparative literature on word order
in the nominal domain of Cantonese or HKSL. There is relatively more research on Can-
tonese than HKSL, especially concerning the syntactic status of numeral classifiers. We first
offer a brief account on nominal-internal word order in Cantonese before moving to HKSL.

3.1 Cantonese

According to Lu (1998, section 3.3), most Chinese grammar books assume that the basic
cross-category ordering in Chinese NPs is \textit{Dem Num Adj N} (or "D Q de modifiers N", to use
Lu's term),\footnote{Note that \textit{de} here is a modifier marker in Mandarin, whose Cantonese counterpart is \textit{ge}. This term reveals
that Lu seems to be talking about Mandarin. As shown later on, this order is also a predominant order in
Cantonese, another variant of Chinese (see Matthews and Yip 1994).} which corresponds to the default order as proposed in Cinque (2005) also con-
firms this order in Cantonese. According to her, Cantonese nominals are head-final, with
modifiers all preceding the noun (Table 2). Two groups of modifiers can be distinguished,
depending on whether they can immediately precede the head noun (see Table 3 for some
concrete examples).\footnote{*(Cl) means the use of Cl is obligatory; most of the examples with * in Group ii are possible if topicalization
is involved.}

As a typical example of classifier languages, Cantonese has a rich pool of numeral clas-
sifiers (cf. Matthews and Yip 1994; Cheng and Sybesma 1999; Sio 2006; Wong 1998 among

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Table 2: Elements that can or cannot immediately precede the head N in Cantonese (based on Wong 1998).

| Nominal structures | Cantonese examples | English translations |
|--------------------|--------------------|---------------------|
| i                  | Adj N daai6 ce1 big car (ni1) gaa3 ce1 (this) Cl car lou5si1 ge3 ce1 teacher ge car | “big cars” “this car” “teachers’ cars” |
| ii                 | *Dem N *ni1 ce1 this car *saam1 ce1 three car | “this car” “three cars” |

many others) and they play a pivotal role in Cantonese nominal syntax. Generally speaking, classifiers cannot occur alone but co-occur with at least one of the following constituents: a determiner, a numeral, or a head noun (see Table 3 for some examples of possible and impossible nominal orders in Cantonese). When the head noun combines with a determiner, a numeral, a classifier (Cl) and an adjective, the canonical word order becomes Dem Num Cl Adj N (cf. Sio 2006; Cheng and Sybesma 1999; Lu 1998, among others), which is consistent with Cinque’s (2005) proposal of an extended default DP formulation as in (3).\(^7\)

(3) \[Q_{\text{uni}} \ldots [\text{Dem} \ldots [\text{Num}_{\text{ord}} \ldots [\text{RC} \ldots [\text{Num}_{\text{card}} \ldots [\text{Cl} \ldots [\text{A} \ldots \text{NP}])))]]]
(Cinke 2005:328)

Compared with all the attested and unattested orders set up according to Cinque’s U20 (ref. Table 3), Cantonese only permits the N-final orders, in contrast to HKSL. As we will see below, HKSL tolerates more flexibility in the order of modifiers relative to the noun.

### 3.2 HKSL

We now turn to HKSL, which is the primary way of communication employed by the local Deaf community of Hong Kong. To date, only two related projects have been conducted (Sze 2000; Tang and Sze 2002). These researchers reported the flexibility of nominal word order as well as the use of non-manual markers (e.g. eye-gaze) to mark referential properties (e.g. definiteness). The nominal expressions reported in Sze (2000) are relatively limited in terms of types and tokens (cf. Sze 2000, p. 96, Table (3.4)), which may be due to the small-sized data pool and the nature of narrative data. For instance, post-nominal index signs are absent in Sze’s narrative data, while they are abundant in the free conversations we have analyzed.

\(^6\)As an article-less language, classifiers in Chinese languages (e.g. Mandarin and Cantonese) are assumed to perform quite a number of functions (e.g. encoding definiteness), which may be realized by articles in article languages (e.g. English) (cf. Cheng and Sybesma 1999; Sio 2006, among others).

\(^7\)As mentioned in Wong (1998), only very marginally adjectives can occur between Num and Cl. In this case, the adjective is assumed to be part of Cl rather than a true adjective.
### Table 3: Possible (Group i) and impossible (Group ii) nominal orders in Cantonese (non-exhaustive)

| Nominal structures | Cantonese examples | English translation |
|--------------------|--------------------|---------------------|
| **i**              |                    |                     |
| Dem *(Cl) N        | go2 gaan1 uk1      | “that house”        |
| Num *(Cl) N        | loeng5 zil bat1    | “two pens”          |
| Adj                | hoi lsam1 ge 3 jat6zi2 | “happy days”        |
| Dem Num *(Cl) N    | ni1 saam3 go3 hap6 | “these three boxes” |
| Adj Dem (Num) *(Cl) N | hou2 dak6bit6 ge 3 go2 (jat1) zung3 cing4 fong3 | “that very special situation” |
| Dem Num *(Cl) Adj N | ni1 sei3 go3 hun4 sik1 ge 3 ping4 waa2 | “these four big apples” |
| **ii**             |                    |                     |
| *N Adj             | *sai3 gaa3 hou2    | “good worlds”       |
| *N Dem Cl          | *syu1 ni1 bun2     | “this book”         |
| *N Num Cl          | *caang2 baat3 go3  | “eight oranges”     |
| *N Dem Num Cl      | *jan4 ni1 luk6 go3 | “these six persons” |
| *N Dem Num Adj Cl  | *gau2 go2 ng5 zek3 teng1 waa6 ge 3 | “those five obedient dogs” |

Furthermore, our data display many more nominal patterns with more tokens than what is reported in Sze (2000).

Based on Sze (2000), Tang and Sze (2002) compared the properties of DP in HKSL with other sign languages (e.g. ASL) and spoken languages (e.g. Cantonese and English) in order to discover modality effects on the linguistic and discourse organization of nominal expressions. According to Sze (2000) and Tang and Sze (2002), HKSL nominal expressions demonstrate flexibility in ordering elements within a noun phrase, such that determiners, adjectives, numerals can either precede or follow the noun (see (4) for some examples; taken from Tang and Sze 2002, pp. 299–300, 302).

(4)

| (a) | IX_3 MALE EAT_RICE | ‘That man eats rice.’ | Dem N |
| (b) | MALE IX_3 SLEEP | ‘That man is sleeping.’ | N Dem |
| (c) | MALE KICK ONE DOG | ‘The man kicked a dog.’ | Num N |
| (d) | YESTERDAY FEMALE_KID ONE COME | ‘One girl came yesterday.’ | N Num |

In the literature, both Cantonese and HKSL are considered classifying languages although they belong to different families: Cantonese is a numeral classifier language whereas HKSL is a classifier predicate language (Tang and Sze 2002). A recent study by Koenders (2018) also suggests that 67.3% of the HKSL nouns observed incorporate a classifier handshape in their lexical form, such as KNITTING_NEEDLES, SUITCASE, etc. Given these observations, it is

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8Note that nonmanual markings are left out here since they are irrelevant to the current discussion.
possible that classifiers in the nominals of HKSL and Cantonese have overlapping functions.\(^9\)
In the remaining sections of the paper, we will focus on a systematic comparison of the
nominal-internal word order of HKSL and Cantonese. For HKSL, we extracted 90 minutes
of a corpus which contains 16 hours of free conversations between dyads of native signers.

3.2.1 Methodology
The corpus data for the analysis came from two video recordings from the HKSL Corpus
(http://www.cslsds.org/hkslcorpus/), each containing free conversations between different
dyads of native signers (female=2, male=2; mean age=31.5 years; dyads coded as PW & BY,
AW & AY respectively). While each of the original recordings is over one hour in duration
(about 72 minutes), only the first 45 minutes of each video were analyzed for the present
study (90 minutes total). The conversations were transcribed using ELAN\(^10\) by a team of Deaf
native signers and hearing proficient signers and were proofread by a native Deaf signer.
For the current research project, we further coded the conversational data in terms of: a)
nominal structure (e.g. bare noun, IX+N, Adj+N), b) utterance context (the signing context
where the target nominal structure occurs, e.g. a target nominal “PERSON TWO” (N+Num) is
identified in the utterance “PERSON TWO ENOUGH”), c) grammatical function (e.g. subject,
object, predicate), and d) referential status (e.g. definite, indefinite, generic). See Figure 1 for
an illustration of annotation in ELAN.

As for the criteria of extracting the nominal structure for analysis, we checked if the sign
or the sign string fulfilled the grammatical function of subject, object, predicate, or any other
functions, to decide which part of the utterance should be extracted for analysis. For exam-

\(^9\)Gebhardt (2011) argues that two types of classifiers (functional vs. semantic) should be distinguished.
While functional classifiers (e.g. gaa3 in saam1 gaa3 cel “three cars” in Cantonese) are purely syntactic in
nature, devoid of semantic meaning and are only attested in part of world languages, semantic ones refer to
those used with mass/count nouns for creating a measurement (e.g. cup in a cup of tea in English) and are
assumed to exist in all languages.

\(^10\)https://archive.mpi.nl/tla/elan
ple, in the utterance “ACTUALLY FELIX STUDY gesture [= hesitation] NORMAL” (lit: As a matter of fact Felix's course (was) normal (as scheduled)), the string “FELIX STUDY” is extracted for further analysis in this study. We further coded the strings in terms of nominal-internal word order, syntactic position and referential properties on separate tiers. For the cases that we were not sure about, we consulted native signers. At last, all of the coded information was exported from ELAN to Excel for further analysis. For the purpose of this study, we only focus on information from the tiers of nominal types (e.g. PN+N) and utterance context.

As shown in Table 4, we have extracted 4281 tokens of nominals in the 90 minutes of free conversation data. Among them, the majority are pronominals (1872 tokens, 44%), including pointing signs for various referents (e.g. the addressee, the signer him/herself, a third person, an object, a location, an event, a previously produced sign, plural people or objects); 16% are bare nouns, without any modifiers and 9% are bare proper noun (PN), kinship term (KN), and modified PN/KN. Modified nouns only account for 12% with 531 tokens. Other miscellaneous patterns account for 19% with 808 tokens, including various bare modifiers (e.g. bare adjective, bare numeral), other noun phrases without a head noun (e.g. IX+Adj), constructions involving incorporation (e.g. N-Num incorporation, Num-CL incorporation; cf. Neidle and Nash 2012, p. 185).

Table 4: Composition of the free conversation data analyzed in this study.

| Nominal types    | Tokens (%) | Examples                      | English Translation |
|------------------|------------|-------------------------------|--------------------|
| Pronominals      | 1872 (44%) | IX_2 JOKE.                    | “You are joking.”  |
| Bare N           | 696 (16%)  | IX_2 HOUSE RAISE CAT.         | “Your family raises cats.” |
| PN/KN            | 374 (9%)   | STAY IX_loc [= Turkey] TURKEY. | “(She) stays in Turkey.” |
| Modified N       | 531 (12%)  | IX_3 VOLUNTEER REMIND CANNOT. | “The volunteer reminded (me) (I) cannot (do that).” |
| Others           | 808 (19%)  | Bare Adj, e.g. BUY NEW.       | “(I) bought a new one.” |
|                  |            | Bare Num, e.g. ONE ENOUGH.    | “One (cat) is enough.” |
|                  |            | Barer Q(uantifier), e.g. BREED MANY. | “(She) raised many (pets).” |
|                  |            | N-Num incorporation, e.g. TWO_MONTH | “two months” |
|                  |            | N-less nominal (e.g. IX+Adj)  | “It’s OK, if you head for those simple (activities).” |
|                  |            | e.g. IF WANT GO IX-a SIMPLE OK. | “It is good to hire maids (to do the housework).” |
|                  |            | Noun clauses                  |                    |
|                  |            | e.g. HIRE-3 MAID GOOD.        |                    |

4281 (100%)

In the following analysis, we will focus on the 12% of modified noun phrases to identify the possible nominal-internal word orders in HKSL. These tokens contain an overt head noun and any or all of the three modifiers (Dem, Num, Adj). The next session presents the results of our analysis, which is to verify to what extent the nominal-internal word orders of HKSL are consistent with U20. Our rationale is as follows: if a given order belongs to one of the 14 attested orders in Cinque's (2005) formulation Table 1, it is in line with U20; otherwise it would be considered as violating U20.
### 3.2.2 Results

Table 5 (Appendix 1) summarizes a total of 472 tokens of HKSL modified nouns. We excluded 59 tokens for various reasons such as the presence of classifier predicates depicting size and shape. The table includes a column for Cantonese word orders to document those orders in HKSL which are also attested in Cantonese. We wanted to compare to what extent the two languages differ from or resemble each other in word order typology. Generally speaking, we hardly found any word order patterns in HKSL that violate Universal 20. In the data, those involving one modifier constitute the majority (383 tokens, 81%), among which Dem N takes up 49% (233 tokens), others include N Num (52 tokens, 11%), Adj N (38 tokens, 8%), N Dem (7 tokens, 1%), N Adj (19, 4%) and Num N (3 tokens, 0.6%). There are 6 tokens (1%) which we grouped under ‘others’, which mainly involve cases where different determiners occur before and after the N; e.g. IX_1 FRIEND IX_3, literally, “my friend (he)”. As shown in the same table, examples involving 2 modifiers make up only a small proportion, with just 49 tokens (10%), out of which there are 16 tokens (3%) of Dem Adj N. We hardly found tokens of a nominal with 3 modifiers, except for one with the order of Dem N Q(uantifier) Adj (1%).

We found two tokens displaying the order Adj Dem N, which belongs to the unattested orders of Cinque (2005), Table 1, 4-IV or 5-IV). Nevertheless, we argue that the two tokens of Adj Dem N order in our data seem to be constrained by information structure, where the adjective is preposed to precede Dem due to pragmatic reasons, following Cinque (2005, p. 328) (7), fn23). Given that the tokens of this order are very few in number (only two), we argue they do not pose serious challenge to our conclusion that HKSL is consistent with U20.

Taken as a whole, the nominal-internal word orders of HKSL are in line with U20, similar to the findings reported in TSL and LIS. From our data, we may infer two possible orders with four elements: Dem N Adj Num, Dem Adj N Num, which are attested orders predicted by U20 (ref. Table 1, 2-II, 2-III respectively). The possible orders are based on the fact that N Adj Num and Adj N Num are attested in HKSL, and on the tendency of occurrence in terms of syntactic positions in which a few of the other modifying elements occupy. In our data set, demonstratives primarily occur at the left edge (90% of the time). Secondly, numerals (cardinal numbers) predominantly occur post-nominally (95% of the time). Thirdly, the results show that the syntactic position of adjectives is variable, being either prenominal or postnominal. Our data show that prenominal adjectives (70%) outnumber post-nominal adjectives (30%). Note however that based on the intuitions of our native signers, the prenominal adjectives could be due to Cantonese influence and indeed this order is getting more common among younger signers while older signers prefer postnominal adjectives. Our data at least show that adjectives appear to be more adjacent to nouns than numerals. More work (both experimental and naturalistic) is called for to determine which is more basic and pertains to HKSL word orders in the nominal domain.

Last, we compare the word order in the nominals of HKSL and Cantonese. While Cantonese is rigidly head-final such that all modifiers (Dem, Adj, Num, Q) occur pre-nominally, HKSL permits its modifiers to flexibly occur before or after the noun, but there is a strong...

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11 Additionally, we found some cases of doubling (35 tokens, 7%) or repetition of the demonstrative (2 tokens). Among the tokens for doubling, demonstrative seems most likely to be doubled (24 tokens, 5%), followed by adjective (4 tokens, 1%), head noun (5 tokens, 1%), and numeral (2 tokens, 0.4%).

12 This is also applicable to the case of Num, where prenominal positioning of Num is assumed to be due to influence of Cantonese. Recall that the four informants whose conversational data were analyzed by this study are relatively young. The deaf school they attended adopted an oral method for teaching. It remains to be seen if they show different nominal ordering patterns in their conversations with older generations (e.g. their parents). We leave this to future investigation.
tendency for Dem to appear pre-nominally and for Num to appear post-nominally; the tendency for Adj is less obvious, as mentioned previously. From Table 5, some word orders observed in HKSL (e.g. D Num, N Num, N Adj) lack a Cantonese counterpart. Also, influence from Cantonese on HKSL is observed. For example, word orders like Adj N (e.g. EXCLUSIVE FOOD GIVE HAVE? “Do you give (the cat) exclusive food?”) and Num N (e.g. IX_3 IN_THE_PAST ONE MALE DO, “In the past, a man made (steamed-bread.”) reflect influence from Cantonese. Another example is HAVE MANY HEARING IX_all PARENT VEXED, “There are many hearing (young people) whose parents (are) vexed”. The sign string beginning with “HAVE” reflects the word order of existential constructions in Chinese languages (see Sze 2000 for this point in HKSL).

Turning to the question of whether HKSL has numeral classifiers similar to Cantonese, our data suggest that HKSL does not have functional (count-)classifiers (e.g. go1, bun2 in Cantonese, see Table 3 for examples), which are devoid of semantic meaning and are found in some of world languages (Gebhardt 2011). Similar to English, numerals in HKSL can combine directly with a count noun without the presence of a classifier element (e.g. PERSON TWO ENOUGH “Two persons are enough”; IX_3 SELF HOUSE BREED CAT FOURTEEN “Her own home raises 14 cats”). What we observe in the nominal domain are those classifiers that are more adjectival in nature (18 tokens, e.g. ONE_HUNDRED_FIFTY tall+CL_sass:coin [=coins stacked to a height], “Coins valued 150 (yen) stacked to a cylindrical shape”). Our data also shows that HKSL has measure words (or massifiers, to use Cheng & Sybesma’s (1999) term) to occur between a noun and a Num (2 tokens, 0.4%; e.g. WRITE ESSAY GROUP [% reduplicated]THREE, “she wrote three groups of essays.”). Temporarily, we conclude that HKSL lacks functional (count-)classifiers unlike Cantonese (cf. Cheng and Sybesma 1999).

4 Conclusions

Our analysis of the 90 minutes of free conversation data reveals that the word order patterns of the nominal phrases in HKSL are in line with Universal 20, echoing what is found in previous studies on TSL and LIS. Meanwhile, our examination of the literature suggests that Cantonese also shows alignment with this universal tendency. As a cross-linguistic generalization, U20 as a typological universal is observed in both spoken and sign languages and modality does not create an effect on linguistic organization. However, the corpus data also show cross-linguistic interaction in terms of influence from Cantonese to HKSL.

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Table 5: Appendix 1: Overall results of modified nouns in HKSL and possible Cantonese counterparts (Total = 472 tokens; target nominals are underscored).

| Order pattern | Tokens (%) | Examples | HKSL | English translation | Violate 20 | Cantonese Orderpattern |
|---------------|------------|----------|------|---------------------|------------|------------------------|
| N+1 Mod (383, 81%) |            |          |      |                     |            |                        |
| Dem N     | 233 (49%)  | IX_2 HOUSE NOT_HAVE? | "Does your home have (such a bell)?" | No         | Dem *(Cl) N           |
| N Dem    | 7 (1%)     | LIKE CAT IX-a WHY?    | "Why do I like cats (in general)?" | No         | /                      |
| N Num    | 52 (11%)   | PERSON TWO ENOUGH.    | "Two persons are enough." | No         | /                      |
| Num N    | 3 (0.6%)   | IX_3 IN THE PAST ONE MALE DO. | "In the past, a man made (steamed-bread)." | No         | Num *(Cl) N           |
| N Cl Num | 2 (0.4%)   | WRITE ESSAY GROUP [%redup] THREE | "(She) wrote three groups of essays." | No         | Num *(Cl) N           |
| N Q (quantifier) | 12 (3%) | HEARING ALL-a SIGN DON'T KNOW | "All the hearing people don't understand sign language." | N/A | /                      |
| Adj N    | 38 (8%)    | EXCLUSIVE FOOD GIVE HAVE? | "(You) have given (it) exclusive food?" | No         | Adj N                 |
| N Adj    | 19 (4%)    | HOPE IX_3 LOOK FOR-a MALE GOOD. | "(They) hope she finds a good man." | No         | /                      |
| Others   | 6 (1%)     | IX_1 FRIEND IX_3 BREED CAT. | "My friend (he) raises cats." | N/A | ? Possessive N Pronoun |
| N+2 mod (49, 10%) |          |          |      |                     |            |                        |
| Dem Adj N | 16 (3%)    | IX-a NORMAL PLAY NO. | "Ordinary playing does not (need interpreters)." | No         | Dem *(Cl) Adj N       |
| Adj N Dem | 12 (3%)    | SPECIAL EDUCATION IX-a | "(Her major) is Special Education." | No         | Adj N Dem *(Cl)       |
| Dem N Adj | 5 (1%)     | AGAIN BUY IX-a BALL CAT BLACK. | "(She) bought one more black Persian cat." | No         | /                      |
| Dem N Num | 1 (0.2%)   | IX_1 CLASSMATE TWO MARRY. | "Two of my classmates got married." | No         | /                      |
| Dem N Q  | 5 (1%)     | IX_1 HOUSE ALL LIKE CAT SAME. | "All members of my family like cats." | N/A | /                      |
| Adj N Dem | 3 (0.6%)   | SPECIAL IX-a EDUCATION WHAT? | "What is Special Education?" | Yes (?)    | Adj N Dem *(Cl) N     |
| Adj N Num | 2 (0.4%)   | JAPAN MONEY 150-1-GIVE-3 FINISH. | "I gave him 150 Japanese yen." | No         | Adj N Num *(Cl)       |
| N Adj Dem | 4 (0.8%)   | WRONG PARENTS HEARING IX-a | "Those hearing parents are wrong." | No         | /                      |
| N Adj Num | 1 (0.2%)   | MONEY JAPAN HUNDRED_TWENTY. | "(It cost) 120 Japanese yen." | No         | /                      |
| N+3 Mod (1, 0.2%) |          |          |      |                     |            |                        |
| Dem N Q Adj | 1 (0.2%)  | IX_loc (=HK) FOOD IX_all VARIOUS CHINA BELONG_TO-a | "Those various kinds of food in HK belongs to China." | N/A | /                      |