

A Count-Mass Typology for Hong Kong Sign Language*

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Abstract

The following paper presents some data on the count-mass distinction in Hong Kong Sign Language. With the notable exception of Koulidobrova's (2021) research on American Sign Language, count-mass distinctions have not been studied in the context of Sign Linguistics. Based on these data, it is possible to categorise Hong Kong Sign Language as a Type I language according to Chierchia's (2010) count-mass language typology. The data show that Hong Kong Sign Language count nouns combine directly with numerals, whereas mass nouns require the intervention of a numeral classifier of the mensural type. Hong Kong Sign Language count nouns use zero marking as pluralisation strategy.

Key words

Classifier intervention, count-mass typology, Hong Kong Sign Language, noun countability, Sign Linguistics

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1. Introduction

In this paper, I discuss the count-mass distinction in Hong Kong Sign Language (HKSL). Specifically, how nouns combine with numerals and, based on those data, to which existing count-mass typology belongs. I will use Chierchia's (2010) count-mass typology for this purpose.

In the context of the HKSL count-mass distinction, it is also possible to discuss the pluralisation strategies for nouns used in HKSL as well as the semantic implications of categorising HKSL as a certain type of count-mass language. I will also argue for the existence and use of numeral classifiers in HKSL, specifically those of the mensural type.

To date, only one other account of count-mass data in a sign language exists, namely Koulidobrova's (2021) research on American Sign Language (ASL). Data on count-mass distinctions in sign languages are important and necessary for several reasons: firstly, sign language data can diversify, supplement, and enrich our current understanding of how count-mass distinctions can surface in a language, regardless of modality. Secondly, they show that sign languages are not a monolith and can differ in their encoding of the count-mass distinction. Thirdly, they contribute to our typological knowledge of count-mass distinctions, as sign languages can pattern with different spoken languages.

2. A typology based on countability (Chierchia 2010)

According to Chierchia (2010, 2021), languages can be divided into three types based on whether nouns can combine directly with numerals (i.e. "countability") or exhibit number marking:

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|-----|---|---|
| (1) | Type I: Number marking languages:
Some nouns may combine directly with numerals, others need the intervention of a classifier or a measure phrase. | e.g. English
<i>three chairs</i> vs. * <i>three blood(s)</i> |
| | Type II: Classifier languages:
<i>No</i> noun can combine directly with numerals but require the presence of (overt) classifiers. | e.g. Chinese, Japanese |
| | Type III: Languages with generalised numerals:
in which <i>all</i> nouns combine freely with numerals. | e.g. Yudja (Lima 2014),
Nez Perce (Deal 2017) |

Koulidobrova (2021) argues that ASL falls into Chierchia's Type III languages, since all nouns combine directly with numerals, as seen in (2).

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|-----|--|------------------------------------|
| (2) | PLEASE GIVE ₁ THREE {BOOK/BLOOD}.
'Please give me three book/blood.'
- piles, containers, puddles | ASL (Koulidobrova
2021:215 (6)) |
|-----|--|------------------------------------|

Though it is a well established fact among sign linguists that sign languages are as diverse and different as any two spoken languages, nevertheless sign languages are rarely included in language typologies in a manner that showcases their diversity. Koulidobrova aims to uncover the ASL count-mass distinction, but also seeks to draw conclusions about where ASL fits in with Chierchia's language typology. As I will show in Section 3 below, HKSL and ASL do not behave the same in terms of this countability, because HKSL mass nouns do not combine directly with numerals. This further proves that sign languages are not a monolith and can differ typologically.

3. Hong Kong Sign Language data

In this section, I will present HKSL count-mass data. I used two sources of data: corpus data (i.e. the coding of all nominal entries in the Asian Signbank) and experimental data (i.e. a gap-filling task and a grammaticality judgement task).

3.1 Noun countability

Chierchia's (2010) typology is based on noun countability, i.e. whether a noun combines directly with numerals, as the most important distinction between count nouns and mass nouns. Of the 700 lexical nouns I analysed from the Asian SignBank, 558 (79.7%) were count nouns and 142 (20.3%) were mass nouns. Table 1 below whether the Asian SignBank nouns could be combined directly with numerals. Firstly, if a noun could combine directly with a numeral it belongs to the *grammatical* category, as shown for the noun APPLE in (3).

(3) MOTHER BUY APPLE THREE. 'My mother buys three apples.'

Secondly, if the combination of noun and numeral received an interpretation that was not ungrammatical but deviated from the most straightforward interpretation of N + Num, it was counted towards the *deviating interpretation* category. For example, FORTUNE-TELLER THREE was not interpreted by my consultant as 'three fortune tellers,' but rather as 'three fortune telling booths.' Thirdly, if my consultant indicated that they preferred using the *event numeral* (Koenders 2022) to enumerate the noun, it was counted towards the *event interpretation* category. For example, the noun AUTUMN was interpreted as an event. The event interpretation of AUTUMN means that AUTUMN THREE is not interpreted as 'three autumns' but in a way that could best be translated into English as 'autumn came three times' and is comparable to the use of Cantonese verbal classifier 次 *chi* 'time.' In other words, the numeral counts not the noun, but an event: not 'three autumns' but the "happening" of three autumns. Fourthly, if the direct combination of a noun with a numeral was only allowed in some highly explicit contexts (cf. Rothstein 2010, 2017), it was counted towards the *acceptable with explicit context* category (i.e. coercion). Finally, if a noun could not combine with a numeral directly in any way, it was counted toward the *ungrammatical* category. Nouns like PLASTIC, CHARACTER, SILVER, and HEALTH belong to this category: *PLASTIC/SILVER/HEALTH THREE.

Table 1. Countability of Asian SignBank nouns

N + Num	Concrete	Abstract	Total	
Grammatical	453	80	533	Count
Deviating interpretation	16	9	25	
Event interpretation	9	14	23	
Acceptable with explicit context (i.e. coercion)	47	35	82	Mass
Ungrammatical	22	15	37	
Total	547	153	700	

Nouns in the *grammatical* and *deviating interpretation* categories were counted towards count nouns and those in the *event interpretation*, *acceptable with explicit context*, and *ungrammatical* categories were considered mass nouns.

Concrete count nouns made up a total of 469 (67%) out of 700 (e.g. KITE), abstract count nouns 89 (12.7%; e.g. JOB), concrete mass nouns 78 (11.1%; e.g. FIRE), and abstract mass nouns 64 (9.2%; e.g. MARRIAGE). Furthermore, the majority of nouns overall contain a classifier handshape, namely 532 (76%) out of 700. The majority of HKSL nouns in the ASB are not compounds, 542 (77.4%) out of 700. Of the compound signs, 74.1% are found in the category of concrete count nouns, 7% among abstract count nouns, 13.9% among concrete mass nouns, and 5% among abstract mass nouns.

3.2 Numeral classifier intervention

Experimental data show that HKSL mass nouns when combined directly with numerals receive low grammaticality scores: 2.7/5. NPs containing mass nouns do often require the intervention of a classifier between numeral and noun. This is a mensural classifier, a type of numeral classifier.

- (4) a. *WATER THREE
'three water(s)'
- (5) a. WATER CL:cup THREE
'three cups of water'
b. OIL CL:bottle TWO
'two bottles of oil'
c. SAND CL:pile THREE
'three piles of sand'

The function of mensural classifiers is creating a countable units from a mass substance. This is also what happens in spoken Type I languages like English, **one rice vs one bowl of rice*. In contrast, the HKSL noun phrase [[Ncount + CL] Num] is not attested. Numeral classifiers do occur in spatial predicates where they can represent count nouns.

Classifier intervention is not only necessary between mass nouns and numerals, but also when mass nouns are modified by count adjectives. Count adjectives describe features of the referent that are related to its pertinent boundaries, for example SMALL and LARGE, as well as adjectives pertaining to shape, such as OVAL. According to my consultants, in order to convey the intended meaning of (6a), adding a classifier is necessary, as in (6b).

- (6) a. *GOLD SMALL
'a small piece of gold'
b. GOLD CL:sycee SMALL
'a small piece of gold'

The introduction of a classifier thus saves the structure. This classifier can then in turn be modified in terms of non-manuals, movement, and handshape to incorporate the meaning 'large' or 'small,' i.e. specifying the size and shape of the measure unit, as in (7):

- (7) a. _____ (rounded lips, protruding tongue)
 WATER CL^{small-cup} (SMALL)
 ‘a small cup of water’
- b. _____ (lips pressed together, puffed cheeks)
 OIL CL^{large-bottle} (LARGE)
 ‘a large bottle of oil’
- c. _____ (rounded lips, protruding tongue)
 RICE CL^{small-grain} (SMALL)
 ‘a small grain of rice’

In other words, the classifier is the measuring unit. This failure of mass nouns to combine directly with numerals or count adjectives unless a classifier intervenes is thus where HKSL’s count-mass distinction surfaces:

Table 2. The count-mass distinction in two structures

	count nouns	mass nouns
numerals	[NP N _{count} [NumP NUM]]	[NP N _{mass} [CLP CL [NumP NUM]]]
count adjectives	[NP N _{count} [AdjP ADJ ^[count]]]	[NP N _{mass} [CLP CL ^{SASS} {AdjP ADJ ^[count] }]]

Under certain conditions, however, it is possible to drop the intervening classifier. When given sufficient context, signers can accept utterances where the classifier has been dropped:

- (8) a. DOCTOR₃ TELL₁ BLOOD FIVE NOT-ENOUGH.
 ‘The doctor told me that five (bags of) blood is not enough.’
- b. TOMORROW IX₁ GO-TO SUPERMARKET BUY WASABI FOUR.
 ‘Tomorrow I’ll go to the supermarket to buy four (tubes of) wasabi.’
- c. REALLY-ABSURD, IX₃ COOK USE OIL NINE.
 ‘He used nine (bottles/dashes of) oil while cooking!’

Familiarity with the context or the referent noun allows coercion (i.e. reinterpretation) to occur. This is similar to how an English speaker in a coffee shop can order *three coffees*. This could be what Rothstein (2010) alludes to when she states that the unit of measure picked out for mass nouns in count syntax are retrievable from context (cf. the Universal Sorter and the Universal Packager).

3.3 Pluralisation

Sign languages often use reduplication to express pluralisation (see Pfau and Steinbach 2006 for German Sign Language). However, for HKSL, only sideward reduplication is available and not as a productive means of pluralisation (cf. Chu 2017). Only one noun reduplicates with the sole purpose of pluralisation: CHILD ‘child’ vs. CHILD^{>+>} ‘children.’ This reduplication can be considered as a form of lexicalisation. There are other nouns that can be reduplicated sidwards, but this reduplication then necessarily implies spatial allocation. For example, the signs PERSON^{>>>} means ‘people,’ but the signer envisions the plurality of people to be located in the surrogate space

surrounding them. Interestingly, the same effect occurs with the reduplication of mass nouns, e.g. GOLD^{>+>+}, WATER^{>>>}, and SHIT^{>+>+}. When signing WATER^{>>>} the signer visualises a large puddle of water located in the space in front of them. That this reduplication is not a form of pluralisation is in line with the existing literature, in which it is established that mass nouns should not be expected to pluralise.

Nevertheless, the absence of reduplication does not imply an overall lack of pluralisation in HKSL. Pfau and Steinbach (2006) show that a plural marking strategy available to both spoken and sign languages is *zero marking* [Ø] (cf. Corbett 2000, Rijkhoff 2002).

- (9) a. sheep sheep-Ø *English*
 b. Fahrer Fahrer-Ø *German*
 'driver' 'drivers' (Pfau and Steinbach 2006:141 (5b))
 c. DOG DOG-Ø *HKSL*
 'dog' 'dogs'
- (10) IX₁ HOME HAVE DOG-Ø TWO.
 'I have two dogs at home.'

4. Typological account of Hong Kong Sign Language

HKSL fits into Chierchia's (2010) typology as a Type I language because its count nouns combine directly with numerals, but its mass nouns require the intervention of a numeral classifier. Furthermore, I have argued that HKSL count nouns reduplicate through zero marking, which can be considered a form of number marking. In what follows, I will discuss three aspects of why categorising HKSL as a Type I language is interesting. Firstly, HKSL would be a Type I language without collective nouns, which is rare. And secondly, categorising HKSL as a Type I language has implications for the denotation of its nouns.

4.1 Collective nouns

HKSL lacks collective nouns, which is rare for a Type I language. Collective nouns are nouns that consist of individuated units, but they do not allow direct combination with numerals either nor do they receive plural marking. In other words, they are conceptually countable, but syntactically behave like mass nouns. In English, nouns like *footwear*, *furniture*, *clothing*, and *stationary* are examples of collective nouns. In HKSL, nouns that are semantically collective behave like count plurals. For example, FURNITURE and CLOTHING allow for direct combination with numerals. In other words, they are count nouns.

- (11) a. OLDER-SISTER GO IKEA BUY FURNITURE ONE.
 'My sister is going to Ikea to buy a piece of furniture.'
 b. YESTERDAY IX₁ GO SHOPPING BUY CLOTHING TWO.
 'Yesterday I went shopping and bought two items of clothing.'

Though, according to Chierchia (2021), it is not uncommon for languages to lack collective nouns. It is typologically rare for Type I languages. Of the known Type I languages, only Greek has been reported to lack collective nouns (Tsoulas 2009).

4.2 Noun denotation

Adopting Chierchia's (2021) semantic framework and categorising HKSL as a Type I language has several implications. First of all, Type I count nouns are atomic. It thus follows that HKSL count nouns thus follow this denotation, for example, $AT(BOOK)$. In contrast, for mass nouns, $AT(P)_w$ is a logically empty property and therefore the atoms are not stable $AT(P)$.

Regarding semantic plurality, Chierchia (2021) follows Link (1983) in assuming that "plurals employ a domain U of individuals that are ordered by a relation ' \geq ' and closed under a plural sum operation '+'" (2021:26), i.e. the structure of plurals is $\langle U, \leq \rangle$. The plural property, *bears*, for example, is true of any sum of bear-atoms. In other words, the singular property *bear* is the generator set of the plural *bears*. Plural count nouns are sets closed under sum, i.e. $BEAR_C$. Mass properties are also sum-closed, i.e. OIL_M . The generator $bear_C$ is the atomic property, however, the existence of the generator oil_M is controversial, because it is unclear what the minimal parts of oil are in that world. Like in English (12a-b; Chierchia 2021:33 (7a-b)), both HKSL count and mass nouns can refer to kinds, (13a-b).

- (12) a. Gold is in short supply.
b. Bears are widespread.

- (13) a. ALL-OVER-THE-WORLD GOLD LITTLE.
'There is not a lot of gold in the world.'
b. BEAR SEEM GO-EXTINCT FINISH.
'I believe that bears have already gone extinct.'

In English, mass nouns and plural count nouns are sum-closed properties (type $\langle s, et \rangle$). Kinds are individual concepts of type $\langle s, e \rangle$ (or e_k). The function $\langle s, et \rangle$ of sum-closed properties maps any instance of the property and the $\langle s, e \rangle$ type of kinds picks out the sum of the corresponding property. Given the parallel between (12b) and (13b), HKSL bare count nouns can refer to kinds and must therefore also be sum-closed. This also shows that HKSL count nouns are semantical plurals, despite lacking overt plural marking.

In terms of numeral properties, Chierchia (2021) asserts that numerals are property modifiers of type $\langle \langle s, et \rangle, \langle s, et \rangle \rangle$ (2021:36). Kind-denoting nouns are of type $\langle s, e \rangle$. Since in Type I languages mass nouns are kind-denoting, they do not combine directly with numerals because of this mismatch in types. Such a mismatch does not exist for property-denoting nouns, i.e. count nouns in Type I languages. The function of classifiers is to type-change kind-denoting nouns into property-denoting nouns.

5. Conclusion

To sum up, the HKSL count-mass distinction surfaces in the inability of mass nouns to combine directly with numerals without the intervention of a mensural classifier, whereas count nouns do allow direct combination with a numeral. Therefore, HKSL can be categorised as a Type I language according to Chierchia's (2010) threefold count-mass typology. It is possible to drop the numeral classifiers and combine mass nouns directly with numerals if the context is sufficiently clear to retrieve the unit of counting meant (Rothstein 2010). This is the same mechanism that occurs for the reference shift mechanisms of the Universal Packager and the Universal Sorter.

HKSL differs from the only other extant sign language on which information about the count-mass distinction is available, namely ASL. ASL, according to Koulidobrova (2021), is a Type III language according to Chierchia's typology, which means that all nouns – regardless of whether they are count or mass – combine directly with numerals.

HKSL count nouns may pluralise, but not through the mechanism of reduplication, as has been established for several sign and spoken languages (Pfau and Steinbach 2006). Instead, HKSL count nouns pluralise through the use of zero marking.

As a Type I language, HKSL count nouns are property-denoting and its mass nouns are kind-denoting. This means that the inability for mass nouns to combine with numerals is caused by the mismatch in type between mass nouns (<s,e>) and numerals (<<s,et>, <s,et>>). Furthermore, HKSL is an exceptional Type I language because it lacks collective nouns, which thus far has only been shown for Greek (Tsoulas 2009).

References

- Chierchia, Gennaro. (2010) Mass nouns, vagueness and semantic variation. *Synthese* 174, 99-149.
- Chierchia, Gennaro. (2021) Mass vs. Count: where do we stand? Outline of a theory of semantic variation. In Tibor Kiss, Francis Jeffrey Pelletier, and Halima Husić (eds.), *Things and stuff: the semantics of the count-mass distinction*. 21-54. Cambridge: Cambridge University Press.
- Chu, Kenny. (2017) *Reduplication in Hong Kong Sign Language*. Bachelor's thesis, The Chinese University of Hong Kong.
- Deal, Amy Rose. (2017) Countability distinction and semantic variation. *Natural Language Semantics* 25, 125-176.
- Koenders, Emily. (2022) Hong Kong Sign Language numerals: interaction of syntactic processes and the movement-parameter. *Sign Language and Linguistics* 25.2, 163-204.
- Koulidobrova, Helen. (2021) Counting (on) bare nouns: revelations from American Sign Language. In Tibor Kiss, Francis Jeffrey Pelletier, and Halima Husić (eds.), *Things and stuff: the semantics of the count-mass distinction*. 213-233. Cambridge: Cambridge University Press.
- Lima, Suzi. (2014) All notional mass nouns are count nouns in Yudja. *Proceedings of SALT 24*. 534-554.
- Link, Godehard. (1983) The logical analysis of plurals and mass terms: a lattice-theoretical approach. In Rainer Bäuerle, Christoph Schwarze, and Arnim von Stechow (eds.), *Meaning, Use and Interpretation of Language*. 302-323. Berlin: de Gruyter.
- Pfau, Roland and Markus Steinbach. (2006) Pluralization in sign and in speech: a cross-modal typological study. *Linguistic Typology* 10.2, 135-182.
- Rothstein, Susan. (2010) Counting and the mass-count distinction. *Journal of Semantics* 27.3, 343-397.
- Rothstein, Susan. (2017) *Semantics for Counting and Measuring*. Cambridge: Cambridge University Press.
- Tsoulas, George. (2009) On the grammar of number and mass terms in Greek. In Claire Halpert, Jeremy Hartman, and David Hill (eds.), *Proceedings of the 2007 Workshop in Greek Syntax*

and Semantics at MIT. 333-348. Cambridge, MA: MIT Press.

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