Counting (on) Bare Nouns: Revelations from ASL

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We examine mass-count distinction and its interaction with number marking in American Sign Language (ASL). The rationale for this undertaking is as follows. First, to our knowledge, the countability distinction has never been examined in a sign language in general and ASL in particular. Literature (see (1)) has argued for a tight connection between countability and a number of other phenomena within the nominal domain of a language, namely 'counting' classifiers and number marking, neither of which have been directly examined in ASL.

(1) '…(T)hree quite different ways in which the mass count distinction is coded. […] (I)n classifier languages we detect a different behavior of mass versus count in the classifier system; in number marking languages the distinction affects the distributions of plural versus singular morphemes, while in nominal number neutral languages it shows up in the distribution of numerals.' (Chierchia 2010)

Indirectly, previous research has noted that (a) number can be marked on a noun via sign repetition, akin to reduplication (Fischer 1973, Wilbur 2005, Sandler & Lillo-Martin 2006, Pfau & Steinbach 2006, Berent et al. 2014), but the quantificational value of the NP does not come not from the marking on the noun but rather from outside of the NP domain instead, i.e. on the verb, event type, etc., including a classifier (CL) (Petronio 1995) (2); (b) the CL is optional (Abner 2012, i.a.); (c) ASL robustly allows bare NP ellipsis that ignores number (Koulidobrova 2017).

(2) a. $\overline{\text{a-STORE,}}^{\text{t}}$ MAN (CL:/1/) GO-a   'The man went to a store'

  b. $\overline{\text{a-STORE,}}^{\text{t}}$ MAN (CL:/44/) GO-a   'The men went to a store'   (Petronio 1995)

(3) A: THREE STUDENT JOIN 1-POSS CLAS   'Three students joined my class'
    B: Ø DROP 1-POSS CLASS   ' _____ dropped my class'
      i. the same/different three students dropped B's class
      ii. some other number students dropped B's class, including one   (Koulidobrova 2017)

Additionally, on an influential typological proposal (Chierchia 1998), one other variable is of relevance – presence vs. absence of overt articles as exponents for the $\exists$ and the ι. ASL is just such a language: lexical items previously suggested to encode either $\exists$ or ι are illicit in contexts requiring just such items; instead, in such contexts N must be bare (1).

(4) a. TODAY SUNDAY. $\overline{\text{DO-DO.}}^{\text{wh}}$ GO CHURCH, SEE (*IX) PRIEST. (*IX) $\overline{\text{PRIEST}}^{\text{t}}$ NICE
    'Today is Sunday. What to do? I'll go to church, see **the** priest. **The** priest is nice.'   = ι
  b. [......] GO LIBRARY, FIND SMART PERSON DISCUSS. (*IX/ONE) SMART PERSON TEND NOT-MIND

    '[…] I'll go to a library, find **some smart person** to discuss things with. A smart person usually doesn't mind.' = $\exists$

To elaborate: the first mention of PRIEST is the case of 'global uniqueness'; the second is anaphoricity. The former context is cross-linguistically encoded by the weak definite article, if such exists in the language, and the latter by the strong one (Schwarz 2009 and references therein; Arkoh & Mathewson 2013). LIBRARY could be interpreted as either definite or not (*a/the*), but [SMART PERSON] is clearly indefinite. Crucially, while [IX NP] is in principle a licit combination, it means something else entirely (Author & Lillo-Martin 2016). In other words, the noun in (2) must occur in its bare form. According to Chierchia (1998), e.g., in a language like this, nouns may all be mass. Thus, (a)-(c) above, coupled with (2), constitute an ASL-internal set of reasons for this inquiry.
    In addition, we aim to contribute to the understanding of the countability distinction in general. To preview: we demonstrate that despite apparent evidence to the contrary, ASL encodes countability; this distinction is flushed out via syntactic tests. On the way to this conclusion, a number of other characteristics of ASL are revealed.

1. ASL is not a generalized classifier language

It is generally accepted in the literature that ASL classifiers are predicates (see an overview in Schembri 2003 and references therein) but those that denote nouns are better described as noun class markers (Hong 2008, Pfau & Steinbach 2006, Benedicto & Brentari 2004, Padden et al. 2013, i.a), a.k.a. sortal classifiers. These are precisely the elements that have been argued to indicate the unit of counting while appearing to be semantically redundant (Grinevald 2005), and which could be left out of a sentence without much change in meaning (Jacob 1965 and Adams 1991 on Khmer, an Austro-Asiatic, Cambodia). The aforementioned is also true of (2). In other words, ASL classifiers are, in fact, eligible for a comparison with their East Asian counterparts – 'count classifiers' in Cheng & Sybesma (1999), Borer (2005), i.a. However, further examination reveals that these sortal classifiers are clearly of a different variety than their 'count classifier' relatives in Mandarin, Khmer and other related languages. First, ASL classifiers encode multiple types of information. Consider CL:/1/ in (2a). This classifier shows that the entity (*man*) is both human and singular; in (2b) what is glossed as CL:/44/ does not mean 44 people – rather it is $CL_{personPL}$. This, turns out, is not an isolated incident of a classifier with a plural marking; the phenomenon is also recorded in other works on the topic as a productive strategy in the language: '+>' encode reduplication (Pfau & Steinbach 2006, Herbert 2016, i.a.).

(5) a. MANY BOTTLE $CL_{cyllindrical}$ >+>+>+   'Many bottles are standing next to each other'
    b. THREE CAR $CL_{vehicle}$ >+>+>+   'Three cars are standing next to each other'   (Pfau & Steinbach 2006)

While the existence of both PL marking and classifiers in the same sentence is not unique to ASL – Halkomelem Salish also allows both classifiers and number marking in the NP (Wiltschko 2008) – what is special about ASL is the ability of CL to encode PL, which implies that the CL and number marking cannot possible vie for the same head (as in Borer 2005, e.g.).

Second, cross-linguistically, in the 'count classifier' languages, CL and the numeral are always adjacent (Greenberg-Sanchez generalization). This pattern has been observed for Indo-European, Altaic, and Niger-Congo languages (Doetjes 2010, Aikevald 2000, Cheng & Sybesma 1999, Ikoro 1996). ASL, however, does not mandate that this adjancency be satisfied (5b vs. 6e).

(6) a. [N – Num – NC]   b. [N – NC – Num]   c. [Num – NC – N]
    d. [NC – Num – N]   e. *[Num – N – NC]   f. *[NC – N – Num]

Third, a part of the Greenberg-Sanchez generalization is that nothing can intervene between the noun and the numeral classifier; this, however is violated in (7) with the addition of the adjectives CHA 'huge' and DRUNK. The data above serve as evidence that ASL is not a generalized classifier language.

(7) a.   THREE CAR CHA $CL_{vehicle}$ >+>+>+   'Three huge cars'
    b.   WOMAN DRUNK CL_{person}1   'A drunk woman'

2. Number specification: strict plurality

The fact that ASL is a language without articles has two consequences: i) its Ns are expected to type-shift between kinds and individuals; and ii) on Chierchia (1998) these Ns may start their lives as mass kinds. The argument against the former comes from (8a): with type-shift unconstrained (at least in the order of operations proposed in Chierchia), there should be no reason for the lack of anaphoric reference to kinds (see Despic 2017). The argument against the latter is in (8b): existence of pluralia tantum nouns like CHILDREN – a lexical item typically intolerant of singular referents

(8) a. $POSS_1$ FAMILY GENERATION MAKE WINE. #DRINK AMAZING
      'My family has been making wind for generation. (This) drink is amazing' => #if DRINK refers to WINE
    b. IX_1 HAVE ONE {*CHILDREN / CHILD} NAME MARY   'I have one child, her name is Mary'

Overt number marking on nouns in ASL is possible, albeit considered optional and is manifested in sign repetition (Cokely & Baker-Shenk 1980) which looks like reduplication in spoken languages (Fischer 1973, Wilbur 2005, Sandler & Lillo-Martin 2006, Pfau & Steinbach 2006, Berent et al. 2014) and the allomorph of which Pfau & Steinbach (2016) argue to be zero-marking. Crucially, with a numeral or a reduplicated adjective, the noun must retain its non-plural form; in this ASL parallels Hungarian, Turkish, and a variety of other languages.

(9) 'Five / many kids'
     a. * {FIVE / MANY} CHILD +>+>+   b. {FIVE / MANY } CHILD
(10) 'Blue/small books'
  a.   * BOOK+++ {BLUE +++/SMALL +++}   b. BOOK +++ {BLUE / SMALL}

Unlike Turkish, however (and English), ASL number encodes strict plurality at least on the entailment test. Consider the English example in (11a), felicitous even if the B only has one child (Sauerland 2008; Rullmann & You 2006; Zweig 2009; Farkas & de Swart 2010, Nomoto 2013; Sag 2017; i.a.). The expectation then is that since ASL behaves as a language with a pluralization strategy (like English) and pluralia tantum nouns (like English), it should also exhibit similar entailment patterns in terms of number. Turkish behaves on par with English (Sag 2017).

(11) a. A: Do you know if she has any children?   B: Yes, she has one daughter
    b. A: IX$_2$ KNOW IXa HAVE CHILDREN   'Do you know if he has children?'
      B: #YES HAVE ONE DAUGHTER   'Yes, he has one daughter'
      B': YES HAVE TWO THREE KID…FORGET   'Yes, he has two or three kids, … I forget'

The strict plurality in (11) is also evident with regular nouns. Note (12) (one-handed noun TREE) and (13) (two-handed noun BALL), the difference between which is phonological in nature – something that has been argued to be crucial in distinguishing among the various types of pluralization strategies (Pfau & Steinbach 2006, 2016; Wilbur 2009; i.a.): the former involves sideward movement in conjunction with reduplication (indicated by '>' and '+'), the latter reduplication only (indicated by '+')[1].

(12)   y/n
        A: HAVE TREE+>+>+> HERE   'Do you have trees?'/ 'Are there trees here?'
        B: #YES, HAVE ONE PINE   'Yes, we have one pine'
        B': NO, ONLY ONE   'No, only one'

(13)   y/n
        A: HERE HAVE BALL +++   'Do you have balls here?'/ 'Are there balls here?'
        B: #YES, HAVE ONE BALL   'Yes, we have one ball'
        B': NO, ONLY ONE   'No, only one'

Assuming that conjunction preserves value (Cruse 1986, i.a.), we predict that the number will be preserved only in the overtly marked cases. This is borne out in (14).

(14) a. JOHN SEE BALL MARY SAME   'John saw (a) ball(s), and so did Mary'
    b.   JOHN MARY SEE BALL   'John and Mary saw ball(s)'
    c.   JOHN MARY SEE BALL+++   'John and Mary saw balls/*a ball'

Interim conclusion: ASL is a language that, on Chierchia's typology, would be described as 'nominal number neutral.' On the surface, it patterns with a number of other languages: number marking is optional and double marking within the NP is ungrammatical. However, the surface similarity is an unreliable diagnostic and the 'number neutrality' is not entirely accurate: PL marking exists and it is strict. The implication here is that sums exclude atoms.

3. Mass-count distinction

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[1] Neither sentence means that there are three books (or trees) here, despite the fact that the relevant noun is repeated three consecutive times.

3.1 Apparent lack of distinction

We begin with the signature property of mass nouns – the impossibility of directly combining with numerals without classifiers or measure phrases (a.k.a. cumulativity). It turns out, however, that both traditionally count and mass nouns are able to do this in ASL (15a and b, respectively):

(15) a. IX_1 WANT 3 DIFFERENT BOWL   'I want 3 different bowls'
     b. PLEASE $GIVE_1$ 3 GOLD/OIL/WOOD/BLOOD   'Please give me 3 (units of) gold/oil/wood/blood'

Like Nez Perce (Deal 2017) and Yudja (2016), ASL appears able to combine a numeral with any type of noun. As expected, since CLs do not fulfil the function of the generalized numeral classifiers, their presence here is not required. At least according to our consultants, this is also true for the ability to combine with typically count D-quantifiers (16) (Abner & Wilbur 2017); in such combinations, unike Nez Perce, the N must remain non-PL – once again showing the lack of cumulativity requirement.

(16) a. WOW NEED {MANY/MUCH} OIL FOR FOOD   'Wow, I need a lot of oil for food'
     b. PILE WOOD WOW HAVE {FEW/SMALL-AMT} WOOD 'That's a pile of wood, wow, there is a little wood here'

Deal (2017) argues that the cumulativity is not the only feature to consider: languages could vary in the 'minimal parts' requirement – how they combine with stubbornly distributive adjectives (Schwarzchild 2011) (17) or compare re volume vs. number (Barner & Snedeker 2005). Here too, however, ASL Ns show no difference (18).
                    ____cha
(17) IX_a GOLD SMALL/LARGE   'That's a small/huge (unit of) gold.'
 (18) a. Mary has more wine than Peter   => true if M's 1 barrel contains more wine than P's 15 bottles -- volume
     b. *Context: A and B are aware of Mary's barrel of wine.*
        A: IX_1 JEALOUS MARY HAVE MORE WINE   'I am jealous because Mary has more wine'
        B: WHY? 15 BOTTLE MEAN MORE WINE CAN   'Why? 15 bottles can mean more wine'
                                        => true if M's 1 barrel is compared to P's 15 bottles -- number

Other items in the dataset are BREAD/MILK/SAND/IMAGINATION/CLOTHING – i.e. both concrete and abstract, substances and aggregates. For the sake of exposition, consider all of the cases in Table 1 below – all nouns behaved identically, including being able to be 'strictly' pluralized (19).

(19) WOW SHIT+>+>+   HERE   'Wow, there is shit everywhere here'

Table 1. Countability distinctions (Deal 2017 (16))

	cat	footwear	water
(a) pluralization	✓	*	*
(b) direct combination with numerals	✓	*	*
(c) combination with *each, many, fewer*	✓	*	*
(d) combination with *much, less*	*	✓	✓
(e) combination with 'count adjectives'	✓	✓	*
(f) comparison based on number	✓	✓	*
(g) comparison based on mass/volume	*	*	✓

The question is then whether all ASL nouns are necessarily interpreted as count, as has been argued by Lima (2014, 2016) for Yudja, or can we find a special context where the countability distinction can be revealed, as has been shown for Nez Perce in Deal (2017)?

3.2 Come out, come out, wherever you are…: countability distinction revealed with partitives

Despite the apparent evidence to the contrary, ASL encodes countability. This is evident in the interaction of the tools we had used thus far. For instance, while the traditionally mass nouns (e.g. SAND), on par with their count counterparts, maintain flexibility of readings under conjunction, PL cannot be applied to them without a classifier ((19c) vs. (20)), and in such a case, the classifier does its sorting – the various possibilities associated with (14) and disappear ((14c) vs. (19c)).

(19) a. JOHN SEE SAND MARY SAME   'John saw sand, and so did Mary' => J - 1 sand castle, M - 5 sandboxes
     b. JOHN MARY SEE SAND   'John and Mary saw sand'   => J - 1 sand castle, M - 5 sandboxes
     c. *JOHN MARY SEE SAND+++   'John and Mary saw sands'
(20) a. JOHN MARY SEE SAND CL$_{tall-object}$ +++ 'John and Mary saw tall sand objects'
                                              => J - 5 sand castles, M - 5 #sandboxes / ^{ok}sand castles
     b. JOHN MARY SEE SAND CL$_{box}$+++ 'John and Mary saw box-shaped sand objects'
                                              => J - 5 #sand castles /^{ok}sandboxes, M - 5 sandboxes

That said then, per (1), having established ASL to be a language without generalized classifiers and non-obligatorily marking for number, we turn to the distribution of numerals. With Ionin & Matushansky (2006), we assume that numerals have restrictive semantics. In ASL, they also been argued to pattern with adjectives (Koulidobrova 2012, 2017) and, like adjectives, can be ignored under ellipsis (3). However, there is syntactic environment in which numerals but not adjectives are found – partitives, uniquely allowing quantifier stranding (21a), which is otherwise banned in NP ellipsis (21b).

(21) a. APPLE$_i$ IX$_1$ WANT 3 / FEW A̶P̶P̶L̶E̶$_i$ 'I want 3/a few apples; *lit*: of apples, I want 3/a few'   (Boster 1996)
     b. *MARY REGISTER {FEW/3}STUDENT, JOHN DROP {MANY/5} S̶T̶U̶D̶E̶N̶T̶
        'Mary registered {a few/3}students, John dropped {many/5}'   (Koulidobrova 2012)

Rothstein (2011) observes that generally, numerical partitives take only count DPs as complements while '*some of the'* partitives can take either mass or count NPs. This observation leads to the following prediction: if all ASL nouns can be interpreted as count, as the results of the diagnostics in Table 1 appear to suggest, we expect both mass and count nouns to be allowed in partitive constrictions. It turns out that mass Ns are illicit in this context ((22) vs. (21a)).

(22) *BLOOD$_i$ IX$_1$ WANT 3 / FEW B̶L̶O̶O̶D̶$_i$ 'I want 3/a few bloods; *lit*: of blood, I want 3/a few'

A classifier, however, rescues the ungrammaticality both in the partitive ((22) vs. (23a)) and in the ellipsis ((21b) vs. (23b)) cases (the latter also in Turkish, Boskovic & Sener 2014). Note, despite being able to have a naturally individuated (Rothstein 2010, i.a.) along various other sums and parts tests (Table 1), simply because sortal classifiers are available for some but not other mass Ns, such a 'rescue operation' may not be possible – ASL does not have a CL for IMAGINATION, and (24) is ungrammatical.

(23) a. BLOOD$_i$ IX$_1$ WANT 3 / FEW CL$_{container}$+>+>+> B̶L̶O̶O̶D̶$_i$ '*lit:* Of blood, I want 3/few CL'
      b. MARY REGISTER FEW STUDENT, JOHN CL$_{person.PL}$DROP
            'Mary registered few students, John dropped CL'
(24) *IMAGINATION IX$_1$ WANT MANY/MUCH CL   '*lit:* Of imagination, I want a lot CL'

The data above lead to the following set of conclusions: it is not the case that all nouns in ASL are vague (Chierchia 2010) or kinds (1998); thus, something else must said about where all of the readings associated with the Ns in ASL come from. Plurality, when marked, is strict, which also means that Ns are not all mass – since, commonly, being mass means being lexically plural. Additionally, despite the overwhelming evidence to the contrary, the countability distinction is maintained. This distinction is not apparent from the semantic diagnostics that have thus far been used by the literature (Table 1); instead, the distinction arises from the syntactic manipulation/movement: i.e. while ASL does not behave like a general classifier language, the data suggest the presence of a projection that is associated with counting along the lines of Cheng & Sybesma (1998) – something like a CLP. In other words, while the semantic tests (sums and parts) have been silent on the issue, syntax has revealed the countability distinction after all: this projection blocks movement for mass nouns but not the count ones. Whether the Ns generate in the different positions or arrive there by movement is a matter of further investigation, but the data show that the countability distinction in ASL is ontological, not grammatical.
        This finding carries a number of other implications. The first one is for the analysis of CLs, still a matter of some debate in sign languages (Sandler & Lillo-Martin 2006) and in spoken ones (Rothstein 2011). It also remains to be seen whether all CLs pattern in the manner described here. Second, the results carry clear

consequences for the nature of the nominal domain in ASL. E.g., Boskovic (2008, et seq.) argues that a language without a definite article lacks a DP layer entirely; the strong version of that thesis is that in such a language NP is a maximal projection. The latter in particular has also been argued for ASL (Koulidobrova 2017). The data presented here force further articulation of the nominal domain and question this view.

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Note: By convention, ASL manual signs are glossed in SMALL CAPS. The line about the utterance records non-manual information. IX is a sign typically assumed to be pronominal. A subscript on a sign indicates the location of the referent (e.g. IX_1 = first person pronominal ≈ 'I'). Redulplication/repetition of a sign is captured with '+' and, if the additional movement in space is required, '+>'