Counting on a verbal dimension: on Mandarin verbal classifiers

Ang Li   *Rutgers University*

OVERVIEW This talk aims to give a formal account of the so-called verbal "classifier"s in Chinese, taking them to be unit measures of events, tied to numbers.

THE BASICS Across languages, counting in the verbal domain seems to always require a "classifier" such as English *time* (Doetjes 2008). In Chinese, speakers can shift away from nominal counting just by opting for such a verbal classifier (CL_V) like *ci*:

(1) Yuehan xiu le   san **ci**   che.
     John   fix ASP three CL_V car

   ≈ "John did car-fixing three times."
   the amount of fixing events is three, the amount of cars being fixed is unknown

Two available formal analyses agree that CL_Vs should crucially select for an event argument, but they either is silent on compositional contribution of the CL_V *per se* (2(a)), or introduces nonstandard notions (2(b)), where "intensionality" is not related to possible worlds). More importantly, neither of these is enough to account for cases where we see a CL_V phrase takes a non-eventive argument such as in (1).

(2) (a) ⟦san ci'3'-CL_V⟧: $\lambda E_{vt}\lambda e_v[^*E(e) \wedge |e| = 3]$ (Yang 2001: 146[1])

   (b) ⟦time⟧: $\lambda P_{\uparrow vt}.P_{\uparrow vt}$ where $\uparrow$ is defined as an intensional type that maps pluralities (sums) to group atoms (Landman 2006: 19)

PROPOSAL I argue Chinese CL_Vs do make counting **about events**, and explore an extension of the classic nominal classifier theory to explain their compositional meaning. In the classic theory (cf. Chierchia 1998), a classifier directly attaches to a kind-referring noun and shifts its denotation to instantiations of that kind. However, the extension can't be taken on the face value because of the following mismatches: i) the notion of "kind reference" doesn't have an obvious counterpart in the verbal domain; ii) CL_Vs don't behave like a sort-shifter strcturally as they are adjoined to the numeral (Deng 2013, a.o.); iii) CL_Vs don't behave like a sort-shifter – which you'd expect to have an asymmetric type – as across languages they can be used iteratively on the events being counted.

Core semantics I argue that despite these difficulties, classifiers across domains share the same core meaning: they help to individualize an appropriate counting level. The mismatches arise because events are individuals of a different kind. A crucial observation that has been overlooked in previous work is that events are inherently multi-dimensional (cf. Champollion 2015) and individualization of events depends on picking out the right dimension (and sometimes granularity). Based on this, my proposal is that a CL_V existentially introduces a partition over a set of events by projecting the set onto a certain dimension; the numeral then counts the cardinality of the partition cells. For example, *ci* introduces such a partition along the temporal dimension (I use $\prod S$ for partition on a plural individual[2], s for partition cells, and τ for the temporal trace function):

(3) (a) ⟦ci($CL_{V\text{-temporal}}$)⟧: $\lambda n \lambda E_{vt}\lambda e_v \exists S[\prod S(e) \wedge \mathbf{CI}(S) \wedge \forall s \in S[E(s)] \wedge |S| = n]$
        $\mathbf{CI}(S) = 1$ iff $\forall s, s' \in S, s \neq s' \to \tau(s) \neq \tau(s')$
        In words: given a number n and a plural event, it'll partition the events into a set of n subevents whose runtimes are different from one another.

I show data supporting the definition in (3): suppose people in three different cities marched in exactly the same period of time; the marching in each city may count as a subevent, but they are indistinguishable on the temporal dimension. Indeed here using *ci* to count to three is impossible:

---

[1]Yang used e^e and Landman used e for the type of events, I adapt both to type v here just for the ease of comparison.
[2]Following Ionin & Matushansky (2006), a partition is a cover with all its cells non-overlapped.

(4) #Zuotian shangwu tamen gao le   san **ci**   youxing.
    yesterday morning they   do   ASP three $CL_{V\text{-temporal}}$ march
    Intended meaning:"They marched three times yesterday morning."

Note it's not that we just don't really have a plural event in this case: the sentence in (4) would be perfect if only we replace *ci* with a spatial dimensional CL_V *chang*. This is expected under the current proposal: *chang* would introduce a partition on the spatial dimension, where the three subevents – marchings in each city – are clearly distinguishable.

Iterative counting My proposal naturally accounts for the iterative use of CL_Vs in sentences like "Dafna jumped twice three times." The iterative use is a major motive for Landman (2006) to take CL_Vs to be intensional operators – as simple conjunction of cardinality tests without some kind of "intensional" grouping would run into a contradiction. That is not a problem under the current analysis: since each cardinality test is bound by an existential quantifier, they'll never contradict with each other; no special definition of "intensionality" is needed:

(5) ⟦Dafna jumped twice three times⟧ : $\lambda e \exists S[....|S| = 3 \wedge \forall s \in S[...\exists S'...|S'| = 2]]$
    In words: a plural event of Dafna jumped that can be divided into two subparts, each of which can be again divided into three subparts.

Positional variants Different from previous work, I argue CL_V phrases locate on different structural levels in a sentence and don't always take an event argument (i.e. argument of type vt). CL_V phrases in the topicalized *there*-phrase *always* scope higher than the quantified object phrase ((5)), and prenominal CL_V phrases are simply impossible to co-occur with a quantified phrase on the object position ((6)) – these are unexpected if they are all adjuncts to the event predicate:

(6) You   [**san ci**] Yuehan kan le   [mei ben shu].
    There-be three CL_V John   read ASP every CL_N book

    'Three times, John read every book.'   every > 3 times, *3 times > every

(7) *Yuehan kan le   [**san ci**] [mei ben shu].
    John   read ASP three CL_V every CL_N book
    Intended meaning: "John read every book three times. "

I argue that CL_Vs in positions other than the vP-adjunct position elicit **indirecrt event-counting**. In particular, the topicalized CL_V phrases locate above the Aspect head and take a property of reference time as its argument; the prenominal CL_V phrases locate low inside the event, subsuming a thematic head, and take an individual property as its argument. Aspect anchoring (cf. Krazter 1998) and thematic role introduction can guarantee the one-to-one mapping between the events obtained on the vP level and these individual/time properties, thus we obtain correct event-counting results in either case. The parametrization of (3) is simple given type neutrality.

CONCLUSION I propose a formal analysis for verbal classifiers that bridges direct counters across domains based on the multi-dimensionality of events, arguing they are not event-selectors but rather measure functions accompanying the numeral on levels beyond NP . The proposal improves on previous work by accounting for a larger range of empirical data, without nonstandard introduction of intensionality.

***Selected References* Champollion, L**. (2015). Stratified reference: the common core of distributivity, aspect, and measurement. *Theoretical Linguistics*, 41(3-4), 109-149. **Chierchia, G.** (1998). Reference to kinds across languages. *Natural language semantics*, 6(4), 339-405. **Ionin, T., & Matushansky, O.** (2006). The composition of complex cardinals. *Journal of Semantics*, 23(4), 315-360. **Landman, F.** (2006). In-definite time-phrases, in situ-scope, and dual-perspective intensionality. *Non-definiteness and Plurality* , 95, 237. **Yang, R.** (2001). *Common nouns, classifiers, and quantification in Chinese* (Doctoral dissertation, Rutgers, The State University of New Jersey).