Available online at www.sciencedirect.com

SciVerse ScienceDirect

Lingua 122 (2012) 1668–1691

Lingua

www.elsevier.com/locate/lingua

# Distinguishing classifiers and measure words: A mathematical perspective and implications

One-Soon Her *

*Graduate Institute of Linguistics & Research Center of Mind, Brain, and Learning, National Chengchi University, Taipei 11605, Taiwan, ROC*

Received 7 October 2011; received in revised form 16 August 2012; accepted 21 August 2012
Available online 16 October 2012

**Abstract**

Based on the insight that a measure word (M) in [Num (Adj)-C/M N] is semantically substantive, while a classifier (C) is redundant and does not block modification or quantification to N (Her and Hsieh, 2010), this paper proposes a distinction of C/M from a mathematical perspective. Synthesizing the concepts of parceler (Landman, 2004), divider (Borer, 2005), and multiplicand (Au Yeung, 2005, 2007), I follow Her (2010) and contend that while C/M both function as a multiplicand mathematically, C's value is necessarily *1* and M's is not, thus *¬1*. This offers a natural explanation to the semantic tests developed in Her and Hsieh (2010). Implications are discussed for these areas: typology of classifiers and classifier languages, correlations between numeral systems and the employment of C/M, the universal count/mass distinction at the lexical level, and first language acquisition of classifiers and numbers.


*Keywords:* Classifier; Measure word; Multiplication; Multiplicand; *1*; *¬1*

## 1. Introduction

Most, if not all, linguists would agree that there is a semantic distinction between the classifier (C) *ben* for books in (1) and the measure word (M) *xiang* 'box' in (2).

(1) 三 本 書[1]
*san ben shu*
3 C book
'3 books'

(2) 三 箱 書
*san xiang shu*
3 M-box book
'3 boxes of books'

* Tel.: +886 2 2938 7246; fax: +886 2 29387466.
*E-mail addresses:* hero@nccu.edu.tw, onesoon@gmail.com.
*URL:* http://www3.nccu.edu.tw/~osh/

0024-3841/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.lingua.2012.08.012

The element between Num and N has been classified into several types[2]; Chao (1968), for example, lists *individual measure* (what we call *classifier*); *group measure* (e.g., 組*zu* 'group'); *partitive measure* (e.g., 份*fen* 'portion, share'); *container measure* (e.g., 碗*wan* 'bowl'); and *standard measure* (e.g., 碼*ma* 'yard'). However, it is generally agreed that it can be divided into two major groups: (individual) classifiers vs. measure words. Tai and Wang (1990:38) characterize this C/M dichotomy as follows:

> A classifier categorizes a class of nouns by picking out some salient perceptual properties, either physically or functionally based, which are permanently associated with entities named by the class of nouns; a measure word does not categorize but denotes the quantity of the entity named by noun.

Unfortunately, that is where the agreement ends. Terminology is part of the confusion. Terms used for C include 'classifier', 'sortal classifier', 'count-classifier', 'count-noun classifier', and 'qualifying classifier', and those for M include 'measure word', 'mensural classifier', 'massifier', 'quantifier', and 'mass-classifier'. Worse still, some use the term 'classifier' or 'numeral classifier' for both, while others use 'measure word' for both (e.g., Zhang, 2007).

Syntactic accounts are likewise contentious. Some studies assign C/M a unified structure, which some, e.g., Li and Thompson (1981:105), Paris (1981:105–117), Huang (1982), Tang (1990), Croft (1994:151), Lin (1997:419), and Hsieh (2008), argue to be left-branching and others, e.g., Tang (2005), Cheng and Sybesma (1998, 1999), Borer (2005), Watanabe (2006), Huang et al. (2009), right-branching. Yet, some syntactic accounts, e.g., Zhang (2011) and Li (2011), contend that both kinds of structures are required for C/M. Also, as pointed out in Her and Hsieh (2010), H&H hereafter, previous studies of Mandarin classifiers have suggested very different inventories, ranging from six hundred (Hu, 1993), four hundred and twenty-seven (Huang and Ahrens, 2003), two hundred (Hung, 1996), to as few as just several dozen (Chao, 1968; Erbaugh, 1986). The major reason for this huge discrepancy is surely the confusion over what counts as a 'classifier' (Liang, 2006:17).

Following H&H, in this paper 'classifier', or C, strictly refers to the kind in (1) and 'measure word', or M, refers only to the kind in (2) and all other non-classifier unit words. There are two reasons for doing so. First, H&H have demonstrated with accurate and reliable tests, which will be discussed in section 2, that the C/M distinction is crucial and real. Second, the main purpose of this paper is to further propose a formal and precise C/M distinction from a mathematical perspective and, in doing so, also offer a natural explanation to all the semantic tests developed in H&H. Thus, this paper also aspires to establish the use of the two terms 'classifier' and 'measure word' by identifying a set of explicit criteria.

The organization of the paper is as follows. Section 2 reviews the semantic characterization of the C/M distinction made by H&H and a set-theoretic interpretation of their insight will be offered. Section 3 then integrates and extends insights gained from Landman (2004), Borer (2005), and Au Yeung (2005, 2007) and looks closely into the mathematical properties of C/M and proposes a precise multiplication-based account for the C/M distinction. Implications of this account, both within Mandarin Chinese and cross-linguistically, are explored in section 4, and some concluding remarks are given in section 5.

## 2. Semantic distinction between C/M

This section serves the primary purpose of reviewing H&H, Hsieh (2009), Her (2011), and Her and Lai (2011). A set-theoretic rendition of the semantic distinction of C/M will be offered, which links this section to the discussions in section 3 on the C/M distinction from a mathematical perspective.

### 2.1. Formal tests for the C/M distinction

H&H observe several scope phenomena that distinguish C/M. Their first observation relates to the scope of Num, which goes beyond C and covers N and thus refers to the cardinality of a set of N. The example in (3a), referring to a miracle by Jesus, shows that numeral quantification of C scopes over N; C can thus be omitted if stylistically required. Yet, the numerals quantifying the M's in (3b) do not scope over the N and cannot be omitted without changing the meaning of the phrase. A formal test obtains, as in (4).

(3) a. 五 (張) 餅 二 (條) 魚 餵飽 五千 (個) 人
*wu* (***zhang***) *bing* *er* (***tiao***) *yu* *weibao* *wuqian* (***ge***) *ren*
5 **C** loaf 2 **C** fish feed-full 5000 **C** person
'5000 people were fed with 5 loaves and 2 fish.'

[1] It is difficult to give this or any other genuine classifier an English translation, as there is nothing quite comparable in the English lexicon. However, I shall argue in this paper that the nominal suffix *-s* marking plurality in English can be viewed as a general classifier, e.g., *ge* in Chinese.

[2] Note that *Num* refers to cardinal numerals only throughout the paper, not to the grammatical category of number in terms of singularity or plurality.