

III. Circle all the correct Chinese translations for the following sentences:

(C=Chinese native speakers; E=first-year Chinese students)

15. Got milk?

a. You niunai ma? have milk Yes-No Question	C: 80% E: 81.25%
b. Ni you niunai ma? you have milk Yes-No Question	C: 100% E: 93.75%
c. Wo you niunai ma? I have milk Yes-No Question	C: 10% E: 18.75%
d. Women you niunai ma? we have milk Yes-No Question	C: 30% E: 43.75%
e. Ta you niunai ma? he have milk Yes-No Question	C: 0 E: 43.75%

16. Don't know.

a. Bu zhidao. not know	C: 100% E: 81.25%
b. Ta bu zhidao. he not know	C: 0 E: 31.25%
c. Wo bu zhidao. I not know	C: 100% E: 100%
d. Ni bu zhidao you not know	C: 0 E: 18.75%

17. Be right back.

a. Wo mashang huilai. I right.away come.back	C: 100% E: 100%
b. Ni mashang huilai. you right.away come.back	C: 20% E: 18.75%
c. Tamen mashang huilai. they right.away come.back	C: 0 E: 25%

**A Cognition-based Study of
双 (*shuāng*), 对 (*duì*), 副 (*fù*) and 套 (*tào*)**

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Abstract: This paper presents a cognition-based study of four Chinese measure words, namely, 双 (*shuāng*), 对 (*duì*), 副 (*fù*) and 套 (*tào*), carried out within the theoretical framework of cognitive linguistics, which has proved to offer a much more comprehensive approach to the study of Chinese linguistic categories than traditional approaches. By constructing a prototype theory of these four categories, the author attempts to: 1) show their distribution with respect to the noun classes they select; 2) explain the limits of these categories and their overlapping; 3) identify central, natural extension, and metaphorical extension members – and within each group the prototypes and the more peripheral members; 4) explain their internal coherence in terms of the family resemblance principle; and 5) shed some light on the influence of Chinese cultural models on the Chinese classification system and, specifically, on their role in the creation of these four categories. We believe our findings will be helpful to foreign students learning to use these four measure words.

摘要：本论文以汉语的四个量词（双、对、副、套）为研究目标。本研究的基础建立于认知语言学理论之框架。透过此四个量词语言范畴的原型理论的创立，作者企图提出下列五项研究结论：一、表示分配之使用，亦即可以与哪些名词搭配。二、说明这些语言范畴的界限及相跨的藩属。三、识别中心的、自然扩张的和比喻扩张的成员（并将各层次内的原型成员和外围成员标示出来）。四、根据家族相似性的原则解释范畴内在的连贯性。五、显示中国文化模式对量词分类制度的影响，特别是对此四个量词形成的影响。

Introduction

The seminal works of Tai and Wang (1990) and later Tai and Chao (1994), which study the classifiers 条 (*tiáo*) and 张 (*zhāng*) respectively within the framework of cognitive linguistics, represent a step forward compared to previous studies of the Chinese classification system. Their research not only focused on these two classifiers themselves, but also analyzed their relationships in terms of distribution with other shape-based classifiers from the same cognitive family,

i.e., used for similar entities.¹

Convinced of the potential contribution of approaches like theirs to the teaching of Chinese measure words and impelled by the need to conduct further research of this kind to analyse the cognitive basis of the Chinese classification system, I offer in this paper a cognitive study that looks into the semantic structures of four Chinese measure words, namely 双 (*shuāng*), 对 (*duì*), 副 (*fù*) and 套 (*tào*).

These four measure words were chosen for the following reasons: a) high frequency (according to 《汉语水平词汇与汉字等级大纲》[1992] they are among the 2,000 most frequently used words in Mandarin Chinese); b) most authors include them within the group of collective measure words (although some consider 副 to be an individual measure word); c) often one measure word entry addresses one of the others, which transmits the mistaken idea that they are always interchangeable; and d) after an extensive review of reference books, I discovered contradictory information as far as collocation was concerned for these measure words.

By applying a prototype theory to these four categories of measure words, I shall attempt to illustrate their distribution regarding the nouns with which they can collocate; mark out the limits and overlapping of these categories to establish the central, natural extension, and metaphorical extension members for each; explain their internal coherence according to the family resemblance principle; and, last but not least, shed some light on the possible influence of cultural and social models as they were being created.

This study was conducted according to the following methodology:

- I created a list of all the occurrences of different nouns with these four

¹ I have used the term classifier here to respect the terminology used in their studies. Nevertheless, I do not agree that a distinction should be made between classifiers and measure words, so hereafter I will use the term measure word for all instances. It is not my purpose to discuss this issue here, but it should be noted that these authors do not apply prototype theory when it comes to describing Chinese grammatical categories. As I will show in this paper – and as Tai & Wang (1990:39) end up acknowledging – no clear-cut line can be drawn between the categorizing and quantifying functions, rather it is a question of degree and subject to context: for a sock, for example, is the property of being used in pairs permanent or temporary? Furthermore, conditioning the description of Chinese language categories to the existence or not of counterpart categories in other languages, from my point of view, is not a good enough criterion to claim for a distinction. English, although not a classifying language, does have words that are very similar both in meaning and function.

measure words from an extensive collection of word lists, dictionaries and grammar books as source material.² Data from these sources were mainly drawn by looking up measure words and checking their collocation with nouns.

- In accordance with Rosch's (1978) definition of prototypes as being those members easiest to recognise and most representative, the prototypes for each category were established according to their number of occurrences. Prototypes work as a model or cognitive reference point and are those members that share the most features with the rest of the category members. In this article they are identified with an asterisk.

- In order to explain the principle of category formation and its subsequent evolution, I took etymology as my starting point, taking historic evolution into account whenever there were data available.

- All the nouns in each of the four categories were classified as central, natural extension or metaphorical extension members. Central members are those that probably paved the way for the creation of the category, with natural extension members pertaining to the category because of their resemblance to central members, while metaphorical extension members entered the category as a result of an imagined resemblance.

1. A prototype theory for the measure word 双 (*shuāng*)

Most modern Chinese dictionaries define 双 as 对 'pair' and/or 两 (*liǎng*) 'two', and scholars say it can categorize things or people forming a pair. According to the ancient dictionary 《说文解字》, this character – originally written 雙 – represented a hand (又) catching two birds (隹) and simply meant 'two birds'. In the modern simplified form it is replaced by a pair of hands (双), keeping the idea of two.

According to Hong's (2000:218) research, the use of 双 as a classifier can be found in pre-Qin texts. Historical data documented by Liu (1965:198) reveal that as early as in the Han dynasty, this 'integrated quantification' (the idea of two birds in one character) had already subdivided and 双 appeared co-occurring with entities different from 鸟 (*niǎo*) 'bird', retaining only its numerical value. By the time of the Northern and Southern dynasties (A.D. 420-588), although its

² This source material is one among 24 items included in the "sources of data" listed after the references.

co-occurrence with “bird” was still quite common, it had already lost its etymological link with *niǎo* and its use had become more generalised. Liu also points out that its use was quite free, co-occurring both with entities grouped in pairs provisionally (thus functioning more as a numeral) and with entities necessarily used in pairs. He argues that later on, except for those entities that exist naturally in pairs, 对 has progressively taken the place of 双, but Hong (2000:332) disagrees and affirms that, according to her data, at least up until the Tang (A.D.618–907), the Five Dynasties (A.D.907–960) and the Ten Kingdoms (A.D.907–979), there is no clear distinction between them.

1.1. Central members of 双 (*shuāng*)

According to historical data, as early as the Han (B.C.206–A.D.220) dynasty, this measure word was used independently of the meaning of “bird” and it clearly referred to a pair of things. The two things we have most immediately within our reach are our own hands (a metaphor linguistically reinforced by the simplified character form of this measure word). Therefore, I consider the central members of the 双 category to be those nouns that refer to symmetrical body parts, such as extremities, organs and appendages (mostly symmetrical regarding a central axis), such as: 鼻孔 (*bíkǒng*) ‘nostril’, 翅膀*³ (*chìbǎng*) ‘wing’, 触角 (*chùjiǎo*) ‘antenna’, 耳朵* (*ěrduo*) ‘ear’, 胳膊 (*gēbo*) ‘arm’, 肩膀 (*jiānbǎng*) ‘shoulder’, 脚* (*jiǎo*) ‘foot’, 角 (*jiǎo*) ‘horn’, 眉毛* (*méimao*) ‘eyebrow’, 眼子 (*móuzi*) ‘pupil of the eye’, 手* (*shǒu*) ‘hand’, 腿 (*tui*) ‘leg’, 膝盖 (*xīgài*) ‘knee’, 眼睛* (*yǎnjing*) ‘eye’ and 爪子 (*zhuǎzi*) ‘claw’.

Prototypical members all represent important body parts playing a crucial role in our interaction with the world (including movement and most of the basic senses) and in face-to-face interpersonal communication.

1.2. Natural extension members of 双 (*shuāng*)

I have subdivided natural extension members into three distinctive but hierarchically equal groups.

1.2.1. Pieces of clothing worn in pairs on the body parts considered central

members.⁴ As we can see from the following examples, these pieces can be identical or symmetrical regarding a central axis: 耳环* (*ěrhuán*) ‘earring’, 护腕 (*hùwàn*) ‘wristband’, 护膝 (*hùxī*) ‘knee band’, 木犀 (*mùxi*) ‘clog’, 手套 (*shǒutào*) ‘glove’, 套鞋 (*tàoxié*) ‘galosh’, 套袖 (*tàoxiù*) ‘oversleeve’, 袜子* (*wàzi*) ‘sock’, 鞋* (*xié*) ‘shoe’, 鞋带 (*xiédài*) ‘shoelace’, 袖子 (*xiùzi*) ‘sleeve’ and 靴 (*xuē*) ‘boot’.

1.2.2. Two different people bound by kinship ties, thus forming a conceptual unit. The list is limited to: 儿女 (*érnǚ*) ‘son and daughter’ and 父母 (*fùmǔ*) ‘father and mother’.

1.2.3. Two identical objects that are used together and that are of some socio-cultural importance. In this subcategory we find: 白璧 (*bái bì*) ‘white jade *bi*’, 筷子* (*kuàizi*) ‘chopstick’ and 玉斗 (*yù dǒu*) ‘jade *dou*’. In the case of 白璧 and 玉斗, Chinese informants have not been able to explain why these are categorized in pairs, so I assume their use is quite archaic.⁵

1.3. Category coherence

Both the traditional (雙) and the simplified form (双) of this measure word show two identical things (two birds and two hands, respectively). Supported by historical data, I argue that the cognitive basis of this measure word is clearly a pair of things, in principle, identical. Since our hands are so crucial for our interaction with the world and are immediately visible to our eyes, we can consider “hand” the prototypical central member and extend the category to those nouns sharing the features of being two in number and body parts at the same time. Natural extension members developed into three distinctive directions, depending on which features are cognitively prioritised. First, we have the group of objects and pieces of clothing that are cognitively associated with central members because of both physical contiguity and shape. Second, there is the subgroup of objects that for socio-cultural reasons have been used in pairs. Third, we find the subgroup including the father-mother and son-daughter pairs. These can be associated not only with the concept of pair; they are also physically very close to us

⁴ This sub-extension possibly originates from the conceptual metaphor “the world is the human body.”

⁵ As a matter of fact, the author has only seen these co-occurrences in examples annotated by Liu (1965:198) that date from the Han dynasty (B.C.206–A.D.220). This might be the same source used by those scholars who gave these nouns as prototypes for this category without mentioning their use is an anachronism.

³ As I mentioned in the Introduction, the asterisk identifies prototype members within each category.

as they are from our flesh and blood. This might explain why they can be categorized with 双, while other people pairs cannot. It is worth noting that this measure word category has not developed any metaphorical extension.

Finally, I would like to emphasise the importance of function in the creation of this third category. Body parts, objects and people categorized with 双 must usually be in pairs to be functionally effective, which lexically implies that if an entity usually categorized with 双 appears as an individual entity, the measure word used is often 只 (zhī), which in its traditional writing (隻) represents a hand (又) grasping a bird (隹).

2. A prototype theory for the measure word 对 (duì)

In most dictionaries the 对 entry references the 双 entry (often in a recursive way). Scholars agree it is used for pairs of things, animals, or people, somehow opposite, however the etymology of this character is not certain. When the original form (對) was simplified in the People's Republic of China, the left side was replaced by a right hand (又), while the right side, representing a thumb (寸), remained the same. According to Hong (2000:334), the appearance of this measure word dates from the Tang Dynasty. As I have previously mentioned, although Liu (1965:200) explains that at some stage in history it substituted for 双 in those instances of entities that did not exist naturally in pairs, Hong (2000:332) casts some doubts on this affirmation, arguing that at least during the Tang and Five Dynasties their semantic field overlapped. This measure word has a verbal origin meaning to reply, to face, to compare, to treat, to match, etc. All these meanings can be associated with the image of two people, one in front of the other, between whom there is a sort of dialogue, opposition, or some kind of complementary relationship.

2.1. Central members of 对 (duì)

Since I have no historical data to rely on, I propose taking 对's verbal meaning as a departing point for the category formation. The group of central members is thus made up of nouns referring to people having a given relationship between them, either kinship-based or socially based, such as: 伴侣 (bànlǚ) 'companion', 搭档 (dādàng) 'partner', 恶人 (è'rén) 'villain', 儿女* (érnǚ) 'son and daughter', 夫妇* (fūfù) 'husband and wife', 夫妻* (fūqī) 'husband and

wife', 父子 (fùzǐ) 'father and son', 活宝 (huóbǎo) 'buffoon', 佳偶 (jiā'ǒu) 'happily married couple', 姐妹 (jiěmèi) 'elder and younger sisters', 恋人 (liànrén) 'lover', 孪生兄弟 (luánshēng xiōngdì) 'twin brothers', 母女 (mǔnǚ) 'mother and daughter', 男女 (nánnǚ) 'man and woman', 朋友 (péngyou) 'friend', 婆媳 (póxí) 'mother-in-law and daughter-in-law', 情侣 (qínglǚ) 'sweetheart', 情人 (qíngrén) 'lover', 棋友 (qíyǒu) 'chess friend', 双胞胎 (shuāngbāotāi) 'twins', 舞伴 (wǔbàn) 'dancing partner', 新人 (xīnrén) 'bride and bridegroom', 兄弟 (xiōngdì) 'elder and younger brothers', 选手 (xuǎnshǒu) 'selected athlete', 冤家 (yuānjia) 'enemy' and 姊妹花 (zǐmèihuā) 'two sisters'.

2.2. Natural extension members of 对 (duì)

Natural extension members are further divided into three subgroups.

2.2.1. An animal pair that lives together or is seen together, such as: 鹌鹑 (ānchún) 'quail', 蝉 (chán) 'cicada', 飞鸟 (fēiniǎo) 'bird', 大象 (dàxiàng) 'elephant', 鸽子* (gēzǐ) 'pigeon', 鹤 (hè) 'crane', 蝴蝶* (húdié) 'butterfly', 鸡 (jī) 'chicken', 金鱼 (jīnyú) 'goldfish', 孔雀 (kǒngquè) 'peacock', 马 (mǎ) 'horse', 蚂蚱 (màzha) 'locust', 牛 (niú) 'cow', 蜻蜓 (qīngtíng) 'dragonfly', 猕猴 (míhóu) 'macaque', 兔子 (tùzi) 'rabbit', 虾 (xiā) 'shrimp', 老虎 (lǎohǔ) 'tiger', 熊猫 (xióngmāo) 'panda', 喜鹊 (xǐque) 'magpie', 鹦鹉 (yīngwǔ) 'parrot', 鸳鸯 (yuānyāng) 'mandarin duck' and 鹧鸪 (zhègū) 'partridge'.

2.2.2. Symmetrical body parts (in most cases they are so regarding a central axis). For example, 髋 (ái) 'pincer', 翅膀* (chìbǎng) 'wing', 触须 (chùxū) 'cirrus', 耳朵* (ěrduo) 'ear', 发辫 (fàbiàn) 'pigtail', 睾丸 (gāowán) 'testicle', 角 (jiǎo) 'horn', 脚* (jiǎo) 'foot', 酒窝 (jiǔwō) 'dimple', 鹿茸 (lùróng) 'pilose antler', 眉毛* (méimao) 'eyebrow', 拳头 (quántou) 'fist', 乳房 (rǔfáng) 'breast', 蹄子 (tízi) 'hoof', 胸脯 (xiōngpú) 'chest', 眼睛* (yǎnjing) 'eye' and 爪子 (zhuǎzǐ) 'claw'.

2.2.3. Objects that are usually used in pairs regardless of whether they are identical or not. This subcategory contains members such as: 杯子 (bēizi) 'glass', 春联* (chūnlián) 'spring festival scroll', 电池* (diànchi) 'battery', 耳环* (ěrhuán) 'earring', 壶 (hú) 'pot', 花瓶* (huāpíng) 'vase', 桨 (jiāng) 'oar', 戒指 (jièzhī) 'finger ring', 钢笔 (gāngbì) 'fountain pen', 手表 (shǒubiǎo)

‘watch’, 门墩 (ménđūn) ‘block supporting the axle of a door’, 沙发* (shāfā) ‘sofa’, 石狮子 (shí shízǐ) ‘stone lion’, 石磨 (shímò) ‘millstone’, 首饰 (shǒushi) ‘jewelry’, 手镯* (shǒuzhuó) ‘bracelet’, 水桶 (shuǐtǒng) ‘bucket’, 套袖 (tàoxiù) ‘oversleeve’, 袜子* (wàzi) ‘sock’, 袖口 (xiùkǒu) ‘cuff of a sleeve’, 椅子 (yǐzi) ‘chair’, 玉鸟 (yùniǎo) ‘jade bird’, 枕巾 (zhěnzhīn) ‘pillow cover’ and 枕头* (zhěntou) ‘pillow’.

In this group we find some members that seem surprising to the foreign student of Chinese, for example, 手镯, 石狮子, 椅子 and 花瓶. Foreign students of the language need to learn more about the historical and cultural background of Chinese society to understand why these entities are categorized in pairs. The deep-rooted belief in Chinese culture that even numbers, especially the number two, are more perfect or complete could explain why this measure word collocates with so many entities.

2.3. Metaphorical extension members of 对 (duì)

To date I have only found one member, 矛盾 (máodùn) ‘contradiction’ (literally meaning “spear” and “shield”). It is different from natural extension members in one important respect: “spear” and “shield” are neither similar objects nor symmetrical as regards a central axis. For this reason, I suggest that these nouns might have joined the category in resemblance to the central members’ conceptual basis of opposition between two entities. Worth noting is the exceptional fact that 一对矛盾 (yī duì máodùn), when used metaphorically, refers to a single entity not to a pair.

2.4. Category coherence

As we have seen from its verbal origin, the cognitive basis of 对 is two nouns referring to pairs of discrete and complementary entities (naturally, functionally or on an idealised basis). Central members of the category are nouns referring to pairs of people between whom there is a given relationship based on kinship (母女), sexuality (情侣), common activity (舞伴), or opposite interests (冤家).

Natural extension members are further subdivided into three groups. The first of these is animal pairs, humanised through a conceptual metaphor to which social human values are attributed. In short, the use of 对 with animals is the re-

sult of an idealised model that assumes that two animals seen together are by default of the opposite sex and form a couple, which might be true in some cases (for example, mandarin ducks) but not in others. I believe that the wealth of symbolism, myths and legendary stories in Chinese culture involving animal pairs (for instance, the love story between Zhu Yingtai and Liang Shanbo, who later transformed into butterflies) reinforce this conceptual metaphor. In the second subgroup we find symmetrical body parts, possible association lines with central members being the number two and the feature of symmetry or opposition. The third group is for objects that are used in pairs, either because otherwise they are useless or because traditionally they have been used this way. The member in metaphorical extension (矛盾) originated from the idea that spear and shield are used to fight, one against the other. This meaning was later metaphorically extended to mean “contradiction”.

3. A prototype theory for the measure word 副 (fù)

Reference books explain that 副 collocates with things or people that form a pair or a group. 《说文解字》 explains that this character was a verb meaning to divide something with a knife. This original meaning has been lost but the character has retained the idea of subdivision and secondary. Its use as a measure word seems to pick up this idea to refer to a number of entities that had originally been physically together and were later scattered because of the action of a knife. According to Liu’s (1965:209) records, this measure word was rarely used before the Northern and Southern Dynasties, a period that witnessed its rise, when it was used both for pairs and for a group of entities forming a collection or set.

3.1. Central members of 副 (fù)

From this character’s etymology, I understand that as a measure word it is used to designate two or more separate objects combined to form a functional whole. Since categories tend to become more complex with the inclusion of new members, I will consider two things (usually identical) meant to be used together to be the central members. For example: 电池* (diàncí) ‘battery’, 对联* (duilián) ‘couplet’, ⁶ 耳环* (ěrhuán) ‘earring’, 耳坠 (ěrzhuì) ‘eardrop’, 拐杖 (guǎizhàng) ‘walking-stick’, 裹腿 (guǒtuǐ) ‘legging’, 护耳 (hù’ěr) ‘earmuffs’,

⁶春联 (chūnlían), which can be considered a hyponym of 对联, can also collocate with 对. I presume cacophony is the reason why 一对对联 (yī duì duilián) is not found as a possible co-occurrence in the literature.

护腿 (hùtuǐ) 'leg guard', 护膝 (hùxī) 'knee pad', 筷子* (kuàizi) 'chopstick', 筐子 (kuāngzi) 'basket', 乒乓球板* (pīngpāng qiúbǎn) 'ping-pong paddle', 球拍* (qiúpāi) 'racket', 拳头 (quántou) 'fist', 手套* (shǒutào) 'glove', 手镯* (shǒuzhuó) 'bracelet', 水桶 (shuǐtǒng) 'bucket', 套裤 (tàokù) 'legging', 套袖 (tàoxiù) 'oversleeve', 鞋带 (xiédài) 'shoelace' and 袖子 (xiùzi) 'sleeve'.

Foreign students learning Chinese who do not know that Chinese people have traditionally carried things on a pole will feel surprised to see that 水桶 and 筐子 (just to give a couple of examples) are also categorized in pairs. There are many members in this category overlapping with other measure word categories. For example, 电池, 耳环, 拳头, 手镯, 水桶 and 套袖 can also collocate with 对; and 护膝, 筷子, 手套, 鞋带 and 袖子 can also collocate with 双.

3.2. Natural extension members of 副 (fù)

3.2.1. These are entities with two parts in some way linked so that they stand opposite one another forming a symmetrical pair. The linkage is sometimes at an end point so that the two parts form a U- or V-shaped object. For example: 床板 (chuángbǎn) 'bed board', 床架 (chuángjià) 'bedstead', 春联* (chūnlián) 'spring festival scroll', 担架* (dānjià) 'stretcher', 担子 (dānzi) 'carrying pole plus load', 耳机 (ěrjī) 'earphone', 杠铃 (gànglíng) 'barbell', 骨头架子 (gǔtou jiàzi) 'skeleton', 假发 (jiǎfà) 'wig', 肩膀 (jiānbǎng) 'shoulder', 脚镣 (jiǎoliào) 'foot shackle', 角 (jiǎo) 'horn', 槌锁 (jiāsuo) 'cangue', 假牙 (jiǎyá) 'denture', 绞架 (jiǎojià) 'gallows', 犁杖 (lízhàng) 'plow', 铺板 (pùbǎn) 'bed board', 手铐 (shǒukào) 'handcuff', 听诊器 (tīngzhěnqì) 'stethoscope', 胸罩 (xiōngzhào) 'bra', 眼镜* (yǎnjìng) 'glasses' and 烛台 (zhútái) 'candlestick'. All these objects are made of different parts which are integrated or combined to fulfill a common goal or to carry out a certain function.⁷

3.2.2. A collection of discrete and different objects forming a cognitive or functional unity. Some of the possible members are: 杯筷 (bēikuài) 'cup and chopsticks', 被褥 (bēirù) 'bedding', 刀叉 (dāochā) 'knife and fork', 钓竿 (diào gān) 'fishing rod', 冬衣 (dōngyī) 'winter clothes', 赌具 (dǔjù) 'gambling paraphernalia', 扑克牌* (pūkèpái) 'playing card', 棋* (qí) 'chess', 首饰

⁷ It is probably because 副 can co-occur with these kinds of nouns that some authors consider it an individual measure word.

(shǒushi) 'jewelry', 碗筷 (wǎnkuài) 'bowl and chopsticks', 武装 (wǔzhuāng) 'military equipment', 香烛 (xiāngzhú) 'joss stick and candle', 下水 (xiàshuǐ) 'animal viscera', 刑具 (xíngjù) 'instruments of torture', 衣服* (yīfú) 'clothing', 渔具 (yújù) 'fishing gear', 鱼网 (yúwǎng) 'fishnet' and 妆奁 (zhuānglián) 'trousseau'. In the case of 刑具 and 渔具, 副 is interchangeable with 套.

3.2.3. A group of ingredients which are mixed up and brewed together to treat a given illness in traditional Chinese medicine. Among the possible members we find 汤药 (tāngyào) 'decoction' and 中药* (zhōngyào) 'Chinese medicine'.

3.3. Metaphorical extension members of 副 (fù)

3.3.1. Abstract nouns related to abilities or skills. Abilities are cognitively perceived as being a group of qualities or aptitudes. Instances of this subcategory are: 本领* (běnlǐng) 'skill', 歌喉 (gēhóu) 'singing voice', 嗓子* (sǎngzi) 'voice', 身材 (shēncái) 'stature', 手段 (shǒuduàn) 'measure', 体力 (tǐlì) 'physical strength', 腿力 (tuǐlì) 'strength of the legs', 言语 (yányǔ) 'speech' and 字 (zì) 'character'. 本领 can also co-occur with 套.

3.3.2. Nouns related to physical aspect, manners, look, attitude or mood. When we are infuriated, sad, happy or frightened we usually express what we feel through body language, especially facial expressions: opening our eyes, frowning, contracting the facial muscles, biting our lips, uttering sounds, etc. One of them alone is not enough to know what is going on but we need to analyse the whole picture to be able to tell. In short, these are all perceived as a gestalt. Members of this group are: 表情* (biǎoqíng) 'expression', 打扮 (dǎban) 'dress up', 架势 (jiàshì) 'manner', 精神 (jīngshén) 'spirit', 脸* (liǎn) 'face', 面孔* (miàn孔) 'face', 容* (róng) 'appearance', 神气 (shénqì) 'expression', 神情 (shénqíng) 'look', 神色 (shénsè) 'expression', 神态 (shéntài) 'manner', 相 (xiāng) 'appearance', 相貌 (xiāngmào) 'facial features', 心肠 (xīncháng) 'state of mind', 样子* (yàngzi) 'look', 姿势 (zīshì) 'posture' and 嘴脸 (zuǐliǎn) 'features'.⁸

⁸ Although this list includes only isolated nouns, they are often preceded by a modifying phrase that can only be preceded by the numeral 一 (yì). For instance: 得意的样子 (déiyì de yàngzi) 'complacent look', 怪相貌 (guài xiāngmào) 'a grimace', 和蔼的面孔 (hé'ài de miàn孔) 'a kind face', 骄傲的神气 (jiāo'ào de

3.4. Category coherence

副 also has a verbal origin. The starting point for the creation of this category is that of disperse entities that make up a whole or a functional unit. Its cognitive basis is, therefore, that of a plurality of entities bound together by a common goal. Central members are entities worn on symmetrical body parts (拐杖, 护耳) or used in pairs for practical, cultural, or social reasons (对联, 球拍).

Within natural extension members we find a quite peculiar subcategory, namely, that including objects that are made of different parts but that form a whole. They resemble central members in that their shape (as far as symmetry is concerned) is fundamental in their categorization, since if we divide them from the real or imagined central axis we obtain two equal parts, for example, 肩膀, 担架, 耳机, 假牙, 绞架, 听诊器 and 眼镜 (note that many of these are U-shaped). The rest of the natural extension members refer to a number of entities, either identical or different, that make up a functional set (for instance, 渔具 and 妆奁). Traditional Chinese medicine is different from this group in that in pharmaceutical formulations, different parts (ingredients) eventually get mixed in such a way that their appearance changes and sometimes cannot be further recognized nor differentiated from the others.

Finally, we have metaphorical extension members subdivided into nouns referring to physical and mental abilities or skills, on the one hand, and nouns referring to body or face language, on the other. In both cases we are dealing with a group of qualities or features seen as a whole.

4. A prototype theory for the measure word 套 (tào)

In the specialised literature, we find that 套 collocates with similar entities forming a unit or group. It is the only measure word in our study that clearly has a nominal origin. It is made up of the characters 大 (dà) 'big' and 长 (cháng) 'long' to transmit the idea of something slightly bigger that is able to envelop another, thus meaning cover, case, or sheath. Careful examination of the etymology of 套 indicates that, as a measure word, it can be used to gather smaller entities together under the same conceptual roof that unifies them functionally.

shéngqì) 'cocky expression', 冷面孔 (lěng miàn kǒng) 'cold aspect', 严肃的表情 (yán sù de biǎoqíng) 'severe expression'.

4.1. Central members of 套 (tào)

Although the entities grouped together by this measure word are different one from another, they all share a common goal or function. For example: 班子* (bānzi) 'squad', 杯子 (bēizi) 'glass', 便装 (biànzhuāng) 'everyday dress', 布景 (bùjǐng) 'scene', 餐具 (cānjù) 'tableware', 茶具* (chájù) 'tea service', 唱片 (chàngpiān) 'disc', 烹具 (chuījù) 'cooking utensils', 厨具 (chújù) 'cooking utensils', 瓷器 (cíqì) 'chinaware', 丛书* (cóngshū) 'a series of books', 单元房 (dānyuánfáng) 'apartment', 防盗装置 (fángdào zhuāngzhì) 'installation to guard against theft', 房间 (fángjiān) 'room', 房子* (fángzi) 'house', 服装 (fúzhuāng) 'costume', 工具 (gōngjù) 'tool', 画 (huà) 'painting', 画片 (huàpiàn) 'picture', 绘图 (huìtú) 'drawing', 家伙 (jiāhuò) 'implement', 家具* (jiājù) 'furniture', 煎饼 (jiānbǐng) 'pancake', 教材 (jiàocái) 'teaching material', 教具 (jiàojù) 'teaching aids', 纪念品 (jìniàn pǐn) 'souvenir', 机器 (jīqì) 'machinery', 救生衣 (jiùshēngyī) 'life jacket', 剧本 (jùběn) 'play', 课本 (kèběn) 'textbook', 锣鼓 (luógǔ) 'gong and drum', 马具 (mǎjù) 'horse riding gear', 模具 (mújù) 'mould', 农具 (nóngjù) 'farm implements', 器材 (qìcái) 'equipment', 曲子* (qǔzì) 'melody', 人马* (rénmǎ) 'troops', 沙发* (shāfā) 'sofa', 设备* (shèbèi) 'facility', 试题 (shíti) 'test question', 图片 (túpiàn) 'photograph', 玩艺 (wǎnyì) 'toy', 碗盏 (wǎnzhǎn) 'dishes', 文集 (wénjí) 'collected works', 文选 (wénxuǎn) 'anthology', 西服 (xīfú) 'Western-style clothes', 刑具 (xíngjù) 'instrument of torture', 乐器 (yuèqì) 'musical instrument', 西装 (xīzhuāng) 'business suit', 衣服* (yīfú) 'clothing', 仪器 (yíqì) 'apparatus', 邮票* (yóupiào) 'stamp', 渔具 (yújù) 'fishing gear', 装置 (zhuāngzhì) 'installation', 桌椅 (zhuōyǐ) 'table and chair' and 资料 (zīliào) 'data'.

4.2. Metaphorical extension members of 套 (tào)

4.2.1 Abstract nouns related to different ways of thinking, behaving, or organising social life that form a coherent set, such as: 办法* (bànfa) 'solution', 本领 (běnlǐng) 'skill', 标准 (biāozhǔn) 'criterion', 策略 (cèlüè) 'strategy', 打法 (dǎfǎ) 'way of playing (a game)', 道理 (dàolǐ) 'reason', 电脑程式 (diànnǎo chéngshì) 'computer program', 方法 (fāngfǎ) 'method', 规范 (guīfàn) 'criterion', 规矩 (guīju) 'rule', 规则 (guīzé) 'regulation', 诡计 (guǐjì) 'trick',

机构 (jīgōu) ‘structure’, 计划 (jìhuà) ‘plan’, 伎俩 (jīliǎng) ‘intrigue’, 经验 (jīngyàn) ‘experience’, 技术 (jìshù) ‘technique’, 理论 (lǐlùn) ‘theory’, 理由 (lǐyóu) ‘reason’, 拳式 (quánshì) ‘martial-arts posture’, 手法 (shǒufǎ) ‘skill’, 说法 (shuōfǎ) ‘formulation’, 仪式 (yíshì) ‘ritual’, 章程 (zhāngchéng) ‘statute’, 说战 (shuōzhàn) ‘tactics’, 制度* (zhìdù) ‘system’, 作风 (zuòfēng) ‘style’, 组织 (zǔzhī) ‘setup’.

4.2.2. Group of words said in an argument with a given purpose (usually carrying a derogatory connotation) such as 大话 (dàhuà) ‘big talk’, 废话 (fèihuà) ‘nonsense’, 谎话* (huǎnghuà) ‘lie’, 谎言 (huǎngyán) ‘falsehood’, 客气 (kèqì) ‘nonsense’, 谎话* (huǎnghuà) ‘lie’, 谎言 (huǎngyán) ‘falsehood’, 客气 (kèqì) ‘words of courtesy’, 空话 (kōnghuà) ‘idle talk’, 骗人话 (piànrénhuà) ‘deceiving talk’ and 脏话 (zānghuà) ‘obscenity’.

4.3. Category coherence

套 is the only one of the four measure words in this study having a nominal origin. It implies some sort of conceptual wrapping, i.e., a common or shared goal is what gives cohesion to a series of discrete and different objects that work as a functional unit. The resulting group enjoys a high degree of cohesion since the sum of the different entities is not perceived as an aggregate anymore but as a single entity.⁹ Most central members are nouns that already convey the idea of plurality (家具, 设备, 文集). This category does not have natural extension members but does have metaphorical extension members which usually refer to a set of principles or rules bound together as a single unit in a systematised and rational way to contribute to achieve a given purpose (办法, 制度). Last, there is a subgroup referring to a string of words dealt with together because they make sense as a whole (空话, 谎话).

5. Distribution of the four measure words with respect to the noun classes they select

The prototype theory I have constructed in the first half of this paper has allowed me to draw a clearer picture of how these four complex categories are internally organized and how particular entities have entered the system. Nonetheless, since memorizing all those examples might be too time-consuming for students, since memorizing all those examples might be too time-consuming for stu-

⁹ Maybe this is why in some reference books, such as 《现代汉语分类词典》(1998), it is considered an individual measure word.

dents, we should find a way to provide them with more abstract information to help them to establish a pattern they can easily apply to categorize new entities. I assume that native speakers have such schematic knowledge for each category which allows them to include new entities into the system out of awareness. This is the kind of information one can sometimes find in specialized literature, but in my experience the information available is mostly partial and insufficient.

In order to provide insight into the salient perceptual or functional properties which serve as a condition for categorizing nouns with any of the four measure words studied in this paper, I have taken the examples listed and grouped them by descriptive items. I believe these four categories will be much easier to grasp for foreign students learning Chinese if summarized in the following way.

双 can co-occur with nouns denoting:

- Kinship relationships.
- Symmetrical body parts.
- Pairs of clothes or accessories worn on symmetrical body parts.
- Identical objects that have been traditionally used in pairs in Chinese culture.

对 can co-occur with nouns denoting:

- Kinship relationships.
- Social relationships.
- Animals in pairs.
- Symmetrical body parts.
- Pairs of clothes or accessories worn on symmetrical body parts.
- Identical objects that are often used in pairs in Chinese culture.
- An abstract noun (contradiction).

副 can co-occur with nouns denoting:

- Objects used in pairs forming a cognitive and functional whole.
- Objects or body parts symmetrical with respect to a central axis, made of two parts linked together or U-shaped.
- Definite or indefinite number of discrete entities forming a functional self-contained unit.
- Abstract nouns referring to strength and cognitive, artistic, or other abilities.
- Abstract nouns referring to facial expression or body language.
- Chinese medicinal brews.

套 can co-occur with nouns denoting:

- a) Nouns referring to a collection of entities of a given domain forming a conceptual unit.
- b) Nouns referring to equipment including a group of machines or parts that fit together to form a self-contained unit.
- c) Different pieces of clothing forming a set.
- d) A series of discrete objects forming a set or collection.
- e) Abstract nouns denoting concepts that imply a series of steps or rules.
- f) A group of words uttered together, thus forming a unit.

Table 1 below summarizes and compares the possible co-occurrences of nouns with 对, 双, 副 and 套. Note that the fact that a type of noun can co-occur with more than one measure word does not necessarily mean that they are always interchangeable.

Table 1
Co-occurrence of the four categories with
different kinds of nouns

	对	双	副	套
[+COUNTABLE] nouns	✓	✓	✓	✓
[−COUNTABLE] nouns			✓	✓
[+CONCRETE] nouns	✓	✓	✓	✓
[+ABSTRACT] nouns	✓		✓	✓
Relationships between people	✓	✓		
Body parts	✓	✓	✓	
Symmetrical entities as regards a central axis (real or imagined)	✓	✓	✓	
U-shaped entities			✓	
Animal pairs	✓			
Paired objects	✓	✓	✓	✓ ¹⁰
Clothing (not in pairs)			✓	✓
Different kinds of entities forming a set or conceptual unit	✓ ¹¹	?	✓	✓

¹⁰ This co-occurrence is possible though it usually refers to more than two entities.

¹¹ In the case of 对, the tendency is for these two entities to be identical.

6. Category limits and overlapping

Once we have drawn a picture of the internal structure for each of these four categories based on the data collected from a corpus of specialised literature, we can compare them and take a closer look at how they actually overlap.

As far as central members are concerned, 双, 对 and 副 share the cognitive basis of 'pair'. 套, conversely, though it occasionally can also refer to a pair, is used more for groups of more than two entities. Regarding natural extension members, 双 and 对 refer again to pairs of things, while 副 refers to a collection of entities or to a single U-shaped object. We have found no members in this extension for 套. Finally, at the metaphorical extension level we find that 双 has no members and 对 has only one. Thus, only 副 and 套 have significantly developed this extension and the common denominators for their members are that they are all abstract concepts, the former referring to facial or body language and the latter to kinds of behaviour or speech. Another shared characteristic is that these concepts are made up of a combination of diverse things. In the case of a facial expression, for example, it would include movements of the eyes, lips, nose, and/or tongue. 副 plays the role of combining them all to provide us with the full picture, i.e., a whole or unit. 套 plays a similar role in grouping together a series of moves or steps to achieve a given goal, as embedded in the words "strategy" or "method".

As was the case with the 条 family of classifiers (Tai & Wang 1990:47), not all the studied categories have developed the same way, 双 being less productive and basically associated with identical body parts and objects. I thus propose that a pair being identical is the salient perceptual property which serves as a condition for categorizing with 双 in modern Mandarin. It can be readily seen that 副 is the most complex of the four, having members in all the extensions. This can be explained by the fact that it is the most versatile as far as number is concerned, referring either to one, two, or more entities gathered together for a common purpose.

Table 2 summarizes both how these complex categories have developed and the distributional patterns as far as prototype members are concerned in terms of a) central membership, b) natural extension, and c) metaphorical extension.

Table 2

Distribution of prototypes as regards central, natural extension, and metaphorical extension

	Central members	Natural extension members	Metaphorical extension members
双	翅膀, 耳朵, 脚, 眉毛, 手, 眼睛	耳环, 手套, 袜子, 鞋, 筷子	
对	儿女, 夫妇, 夫妻	蝴蝶, 翅膀, 耳朵, 脚, 眉毛, 眼睛, 电池, 耳环, 花瓶, 沙发, 镯子, 袜子, 枕头	矛盾
副	电池, 对联, 耳环, 筷子, 拍子, 手套, 镯子	担架, 眼镜, 扑克牌, 棋, 衣服, 中药	本领, 好嗓子, 表情, 笑脸, 面孔, 笑容, 样子
套	班子, 茶具, 丛书, 房子, 家具, 曲子, 人马, 沙发, 设备, 衣服, 邮票		办法, 制度, 谎话

Categorization is not fixed but dynamic. As Adams & Conklin (1973:2) put it: "Shifting the numeral classifier of a noun shifts the focus from one salient parameter to another." Table 3 shows the overlapping among these four measure words.¹²

¹² It should be taken into account that the findings are based on prescriptive data, so they do not necessarily coincide with native speakers' actual use.

Table 3

Overlapping among the four categories

	对	副	双	套	副+双
对		电池, 镯子, 手镯, 首饰, 水桶, 耳环, 春联, 拳头, 拍子	翅膀, 耳朵, 眼睛, 脚, 角, 犀角, 眉毛, 袜子, 儿女	花瓶, 沙发, 杯子	耳环, 套袖
副			手套, 筷子	本领, 刑袖子, 护膝, 鞋带, 肩膀	具, 渔具

The above overlapping can be explained because of fuzzy boundaries among these categories, as well as the cognitive ambiguity concerning the salient perceptual properties of the entities they co-occur with in terms of identical pair, symmetrical pair as regards an axis, or simply a pair. So in the case of overlapping members, interchangeability would apparently not imply any change in meaning but actually be shifting the focus (from identical pair to functional unit, for example).

The intersection between 对 and 双 seems to have the most shared members, which means there are no clear limits between the two. To illustrate how puzzling it can be for the foreign student to search for information on the usage of measure words from different sources, it is worth taking a closer look at what some Chinese linguists have to say with respect to 对 and 双.

According to Dong (1991), 手, 脚, 鞋 and 筷子 can only co-occur with 双, and 双胞胎, 夫妻 and 情人 can only co-occur with 对. Nonetheless, Luo (1996) and Guo (1987) argue that 脚 can also co-occur with 对.

Huang, Chen, and Lai (1997) make the following distinction: one chooses 双 when objects must be used together (such as gloves, shoes, socks and chopsticks), but when objects can be used separately (such as a fountain pen or a bracelet), then 对 must be chosen.

Lü (1981) states that **对** is interchangeable with **双** whenever we are dealing with body parts, yet he later mentions they can be interchanged in the case of **翅膀** and **眼睛**. We are left to wonder why he specifically mentions these two cases if he has previously stated that body parts can always be substituted.

Jiao (1973) describes **双** as an alternative form for **对**, but he further explains they are slightly different. For him, **对** should always be used with **夫妻**, **枕头**, and **花瓶**, while for the rest any of the two measure words is possible.

Guo (1987) argues that, when referring to extremities or symmetrical organs, **双** can sometimes be substituted for by **对** (though he does not specify when), and that **对** can co-occur with people or animals having some kind of relationship.

In 《应用汉语词典》(2000) we find that **双** is normally used with nouns referring to extremities or organs (and the objects worn on them), and **对** is used with the rest. So if we believe this dictionary, the collocation **一对袜子** (*yī duì wàzi*) 'a pair of socks' is not possible in standard Mandarin, even though for authors like Wang and Wu (1988) it is perfectly correct!

For Chao (1985) the difference is that **双** is used more often in Mandarin and **对** in Cantonese. He is the only one to introduce the interesting element of dialectal variation to the discussion.

According to prescriptive data collected from Chinese linguists, it can be observed that, except for **手**, all the prototypes in the central category of **双** (cf. 1.1) coincide with those of the natural extension of **对** (cf. 2.2.2) – namely, ear, wing, eye, horn, foot, and eyebrow. If we analyse the rest of the members in each of the two groups, I feel that distribution in one group or another does not correlate with a clearly distinct feature that explains why they are categorized with one and not the other. There are only two aspects that are worth mentioning. On the one hand, most members in **双** that cannot co-occur with **对** are body parts (nostril, hand, arm, shoulder, leg, and knee), the only exception being "antenna". On the other hand, members in **对** are more heterogeneous, comprising human body parts (i.e., testicle, pigtail, fist, breast, and dimple) as well as animals' body parts (such as pilose antler, horn, claw, hoof, pincer, and cirrus).

It is interesting to compare what different authors have written about the same measure words; if we do so, we can readily appreciate that the present situation is rather confusing and in need of clarification. I think the fact that these contradictory data derive from what should be considered reliable sources is due to the use of an inappropriate methodological approach, since authors want to establish artificial and strict limits to the various categories, as if the classification system was static and objective, rather than dynamic and subject to speakers' use as well as collective socio-historical evolution.

In short, I suggest **双** in most cases cannot be substituted for by **对** because complementarity between the two entities is more salient than the fact of being a pair. In other words, not all features in a category are equally important; **双** and **对** can be considered synonyms when relying only on their numerical value.

As a final point, there are nouns denoting body parts, such as lungs, ovaries, and kidneys that exist in pairs but do not co-occur in our sources with any of the aforementioned measure words. For some reason, they tend to take individual measure words, possibly because they are internal organs and there is no physical interaction with them as a pair.

Conclusions

Inspired by two very interesting antecedents (Tai & Wang 1990; Tai & Chao 1994), I have in this paper conducted a cognition-based study of a 'family' of measure words, namely, **双**, **对**, **副** and **套**. By constructing a prototype theory of these four categories, I have achieved the following goals: 1) to show their distribution with respect to the noun classes they select; 2) to explain the limits of these categories and where they overlap; 3) to identify central, natural extension, and metaphorical extension members – and within each group, the prototypes and the more peripheral members; 4) to explain their internal coherence in terms of the family resemblance principle; and 5) to shed some light on the influence of Chinese cultural models and their role in the creation of these four categories.

The theoretical framework provided by cognitive linguistics has allowed us to carry out a detailed study of these measure words from a semantic and cognitive point of view. I have demonstrated that they are closely related. Examining their conceptual structures, pointing out both their shared features and the dis-

tinctive ones, has proved useful in describing their internal structure.

We have seen that what these four measure words have in common is that they group together two or more entities for a given purpose. They refer to a limited collection of discrete elements that are conceived of as an integral part of a bigger entity whose unitary character derives from its functional value and is determined by co-occurrence with the measure word. We can consider these measure words as being mainly functionally-derived; nonetheless, in some cases shape and disposition can also be considered as playing a certain role. **副** can categorize U-shaped entities and shape and spatial disposition are the cognitive basis for distributing entities between **双** or **对**.

We can see that categorization is not merely based on shared properties among entities, but is influenced by cultural and contextual factors. Studies on human categorization have revealed that furniture and tool categories are categorized according to functional features in the same way that domestic objects and animals tend to be categorized in a more special way than other entities that are not present in our daily life. The use of **对** in Chinese to categorize many animals or everyday objects seems to confirm the hypothesis that the categorization system is deeply influenced by cultural convention, i.e., class membership is not just a matter of objectifiable physical or functional features but often depends on the cultural values we attribute to them. One outstanding example is the good omen associated to even numbers in Chinese culture, especially the number two, and all the cultural imagery created around it, beginning with the *yin-yang* dichotomy (it is not a coincidence that these are complementary opposites) and followed by all the animal pairs we have seen in this paper.

As far as the teaching of these four measure words is concerned, the present study has identified three main problems regarding their satisfactory acquisition by non-native speakers. First, when we look them up in a dictionary or in a grammar book, one entry refers to the other circularly, thus giving the false impression that they are completely synonymous and interchangeable. Second, measure words are usually treated according to the classical model of Aristotelian categories, i.e., as strictly delimited categories subject to uniform characterization, where membership is a predictable, all-or-nothing affair. This approach denies their dynamism and the fact that they are susceptible to being influenced by nearby categories. Third, if one is not familiar with the cultural background and social changes through time, the system appears nonsensical and arbitrary.

We have learned much about the Chinese classification system after conducting cognition-based studies of particular measure words, but there is still a long way to go, since a broader and systematic study of the whole Chinese classification system still needs to be done. Finally, I hope that both the new approach provided by cognitive linguistics and the prototype theory now available for these three "families" of measure words will actually be applied and used in teaching, in order to make this grammatical category more pleasant—if not fascinating—to learn, rather than constituting a stumbling block for students.

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