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

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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 (tiào), 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.

Introduction

The seminal works of Tai and Wang (1990) and later Tai and Chao (1994), which study the classifiers 条 (tiào) 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,
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 (shuang), 对 (dui), 副 (fu) and 份 (fen).

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 measure words from an extensive collection of word lists, dictionaries and grammar books as source material. 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 (shuang)

Most modern Chinese dictionaries define 双 as 对 ‘pair’ and/or 两 (liang) ‘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 亖 – 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 (niao) ‘bird’, retaining only its numerical value. By the time of the Northern and Southern dynasties (A.D. 420-588), although its
co-occurrence with "bird" was still quite common, it had already lost its etymological link with hú 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, there 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 (bìkōng) ‘nostril’, 翅膀* (chībǎng) ‘wing’, 触角 (chùjiǎo) ‘antenna’, 耳朵* (ěrduō) ‘ear’, 脚趾 (jiǎo) ‘toe’, 脚* (jiǎo) ‘foot’, 角 (jiǎo) ‘horn’, 眉毛* (méimào) ‘eyebrow’, 眼子 (yǎnzǐ) ‘pupil of the eye’, 手* (shǒu) ‘hand’, 腿 (tuǐ) ‘leg’, 膝盖 (xīgài) ‘knee’, 眼睛* (yǎnjīng) ‘eye’ and 爪子 (zháozǐ) ‘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.


1.2.2. Two different people bound by kinship ties, thus forming a conceptual unit. The list is limited to: 儿女 (ěrni) ‘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 (báibì) ‘white jade bi’, 筷子* (kuàizi) ‘chopstick’ and 玉斗 (yùdòu) ‘jade dou’.

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 have socio-cultural reasons for having 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.

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

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.
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 usually must 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, which in its traditional writing (箇) 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 (bànlèi) 'companion', 搭档 (dādàng) 'partner', 恶人 (èrén) 'villain', 儿女 (érnǚ) 'son and daughter', 夫妇 (fūfù) 'husband and wife', 夫妻 (fúqī) 'husband and wife', 父子 (fùzǐ) 'father and son', 活宝 (huóbāo) 'buffoon', 佳偶 (jiā'òu) 'happily married couple', 姐妹 (jiěmèi) 'elder and younger sisters', 恋人 (liànrén) 'lover', 孝子兄弟 (xiàozi xiōngdì) 'twins brothers', 母女 (mùnǚ) 'mother and daughter', 男女 (nán'grǔ) 'man and woman', 朋友 (péngyǒu) 'friend', 父母 (fùmǔ) 'mother-in-law and daughter-in-law', 情侣 (qínglǜ) 'sweetheart', 情人 (qíngrén) 'lover', 梦友 (mènɡyǒu) 'friend', 双胞胎 (shuāngbāotāi) 'twins', 舞伴 (wǔbàn) 'dancing partner', 新人 (xìnrén) 'bride and bridegroom', 兄弟 (xiōngdì) 'elder and younger brothers', 选手 (xuǎnhǎo) 'selected athlete', 冤家 (yuānjia) 'enemy' and 妯娌花 (zhúlíhuā) '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: 鸟鹊 (niàoke) 'quail', 鳥 (chán) 'cicada', 飞鸟 (fēiniǎo) 'bird', 大象 (dàxiàng) 'elephant', 鸽子* (gēzǐ) 'pigeon', 鸭 (yā) 'crane', 两只 (zhījiù) 'butterfly', 鸡 (jī) 'chicken', 金鱼 (jīnyú) 'goldfish', 孔雀 (kònque) 'peacock', 马 (mǎ) 'horse', 蛙 (mázhā) 'locust', 牛 (niú) 'cow', 棋 (qí) 'chess', 鸵鸟 (dèiniǎo) 'macaque', 青蛙 (qīwā) 'rabbit', 虾 (xiā) 'shrimp', 老虎 (lǎohǔ) 'tiger', 熊猫 (xióngmāo) 'panda', 喜鹊 (xǐquè) 'magpie', 蝴蝶 (húdié) 'twin brothers', 金鱼 (jīnyú) 'fish', 萤火虫 (yínhuǒ chóng) 'fountain pen', 鹦鹉 (yíngwǔ) 'parrot', 鹅 (yuānyāo) 'mandarin duck' and 鸡 (jī) 'chicken'.

2.2.2. Symmetrical body parts (in most cases they are so regarding a central axis). For example, 筋 (jīn) 'pincer', 翅膀* (chìbāng) 'wing', 脉 (mài) 'vein', 嘴 (zuǐ) 'mouth', 耳朵* (ěrduō) 'ear', 发辫 (fàbiàn) 'pigtail', 眉 (méi) 'brow', 角 (jiǎo) 'horn', 脚* (jiǎo) 'foot', 兽 (shòu) 'animal', 欺骗 (qīguàn) 'deception', 前肢 (qiánzhī) 'foreleg', 尾巴 (wěiba) 'tail', 背 (bèi) 'back', 腹 (fù) 'stomach', 翅 (chì) 'wing', 尾气 (wēiqì) 'exhaust', 膀胱 (bāngliang) 'bladder', 耳 (ěr) 'ear', 腿 (tuǐ) 'leg', 眼 (yǎn) 'eye', 嘴 (zuǐ) 'mouth', 眼 (yǎn) 'eye', 嘴 (zuǐ) 'mouth', 眼 (yǎn) 'eye', 爪 (zhuǎ) 'claw'.

2.2.3. Objects that are usually used in pairs regardless of whether they are identical or not. This subgroup contains members such as: 杯子 (bēizhǐ) 'glass', 锤* (chuí) 'hammer', 春联 (chūnlìan) 'spring festival scroll', 电池* (diànié) 'battery', 耳环* (ěrhuán) 'earring', 葵 (huī) 'pot', 花瓶 (huāpíng) 'vase', 青 (qīng) 'green', 戒指 (jièzhī) 'finger ring', 钢笔 (gāngbǐ) 'fountain pen', 手表 (shǒubāo) 'wristwatch'.

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'watch', 门墩 (mèndūn) 'block supporting the axle of a door', 沙发* (shāfà) 'sofa', 石狮子 (shí shīzǐ) 'stone lion', 石磨 (shìmó) 'millstone', 首饰 (shǒushì) 'jewelry', 手镯* (shǒuzhuó) 'bracelet', 水桶 (shuǐtǒng) 'bucket', 袍袖 (páoxiù) 'oversleeve', 袜子* (wàizi) 'sock', 袖口 (xiùkǒu) 'cuff of a sleeve', 椅子 (yǐzǐ) 'chair', 玉鸟 (yùniǎo) 'jade bird', 枕巾 (zhěnjīn) '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 (módùn) '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 módùn), 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 whom there is a given relationship based on kinship (母女), sexuality (情侣), common activity (伙伴), 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 result 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* (diàichē) 'battery', 对联* (duìlián) 'couplet', 耳环* (ěrhuán) 'earring', 耳坠 (ěrzhuì) 'eardrop', 拐杖 (guàizhàng) 'walking-stick', 裤腿 (kùtuǐ) 'legging', 护耳 (hù'ěr) 'carmuffs'.

6臂联 (chūnlián), which can be considered a hyponym of 对联, can also collocate with 对. I presume cacophony is the reason why 一对联 (yī duì lián) is not found as a possible co-occurrence in the literature.
Foreign students learning Chinese who do not know that Chinese people have traditionally categorized things on a pole will feel surprised to see that water and vessel (just to give a couple of examples) are also categorized in pairs. There are many members in this category overlapping with other meaning word categories. For example, electric, heat, pulse, hand, water, cup and vase can also collocate with each other; and rod, vessel, hand, hand, water, and vase can also collocate with each other.

3.2. Natural extension members of 副 (fù)


3.3. Metaphorical extension members of 副 (fù)


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 (dǎbàn) ‘dress up’, 套装 (tàizhuō) ‘manner’, 精神 (jīngshén) ‘spirit’, 脸 (liǎn) ‘face’, 面孔 (miànkǒng) ‘face’, 容貌 (róngmào) ‘appearance’, 神气 (shénqì) ‘expression’, 神情 (shénqíng) ‘look’, 美色 (měisè) ‘expression’, 神态 (shèntài) ‘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’.

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

8 Although this list includes only isolated nouns, they are often preceded by a modifying phrase that can only be preceded by the numeral 十 (shí). For instance: 得意的样子 (déyì de yàngzi) ‘complacent look’, 怪相貌 (guàixiàngmào) ‘a grimace’, 喜悦的面孔 (xǐyuè de miànkǒng) ‘a kind face’, 骄傲的神气 (jiāo'ào de shénqì) ‘arrogant expression’, etc.
3.4. Category coherence

Category 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 (耳, 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, U-shaped. The rest of the natural extension members refer to a number of 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.


4.1. Central members of 套 (tào)


4.2. Metaphorical extension members of 套 (tào)

4.2. Category coherence

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, 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.
- Abstract nouns referring to strength and cognitive, artistic, or other abilities.
- Abstract nouns referring to facial expression or body language.
- Chinese medicinal brews.

4.2.2. Grouping of words said in an argument with a given purpose (usually carrying a derogatory connotation) such as

欠 (足) ‘nonsense’
谎 (谎) ‘lie’
欺 (欺) ‘falsehood’
客气 (客气) ‘words of courtesy’
空话 (空话) ‘idle talk’
骗人话 (骗人话) ‘deceiving talk’
脏话 (脏话) ‘obscenity’

4.3. Category coherence

堆 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. Most central members are nouns that already convey the idea of plurality (家具, 设备, 文献). 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 stu-
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.
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.

| Co-occurrence of the four categories with different kinds of nouns |
|--------------------------|---|---|---|---|
| [+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           | ✓ | ✓ | ✓ | ✓  |
| Clothing (not in pairs)  | ✓ |   | ✓ | ✓  |
| Different kinds of entities forming a set or conceptual unit | ✓ | ✓ | ✓ | ✓ |

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.

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.
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

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 双 is interchangeable with 双 whenever we are dealing with body parts, yet he later mentions they can be interchanged in the case of 腿膀 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 双, but he further explains they are slightly different. For him, 双 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 双 (though he does not specify when), and that 双 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 双 is used with the rest. So if we believe this dictionary, the collocation 一对袜子 (yì 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 双 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 双 (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 双 are body parts (nosepil, hand, arm, shoulder, leg, and knee), the only exception being “antenna”. On the other hand, members in 双 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 双 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 双 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, 双, 双, 双, and 双. 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-
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. 我们可以将这些量词视为功能性的，尽管在某些情况下形状和位置也可以被考虑为起着一定作用。

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 材 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.

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