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Chinese Classifier Systems and Human Categorization*

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This paper represents the first cognition-based, systematic study of classifier systems across Chinese dialects. It shows that these systems reflect conceptual structures and human categorization to a great extent. The paper identifies some relevant cognitive categories underlying classifier systems in different Chinese dialects to account for their seemingly arbitrary and random variation. Both the prototype theory and the part-whole analysis are found to be of great use in explaining the criss-crossing complexity of Chinese classifier systems. This paper provides important evidence that linguistic structure does involve general cognitive apparatus.

1. Introduction

Chinese dialects exhibit a whole array of classifier systems with considerable variation from one dialect to another. Chinese classifier systems, which categorize nouns into different classes, present an obvious case of overt categorization in language. Nevertheless, it is not immediately clear whether they reflect conceptual structures or are merely arbitrary systems of classification. In this paper, we will show that Chinese classifier systems mostly reflect conceptual structures. More importantly, insofar as they reflect conceptual structures, they bear crucially on the issue of the nature of categorization in human cognition.

The Chinese classifier systems have not yet been studied systematically, especially from the cognitive point of view. While Craig (1986) is an excellent collection of articles concerning classifier systems in different languages and their implications for human

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categorization, that collection does not discuss the classifier systems across Chinese dialects. At the same time, in Allan's (1977) seminal work published in *Language* on classifiers, many important facts about the classifier systems in Chinese dialects are neglected. The present study therefore represents the first systematic study of Chinese classifier systems in relation to the central issue of human categorization.

This paper addresses the following three questions regarding the nature of categorization in Chinese classifier systems:

1. To what extent do Chinese classifier systems reflect conceptual structures?
2. What are some of the relevant cognitive categories underlying Chinese classifier systems?
3. How does the prototype theory of categorization account for some of the complicated facts of Chinese classifiers?

In this paper, section 2 provides some preliminary background for answering the three questions raised above. The questions themselves will be answered in section 3. Section 4 further discusses the importance of the prototype theory in analyzing Chinese classifier systems. Section 5 concludes with some theoretical implications and suggestions for further study of Chinese classifier systems.

2. Preliminaries

Background will be given in this section on the following: the distinction between classifiers and measure words (section 2.1), prototype theory and experiential view of categorization (section 2.2), categories of classification (section 2.3), and the data base used for the present study (section 2.4).

2.1. Distinction between classifiers and measure words

In the literature on general grammar as well as Chinese grammar, classifiers and measure words are often treated together under one single framework of analysis. For example, in his study of classifiers in more than fifty languages, Allan (1977) has treated measure words on a par with classifiers. On the other hand, Chao (1968:584–620) has treated classifiers as 'individual measures'. Li and Thompson (1981:81) have blended classifiers with measure words and stated that 'any measure word can be a classifier'. Thus, they treat bàng 'pound' in shì bàng ròu 'ten pounds of meat' and qūn 'group' in yì qūn yáng 'one flock of sheep' on an equal footing with tiáo in yì tiáo yú 'one fish' and zhāng in yì zhāng zhūōzi 'one table'.


However, in order to better understand the nature of categorization in a classifier system, it is not only desirable but also necessary to differentiate classifiers from measure words. The distinction below is adopted from Tai and Wang (1990:38).

'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 a noun.'

The distinction in question has a cognitive basis in that while classifiers refer to relatively 'inherent' or 'permanent' properties of entities, measure words refer to 'contingent' or 'temporary' properties. In simple terms, while a classifier is used to 'categorize' an object in reference to its salient perceptual properties, a measure word is used to 'measure' the quantity of an object or a collection of objects.

This cognitively-based distinction between classifiers and measure words can be further justified on syntactic grounds in Chinese grammar. In the first place, a classifier in Mandarin Chinese can be substituted by the general classifier ge without changing the meaning of the expression, whereas a measure word cannot. Thus, tiào in yī tiào yù and zhāng in yī zhāng zhōuzi can be substituted by ge, especially in colloquial spoken Mandarin. In contrast, bāng in shí bāng ròu cannot be substituted by ge; qīn in yī qīn yáng can be substituted by ge but only with the meaning 'one sheep' rather than 'one flock of sheep'. In the second place, the modifier marker de can be added between a measure word and its head noun but not between a classifier and its head noun. Thus, while the expressions shí bāng de ròu 'ten pounds of meat' and yī qīn de yáng 'one flock of sheep' are grammatical, the expressions yī tiào de yù 'one fish' and yī zhāng de zhōuzi 'one table' are not. Therefore, on both cognitive and syntactic grounds, classifiers like tiào and zhāng must be distinguished from measure words like bāng and qīn. Furthermore, the distinction accounts for both classifier and measure word interpretations in cases such as yī bā dāozi, which can mean either 'one knife' or 'one handful of knives'.

The distinction between classifiers and measure words is also meaningful from the point of view of language typology. It can be said that every language including English has measure words, but only some languages like Chinese and Thai have classifiers. Accordingly, languages like Chinese and Thai can be properly called 'classifier languages', but not languages like English.

Finally, the distinction serves an important purpose in the study of different classifier systems in Chinese dialects. Measure words do not vary much from one dialect to another, whereas classifiers vary considerably across Chinese dialects.

This paper will be concerned primarily with classifiers proper. Even though there are cases where the distinction between classifiers and measure words can become murky (cf.
Tai and Wang 1990:39), it serves to define the domain of the present study. Furthermore, a distinction with fuzzy boundaries is in line with the prototype theory of categorization to be adopted in this study.

2.2. Prototype theory and experiential view of categorization

The classical view of categorization is that a category is formed by a set of discrete properties which serve as necessary and sufficient criterial conditions to define the category. This view thus holds that categories consist of definitions. Accordingly, an object is categorized as an instance of a category if and only if the object possesses the defining properties of that category. This classical and influential view of categorization has been crucial in the development of many branches of natural and social sciences. Mathematics, logic, and formal semantics and syntax depend heavily on this classical view.

Since the early 1970's, the classical view of categorization has been seriously challenged by the collective work of anthropologists (cf. Berlin and Kay 1969, Kay and McDaniel 1978), psychologists (cf. Rosch 1975, 1978; Tversky and Hemenway 1983, 1984), linguists (cf. Ross 1972, Hopper and Thompson 1984, Lakoff 1987), and philosophers (cf. Wittgenstein 1953, Austin 1961, Putnam 1981, Johnson 1987). These studies have shown that a new theory of categorization, known as prototype theory, is more compatible with the facts of human categorization than the classical theory. The prototype theory proposes that categorization can be achieved through association with the prototype(s) or the central member(s), and that members of a category may be associated with one another in the fashion of 'family resemblance' (à la Wittgenstein). It is thus not necessary for all members of a category to possess a common objective property which criterially defines that category. In the prototype theory, the notions of 'centrality' and 'gradation' are essential to human categorization. Thus, some members of a category, being prototypes, may serve as 'typical' or 'better' examples of that category than others. As shown by Rosch (1973, 1975), people in North America regard robins and sparrows as better examples of birds than pelicans and penguins. In essence, in the prototype theory, categories are formed through typicality conditions rather than criterial conditions.

Admittedly, there are some concepts in human language that conform to the classical view. Examples borrowed from Smith (1989) include kinship concepts like grandmother and uncle, legal concepts like contract and robber, mathematic concepts like even number and triangle, and other definitional concepts which are invented or technically defined for some specialized field of study. But they are what Schwartz (1979) has referred to as 'nominal-kind' concepts, which are markedly different from 'natural-kind' concepts such as fish and table, which make up most of our life experience. Categorization involving natural-kind concepts seems to be formed through induction based on experience rather than through deductive definition.
As the classical view is often linked with the proposition that the defining properties for a category are inherent to the objects in the world. It has been referred to as the objectivist view of categorization by Johnson (1987) and Lakoff (1987). Johnson and Lakoff argue instead for the experiential view of categorization, which regards human categorization as resulting primarily from the interaction between the human body and its physical environment in different socio-cultural contexts. Thus, objects with drastically different physical properties can be grouped together through the same domain of experience. For example, Lakoff (1986) observes that in Dyirbal, fish and fishing implements are in the same class even though they might be expected to be in different classes, since fish are animate and fishing implements are neither animate nor food.

In Johnson and Lakoff’s experiential view of human categorization, human imagination plays a critical role in categorization. Thus, metaphor, metonymy, and human imagination all enter into the formation of a category, as convincingly demonstrated in Lakoff's (1986) explication of Dyirbal classifiers and the classifier hon in Japanese. Furthermore, Johnson and Lakoff incorporate the prototype theory into their experiential view of human categorization, since the two are compatible. The prototype theory is based on the categorization of 'basic-level objects' by human beings through their experience and interaction with the world around them.

It will be seen in this study that the theory of prototype and the experiential view of categorization together provide the right perspective for our understanding of Chinese classifier systems in terms of human categorization.

2.3. Categories of classification

Based on his cross-linguistic study, Allan (1977) has identified seven categories of classification: (1) material, (2) shape, (3) consistency, (4) size, (5) location, (6) arrangement, and (7) quanta. Category 5 does not apply to Chinese classifiers, while categories 6 and 7 deal with measure words. Therefore, only the first four categories are of relevance to the present study of Chinese classifier systems.

The first four categories — material, shape, consistency and size — are further divided into subcategories. The material category has three subcategories: animacy, inanimacy, abstract and verbal nouns. The shape category is subdivided into long, flat, and round (or more precisely, one-dimensional, two-dimensional, and three-dimensional). The consistency category is subdivided into flexible, hard or rigid, and non-discrete. And lastly, the size category is subdivided into big and small.

Allan’s first four categories and their subcategories will be adopted in the present study. In addition to Allen's categories, this study follows Tversky and Hemenway (1983, 1984) in recognizing the importance of the principle of using attributes derived from parts of objects in human categorization. Attributes of parts constitutes the fifth category in our study, since it plays an important role in the our analysis of Chinese classifier systems.
2.4 Data base

The data base for the present study comprises the following sources:

(A) *Hanyu Fangyan Cihui* (Beijing University 1964).
(B) *Hanyu Fangyan Gaiyao* (Yuan et al. 1983).
(C) 1990 survey conducted in Columbus, Ohio, by Wang Lianqing of classifiers at various sites in Beijing Mandarin and other Chinese dialects.
(E) Publications in *Zhongguo Yuwen* and *Fangyan*.

3. Relevant cognitive categories in Chinese classifier systems

There is ample evidence that Chinese classifier systems are cognitively based rather than arbitrary systems of classification of nouns. In the following, we identify those relevant cognitive categories which underlie Chinese classifier systems, and shows that Chinese classifier systems largely reflect conceptual structures.

3.1. Animacy

In the great majority of Chinese dialects, animals are distinguished from inanimate objects and organisms with respect to the use of classifiers. The general classifier for the category of animals is *zhī* (隻). The specific classifiers are *pī* (匹) for *ma* 'horse'; *tiào* (條) for *gǒu* 'dog' and *níú* 'ox'; *tóu* (頭) 'head' for oxen, horses and pigs; and *kǒu* (口) 'mouth' for pigs. The classifier *gěn* (根) instead of *tiào* is used for animals with a long shape in many Mandarin dialects in Sichuan, Shaanxi and Shanxi; and the classifier *wěi* (尾) 'tail' is used in Southern Min for *yú* 'fish', *shē* 'snake' and other animals and insects with rope-like shapes. Except for the classifier *pī*, these specific classifiers in different Chinese dialects clearly refer to the salient perceptual features of different animals. They override the general animal classifier *zhī*. In some dialects, *ge*, the general classifier for all sorts of entities, is also used for some animals; for example, in Xinhui, Kaiping, and Enping in Guangdong, as well as in Qionghai on Hainan Island.

There seems to be no general classifier for inanimate objects and organisms. One might be tempted to consider the general classifier *ge* as marking the category inanimacy. However, it makes more sense to treat *ge* as a general classifier with a default value signalling simply existent entities. Specific classifiers for inanimate objects in Chinese
dialects are preponderant in number. Just for *shù* 'tree' alone, there are at least eight classifiers used across different dialects: *kē* (棵), *gēn* (根), *zhū* (株), *tóu* (頭), *pō* (頸), *dōu* (兜), *cōng* (叢), and *tiáo* (條). The cognitive basis for each of the eight classifiers is nevertheless discernible, if not readily transparent. *Tiáo* and *gēn* associate the 'tree' with the class of long objects; *tóu* with the salient 'head-like' leafed part of a plant; *kē*, *zhū*, and *pō* with the trunk of a plant; *dōu* with the stem of a plant; and *cōng* with the collection of leaves on the trunk of a plant. Thus, it appears that in Chinese dialects, while there is a general classifier *zhī* for animals, there is no corresponding general classifier for plants.

In most of the Chinese dialects, *rén* 'human beings' are classified separately from animals by means of the general classifier *ge*. However, in some of the Kejia dialects in the Pearl River Delta region, the animal classifier *zhī* is used for human beings as well. ⁸

3.2. Shape

The category of shape has conventionally been divided into the three major subcategories: longness, flatness, and roundness. Allan (1977) prefers to replace them with one-dimensional, two-dimensional, and three-dimensional, his reasons being that the latter terms are more precise and suitable in accounting for some cross-linguistic classification of nouns better than the former terms (p.300). However, it will be seen in the discussion below that both sets of terms are needed in order to adequately describe the salient cognitive features underlying the Chinese classifier systems.

3.2.1. Longness

In Tai and Wang's (1990) semantic study of the classifier *tiáo* (條) in Mandarin Chinese, longness of shape is identified as the cognitive basis of that classifier. However, there are many nouns referring to long objects which do not take *tiáo* as the classifier. In section 3.1, we noted that many nouns referring to animals with a long shape take *zhī* (隻) rather than *tiáo*, the former being the default marker for the cognitive category 'animacy'. Moreover, some long objects take *gēn* (根) or *zhī* (枝) instead of *tiáo*. To account for the distribution of *tiáo* and the other two classifiers, *gēn* and *zhī* (枝), Tai and Wang propose that each of the three classifiers has its own salient perceptual property which serves as the *typicality* condition for categorization: namely, one-dimensional extension in length for *tiáo*, three-dimensionality of a long, rigid object for *gēn*, and the cylindricty of a long, rigid object for *zhī*. This three-way distinction based on the prototype theory of categorization can be illustrated by the following examples:

(1)  
yí tiáo shé  'one snake'
yí tiáo yú  'one fish'
yí tiáo huángguā 'one cucumber'
yí tiáo děngzi 'one bench'
Tai and Wang recognize that the distribution in (1) to (3) represents the norm for educated speakers of Standard Mandarin. However, for some individuals, there is overlapping between tiáo and gēn on one hand, and between gēn and zhī on the other hand. For example, for some Mandarin speakers, gēn instead of tiáo is used for huángguā 'cucumber', and gēn instead of zhī for xiāngyān 'cigarette' and qiāng 'gun'. This kind of variation among speakers is to be expected, with the three salient perceptual properties of tiáo, gēn, and zhī serving as a cluster of typicality conditions restricting the variation.

One striking fact about categorization involving the three classifiers mentioned above is that only tiáo can be used to refer to nouns like lù 'road', hé 'river' and jiē 'street'. This kind of extension can be explained by the assumption that the salient perceptual feature of tiáo involves the one-dimensional extension in length, whereas the other two classifiers involve three-dimensionality. This assumption can also account for the difference between yī tiáo xian 'one line' and yī gēn xiàn 'one thread'. The expression yī tiáo xian denotes a one-dimensional 'line on a two-dimensional plane, such as a line drawn on a piece of paper. The expression yī gēn xiàn, in contrast, denotes 'thread', a three-dimensional object. Therefore, in spite of the fact that the classifier tiáo is used for three-dimensional objects such as huángguā, yú and shé, the salient perceptual feature of the noun class categorized by tiáo is still the long-shaped configuration of the objects, with the configuration perceived as one-dimensional extension in length.

In most dialects of Mandarin Chinese, among the guā 'melon' class, only those with a long shape take the classifier tiáo; for example, huángguā 'cucumber' and sīguā 'towel gourd'. Those which do not have a long shape take the general classifier ge; for example, xīguā 'watermelon' and dōngguā 'wax gourd'. Similarly, only long-shaped máojīn 'towel' and dèngzi 'bench' take tiáo. Otherwise, the classifier kuài (塊) is used for máojīn and the classifier zhāng (張) or the general classifier, ge, is used for dèngzi. This kind of distribution provides crucial evidence that the classifier tiáo is cognitively based rather than merely representing an arbitrary noun class.

We have earlier noted that for long-shaped objects, some Mandarin dialects in Sichuan, Shaanxi and Shanxi prefer gēn to tiáo even in reference to animals such as niú 'ox', yú 'fish', and shé 'snake'. In these dialects, tiáo is nevertheless used to refer to hé 'river' and
jiē 'street'. The cognitive distinction between tiào and gèn proposed by Tai and Wang fits well with the use of gèn in these dialects, since animals are three-dimensional after all.

In most dialects of Yue, Min, and Kejia, the classifier gèn is not used. In these dialects, there is no contrast between tiào and gèn. Instead, the distinction is between tiào and zhī. While Yue dialects use tiào for a large number of three-dimensional objects (e.g. yī tiào chái 'one piece firewood' and yī tiào zhúgān 'one bamboo pole', Min dialects use zhī to refer to these objects. However, in reference to hé 'river' and jiē 'street', these dialects consistently use tiào.

Based on the above observations, it is safe to conclude that across Chinese dialects, the cognitive basis of tiào is the salient one-dimensional extension in length and that gèn or zhī is the three-dimensionality of long objects. For those dialects which have all three classifiers, a further distinction is made between gèn and zhī with respect to the salient perceptual feature of cylindricity.

It is interesting to note here that the classifier wēi (尾) is used for nouns such as yú 'fish', shé 'snake' and nqīū 'loach' in most of the Southern Min and Kejia dialects. The class of nouns categorized by wēi refers to animate, moving, living beings that have the long shape of a rope and do not have legs to stand up.

3.2.2. Flatness

It is a well-known fact that Mandarin Chinese use the classifier zhāng (張) to categorize zhī 'paper', zhuōzi 'table', and chuáng 'bed'. For many native speakers of Mandarin, the category of zhāng extends to cover yéi 'chair' and dèngzi 'bench', since they all have a flat surface like tables, the central member among the class of furniture categorized by zhāng.

In most Yue dialects and some Kejia dialects, the classifier zhāng is also used to refer to bèi 'quilt' and dāo 'knife'. It makes sense to assume that the flat shape of both quilts and blades of knives is a salient perceptual feature in these dialects. However, in Mandarin dialects, either tiào or chuáng (床) is used for bèi 'quilt', and bā (把) 'handle' is used for dāo 'knife'.

In Southern Min dialects, the classifier zhāng is also used for xìn 'letter'. The difference in the use of the classifier fēng (封) in Mandarin as opposed to the use of zhāng in Southern Min can be interpreted as reflecting two salient perceptual features of a letter: the envelope of a letter in Mandarin but the letter paper itself in Southern Min.

In most Yue dialects including Guangzhou, a distinction is made between kau²² (舊) and fa:i³³ (塊). Both correspond to kuài (塊) in Mandarin. While kau²² is very similar to Mandarin kuài, fa:i³³, however, refers to objects with a particularly flat surface. More precisely, kau²² focuses more on the three-dimensionality of objects, whereas fa:i³³ focuses on the two-dimensional flatness of objects.
3.2.3. Roundness

In Southern Min dialects, regardless of the size, nouns with reference to roundish objects take the classifier \textit{ll} (粒). Thus, \textit{xīguā} 'watermelon', \textit{dōngguā} 'wax melon', \textit{qiū} 'ball', \textit{dàn} 'egg', and \textit{mǐ} 'rice' form a class under the classifier \textit{ll}. However, in Mandarin, Yue, Kejia and other dialects, only the relatively small roundish objects such as \textit{mǐ} 'rice' and \textit{shāzi} 'sand' take the classifier \textit{ll}. Furthermore, Mandarin dialects, more than Yue and Kejia dialects, use \textit{kē} (棵) instead of \textit{ll} for small roundish objects.

3.3. Size

We now turn to size, and discuss consistency later. We noted in section 3.2.3 that in reference to roundish objects in Mandarin, Yue, Kejia and other dialects, only those of relatively small size use the classifier \textit{ll} (粒). Also in many Chinese dialects, the classifier \textit{tóu} (頭) 'head' is used for relatively large animals such as \textit{niú} 'ox' and \textit{mǎ} 'horse' but not for \textit{gǒu} 'dog' and \textit{māo} 'cat'. The classifier \textit{zuò} (座) 'seat' in most Chinese dialects also refer to massive and solid objects such as \textit{shān} 'mountain', \textit{qiáo} 'bridge', and \textit{dàlóu} 'big building'.

3.4. Consistency

In section 3.2.1, we use the perceptual feature \textit{rigidity} to distinguish \textit{gēn} (根) and \textit{zhī} (枝) from \textit{tiáo} (條). In most Chinese dialects, \textit{tiáo} usually refers to more flexible objects, while \textit{gēn} or \textit{zhī} refer to more rigid objects. But the flexibility/rigidity distinction seems to be secondary to the shape distinction. Thus, in many dialects in Sichuan, Shaanxi and Shanxi, long shape is the central determining perceptual feature; long things, whether flexible or rigid, take \textit{gēn}. In these dialects, \textit{tiáo} is still used for \textit{hé} 'river' and \textit{jiē} 'street', of which the salient perceptual feature is the one-dimensional extension in length.

In many Chinese dialects, while the classifier \textit{kuài} (塊) is used for hard objects, the classifier \textit{tuán} (團) is used for objects of mushy substance. For example, the contrast between \textit{yī kuài tiě} 'one chunk of iron' and \textit{yī tuán miánhuā} 'one ball of cotton' holds good in most dialects. The distinction between hard and mushy consistency again seems to be secondary to the shape. Thus, \textit{tuán} usually refers to roundish objects of mushy consistency, particularly with respect to its convex shape, while \textit{kuài} refers to objects which are not roundish.

3.5. Attributes referring to parts of objects

The classifiers \textit{tiáo} (條), \textit{gēn} (根) and \textit{zhī} (枝) all have their nominal origins referring to parts of a tree. It is obvious that they have been generalized to refer to many objects
other than trees and plants. In section 3.1, we have shown that all of the eight classifiers
for shù 'tree' across Chinese dialects have their nominal origins referring to different parts
of a plant. Similarly, for yú 'fish', in addition to the classifier tiáo used in Mandarin, Gan,
Kejia, Wu, Xiang and Yue dialects, the classifier wēi (尾) 'tail' is used in most of the
Southern Min dialects, and the classifier tóu (頭) 'head' is used in Northern Min dialects,
including Fuzhou, and in Southern Wu dialects, including Wenzhou. Both the tree and the
fish example show that variation in classifier systems can be accounted for by assuming
that different dialects take different attributes of parts of an object as the salient perceptual
property.

The classifier bā (把) 'handle' for nouns such as dāozǐ 'knife', jiàn 'arrow' and yězi 'chair'
is still limited to those objects with a handle. Other classifiers based on attributes of parts
in Chinese dialects include: lǐng (領) 'collar' in reference to shān 'garment' in Southern
Min and Kejia dialects, and tóu (頭) 'head' in reference to large animals in many dialects.
In some Yue dialects and many Kejia dialects, the classifier tóu is also used for plants.
Similarly, kǒu (口) 'mouth' and yǎn (眼) 'eye' are used as classifiers in many Chinese
dialects; for example, yì kǒu zhū 'one pig' and yī kǒu jīng 'one well' in Mandarin, and
yǐyǎn jīng 'one well' and yǐyǎn zhēn 'one needle' in Yue dialects.

4. Some further application of prototype theory

In section 3, we have seen that Tai and Wang (1990) applied the notion of typicality
condition to account for the complicated overlapping and variation among educated
Mandarin speakers with respect the three classifiers, tiáo, gèn, and zhī. The same notion,
along with the respective salient perceptual property of the three classifiers, has also
served to explain their distribution in different dialects. We have also pointed out that
zhùzì 'table' serves as the prototype for the class of furniture categorized by the classifier
zhāng (張). In this section, we give further examples which conform to the prototype the-
ory of categorization.

In most dialects, through metaphorical extension, the classifier tiáo is used to classify
not only concrete objects but also entities which are invisible and abstract. For example,

(4) yì tiáo xīnwén 'one item of news'
yì tiáo fǎlǐ 'one legal clause'
yì tiáo yǐjiàn 'one opinion'
yì tiáo líyǒu 'one reason'
yì tiáo měnglíng 'one order'

The metaphorical extension in (4) is built on a domain of experience to which most
native speakers can still relate, namely, the fact that news items, legal articles, agreements,
opinions, and so forth, are traditionally written down on a page, vertically from top to bottom. It is significant that the metaphorical extension is based on the long shape of an entity as imagined by the creative mind of human beings.

The use of the classifier \( pî (鲶) \) for \( m̀a \) 'horse' in many dialects is now arbitrary to native speakers of these dialects, although semantically motivated in origin (see note 7). The prototype theory applies nonetheless to the use of the classifier for animals that are similar in appearance to horses. Based on the survey conducted by Wang Lianqing of native speakers from Beijing, some of the informants extended the use of \( pî \) to \( luó \) 'mule' and \( luòtuó \) 'camel', but only one young informant used it for \( lú \) 'donkey'. Thus, horses can be construed as the central member for the classifier \( pî \), with mules and camels as less central members, and donkeys even more marginal. This example provides important evidence of graded extension of the use of classifiers, and thus exemplifies the explanatory value of the prototype theory. Mules, being the hybrid of horses and donkeys, have bodies shaped like horses. Camels, though very different from horses in body shape, serves some of the same functions as horses in human activities. And, in the case of donkeys, they are physically less similar to horses than mules are. In terms of function, they are also less similar to horses than mules and camels are, because of their smaller size and hence less functional role as beasts of burden.\(^{11}\)

Also based on Wang's survey, with respect to the \( tiáo \) category, \( gòu \) 'dog' appears to be a prototype for \( láng \) 'wolf', for which only a few of the informants used \( tiáo \). The Beijing informants almost never provided \( tiáo \) for \( mào \) 'cat', although some did for \( húli \) 'fox'.

In most dialects, \( shé \) 'snake' serves as the prototype for the legendary animal \( lóng \) 'dragon'. Thus, \( tiáo \) is used for both \( shé \) and \( lóng \) in most Mandarin and Yue dialects, while \( wèi (尾) \) is used for both in many Kejia and most Southern Min dialects.

On the other hand, almost no dialect classifies \( èyú \) 'crocodile' with \( yú \) 'fish' under the same classifier, even though \( èyú \) is a compound containing \( yú \) 'fish'.

5. Conclusion

We have shown that although classifier systems across Chinese dialects contain great differences, these differences can be more systematically understood in terms of Allen's (1977) first four categories of classifications and Tversky and Hemenway's (1983, 1984) attributes of parts of objects, in conjunction with the theory of prototypes. To the extent that we have succeeded in accounting for differences as well as similarities in classifiers across Chinese dialects using cognitive-based categories, we have demonstrated that the Chinese classifier systems are cognitively and semantically motivated and not arbitrary. Within a closed, universal set of cognitive categories, different dialects choose different salient perceptual properties for an object. We have thus demonstrated that Chinese classifiers, to a great extent, reflect human categorization in Chinese culture and subcul-
tures in different geographical regions. They appear to be arbitrary only in some cases only because the original salient conceptual basis has become conventionalized, with semantic motivation buried in oblivion.

Like linguistic signs in general, a classifier can become 'fossilized' and become conventionalized by losing its original semantic motivation. The classifier *pi* for horses is a good case in point. A classifier can also be borrowed from other dialects and presents an appearance of arbitrariness. However, it is precisely in the face of continuous fossilization and abstraction that human nature counters them by reinterpreting such abstract and seemingly arbitrary symbols with natural associations (Haiman 1977, Joseph 1989). For example, reinterpretation and restructuring of Chinese written symbols on the basis of 'folk etymology' by ordinary people are quite common occurrences (cf. Hsueh 1987). In the case of Chinese classifier systems, Tai and Wang (1990) observe that even though the classifier system in Standard Mandarin Chinese contains a great degree of dialectal mixture, speakers of this language tend to use some cognitive strategies to systematize their use of classifiers in reference to different objects.

As demonstrated in by Tai (1985, 1989, 1992, 1993) and Hsieh (1989), Chinese grammar contains a large number of iconic patterns, such as word order reflecting temporal sequence (Tai 1985). Syntactic iconicity reflects human beings' conceptualization of the world; and iconic, grammatical patterns mirror natural, linguistic symbolization rather than arbitrary, formal representations. The present study of classifier systems in Chinese dialects shows that linguistic structure makes use of general cognitive mechanisms, such as category structure, and thus provides another important evidence for the pervasiveness of iconicity in Chinese grammar. The extensive use of natural iconic principles in Chinese grammar strongly argues against both Saussure's arbitrariness principle of linguistic signs and Chomsky's theory of innate language faculty as independent of human beings' general cognition (cf. Haiman 1983, 1985).\(^{12}\)

It is well recognized by cognitive psychologists that knowledge about parts play a special role at the basic level of categorization for common objects and organisms (cf. Lakoff 1987, Tversky and Hemenway 1983, 1984). We have seen that many Chinese classifiers are based on attributes of parts of objects. Hence, the present study further supports Tai's (1989) observation that the whole-part principle plays a key role in Chinese grammar. Since parts of objects are usually associated with functions of objects in relation to human activities, Chinese classifier systems provide a rich data base for the study of the interaction between functions and salient perceptual properties of objects and organisms.

We have shown that the prototype theory of categorization has much explanatory value in accounting for the complexity of Chinese classifier systems. It is interesting to see whether future experiments on prototype, or typicality, effects, such as direct rating, example listing, and reaction time, can further confirm our linguistic analysis.
To conclude, the classifier systems in Chinese dialects offer a wealth of data for the study of interaction between cognition and language, between form and function, between symbolization and reality, and above all, between culture and language in the long history of China. It is important to methodically collect as much data as possible from as many localities as possible in China in order to answer many important questions regarding the cognitive basis of the Chinese language.\textsuperscript{13}

Notes

1. Erbaugh's (1986) article on Chinese classifiers in Craig's (1986) volume deals with only a few classifiers from the point of view of historically development and child language acquisition, and does not directly address the issues raised here.

2. However, Allan was quick to admit that some languages, such as Thai, are more appropriate "classifier languages" than languages like English in which measure words abound (p.286). The three criteria which he proposes for distinguishing classifier languages from non-classifier languages are ambiguous and intertwined. The cognitively-based distinction between classifiers and measure words proposed in this study serves the purpose better than Allan's typologically-based criteria.

3. Pinyin romanization is used for transcribing terms in this paper except those examples from Yue dialects in section 3.2.2, which are given broad phonetic transcription with supercripting of tone numbers. Chinese characters are provided for the classifiers in sections 3 and 4. The characters for the same classifiers are then repeated as needed for the sake of clarity.

4. See Wang (in preparation) for more syntactic reasons for the distinction between classifiers and measure words in Chinese.

5. Cognitive psychologists (cf. Tversky and Hemenway 1983, 1984) have made the important observation that knowledge about parts of objects and organisms play a special role at the basic level of categorization.

6. In Mandarin Chinese, the classifier zhī (支) is homophonous with the classifier zhī (枝). But they are distinguished from each other historically, in modern southern dialects, and in writing.

7. See Liu (1965) and Yau (1988) for a detailed discussion of the historical origin and development of the classifier pǐ in reference to animals. In many dialects, in reference to horses, the classifiers zhī (支) and tōu (头) are used in colloquial speech, with the classifier pǐ reserved for more formal and literary speech. According to Liu (1965: 184–187), the use of pǐ was derived from the 'matching-coupling' relationship between humans and horses in ancient China. The classifier was therefore semantically motivated rather than arbitrary to begin with.

8. The classifier kǒu (口) is also used for rén 'human beings', but only in reference to the number of people in a household, as in yī jiā sì kWǒu rén 'a household of four persons'.

9. For guns, the classifier gǎn (桿) 'shaft' is also used.

10. Further examples include yī wěi hūkòng 'one roundworm', yī wěi xiā 'one shrimp', and yī wěi lóng 'one dragon' in Southern Min dialects.

11. In Chao (1968:590), mǎ 'horse', luó(zi) 'camel', and lǘ 'donkey' are the three examples listed under the classifier pǐ. It appears that Chao would rather treat the three nouns on an equal footing than choose horses to be the prototype of the pǐ category.

12. Also see Tai (1993) for a detailed discussion of the relationship between Saussure's arbitrariness principle and Chomsky's innate hypothesis.
13. The collection of classifiers in different dialects would also serve to answer other questions concerning sociolinguistic variation, as well as grouping and subgrouping of Chinese dialects, synchronically and diachronically.

References

English


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**Chinese**


