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Individuals, kinds and events: classifier coercion of nouns

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Abstract

This paper challenges the traditional view that nominal classifiers classify individuals. Instead, we suggest that classifiers coerce nouns to refer to kinds and events as well as to individuals. This finding argues against the view that nouns refer only to entities, and suggests that classifiers do not simply agree with a noun, but instead coerce a particular meaning from it. Moreover, the Mandarin classifier system creates a taxonomic system involving events, kinds and individuals respectively. Within each classifier type an independent classification system of the collocating noun type is created. These findings are important first because they emphasize that the understanding of the semantics of nouns involves more than simple reference to an individual entity. Second, it is the first time that the previously abstract semantic distinctions among kinds, individuals and events, as well as within kinds and within events, have been found to be instantiated in a particular system of a natural language grammar, namely, the classifier system. © 2003 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The notions of individuals, kinds and events are three useful, albeit abstract, semantic distinctions found in formal semantic theories. These concepts usually involve separate domains of inquiry within formal semantics, but Lyons (1995),

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summarizes the prevailing viewpoint concerning these concepts in the two passages below.

Throughout this book I have adopted the viewpoint of naïve realism, according to which the ontological structure of the world is objectively independent both of perception and cognition and also of language. . . . According to the viewpoint adopted here, the world contains a number of first-order entities (with first-order properties) which fall into certain ontological categories (or natural kinds); it also contains aggregates of stuff or matter (with first-order properties), portions of which can be individuated, quantified, enumerated—and thus treated linguistically as entities—by using the lexical and grammatical resources of particular natural languages. All natural languages, it may be assumed, provide their users with the means of referring to first-order entities and expressing propositions which describe them in terms of their (first-order) properties, actual or ascribed, essential or contingent: such languages have the expressive power of first-order formal languages (p. 325).

In the above passage, Lyons argues for the existence of kinds and individuals, as well groups of individuals that can be apportioned. These concepts are available to all human languages, and all languages that have these concepts are considered to be first-order formal languages.

Lyons is less certain about the concept of event being present in all natural languages, as the following passage shows:

Whether all natural languages have the greater expressive power of various kinds of higher-order formal languages is a more controversial, and as yet empirically unresolved, question. But some natural languages certainly do; and [such languages enable] users to reify, or hypostatize, the properties of first-order entities, the relations that obtain among them, and the processes, activities, and states of affairs (and other kinds of situations) in which they are involved (p. 325).

Higher-order languages, then, allow users to understand abstract concepts as concrete (i.e. through metaphorization). Higher-order languages can also describe the events in which first-order entities are involved. Lyons argues that English is a higher-order language.

It is interesting to note that Lyons rejects the notion that there is an underlying linguistic or cognitive motivation for the concepts of individuals, kinds and events (i.e. ‘the ontological structure of the world is objectively independent both of perception and cognition and also of language’). Moreover, these three concepts are treated as distinct by formal semanticists, and not as part of a unified system. But we will show in this paper that these concepts are part of a coherent and conceptually motivated grammatical system. We will show that individuals, kinds, and events are reflected in the classifier system of Mandarin Chinese, a linguistic system based on cognitive principles.

This finding is relevant for the following reasons: first, it challenges the traditional treatment of individual as one of the basic semantic concepts. In other words, when individuals, kinds and events share the same level of linguistic/cognitive taxonomy, a treatment that puts one of them (individuals) as basic and the others derived needs to be re-examined. Second, this classification allows a fresh look at the complex semantic concepts of nouns, and at the interaction and coercion that takes place between classifiers and nouns. Third, it explains why the *kind* reading in Mandarin Chinese occurs with a subset of classifiers in addition to its function as a generic reading typical of bare nominals.¹ Lastly, for each noun type (i.e. individual, kind and event nouns) the corresponding classifier type creates a taxonomic system. The fact that the more abstract noun types (i.e. events and kinds) can be classified by a grammaticalized system offers the strongest empirical support for their conceptual felicity, since it is the first time that previously abstract semantic distinctions between kinds, individuals and events is found to be instantiated as a particular system of a natural language grammar. It is important to note that it is well known that linguistic devices can be used to mark the distinctions of individual, kind, and event. However, there are two crucial differences between these cases and the Chinese classifier system that we are discussing now. First, previous cases all involve grammatical devices that are independently motivated and are taken from separate grammatical levels or systems, while the classifier system we discuss here is a single integral grammatical system. Second, previous cases involve representational clues that typically, but not always, mark the semantic distinction, while the Chinese classifier system entails the exact grammatical function to categorize these semantic distinctions. In other words, there are two possible levels of grammaticalization. A distinction is grammaticalized if the contrasting elements can be distinguished by some representational clues. However, a system of categorization is grammaticalized only when the whole system is given corresponding grammatical representations.²

This paper is organized as follows: in Section 2 we distinguish classifiers from measure words in Mandarin Chinese and we give an overview of the data on which our study was based. In the third section, we present evidence for the individual readings of nouns and demonstrate that nouns can occur with more than one individual classifier, and that these occurrences coerce different meanings from the noun. In the fourth section, we discuss the kind readings of classifiers and demonstrate that kind classifiers select a particular class of nouns. In the fifth section, we demonstrate that the Mandarin classifier system also contains classifiers that can coerce an event reading from a nominal. In the last section, we summarize our findings, giving examples of nouns that can be coerced to all three readings, individual, kind and event, and suggest future areas for study.

¹ Note that in this paper, the term *kind* loosely follows Carlson's (1977) definition. In this reading, *kind* refers to a (contextually relevant) subset of individuals to which the noun applies. For instance, the sentence *Cats are smarter than dogs* gets translated into the reading of *The cat kind is smarter than the dog kind*. This reading cannot be refuted by an individual case of a certain dog having higher IQ than a certain cat. See discussion of the kind reading in Mandarin Chinese in Huang (1987).

² Thanks to a reviewer for pointing this out.

2. Background

In the following section we define classifiers as contrasted with measure words, and we discuss the scope and source of classifiers used in our study.

2.1. Classifiers and measure words

Two traditions of study of classifiers exist in Mandarin Chinese. The classical view does not differentiate measure words from classifiers. For example, Chao (1968: 584–620) refers to classifiers as individual measures, and subsumes them under the rubric of “measure words”. Li and Thompson (1981: 106) state that “any measure word can be a classifier”.

However, another tradition is based on the premise that measure words are distinguishable from classifiers on the basis of a simple syntactic test (Kuo, 1998; Tai and Chao, 1994): Can the genitive *de* particle be inserted between the classifier/measure word and its noun? In (1) below, *de* cannot be inserted, so *ben* is a classifier. But in (2), *de* can be inserted, thus *kuai* is a measure word.

(1a) yi ben shu
one CL book
'one book'

(1b) *yi ben de shu
one CL GEN book
'one book'

(2a) yi kuai rou
one piece meat
'a piece of meat'

(2b) yi kuai de rou
one piece GEN meat
'a piece of meat'

Tai (1990) points out that there is also an important semantic distinction between the two notions in that classifiers can only classify over a limited and specific group of nouns, while measure words can be used as a measure for a wide variety of nouns. His definition is as follows:

A classifier categorizes a class of nouns by picking out some salient perceptual properties, whether physically or functionally based, which are permanently associated with the entities named by the class of nouns; a measure word does not categorize but denotes the quantity of the entity named by a noun. (1990: 312).

For example, in (2b) above, ‘kuai’ is a measure word because it does not pick out any salient properties of ‘meat’ nor does it categorize a particular type of meat. ‘Ben’, on the other hand, picks out the salient properties of ‘book’ (i.e. a bound volume with content).

Underlying the concept that a classifier categorizes over a class of nouns based on permanent perceptual properties is the idea that the basic semantic function of nouns is to refer to classic individuals. And although it is a main function of classifiers in Mandarin to select individuals, in what follows we will show that it is inadequate to only view nouns as referring to classic individuals, and that instead nouns can be coerced by different types of classifiers to refer to kinds and events as well as to individuals. Before we discuss coercion to kind and event types (Sections 4 and 5), however, we will first explore coercion within the individual reading to demonstrate how different classifiers can emphasize different salient properties of the same noun (Section 3).

In this study, while acknowledging the conceptual validity of the classifier/measure dichotomy, our emphasis is on how the ‘classifier’ system correlates with the semantic properties of a noun. In other words, we follow Lyons (1995) and simply treat ‘mensural classifiers’ as a sub-category of classifiers. Hence, there is no need to make any a priori cutoff between the two possible sub-categories.

2.2. Source and scope of data

Our data are based on the Mandarin Chinese Classifier Dictionary (Chang et al., 1994; Huang et al., 1995b). The dictionary itself was compiled based on data from the Academia Sinica Balanced Corpus of Modern Mandarin Chinese (abbreviated as Sinica Corpus hereafter). The Sinica corpus is a grammatically tagged and balanced corpus containing a total of five million words (CKIP, 1995). It reflects the Mandarin Chinese spoken in Taiwan.

The dictionary contains definitions and examples of 427 classifier and measure words. One hundred twenty of these are found in elementary school textbooks and the other 307 were selected based on their high frequency in the Sinica Corpus. The dictionary also has a second part that lists 1910 noun ending morphemes (and their associated 12,352 nouns) and lists the classifiers that can co-occur with these morphemes.

In the dictionary, the classifiers and measure words are classified into seven types. (The dictionary uses the term *liang4ci2* to refer to both classifiers and measure words.) The first three types correspond to our definition of classifier based on the syntactic and semantic definitions given in the previous section and that latter four types correspond to measure words. The seven types are (1) general classifiers (what we call individual classifiers), (2) event classifiers, (3) kind classifiers, (4) proximation measure words, (5) container measure words, (6) standard measure words and (7) activity measure words. There are 174 general classifiers listed in the dictionary, as well as 35 event classifiers and 14 kind classifiers. In the following section we will look at how the general classifiers can coerce a particular semantic reading based on their semantic properties.

3. The individual reading

The individual reading is the most common aspect of classifier usage. Previous work (Tai and Chao, 1994; Ahrens, 1994) has emphasized that the classifier picks out salient features of the noun. Thus each noun will have associated classifier(s), that are learned along with that noun. For example, in (3) the classifier *tiao* classifies for long, cylindrical, flexible objects (Tai and Wang, 1990).

(3a) *yi tiao shenzi*
one CL rope
'rope'

(3b) *yi tiao she*
one CL snake
'snake'

(3c) *yi tiao yu*
one CL fish
'fish'

(3d) *yi tiao shayu*
one CL shark
'shark'

Tai argues that properties entailed in the classifiers can be deduced from examining the perceptual similarities among nouns that they occur with. For example, in addition to the analysis given in Tai and Wang (1990) for *tiao*, Tai and Chao (1994) proposes that *zhang* classifies over flat, rectangular, two-dimensional, horizontal objects (i.e. it classifies for paper, tables, chairs etc.).

In addition to occurring with classifiers that contain specific perceptual properties, nouns can, in addition, occur with the classifier *ge*. This classifier has been viewed as a neutral classifier, because it can occur with nouns of many different semantic classes. Meyers (2000) argues that *ge* is more correctly viewed as a semantically vacuous morpheme that is inserted by a default rule, as opposed to being linked with nouns through analogy as other classifiers are. This may be the case; however, Ahrens (1994) demonstrates that the critical point is that the occurrence of *ge* (whether by a default rule or by analogy) does not apply *uniformly* across nouns.

Her production experiments with native speakers demonstrate that if the classifier has a unique and elaborative relationship (cf. Langacker, 1987) with its noun, it is less likely to occur with the neutral classifier *ge*. On the other hand, the less unique and elaborative the relationship, the more likely the neutral classifier *ge* will occur in place of the more specific individual classifier. For example, in an experiment where subjects were asked to describe the pictures they saw, *tiao* occurs with *shenzi* 'rope'

83% of the time, but occurs only 47% of the time with *she* ‘snake’, only 23% of time with ‘fish’ and only 16% of the time with ‘shark’.

Ahrens attributes these results to the fact that although ‘snake’ embodies the qualities of ‘thin, cylindrical and flexible’, and therefore has an elaborative relationship with its classifier, the animal classifier *zhi* is competing for occurrence with this noun, and so it does not involve a unique relationship with the noun. ‘Fish’ not only has the animal classifier competing to occur with the classifier *zhi*, it also does not necessarily entail the quality of cylindricality. ‘Shark’ has an animal classifier competing with *tiao* and in addition, does not embody ‘thinness’ nor ‘cylindricality’. Thus, although the system of individual classifiers is based on cognitive principles, the occurrence of a noun with a particular classifier is dependent upon the uniqueness of the relationship with the noun as well as the possibility of other competing classifiers.

This possibility of other competing classifiers is what we will turn to next. In addition to individual nouns occurring with the semantically neutral *ge*, nouns can also occur with different specific classifiers, although this fact has not been examined closely in the previous literature. For example, in (4) the use of the classifier *ben* is the usual specific classifier used for books. There is a contrast, however, in meaning between (4a) and (4b).

(4a) Zhangsan mai le san ben shu/bijiben
Zhangsan buy ASP three CL_IN book/notebook
“Zhangsan bought three books/notebooks.”

(4b) Zhangsan mai le san bu shu/*bijiben
Zhangsan buy ASP three CL_IN book/notebook
“Zhangsan bought three (different) books/*notebooks.”

Ben refers to individual books, while *bu* refers to both individual books as well as to the content of the individual books. Thus, in the case of (4a) the three books may (or may not) be three copies of “War and Peace”, or they may be notebooks when *bijiben* ‘notebook’ is used. However, in the case of (4b) it is that the three books must all differ in terms of their content, as seen from the fact that the classifier *bu* cannot occur with *bijiben* ‘notebook’ because notebooks do not necessarily involve content.

Another interesting example of individual classifiers creating a semantic type shifting is given in (5).

(5a) bangongshi li you san ju dianhua
office IN has three CLS_IN telephone
“There are three telephone sets in the office. [i.e. three pieces of machinery]”

(5b) bangongshi li you san xian dianhua
office IN has three CLS_IN telephone
“There are three telephone lines in the office. [i.e. three telephone numbers]”

Both *ju4* and *xian4* are individual classifiers. However, *ju* selects machinery while *xian4* selects a line-like object, including the more abstract meaning of lines of communication.

The selection of a noun by a classifier is limited however. “Book,” for example, cannot occur with the animal classifier *zhi* to refer to, for example, books about animals, or a child’s book in the shape of an animal. The classifier must select a property of the entire class of nouns, and not just a particular noun. Thus, all telephones have a physical receiver as well as a phone line. All books have a physical manifestation of paper (or what appears to be paper in a computer) and have content, while notebooks only necessarily have the former. It is the classifier that selects the relevant properties of the noun and coerces the appropriate meaning.

Pustejovsky (1995) proposes the concept of qualia structure to encode a “set of semantic constraints by which we understand a word when embedded within the language” (p. 86). These constraints may be Constitutive, Formal, Telic, or Agentive and are defined as follows: Constitutive constraints involve the relationship between an object and its parts and include material, weight and components. Formal constraints distinguish the object within a larger domain and involve orientation, magnitude, shape, dimensionality, color and position. Telic constraints involve the purpose and function of the object, and Agentive constraints are “the factors involved in the origin of an object” (Pustejovsky 1995: 86). For instance, *book* is Constitutively defined to contain information; it is Formally defined to be made of bound sheets of paper; its Telic constraint defines its typical purpose as being read; and finally, its Agentive constraint states that it is created by writing.

Thus we can see that with the noun *dianhua* ‘telephone’, the classifier *ju4* in (5a) has the Formal role of telephone as an object while the classifier *xian* in (5b) represents the Telic role of telephone as a tool to connect to telephone lines. In the case of *shu* ‘book’, the classifier *ben* has the Formal role of a bound volume while the classifier *bu* involves the Constitutive role of complete and structured knowledge. Thus, individual classifiers can coerce nominal semantic types, and semantic coercion can be predicted through a well encoded qualia structure.

In terms of the representation of meaning, Pustejovsky (1995) implies that the complete qualia structure represents a single nominal sense that facilitates generation of different interpretations. In our theory (Ahrens et al., 1998), we make the crucial distinction of allowing a sense to be instantiated as different meaning facets. These different meaning facets (of the same sense) can be derived either by Pustejovsky’s type-shifting rules or Allen’s (1977) pragmatic rules. Following our earlier attempt to define the unit of sense, our focus of the current study is on how these disparate semantic objects can be coherently represented as a sense. We assume without further elaboration that when different semantic types (such as individuals, sets of individuals, properties, sets of properties, etc.) are involved, a Chierchia et al. (1989) style type-shifting rule will apply. However, with or without type-shifting, contextual information will ‘coerce’ a sense by eliminating other possible interpretations in a richly encoded but under-specified lexicon. Hence, what is important to us is the fact that, very often, the semantic shifting is applicable to an entire class of nouns (Ahrens et al., 1998). For example, the classifier *duo* refers to ‘bud’ of a plant or flower, while *zhu* refers to the plant itself, as in (6).

- (6a) yi duo hua
 one CL flower/plant
 ‘one flower’
- (6b) yi zhu hua
 one CL flower/plant
 ‘one plant’

This same shifting in instantiated meaning is applicable to all nouns that end in the morpheme *hua* ‘flower’, such as *meiguihua* ‘rose’ or *meihua* ‘plum flower’, etc. In these cases, it is differences in the Formal properties of the noun that are being distinguished.

We have demonstrated above that classifiers can coerce nouns to have a particular individual reading depending on the information entailed in the classifier itself. The classifier can vary in the Constitutive, Formal, Telic or Agentive roles that it carries. The classifier then forces the noun to undergo a semantic type-shifting, so that the salient properties that the classifier entails are then viewed as the salient properties of that noun (even if they weren’t viewed as salient previously).

In what follows we will show that this semantic type-shifting is not limited to the individual reading of nouns. Classifiers can also type-shift nouns to a kind reading and to an event reading.

4. The kind reading

4.1. Kind classifiers and their semantics

A kind classifier explicitly marks that the nominal element that it selects and gives it a kind reading, as in (7).³

- (7) Nei zhong gou hen huai
 that CLS_KND dog very bad
 ‘That kind of dog is bad.’

If there was only one kind classifier, then one could argue that the notion of kind, like shape or dimension, is just one of the salient perceptual concepts utilized in the classifier system of the language. In this scenario, the kind reading would be just one

³ Downing (1996) does refer to kind-classifiers and quality-classifiers in her study of the Japanese classifier system. However, she uses the term to refer to classifiers that pick out natural kinds, which are often already present in noun classes. In her study, the crucial distinction is whether a category is inductively or deductively defined. In other words, Downing’s kind-classifiers actually pick out a category ‘given by the world’. This is very different from our kind classifiers that categorizes different kinds and coerce kind readings from the noun. Her kind-classifiers would simply be a subset of our individual classifiers.

Table 1
Kind classifiers

1.	種 <i>zhong3</i>	kind
2.	般 <i>ban1</i>	kind (of similar outlook)
3.	派 <i>pai4</i>	kind (of cult, of trend), school of
4.	碼 <i>ma3</i>	kind (of event)
5.	碼子 <i>ma3zi</i>	kind (of event)
6.	檔 <i>dang3</i>	kind(of event)
7.	檔子 <i>dang3zi</i>	kind (of event)
8.	等 <i>deng3</i>	rank of
9.	類 <i>lei4</i>	cluster of kinds
10.	款 <i>kuan3</i>	design of
11.	號 <i>hao4</i>	kind (of characters)
12.	式 <i>shi4</i>	style
13.	色 <i>se4</i>	kind/style (more related to visual effect)
14.	樣 <i>yang4</i>	kind (subdivision of a bigger kind)

of the nominal semantic features picked by the classifier. In fact, we will show that there is a whole set of different kind classifiers selecting different semantic kinds. In other words, this is a case where a sub-system of classifiers is devoted to the classification of the concept of *kinds*. This fact suggests that kind is treated as a primary semantic type that is ascribed to nominals and allows sub-typing selection by classifiers. Thus the Mandarin classifier system will offer the first known evidence that the semantic notion of *kind* is grammaticalized in a language.

In addition to the mostly commonly used *zhong3*, 13 additional kind classifiers are listed in Table 1.

All these kind classifiers have the following common grammatical characteristic: they select a broad class of nouns, unlike the highly idiosyncratic selection of the individual classifiers. Semantically, this follows from the fact that kind classifiers select the kinds represented by nouns, not the individuals referred by them. Hence, the natural kind delimited by a certain noun class is selected by the appropriate kind classifier. Thus *lei4* selects the kinds defined by properties over concrete objects; *lei4* can also refer to a kind defined by a collection of smaller kinds as in (8). In (9), *yang4* selects the kinds defined by shape and appearance. *Shi4* in (10) is similar to *yang4* with an emphasis on appearance; however, in this case the appearance must be an artificial styling. *Kuan3* in (11) selects the kinds defined by intensive design; and lastly, *ma3* in (12) and *dang3* in (13) select kinds of events. This leaves *zhong3* as the neutral kind classifier, not unlike

the neutral (or default) individual classifier *ge*, but even more prominently so since it co-occurs with virtually all nouns, concrete or abstract.

- (8) zhei san lei shiwu dou shi richang bixu de
 this three CLS_KD food all be daily required DE
 “All these three types of food are daily requirements.”
- (9) ta daile san yang shuiguo lai kan ni
 s/he bring-PERF three CLS_KD fruit come see you
 “S/He brought three kinds of fruit when she came to see you.”
- (10) canzhuo shang bai man ge shi caiyao
 dining-table on place full every CLS_KD dish
 “The dining table is full of all different kinds of dishes.”
- (11) fengtian jinnian tuichule liang kuan xinche
 Toyota this-year push-out-PERF two CLS_KD new-car
 “Toyota has brought out two lines of new cars this year.”
- (12) xunlian he bisai wanquan shi liang ma(zi) shi
 training and competition total be two CLS_KD matter
 “Training and actually playing are two totally different matters.”
- (13) qiuxue he jiaoxue wanquan shi liang dang(zi) shi
 studying and teaching totally is two CLS_KD matter
 “Studying and teaching are two totally different things.”

The kind classifiers in the above six instances can be replaced by the neutral classifier *zhong3*, but not by the neutral individual classifier *ge*. This further supports the position that kind classifiers form a semantically motivated grammatical class by themselves and are different from individual classifiers. Moreover, like other Mandarin classifiers, the instances of kind classifiers that we give in (8)–(13) involve the numeral-classifier construction, which shows that kinds are individuated and enumerated.

4.2. The bare NP reading

Bare NPs in Mandarin Chinese have a wide range of possible interpretations. Among these interpretations the kind reading is one of the most difficult to account for (see example 14 below).

- (14) gou bi mao da
 dog compare cat big
 “Dogs are bigger than cats. [preferred reading]”
 OR “This dog is bigger than this cat.”

With the kind reading exemplified in (14), the NPs do not refer to any specific individual, nor do they refer to all instances within the species. Hence (14) does not logically entail that a specific dog is bigger than a specific cat, contrary to the prediction of an account where the bare NP refers to either an individual animal or some subset of the animals. What is interesting is the additional reading. It *says* a specific dog is bigger than a specific cat. This is an impossible interpretation for the (English) generic reading. However, if we take the kind reading in Chinese as picking up the contextually defined subset of individual(s) to which the noun applies, then it is possible to see contexts where exactly one individual will be picked. Hence the individual reading can be uniformly accounted for (Huang, 1987).

The same semantic effect is achieved when the kind interpretation is marked by a classifier. Although the kind reading is previously thought to be one of the generic readings typical of bare nominals (Carlson, 1977; Chierchia, 1982), this reading can also occur with the kind classifier in Mandarin as shown in (15).

- (15) zhe zhong ma zai huabei hen changjian
 this CLS_KD horse at China-north very common-seen
 “This kind of horse is very commonly seen in Northern China.”
 (Huang, 1987).

The sentence in example (15) does not entail that any specific individual horse of the referred kind is in north China, nor does it entail that a majority of this kind of horse is there. Its interpretation is that a contextually defined subset of this particular kind of horses is commonly seen in north China. In addition, this data casts doubt on a structural account, such as in the Government and Binding framework (e.g. Tang, 1990), where classifiers are assigned to the Specifier position; since whether the Specifier position is lexically filled or not can no longer be a test of the specificity/definiteness of the NP.⁴

The fact that (16) below serves as a paraphrase of (14) also supports our observation that the existence of classifiers such as *zhong3* achieve the same semantic effect of kind reading.

- (16) zhe zhong dongwu bi na zhong dongwu da
 this CLS_KD animal COMP that CLS_KD animal big
 “This kind of animal is bigger than that kind of animal.”

The free variation of Mandarin bare nominals between kind and individual readings is accounted for with type-shifting (Huang, 1987; Chierchia et al., 1989). It is

⁴ The relationship between the classifier and the specific interpretation is language-dependent. For example, in Cantonese a classifier is necessary but not sufficient for a specific interpretation. However, in Mandarin Chinese a classifier is neither necessary nor sufficient to imply a specific interpretation (Matthews and Pacioni, 1997).

interesting to observe, however, that the use of the classifier *zhong3* in (15) and (16) entails that there is obligatory type-shifting and the sentence is unambiguously interpreted as a kind reading.

In sum, we have shown in this section that kind classifiers form an integral class within the Mandarin classifier system. They individuate and classify the different kind readings that can be obtained from nominal semantics. Thus we have shown that the notion of kind is not only crucial to theories of nominal semantics, but is also attested by the grammatical system of a natural language.

5. The event reading

In this section we will show that the Mandarin classifier system contains a subclass that selects another theoretically significant entity: i.e. event-type entities. Chierchia (1982) was one of the first semanticists to propose that events and activities could be referred to as entities. He studied nominalization and the English gerund system and demonstrated that the grammatical system marks the type-shifting from events to event-type entities (i.e. names of the events.) In (17), that the gerund “seeing” refers to a certain type of event as is obvious from its verbal derivation.

(17) Seeing is believing.

Thus the semantics of nominalization is treated by Chierchia as an instance of type-shifting which individuates the events. In Mandarin, however, not only is no morpho-lexical marking involved when the event-type nominal is deverbal, it is also possible to coerce an event type reading from a noun without any derivation. We will show in this section that the event classifiers coerce just such an effect. Since there will be no marking on the nouns, it is necessary to develop tests for event-type entities to prove that the classifier-noun phrase does have an event reading.

It should be noted that event-type nominals have eventive semantics, including event structures. The semantic (not syntactic) nature of events is that they are temporally anchored, and that they take arguments. Thus, the semantic tests we have for event-type nominals are that they occur as temporal delimiters, and that they allow oblique arguments. Two additional syntactic tests are that they satisfy the subcategorization requirement of predicates which take event-type arguments, and that they cannot be replaced by the neutral individual classifier *ge*.

First, an event cannot take place without a time frame, either a temporal point of its occurrence or a (relative) time duration of its existence. Thus, temporal reference is an integral part of the semantics of events, including event-type nominals. The individual classifiers, on the other hand, do not carry temporal reference in their semantics. Thus, an important grammatical characteristic of event-type nominals is that they co-occur with a temporal subordinator, such as *yi3hou4* ‘after’ (without any predicates) to establish the temporal (and causal) sequence of events; (18a)

shows how such a temporal sequence is established with a full clause. In (18b) we show that when the classifier *tang4* is used, the noun *taijiquan* ‘TaiChi boxing’ can refer to the event without any overt verbal predicate.

(18a) *dale taijiquan yihou ta shenti shufu duo le*
 playLE Tai_Chi after s/he body comfortable more LE
 ‘S/he feels much better after doing Tai Chi.’

(18b) *san tang taijiquan yihou ta shenti shufu duo le*
 three CLS_EV Tai-Chi after s/he body comfortable more PERF
 ‘S/he feels much better after (performing) three rounds of Tai Chi.’

Second, it is well-known that event-type nominals preserve their argument structure and take (oblique) arguments, such as the English possessive ‘John’s promotion’ or ‘Mary’s leaving early’. In Mandarin, a deverbal noun can take a possessive (encliticized with *de*), or preceding oblique arguments, such as the underlined NP in (19).

(19) Zhangsan dui Lisi de jianyi
 Zhangsan TO Lisi DE suggestion
 ‘Zhangsan’s suggestion/advice for Lisi (i.e. Zhangsan advised Lisi)’

In (20), we show that when an event classifier is used, the nominal head takes an event reading and the possessor is interpreted as an argument of the head.

(20) zhongtong de yitong dianhua
 president DE oneCLS_EV telephone
 ‘A call from the President (i.e. the President made the phone call)’

Last, it can be shown in Mandarin that the event reading is selected by a few small classes of verbs, such as light verbs *jin4xing2* ‘to proceed’ (Huang et al., 1995a,b), happenstance verbs *fa1sheng1* ‘to happen’, and event-evaluation verbs *hua1* ‘to cost’. For instance, *hua1* takes a nominal subject that refers directly to an event (21a), or a clause describing an event (21b).

(21a) *xishi hen hua qian*
 happy-event very cost money
 ‘Weddings cost a lot.’

(21b) *jiehun hen hua qian*
 marry very cost money
 ‘It costs a lot to get married.’

In (22), we show that the same semantic selection can be satisfied when an event classifier is used. Thus, it supports our position that event classifiers selects event-type nominals.

- (22) zhechang dianying bu hua qian
 thisCLS_EV movie NEG cost money
 “It did not cost any money to see this movie.”

In addition, example (23) also shows that the event reading can be coerced from a bare NP, similarly to example (21a).

- (23) dianying hen hua qian
 movie very cost money
 “It is very expensive (to make/finance/watch/...) movies”

However, when a bare NP is type-shifted to an eventive reading, the actual event is underspecified and may have a wide range of interpretations whereas in (22), we showed that when the event meaning is coerced by a classifier, it also determines the event-type. In other words, the semantic coercion fits the classical description of what a classifier does. The event classifiers force the event reading by classifying the event into a specific type. In (22), *chang3* refers to scheduled and regularly occurring events.

To sum up, we have demonstrated with two semantic tests and two syntactic tests involving selectional restrictions that event classifiers do coerce the event readings on the nouns that they co-occur with. We will discuss in more detail the semantics of the event classifiers in the next section.

5.1. *Event classifiers and their semantics*

Pustejovsky’s (1995) theory of a Generative Lexicon proposes that the semantics of nouns cannot be completely represented without referring to two different event-structures encoded in the qualia structure of each lexical entry. The Agentive role of a noun is defined in terms of an event structure describing how this noun “originated”. The Telic role is defined in terms of an event structure describing the function of the noun. His point is that polysemy cannot be accounted for if these two aspects of a noun are not considered.

Adopting Pustejovsky’s position, the fact that certain classifiers can coerce event readings from nouns that are typically interpreted as individuals is not surprising, since their semantic representation already contains event structure information. Since these event structures are idiosyncratically encoded, we also correctly predict that the selection between event classifiers and their nominal heads are more restrictive than kind classifiers. We will further classify the event classifiers into the event-type classifiers, which individuate different event structures, and the event-token classifiers, which individuate each occurrence of an event.

Table 2
Event classifiers

1.	波 <i>bo1</i>	of staggered event
2.	班 <i>ban1</i>	of shift, scheduled flight/bus etc.
3.	筆 <i>bi3</i>	of transaction
4.	步 <i>bu4</i>	step (event procedures)
5.	泡 <i>pao4</i>	a brewing (of tea etc.)
6.	盤 <i>pan2</i>	a serving round (of a dish)
7.	幕 <i>mu4</i>	act (of a play)
8.	番 <i>fan1</i>	times (of a repeated event)
9.	道 <i>dao4</i>	of dishes of procedures
10.	檔 <i>dang3</i>	duration of a run (of play, movie etc.)
11.	段 <i>duan4</i>	section (of play, etc.)
12.	頓 <i>dun4</i>	the process of a meal
13.	台 <i>tai2</i>	a run of a traveling troupe
14.	堂 <i>tang2</i>	a class
15.	趟 <i>tan4</i>	a journey
16.	通 <i>tong1</i>	a phone call
17.	輪 <i>lun2</i>	a round
18.	回 <i>hui2</i>	a roundtrip
19.	節 <i>jie2</i>	a class, a session
20.	屆 <i>jie4</i>	an annual event
21.	件 <i>jian4</i>	event
22.	局 <i>ju2</i>	game
23.	期 <i>qi2</i>	term
24.	起 <i>qi3</i>	event (especially a happening, an accident)
25.	圈 <i>quan1</i>	round (of majong)
26.	席 <i>xi2</i>	lecture
27.	折 <i>zhe2</i>	an act (in a Chinese play)
28.	陣 <i>zhen4</i>	one of a sporadic event(s)
29.	樁 <i>zhuān1</i>	event
30.	場 <i>chang3</i>	a (scheduled) event (with beginning and ending)
31.	齣 <i>chu1</i>	a play
32.	任 <i>ren4</i>	term (of a termed position)
33.	宗 <i>zhong1</i>	trade/transaction
34.	餐 <i>can1</i>	a meal
35.	次 <i>ci4</i>	once (re. frequency of event)

Huang et al. (1995a,b) list 35 classifiers as event classifiers. They are listed in Table 2.

Among these event classifiers, the event-type classifiers are more specialized since they select a particular event type. For instance, the event-type classifier *chu1* selects the nouns which contains the stems of either *ju2* “drama” in (24a) or *xi4* “play” in (24b).

(24a) shashibiya daodi yigong xiele ji chu xi?
 Shakespeare eventually together write-PREF how_many CLS_EV play
 “How many plays did Shakespeare write all together?”

(24b) bailaohui jin nian zhi yan le yi chu gewuju
 Broadway this year only play PERF one CLS_EV musical
 “Only one musical (e.g. Cats) was performed on Broadway all year this year.”

The two sentences above have Agentive (24a) and Telic (24b) readings respectively, suggesting that these event readings are coerced from the Pustejovskian qualia structure. The Agentive reading of (24a) specifically refers to the event types of how a play comes into being. The Telic reading of (24b) refers specifically to the event types of why a play is produced (to be viewed). They also clearly show that *chul* individuates event-types.

In contrast, when an event-token classifier is used, the same noun will refer to the occurrences of the event. The event-token classifier *chang3* selects a scheduled event as in (25).

(25) bailaohui jin nian gong yanle yibai chang gewuju
 Broadway this year together play PERF one hundred CLS_EV musical
 “Broadway had one hundred performances of musicals this year.”

Thus (25) claims that musicals were performed 100 times on Broadway without referring to whether the same play was shown or not, while (24b) claims that only one musical was performed without claiming to how many times it was done so.

Even though event-types and event-tokens are semantically distinct entities and the classification is supported by the two unambiguous cases given above (24b and 25), we do find that in many cases the same classifier will be polysemous with both event-type (26a) and event token readings (26b).

(26a) Changrong you shi ban feiji fei gaoxiung
 EVA has ten CLS_EV airplane fly Kaohsiung
 “EVA has ten scheduled flights to Kaohsiung .”

(26b) Changrong gang feizou le san ban feiji
 EVA just fly-away PERF three CLS_EV airplane
 “Three EVA flights just took off.”

Example (26a) has the event structure of “flights”, while (26b) individuates each particular flight.

In sum, our semantic account of the event classifiers in this section suggests that event classifiers can adopt the event information encoded in qualia structures to

define both Agentive and Telic roles and coerce the semantics into agentive or telic events. We also have shown that the semantics of event classifiers can be further distinguished as referring to either the event type or event tokens.

6. Conclusion

We have demonstrated above that it is inadequate to view the ontology of the classifier system as based on the classic notion of individuals. We argue instead that the top level of the ontology of the Mandarin Chinese classifier system is actually tripartite: individual, kind, and event. An important motivation in studying this new ontology of the Mandarin Chinese classifier system is the fact that even seemingly straightforward referential nominals have complex semantic content, as suggested by our data as well as recent studies on nominal lexical semantics which refer to different individual or events (Pustejovsky, 1993, 1995). In fact, the semantics of nouns are more complicated than one might suspect. As we have shown above, Mandarin Chinese offers one of the most dramatic illustrations since its nouns can have very different meanings without any additional morphological markings. Our main generalization is summarized below. Three of the possible meanings of the noun *dian4hua4* “telephone” and of *fei1ji1* “airplane” can be brought out by the use of different classifiers, as given in Tables 3 and 4 respectively.

The individual classifiers *ju* and *xian* can select one of two interpretations relating to the ‘phone’. The former selects the telephone machinery itself, while the latter selects the line for the phone, as in ‘line one’ or ‘line two’. The kind classifier coerces a kind reading so that a particular type of phone (i.e. cordless or cell phone) is referred to. The event classifier coerces an eventive reading and refers to the completed act of calling.

Table 3
Classifier and nominal semantic type correlation for *dianhua* “telephone”

Semantic/Classifier type	Example	Reference
Individual	<i>yi ju dian-hua</i> one CLS_IN telephone “one telephone”	Telephone Machinery
	<i>yi xian dian-hua</i> one CLS_IN telephone “one telephone line”	Telephone line
Kind	<i>yi zhong dian-hua</i> one CLS_KD telephone “one kind of telephone”	A particular kind of phone, e.g. cordless
Event	<i>yi tong dian-hua</i> one CLS_EV telephone “one phone call”	The completed event of calling

Table 4
Classifier and nominal semantic type correlation for *feiji* ‘airplane’

Semantic/Classifier Type	Example	Reference
Individual	<i>yi jia feiji</i> one CLS_IN airplane ‘one airplane’	Airplane
Kind	<i>yi zhong feiji</i> one CLS_KD airplane ‘one kind of airplane’	A particular kind of airplane, e.g. jet
Event	<i>yi ban feiji</i> one CLS_EV airplane ‘one scheduled flight’	The completed event of flying

In Table 4, *jia* is the individual classifier that is used to refer to the physical entity of an airplane, while *zhong* is used to refer to a particular kind of airplane. *Ban* is an event classifier that coerces the concept of a completed event flying from the noun ‘airplane.’

The implications for this new tripartite classification of classifiers are three-fold: first, it explains why the kind reading in Mandarin Chinese, while it can be understood as a generic reading typical of bare nominals, also occurs with a subset of classifiers (i.e. the kind classifiers) and is a semantic type in and of itself. Second, the previously abstract semantic distinctions between kinds, individuals and events are now found to be instantiated in one particular system (i.e. the classifier system) of a natural language grammar, and moreover, these three classifier types have their own taxonomic system. Thus, this suggests that the semantic types of individuals, kinds and events are useful categorizing tools for humans (and not just formal semanticists), and that these concepts are encoded on a cognitive level. Finally, this classification allows us to take a fresh look at the complex semantic contents of nouns, and at the interaction and coercion that takes place between classifiers and nouns.

In future studies, we hope our findings will help us to better understand the interaction of semantic meanings among kinds, individuals, and generics (Carlson and Pelletier, 1995; Chierchia, 1994). In particular, based on the ready availability of the kind reading, either with bare plurals in all languages or with kind classifiers in Chinese, we suspect that the kind role should be part of the nominal qualia structure in the theory of a Generative Lexicon. With regard to the event readings of nominals, even though the present theory of qualia structure does offer a possible account of how these readings can be obtained from the lexical semantics of the nominals, more thorough studies are needed in order to shed light on whether the Agentive and Telic events are the only events that are necessarily encoded in the nominal semantics, as well as additional studies on how these event readings are selected. Lastly, as Alexandra Aikhenvald has pointed out (p.c. August 2001) event-type classifiers in other languages have been described, although the term event may not

have been used [e.g. Aikhenvald's (2000) discussion of use of classifiers with abstract nouns (pp. 335–336)]. It would be interesting to examine if these instances do fall under event-type classifiers as we have defined them in this paper.

Moreover, if they do, do these languages also have a kind classifier system (in addition of course to an individual classifier system)? That is, to what extent are the semantic concepts of individual, kind and event instantiated in the grammars of other language's classifiers systems?

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References

- Aikhenvald, A.Y., 2000. *Classifiers: A Typology of Noun Categorization Devices*. Oxford University Press, Oxford.
- Ahrens, K., 1994. Classifier production in normals and aphasics. *Journal of Chinese Linguistics* 22 (2), 202–247.
- Ahrens, K., Chang, L., Chen, K.-J., Huang, C.-R., 1998. Meaning representation and meaning instantiation for Chinese nominals. *Computational Linguistics and Chinese Language Processing* 3 (1), 45–60.
- Allen, K., 1977. Classifiers. *Language* 53 (2), 285–311.
- Chang, L., Chen, K.-j., Huang, C.-R. 1994. The use of corpus in dictionary compilation. *Proceedings of ROCLING IX*. pp. 255–279 (in Chinese).
- Carlson, G., 1997. A unified analysis of the English bare plural. *Linguistics and Philosophy* 1, 413–457.
- Carlson, G., Pelletier, F., 1995. *The Generic Book*. University of Chicago Press, Chicago.
- Chao, Y.R., 1968. *A Spoken Grammar of Chinese*. University of California Press, Berkeley.
- Chierchia, G., 1982. Nominalization and Montague grammar: a semantics without types for natural language. *Linguistics and Philosophy* 5, 303–354.
- Chierchia, G. 1994. Plurality of mass nouns and the notion of semantic parameter. *Department of Cognitive Science Working Papers*, Vol. 7, Istituto Scientifico San Raffaele.
- Chierchia, G., Partee, B., Turner, R. (Eds.), 1989. *Properties, Types and Meaning*, Vol. II. *Semantic Issues*. Kluwer, Dordrecht.
- Chinese Knowledge Information Processing (CKIP), 1995. *An Introduction to the Sinica Corpus*. CKIP Technical Report 95-02. Academia Sinica, Taipei (in Chinese).
- Downing, P., 1996. *Numeral Classifier Systems: The Case of Japanese*. John Benjamins Publishing, Amsterdam/Philadelphia, PA.
- Huang, C.-R. 1987. *Mandarin Chinese NP de: A Comparative Study of Current Grammatical Theories*. Dissertation, Cornell.

- Huang, C.-R., Yeh, M., Chang, L.-P. 1995a. Two light verbs in Mandarin Chinese. A corpus-based study of nominalization and verbal semantics. In: *Proceedings of NACCL6*, Vol. 1. GSIL, USC, Los Angeles, pp. 100–112.
- Huang, C.-R., Chen, K.-j., Lai, C.-X., 1995b. *Mandarin Chinese Classifier and Noun-Classifier Collocation Dictionary*. Mandarin Daily Press, Taipei.
- Kuo, Y.-j. 1998. *A Semantic and Contrastive Analysis of Mandarin and English Measure Words*. Unpublished MA thesis, National Chung Cheng University, Jiayi, Taiwan.
- Langacker, R., 1987. *Foundations of Cognitive Grammar*, Vol. 1. Stanford University Press, Stanford.
- Li, C.N., Thompson, S.A., 1981. *A Reference Grammar of Mandarin Chinese*. University of California Press, Berkeley.
- Lyons, J., 1995. *Linguistic Semantics: An Introduction*. Cambridge University Press, Cambridge.
- Meyers, J., 2000. Rule vs. analogy in Mandarin classifier selection. *Chinese Languages and Linguistics* 1 (2).
- Matthews S., Pacioni, P. 1997. Specificity and genericity in Cantonese and Mandarin. In: Xu L. (Ed.), *Proceeding of the Symposium on Referential Perspectives of Chinese NPs*. Paris, EHESS, pp. 45–61.
- Pustejovsky, J., 1995. *The Generative Lexicon*. MIT Press, Cambridge.
- Pustejovsky, J., 1993. Type coercion and lexical selection. In: Pustejovsky, J. (Ed.), *Semantics and the Lexicon*. Kluwer, Dordrecht.
- Tai, J.H.-Y., 1990. Variation in classifier systems across chinese dialects: towards a cognition-based semantic approach. In: *Proceedings of the First International Symposium on Chinese Languages and Linguistics*, pp. 308–322.
- Tai, J.H.-Y., Chao, F.-Y., 1994. A semantic study of the classifier Zhang. *Journal of the Chinese Language Teachers Association* 29, 67–78.
- Tai, J.H.-Y., Wang, L.-Q., 1990. A semantic study of the classifier Tiao. *Journal of the Chinese Language Teachers Association* 25, 35–56.
- Tang, C.-C. J., 1990. *Extended X-bar Theory and the Chinese Phrase Structure*. PhD Thesis, Cornell University.