Conceptual Structure and Conceptualization in Chinese[*]

James H-Y. Tai
National Chung Cheng University

Conceptual structure has been the focus of research in recent years not only in cognitive grammars but also in autonomous syntactic theories concerned with mapping form to meaning. In this paper, we give a sketch of the universal basis of conceptual structure and propose a relativist view of conceptual structures underlying different languages. Spatial expressions in Chinese and English are used to explore this view. Spatial expressions in sign language are also considered to deepen our understanding of conceptual structure. We take issue with the theory of conceptual semantics advocated by Jackendoff for the past two decades. We present a view that "creativity" and "generativity" resides largely in conceptual component, and only derivatively in syntactic component. Thus, the process of "syntacticization" is essentially on a par with lexicalization. We argue that syntactic patterns reflect conceptualizations in different languages and cultures and genuine cases of syntax-semantics mismatch are greatly reduced and hence simpler syntax. We also show how pragmatic inferences can be used to simplify syntactic structure, using word order, argument selection, and contextual expressions in Mandarin Chinese as case studies. We thus propose a sketch to work out a non-autonomous theory of syntax with minimal requirement of tentative innate linguistic structure.

Key words: conceptual structure, conceptualization, spatial expressions, syntacticization, pragmatic inference, cognitive grammar, Chinese, English

1. Introduction

The central topic of linguistics is the study of the relationship between form and meaning. This relationship has proven to be complicated and enigmatic, and still

---

recalcitrant to analysis, even after centuries of efforts by linguists, philosophers, and psychologists. With the benefit of hindsight, we can now see that the source of complication resides not so much in the structure of forms as in the structure of meaning. While syntactic forms are overt and accessible to observation, semantic structures are covert and enormously richer and more complex than syntactic forms. In light of this, Chomsky (1957) was strategically justified in excluding meaning from syntactic analysis, and to focus on syntactic structure and its recursive function (thus the birth of generative grammar). At the same time, Chomsky (1957:108) was aware of the need for a "general theory of language concerned with syntax and semantics and their points of connection."

The history of syntactic studies in the past half-century in North America has witnessed a long series of trials and errors by thousands of talented minds striving for a theory for points of connection between syntax and semantics, as envisioned by Chomsky. In retrospect, there have been basically two orientations from which various approaches to the mapping between syntax and semantics have developed. One can be referred to as "syntax-based orientation", in which semantics is derived from syntax. The other can be referred to as "semantics-based orientation", in which syntax is shaped by semantic/pragmatic factors.

Since 1957, various versions of generative grammar (from classical transformational grammar to standard theory, to extended standard theory, to government-binding theory (GB), and most recently to minimalist theory with core syntax) are syntax-based, holding firmly on to the autonomy thesis of syntax. Although Chomsky and his followers have increasingly been paying attention to the semantic and pragmatic properties of natural language, the syntactic component continues to be the focus of research. They have attempted to incorporate as much as possible semantic and pragmatic information into syntactic component, resulting in a rich and complex syntactic component as well as complicated derivation from deep structure to surface structure. As correctly observed by Culicover & Jackendoff (2005), although syntactic principles appear to be simple, the actual syntactic structures ascribed to sentences are not simple. The derivation between hidden level and surface structure is also complex and abstract. The surface structures are full of complexity that cannot easily map into the phonological component. They therefore propose an alternative approach named Simple(r) Syntax Hypothesis (SSH): "The most explanatory syntactic theory is one that imputes the minimum structure necessary to mediate between phonology and meaning" (ibid. p.2). In this approach, the hidden level is not syntactic structure, but rather Conceptual Structure (Jackendoff 1983, 1990). The mapping between conceptual structure and surface syntactic structure is not through syntactic derivation, but through interface.

Semantics-based orientation was initiated in generative semantics as advocated by McCawley (1968) and Lakoff (1971). Generative semantics was later replaced by two branches of the semantics-based orientation. One is based on model-theoretic semantics. Montague grammar and categorial grammar belong to this branch.[1] The other is based on cognition-based semantics. Various approaches to cognitive grammar, such as Fauconnier (1985, 1997), Jackendoff (1983, 1990), Lakoff (1987), Langacker (1987, 1991), Tai (1989, 2002), and Talmy (2000), are built upon cognition-based semantics. A common ground of these different approaches to cognitive grammar is the assumption that meaning fundamentally resides in conceptual structure.

It is clear that in recent years both syntax-based and semantics-based orientations for the study of mapping between form and meaning have come to converge on the conceptual structure. Nonetheless, the content and nature of conceptual structure is still poorly understood. The purpose of this paper is to explore the nature of conceptual structure and its interface with basic syntactic patterns as well as fragments in discourse. Section 2 lays out the essential components of conceptual structure underlying natural languages. Jackendoff's well-known hypothesis of conceptual structure is examined with respect to spatial expressions and inferences in Chinese. We propose a modification of Jackendoff's theory by making conceptual structure the center of "creativity" and "generativity" of human languages. Section 3 puts forth the notion of syntacticization on a par with lexicalization, arguing for the derivative nature of syntax rather than its autonomy. Section 4 presents a relativist view of conceptualization with a tentative list of language-specific conceptualizations in Chinese. Section 5 uses word order, argument structure, and contextual expression to show how syntactic expressions can be simplified via pragmatic inferences in conjunction with real world knowledge. We suggest that Zipf's (1935) account of the length of words in terms of frequency can be extended to the simplification of syntactic structures. Following Horn (1984), we also suggest that syntactic structures are resultant from the compromise between speaker's economy and auditor's economy, both of which are based on Zipf's (1949) least effort principle. Section 6 concludes the paper with a rough sketch toward a non-autonomous approach to syntax.

---

[1] I have left out Generalized Phrase Structure Grammar (GPSG), Head-Driven Phrase Structure Grammar (HPSG), and Lexical-Functional Grammar (LFG) in this brief introduction. All three grammars are somehow driven by computational syntax. GPSG and HPSG assume a mono-stratum analysis, whereas Government and Binding (GB) assumes a multiple-stratum analysis. In addition, they do not see linguistic structure as mentally represented. Instead, they treat linguistic structure as objects outside of mind. Thus, on top of their syntax, they adopt model-theoretic semantics. Although LFG has a level of conceptual structure, it has never been spelt out explicitly.

2. The nature of conceptual structure

2.1 Preliminaries

To begin with, we summarize below a list of components of conceptual structure as uncovered in recent literature. Each component consists of basic elements and their relations. This list is, of course, not complete. Yet, it provides with us a rough estimation of the minimal content of conceptual structure. One of the main points to be made in this paper is that humans communicate via conceptual structure with language, be it spoken or signed language. Language only provides clues to the content and intent of communication. Therefore, relatively poor syntactic forms can convey relatively rich meanings by virtue of conceptual structure, in conjunction with pragmatic principles and knowledge of real world. It is with this perspective that this paper takes the position of simple syntax and complicated conceptual structure. The list below constitutes only a very brief and incomplete outline of conceptual components of conceptual structure underlying human languages. Their delineation would require much more space than permitted in the present paper.

1) Ontological categories such as Event, State, Place, Path, Action, Object, Property, and Amount (Jackendoff 1983, 1990).
2) Conceptual formation rules in the form of function-argument structure operated on these ontological categories and conceptual categories such as Be, Go, and Cause (Jackendoff 1983, 1990). Also the general rule of modification attributing Property to Object (Jackendoff 1983, 1990).
3) Figure/Ground segregation (gestalt psychology) and Trajector/Landmark distinction (Langacker 1987).
4) A motion event as consisting of Figure, Ground, Path, Motion, Manner, and Cause (Talmy 1985, 2000).
5) Categorization for both nominal kinds (classical theory of categorization) and for natural kinds (prototype theory of categorization, Rosch 1976, 1978).
6) Metaphorical mappings as re-categorizations for creation of new reality in both conceptual and physical worlds (Lakoff & Johnson 1980, Ortony 1993).
7) Levels of categorizations (superordinate, basic, and subordinate categories in cognitive psychology) and taxonomic hierarchies (experiential and logical).
8) Attributive concepts: male/female; alive/dead; hot/cold; good/bad.
9) Different part-whole relations: component-object (branch-tree); member-collection (tree-forest); portion-mass (slice-cake); stuff-object (aluminum-airplane); feature-activity (paying-shopping); place-area (Taiwan-Chiayi); phase-process (adolescence-growing up) (Miller 1991).

10) Object properties: animacy, humanness, shape, count/mass, rigidity; substance/ aggregate (Pinker 1989).

The components with their elements and operational mechanisms form a major part of the conceptual structure underlying human languages. Language-specific conceptualizations may vary from one language to another, but they vary on these universal conceptual axes. Differences in syntax forms among languages are partly due to language-specific conceptualizations, and partly due to different strategies of interface between syntax and conceptual structure.

2.2 Jackendoff's conceptual semantics

To explore the nature of conceptual structure, it is not only desirable, but also necessary to use Jackendoff's theory of conceptual semantics as a point of departure.[2] Central to Jackendoff's conceptual semantics is his hypothesis of conceptual structure, a level representation that mediates between syntactic structures and the perceptual world of vision and action. The level of conceptual structure is the level of mental representation at which linguistic, sensory, and motor information are compatible. It is the level where the rules of inference are made in natural languages. Conceptual structures are generated by conceptual formation rules, just as syntactic structures are generated by syntactic formation rules. Conceptual structures are linked to syntactic structures by correspondence rules. Jackendoff gives an overall organization of the mental information structure involved in language in Figure 1 below (Jackendoff 1990:16).

---

[2] There are two main reasons for this. First, among the cognitive grammarians, he is the only one who has consistently adopted a syntax-determined approach, adhering to the autonomy thesis of syntax. He also faithfully follows Chomsky's mentalistic view of cognition and innateness hypothesis. Second, Jackendoff has spent most of the past twenty years developing conceptual semantics, building on his hypothesis of conceptual structure (cf. Jackendoff 1983, 1990, 2002).
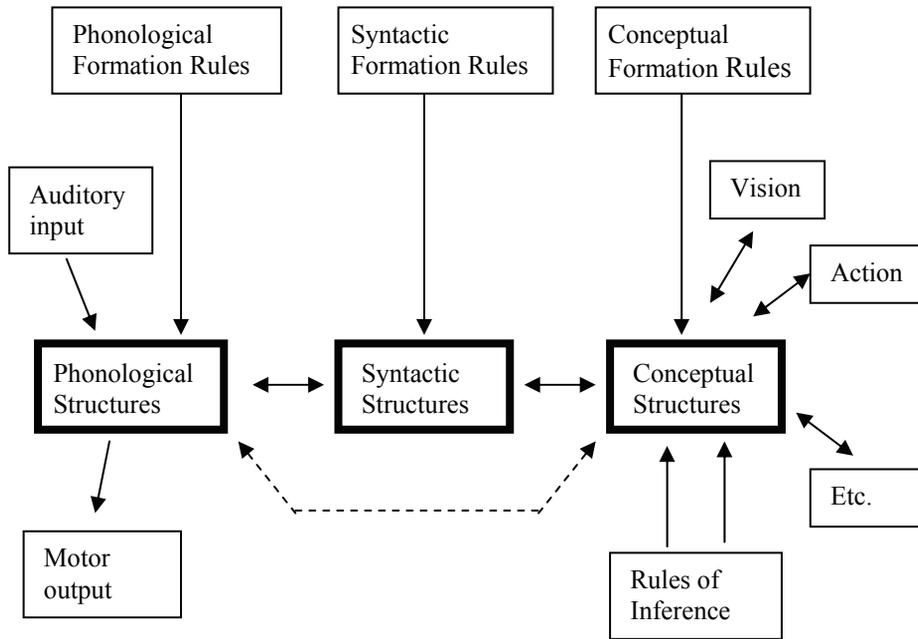
Figure 1: Organization of grammar (Jackendoff 1990:16)

Jackendoff's conceptual formation rules operate on a vocabulary of conceptual categories such as THING, PLACE, PATH, EVENT, and STATE. These conceptual categories are ontological categories in nature, and have been referred to by Jackendoff as "semantic parts of speech." Each of the conceptual categories can be further elaborated into a function-argument organization. Two of the most important conceptual formation rules formulated by Jackendoff (1990:43) for the spatial domain are presented here in (1) and (2).

(1) [PLACE] → [$_{Place}$ PLACE-FUNCTION ([THING])]

(2) [PATH] → $\begin{bmatrix} _{Path} & \begin{Bmatrix} TO \\ FROM \\ TOWARD \\ AWAY\text{-}FROM \\ VIA \end{Bmatrix} & \begin{bmatrix} \begin{Bmatrix} THING \\ PLACE \end{Bmatrix} \end{bmatrix} \end{bmatrix}$

Rule (1) says that the conceptual constituent of the category PLACE can be elaborated as a place-function, plus an argument of the category THING. The reference

object serves as an argument for the PLACE-FUNCTION to define a region. For example, in the expression *in the box*, the box designates a reference object and the preposition *in* serves as a place-function which maps the box into the region inside it. Similarly, Rule (2) elaborates on the conceptual constituent of the category PATH as one of the five functions that map THING or PLACE into PATH. For example, in the expression *to the park*, the preposition *to* serves as PATH function, mapping the reference object *park* to a PATH. It should be noted that Rule (1) deals with positional (static) spatial relations, and Rule (2) with directional (dynamic) spatial relations. For both rules, English spatial prepositions are construed as abstract functions that map reference objects into regions or paths.

2.3 Problems with Jackendoff's hypothesis of conceptual structure

Now let us take a look at the positional spatial relations in Chinese, as illustrated in sentences (3) and (4).

(3) Shu   zai   xiangzi   de   litou.
    book   at   box   DE   inside
    'The book is in the box.'
(4) Shu   zai   xiangzi   de   shangmian.
    book   at   box   DE   top
    'The book is on the box.'

It can be observed that Chinese grammar uses place words such as *litou* 'inside' and *shangmian* 'top' as head nouns to be modified by reference objects, employing the part-whole schema. If conceptual structure underlying natural languages is to be universal and closely linked to our sensory and motor systems, as Jackendoff's theory of conceptual semantics claims it is, then conceptual formation rule (1) is short of being a genuine universal conceptual formation rule. In rule (1) PLACE-FUNCTION is an abstract functor and does not reveal the part-whole schema. The part-whole schema is fundamentally important not only to the conceptual system of human language, but also to other human (primate) cognitive systems. The part-whole schema underlies spatial relations not only in Chinese but also in some Mayan languages such as Tzotzil (de Leon 1993) and Tzeltal (Brown 1994), in which the body part terms, in the form of possessive construction, are used to express different spatial positions. In fact, in these two languages, the locative word *ta* 'at' functions like *zai* in Chinese sentences (3) and (4). Furthermore, Brown (1994) and Levison et al. (2003) show that notions like IN and ON do not seem to be universal primitive holistic concepts. Furthermore, they are not

used uniformly across languages. For example, while the bird is "in the tree" in English, it is *zai shu-shang* "on the tree" in Chinese. Similarly, while the nail can be "in the door" in English, it can only be *zai men-shang* "on the door" in Chinese.

Let us further examine how directional spatial relations are expressed in Chinese. Consider the following sentences,

(5) Ta cong gongyuan chufa.
    he from park depart
    'He departed from the park.'

(6) Ta wang gongyuan zou.
    he towards park walk
    'He walked towards the park.'

(7) Ta zou-jin gongyuan.
    he walk-into park
    'He walked into the park.'

(8) Ta chuan-guo gongyuan.
    he walk-through park
    'He walked through the park.'

While directional spatial relations in (5) and (6) are expressed by coverbs (prepositional) phrases, those in (7) and (8) are expressed by resultative verb compounds. These sentence patterns are organized in terms of two mutually reinforcing conceptual schemata. They are temporal sequence and action-result schemata. In (5) and (6), the directional expressions *cong gongyuan* 'from the park' and *wang gongyuan* 'towards the park' serve to indicate the starting point of the path. At the conceptual level, the starting point precedes the action leading to the endpoint. On the syntactic plane, expressions denoting the starting point are ordered before the verb. In (7), the directional expression *jin gongyuan* 'into the park' serves to denote the endpoint of the path. Therefore, it is ordered after the main verb *zou* 'walk'. In (8), the directional expression *guo gongyuan* 'through the park' serves to denote the path itself. In our conceptual world, the starting point of a motion precedes the path. On the syntactic plane, the directional expression indicating the path is ordered after the motion verb. In both (7) and (8), the directional expression is part of the action-result verb compound, with word order following the general principle of temporal sequence, as proposed in Tai (1985). The data in (5) through (8) show that Jackendoff's conceptual formation rule (2) for spatial relations, like rule (1), is too abstract to reveal significant conceptualization of spatial relations in languages like Chinese.

Closely related to the directional spatial relations is the analysis of motion event. In his seminal works, Talmy (1985, 2000) has shown that languages code MANNER

and PATH differently. In verb-framed languages like French and Spanish, the verb incorporates the information of PATH, separating MANNER expressions from the verb. In contrast in satellite-framed languages like English and German, the verb incorporates MANNER, separating PATH expressions from the verb. Tai (2003) has shown that in Chinese action-result verb compounds such as *zou-jin* 'walk-enter', the first verb is Manner verb, and the second verb is Path verb. Chinese is neither a verb-framed not a satellite-framed language. Slobin (2004) and Huang & Tanangkingsing (2005) have developed a more elaborated semantic typology for motion events, and Chinese seems to fall into a sub-type of serial verb languages where Manner verb is placed before Path verb. Shuanfan Huang (personal communication) has pointed out to me that Slobin and his colleagues have shown that the different ways of coding MANNER and PATH in languages do affect the speakers' behavior during language-mediated tasks and thus have a direct impact on conceptualization. Thus, different ways of conceptualizing MOTION event across languages lend further support for our argument for conceptual relativity in spatial expression.

It is obvious that Jackendoff's conceptual formation rules for spatial relations are biased toward English grammar. This observation should not be surprising, for it is often the case in contemporary syntactic theories that an 'object language' tends to bias us toward a 'meta-language' that is convenient for describing the 'object language'. In Jackendoff's case, the bias is a result of his implicit desire to maximize the transparency of the correspondence between syntax and semantics via conceptual structure.

Faced with systematic differences between Chinese and English spatial expressions, there are basically two alternative approaches to modifying Jackendoff's hypothesis of conceptual structure. One alternative is to construct a universal conceptual structure based on the tentative universal conceptual elements and conceptualization principles as outlined in §2.1. This universal conceptual structure would, in part, consist of general cognitive principles of human beings, including the part-whole schema and the action-result schema. This view of conceptual structure is within the purview of Jackendoff's conceptual semantics. The approach would be able to reveal the relatively transparent syntax-semantics match-up in languages such as Chinese.[3] It would, however, still not able to make sense of the opaque syntax-semantics match-up in more syntax-based languages such as English. In this approach, we would have to find ways to translate English syntax to Chinese syntax and then to this tentative universal conceptual structure of spatial relations. As a matter of fact, Jackendoff (2002) has proposed a higher level of spatial structure, onto which conceptual structure of spatial relations is mapped. It is at this level that we form an image of the spatial relation

---

[3] See Tai 1993 for a more detailed discussion.

between two objects in the real world. Perhaps, this is the level where vision and action are mediated, rather than the level of conceptual structure as defined in Jackendoff's earlier works.

The other alternative is to allow different languages to have different conceptual structures. This amounts to the acceptance of Quine's ontological relativity, that we cannot go beyond the expressions of a language to uncover its ultimate ontological world. The merit of such an approach is that a maximal syntax-semantics match-up in each individual language can be maintained. This approach seems to be in keeping with the philosophy and methodology of cognitive grammar (Tai 2002). This relativist approach to conceptual structure would fall short of the very high goal of Jackendovian conceptual structure, the level of mental representation where innate and universal linguistic information interfaces with visual and motor information. However, with the postulation of a level of spatial structure above the level of conceptual structure as in Jackendoff (2002), different conceptualizations of spatial relations in different languages can be mapped onto universal visual representations of the spatial relations in the real world. The postulation of spatial structure allows a relativist view of conceptual structure of spatial relations and offers a solution to Quinean's relativity in language acquisition of spatial expressions. Since conceptual structures of spatial relations in different languages can be mapped onto spatial structure with different strategies, the relativist approach can be maintained without implying a relativist view of spatial cognition in the real world. We feel that at present it is more feasible and profitable for us to take a relativist approach to the relationship between syntax and conceptual structure.

2.4 Rules of inference and conceptual structure

Jackendoff's theory of conceptual semantics includes a component of "rules of inference", which map conceptual structures into conceptual structures. Included in this component are rules of logical inference, invited inference, pragmatics, and heuristics.

They are all defined over the same level of mental representation without different levels or orders of application (Jackendoff 1990:18). We would like to point out here that the rules of inferences also map our simple sentences into complicated conceptual structures through which we understand and communicate with each other.

Consider the following three sentences in Mandarin Chinese.

(9) Zhangsan zai tushuguan kan shu.
    Zhangsan at library read book
    'Zhangsan is reading in the library.'

(10) Zhangsan   zai   chuan-shang   kan   fengjing.
       Zhangsan   at   boat-on   look   scenery
       'Zhangsan is viewing scenery on the boat.'
(11) Zhangsan   zai   zhuozi-shang   xiezi.
       Zhangsan   at   table-on   write
       'John is writing at the table.'

All three sentences are action sentences with the locative *zai* phrase denoting the location of the action. In (9), the location of John's reading is the library. In (10), the location from which John views the scenery is the boat. In (11), John's writing occurs at the table. These three sentences can be characterized with the same semantic structure, in that an event occurred at some location at a certain point in time. In terms of Davidson's (1967) event analysis of action sentences, this semantic structure has the logical form: (∃e) (e be located at x) & (e occur at t). In Jackendoff's conceptual semantics, there is no semantic structure other than conceptual structure. Therefore, the semantic structure underlying these three sentences must be an element of the conceptual structure. From this conceptual structure, we can infer that the event/action occurred in some location at a certain point in time. However, if the conceptual structure is to be closely linked to human beings' motor systems and their actions in daily life, as Jackendoff wants it to be, it needs to provide more important inferences of spatial relations in these three sentences. These are inferences with respect to the locations of the participants in various actions. From sentence (9) we can infer both 'John is in the library' and 'the book is in the library'. From sentence (10) we can only infer 'John is on the boat', but not 'the scenery is on the boat'. From sentence (11) we can infer neither 'John is on the table' nor 'the characters being written are on the table'. In normal situations, from sentence (11) we can only infer that John's hands are on the table and that the characters being written are on a piece of paper. Inferences of this kind are crucial for human actions and communication. We can therefore see that not all inferences take place at the level of conceptual structure. Instead, we make many inferences based on our knowledge of the world in which we live, inferences that cannot be easily formalized using rules of logical inference. Therefore, the mental information structure as diagrammed in Figure 1 needs to include a component of knowledge of real world as shown in Figure 2 at the end of §2.5.

From (9) through (11) examples, we can also see that compared with human beings' vast knowledge of the real world, linguistic forms are extremely simplified, and so are the conceptual structures underlying sentences. Although sentences (9) through (11) encode rich information concerning locations of participants of actions, there is only one systematized conception underlying these three sentences, namely, the conception

that 'an event/action occur(s) at some location at a certain point of time'. At the level of conceptual structure, this is the only inference we can obtain. The other inferences regarding locations of participants of actions can only be retrieved from our vast knowledge of the real world, knowledge that we acquired through our experiences. Here we are tempted to venture a conjecture. While our rich knowledge of the real world is stored in long-term memory, sentences are generated in short-term (working) memory.[4] Words, phrases and sentences are merely cues for retrieving information from memory storage. In between linguistic structure and information storage lies the conceptual structure, which systematizes and simplifies detailed cognitive information stored in long-term memory. Conceptual structure uses simplified syntactic structure to express that systematization, as shown in the discussion of (9) to (11) sentences.

2.5 Meaning construction and creativity in language

In the tradition of generative grammar, meaning construction relies mostly, if not totally, on the composition of words into phrases, and phrases into sentences. The notion of "creativity" refers to native speakers' ability to combine the basic linguistic units to form an infinite set of "well-formed" novel, yet grammatical sentences. Recursive functions are built into phrase structural rules. A phrase or sentence can be therefore indefinitely long. However, the notion of 'creativity' needs to be taken at a deeper and more fundamental sense. Lakoff & Johnson (1980) have shown that everyday conventional language is largely based on metaphorical concepts. Metaphorical mappings from one domain to another domain contribute greatly to meaning construction. Metaphors such as ARGUMENT IS WAR and LOVE IS JOURNEY are part of our conceptual structure. It is based on these metaphors that we think, communicate, and act. It is also based on these metaphors that meanings of hundreds and thousands of sentences are construed. Thus, the locus of metaphors is not in language itself, but in the way we conceptualize one mental domain in terms of another. From this point of view, "creativity" of language resides in the creativity of conceptual mappings, which are open-ended. Conceptual mappings give rise to the creativity of language. They also yield conventionalized as well as innovative polysemy for words and sentences.

Fauconnier (1997:1) refers to meaning construction as "the high-level, complex mental operations that apply within and across domains when we think, act, or

---

[4] While words and idioms are stored in long-term memory, the combinatoriality of on-line generation of sentences requires working memory. See Jackendoff (2002) for a detailed discussion of the interaction between working memory and long-term memory in syntax. For conceptual structure to mediate linguistic information and vision/action, episodic memory is also crucially important.

communicate." He cogently argues that mappings between mental domains are central to meaning construction. He further identifies various types of mappings including projection mappings (metaphorical mappings), pragmatic function mappings, schematic mappings, and mental-space mappings. It is obvious that these mappings contribute greatly to our conceptual structure and they play a role as important as Jackendoff's conceptual formation rules. The incorporation of these mappings into Jackendoff's diagram, along with other factors shaping our conceptual structure such as simplification, schematization, and perspective-taking, can be shown in Figure 2.

Hsieh (1997) proposes a very insightful view regarding the mapping between form and meaning. His view can be summarized as follows.

(i)   There are many more meanings than available forms to express these meanings.

(ii)   Meanings are images that human minds create to depict our feelings and thoughts and our conceptualizations of the reality.[5]

(iii)   Syntax and semantics are two separate structures independent from each other. They are partially connected by a set of rules that map meanings to their expressions.

(iv)   Newly created images are fresh and poetic in nature, but become prosaic through conventionalization. The conventionalized images are literal meanings in our ordinary languages.[6] In other words, yesterday's poems are today's proses that provide grammatical forms.

Therefore, in addition to the various kinds of mappings identified by Fauconnier (1997), image creations also contribute greatly to conceptual structures as shown in Figure 2.

---

[5] While meanings cannot be equated with images, imagery plays an important role in meaning construction.

[6] Many conventionalized expressions are metaphorical in nature, for example, 'electric current' and other expressions in science (Ortony 1993).

```
┌─────────────┐   ┌─────────────┐   ┌─────────────┐
│ Phonological│   │  Syntactic  │   │  Conceptual │
│ Formation   │   │  Formation  │   │  Formation  │
│   Rules     │   │   Rules     │   │   Rules     │
└─────────────┘   └─────────────┘   └─────────────┘
```
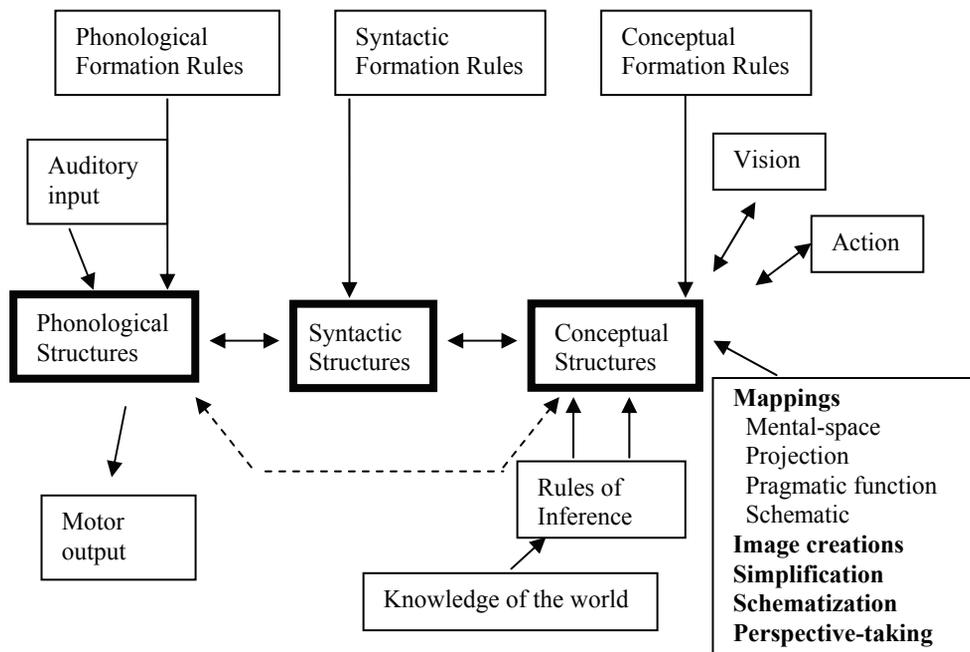
Figure 2: Modification of Jackendoff's conceptual structure

Language expressions do not reflect objective things and events in the real world, but rather through human cognitive constructions and construals (cf. Fauconnier 1997). Syntactic forms reflect human conceptualization of reality in different physical and cultural environments. There are various types of conceptualization, including (a) simplification, (b) schematization, (c) perspective-taking, (d) imagery creation, and (e) metaphorical and other kinds of mappings. Some forms of conceptualization are universal and others are language-specific. Syntactic universals are reflections of universal conceptualization, while variations across languages are reflections of language-specific conceptualizations.

2.6 Sign languages and conceptual structure

The research on sign languages over the past forty-some years has demonstrated that sign languages are natural languages produced and perceived through gestural-visual means, yet with all necessary properties that distinguish human language from animal communication systems (e.g., Stokoe 1960, Stokoe, Casterline & Croneberg 1965, Klima & Bellugi 1979, Fischer & Siple 1990, Siple & Fischer 1991, Liddell 1980, 2003). Like spoken languages, sign languages are rule-governed systems. Like spoken

languages, sign languages have elaborative systems of phonology, morphology, syntax, semantics, and pragmatics. Neurolinguistic findings in the past two decades also suggest that the brain's left hemisphere is dominant for sign languages, just as it is for spoken languages (e.g., Emmorey 2002). It is by now well established that there are two modalities for human language to be produced and perceived, namely, auditory-vocal modality of spoken languages and visual-gestural modality of signed languages (e.g., Meier, Cormier & Quinto-Pozos 2002).[7]

Let us take a look at how positional and directional spatial relations are expressed in sign languages. While spoken languages use prepositions (as in English), postpositions (as in Japanese), or place words (as in Chinese, see §2.2 above), sign languages use proforms of focal and reference objects simultaneously to show the spatial relations. Thus, the visual image in conceptual structure is iconically represented by the arrangement of proforms in sign languages. Here we use Taiwan Sign Language (henceforth TSL) to illustrate both positional and directional spatial relations in signed languages.[8]

In Talmy's analysis of events, focal and reference objects are treated as FIGURE and GROUND respectively. In (12), the handshape /TONG/ (with five fingers bent) is used as a proform for the FIGURE 'box', and the handshape /ZONG/ (with index+middle fingers pointing) is used as a proform for the GROUND 'chair'. The handshape /TONG/ is placed on the handshape /ZONG/ to show the concept 'on'.

(12)   A box is on the chair.

a. CHAIR   b. BOX   c. CHAIR$_{PRO}$+BOX$_{PRO}$-ON

Example (13) shows how TSL represents the spatial relation 'below'. Handshape /JIU/ (with palm bent), the proform for the FIGURE 'frog', is put under the handshape

---

[7] For a more detailed discussion, see Tai (2004).

[8] TSL is widely used by deaf and hearing-impaired people of Taiwan. It belongs to the Japanese Sign Language family, not the Chinese Sign Language family used in Mainland China. In Taiwan, in addition to TSL, Signed Chinese was also invented by educators for the purpose of instruction in schools for the hearing-impaired. Signed Chinese in Taiwan adopts the grammar of Mandarin Chinese and its signs are mainly Chinese character-based. Hence TSL and Signed Chinese are very different in their vocabulary and grammar.

/TONG/, the proform for the GROUND 'UMBRELLA'.

(13) A frog hid under the umbrella.

a. UMBRELLA   b. FROG   c. UMBRELLA$_{PRO}$+ FROG$_{PRO}$-BELOW

Examples (14) and (15) involve movement of focal object (FIGURE) to reference object (GROUND). As shown in (14), the predicate RUN ABOUT contains information about the movement of FIGURE (dog) in relation to GROUND (house/room). The proform for FIGURE is now represented by the ANIMAL classifier (handshape of a claw with thumb, index and middle fingers).[9] The proform for GROUND is now represented by half of the full sign for house/room.

(14) The dog is running about in the room.

a. ROOM   b. DOG   c. ROOM$_{pro}$+ANIMAL-RUN.ABOUT

As observed by Talmy (2003:233), classifier predicates in signed languages are also iconic with visual parsing in its representation of temporal progression of the path trajectory of FIGURE. We can use Talmy's example {*The car drove past the tree.*} to illustrate the point (as shown in (15)). In TSL, as in ASL, the FIGURE hand, in its pronominal form for *car*, progresses along the PATH, approaching the Ground hand, in its partial representation of the *tree* sign, passing the Ground hand. One may be tempted to think that the word order in the sentence {*The car drove past the tree.*} somehow follows the order of representation. Yet being linear in spoken languages, we cannot

---

9 For a detailed discussion of classifier predicates and proforms in TSL, see Chang, Su, and Tai (2005).

say the word *car* all the way through and beyond the word *tree*.

(15)   The car drove past the tree.

a. tree   b. tree + car   c. tree + car driving   d. car passing the tree

It can be observed in (14) and (15) that the movement of focal object to reference object along the PATH with different expressions of MANNER is visually and iconically represented in signed languages. Also, in (15), the temporal progression of the PATH is also iconically represented.

It appears that conceptual structures in sign languages can be one step closer to the level where the linguistic information and visual world interface. In other words, the correspondence between conceptual structure and spatial structure is more iconic and transparent in sign languages than in spoken languages. Questions can be raised as to the possible differences in conceptual structures in the two modes of communication. It is not clear as to what would constitute meaningful questions. Although it was pointed out by Bellugi & Fischer (1972) that the rate of speaking and that of signing are about the same, it is speculated here that in perception the spatial relations can be accessed faster in sign language than in spoken language. Otherwise, both sign language and spoken language should operate on the same set of elements and principles as outlined in §2.1. The relativist approach to conceptual structure we have adopted for the analysis of Chinese grammar should apply to both modes of communication, notwithstanding possible modality effects.

2.7 Interface between conceptual structure and the sensory/perceptual systems

Conceptual structure is the level of mental representation at which linguistic, sensory, and motor information are compatible. In previous sections, we have examined Jackendoff's conceptual primitives and formation rules from the point view of mapping conceptual structures to syntactic structures. The interface between conceptual structure and the sensory/perceptual systems is extremely complicated and deserves a lengthy and detailed discussion in a separate paper. Regrettably, we can here only cite a few works to illustrate the nature of the interaction. Jackendoff (1983: chapter 8) has shown

that the principles for grouping objects of different shapes and sizes also apply to musical groupings. This preference-rule system is also exhibited in linguistic structure. Williams (1976) examined the interface between sensory and perceptual systems through synæsthetic adjectives in the history of English. Sweetser (1990) studied the metaphorical extensions of sensory terms in European languages. Lien (1994) and Tsao (2003) uncovered some important aspects of the interaction in Chinese. It is hoped that Figures 3 and 4 can serve as very rough sketches for future heuristic explorations on the interface among different sensory and perceptual systems through linguistic expressions. Figure 3 represents a juxtaposition of Fodor's (1983) modularity hypothesis with Jackendoff's hypothesis of conceptual structure. It does not mean that we subscribe to the modularity hypothesis. Rather, we feel that the modularity hypothesis, like Chomsky's innateness hypothesis, is a very good hypothesis to work against, not to work for. In Figure 4, both signed and spoken languages are incorporated to interface with the sensory/perceptual systems.
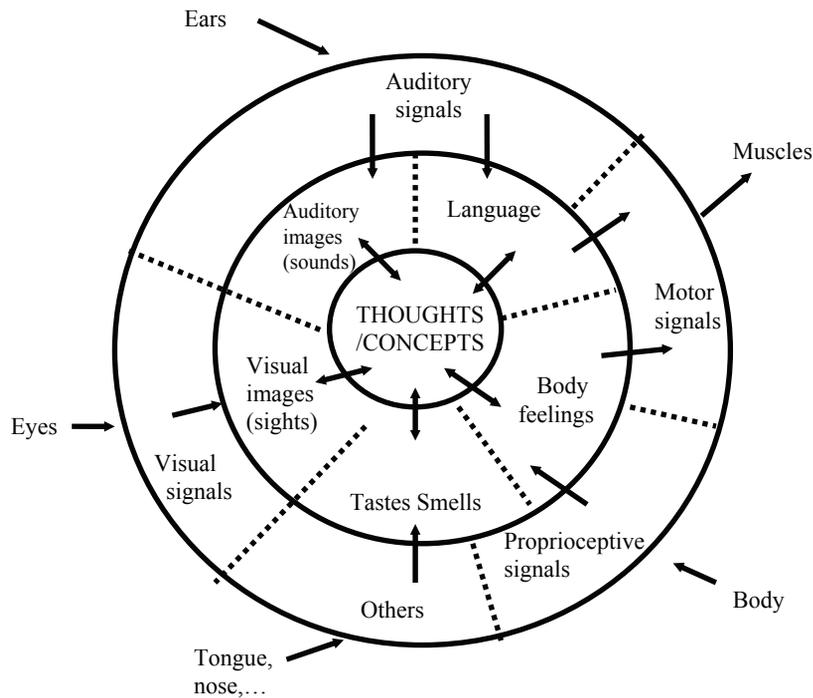

Figure 3: Interface between language and the sensory/perceptual systems (version 1)
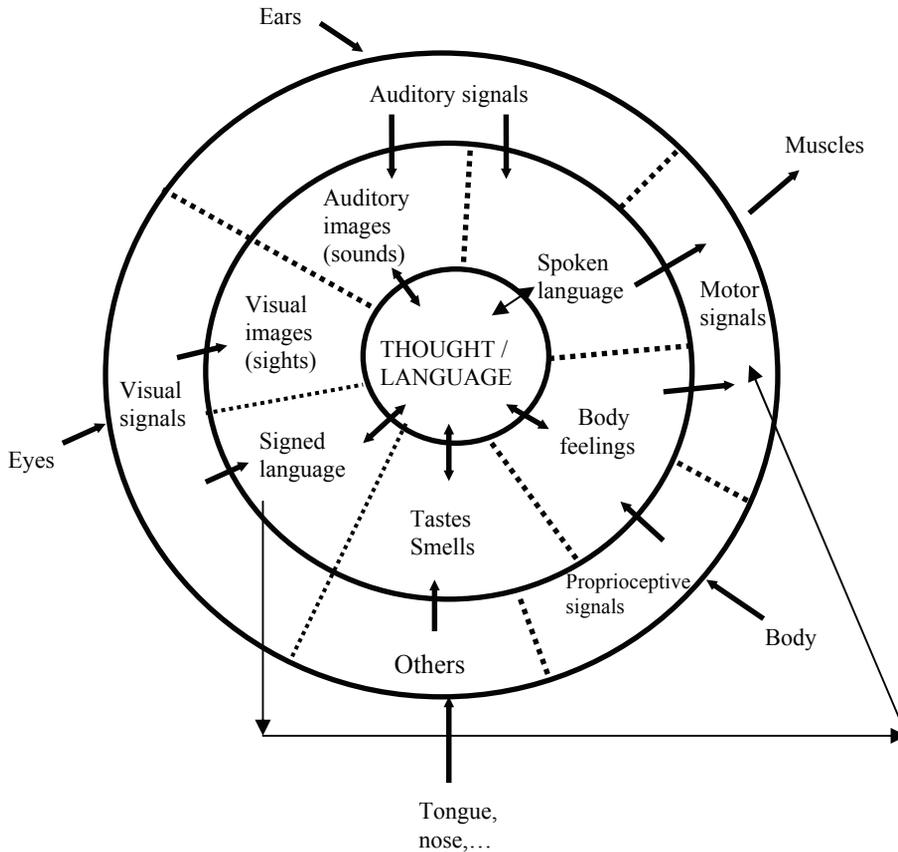
Figure 4: Interface between language and the sensory/perceptual systems (version 2)

3. Lexicalization and syntacticization of conceptual structure

As pointed out in §2.5, meaning construction by means of conceptual mappings is more fundamental than Chomsky's notion of 'creativity' of language via composition and recursive functions in the syntactic component. Conceptual mappings do not generate sentences directly, but generate new conceptual structures, each of which serves as a template for an infinite number of sentences. As a matter of fact, recursive functions in syntax can be built into the conceptual component, rather than in the syntactic component. If so, the central role of "creativity" would largely reside in conceptual structure, and syntactic structure can then be construed as an inventory of "precompiled" forms which serves to symbolize conceptual contents for purposes of communication. The inventory of syntactic forms can be systematized by syntactically well-formed conditions and lexical projection. Syntactic rules or syntactic constructions represent generalizations of

items and their relationships in language use. They do not generate forms along with meanings as assumed in generative grammar. Therefore, grammatical constructions have meanings independent of the composition of its parts (e.g., Goldberg 1995). In short, the generativity of language comes largely from mappings of conceptual structures to conceptual structures, and only derivatively from syntactic formation rules.

As delineated in Langacker's cognitive grammar, there is no clear division between lexicon and syntax. Instead, there is a continuum from opaque lexical items to semi-transparent compounds, to frozen syntactic phrases, to formulaic and idiomatic sentences, and to sentences composed from words and phrases. Syntactic forms (like lexical items) embody conventionalized imagery (Langacker 1987). Newly created images are fresh and poetic in nature, but become prosaic through conventionalization. The conventionalized images become the basis of syntactic forms in ordinary language. In other words, yesterday's poems are today's prose that provide syntactic form (cf. Hsieh 1997). On this view, many alleged syntax-semantics mismatches can be understood without stipulating *ad hoc* syntactic devices to explain them (cf. Tai 1989, 2002).

In view of the discussion in this section, the notion of "syntacticization" is proposed to be on a par with familiar notion of lexicalization as shown in Figure 5 below.
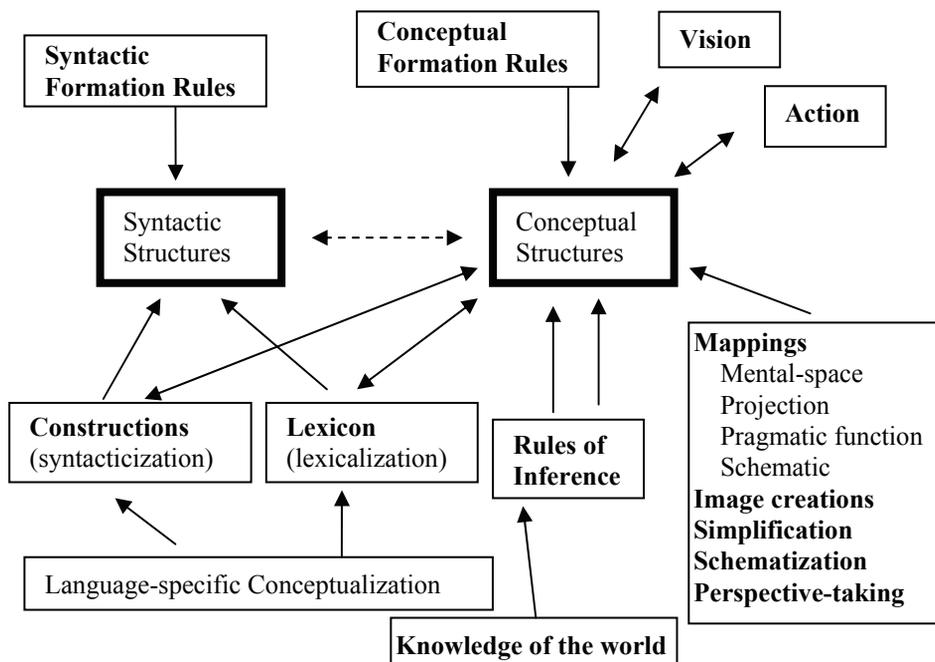

Figure 5: Lexicalization and syntacticization of conceptual structure

4. Conceptualization in Chinese grammar

Conceptual structure as proposed by Jackendoff is supposed to be universal at the level where it closely interacts with vision and action. However, our conceptualization of reality can be relative. The world contains an infinite set of discernible cognitive patterns that we have acquired and stored through our experiences with the physical world. Although human beings have the same biological make-up and live in the same physical world, it does not necessarily entail that all languages have the same principles of conceptualization. Admittedly, languages share conceptual universals, which may or may not be innate, but they also exhibit differences in conceptualization of reality. This is because human beings are endowed with a highly flexible and imaginative mind that can view the same object or situation from different perspectives, based on their experiences, inner feelings and perceptions. Therefore, some conceptualizations are universal, as in the case of 'an event/action occurs at some location at a given time' or 'X causes Y to move from location A to location B.' Other conceptualizations are, however, language-specific. Consider, for example, the following three sentences, which illustrate how the conceptual schema of action-result organizes and structures different cognitive situations in Chinese. (CLS = classifier)

(16) Ta   zou-jin   gongyuan.
     he   walk-into   park
     'He walked into the park.'
(17) Ta   da-si-le   yige   ren.
     he   hit-dead-ASP   one-CLS   person
     'He killed someone.'
(18) Ta   jin-cuo-le   men.
     he   enter-wrong-ASP   door
     'He entered the wrong door.'

The situation in (16) involves a directional spatial relation, that in (17) a causal relation, and that in (18) a situation wherein a mistake has occurred. The three situations are construed as related patterns in Chinese, sharing in common the action-result schema. This is reflected in the use of action-result verb compounds in all three sentences. In contrast, as shown in the English translations, these three situations are construed as three schemata that are reflected in three correspondingly different syntactic patterns. In situation (16), the directional preposition 'into' is used to express the spatial relationship. In situation (17), the action-result meaning is lexicalized into the action verb 'to kill' with the resultant state incorporated into the verb. In situation (18), the 'wrong' result is

attributed to the target rather than the action *per se*.

Thus, Chinese and English exhibit a systematic difference in structuring events consisting of both action and result. This systematic difference can be stated to the effect that while English structures on the action aspect, Chinese structures on the result aspect. From the perspective of linguistic relativism, the differences can be treated as reflecting ontological relativity involving events. This ontological relativity means that English speakers tend to attend relatively more to the process of an event and, in contrast, Chinese relatively more to the result (Tai 2003). In other words, while English is an agent-oriented language, Chinese is a patient-oriented language. The ontological relativity suggested here is an application of ontological relativity articulated by philosopher Quine (1960).

Here it is also worthy of noting that Quine's well-known *gavagai* example has illustrated two alternative ontological beliefs the speakers can hold about the referents of nouns. One is for nouns to refer to <u>bodies</u> of the objects, the other to <u>materials</u> of objects. This difference has already been reflected in the semantic contrast between count and mass nouns in English. Yet, the distinction does not appear to exist in classifier languages, where nouns are not inflected for plural and cannot be counted without the accompaniment of classifiers. In addition, bare nouns can indicate either definite or indefinite reference depending on context. In terms of the mass noun hypothesis (Hansen 1983, Lucy 1992), nouns in classifier languages denote materials or substances, non-discrete and unbounded, while in English and other European languages count nouns, as the default category of nouns, denote objects with discrete boundaries.[10]

Figure 6 lists some important principles of conceptualization specific to Chinese. These include: Temporal Sequence (Tai 1985), Action-Result (Tai 2003), Part-whole (Tai 1989), Topic Prominence (Li & Thompson 1983, Tsao 1979, 1990), Patient Prominence (Tai 2003), and Mass Nouns (Tai 2003). While these principles are specific to Chinese, they are not uniquely so. They are in the repository of possible conceptualization principles underlying syntactic expressions. Linguistic differences can be construed as a consequence of drawing different principles and their combinations from this repository.

---

[10] This hypothesis, if to be tested for the cognitive consequences of linguistic relativity, would predict that native speakers of classifier languages would give prominence to material or substance, while native speakers of English and other European languages would give prominence to bodies. See Lucy (1992) for an experiment on English speakers and Yucatec speakers which confirms this hypothesis.
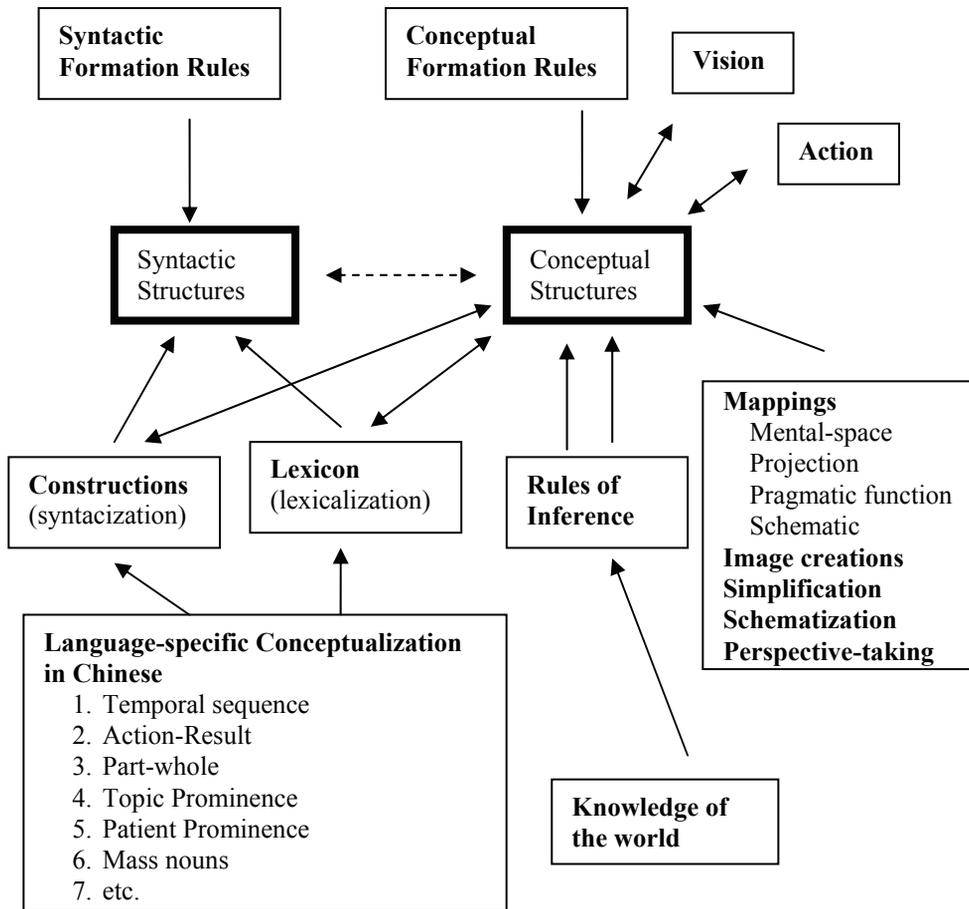
Figure 6: Lexicalization and syntacticization of conceptual structure in Chinese

Reflecting the human mind, human conceptualization in natural language is highly imaginative and creative. For example, (19) is as grammatical as (20).[11]

---

[11] The English translation given in (21) and (22) are more or less literal translations from Chinese. A more natural English translation for (21) would be: 'Sadly, his tears fell.' This is because in English, tears normally fall of their own volition and do not involve an agent (as in 'He dropped the letter into the mailbox'). For (22), the closest English translation might be: 'His sad tears fell.', but that would be in the realm of more poetic language. The difficulty of providing translational equivalents here shows precisely the inadequacy of the objectivist view of conceptual structure, and supports the relativist view of conceptual structure.

(19) Ta   shangxin-de   diao-xia-le   yanlei.
      he   sadly   drop-ASP   tear
      'He dropped tears sadly.'

(20) Ta   diao-xia-le   shangxin-de   yanlei.
      he   drop-ASP   sad   tear
      'He dropped sad tears.'

In our objective cognitive world, human beings can be sad, but not tears. Sentence (19) reflects this kind of cognition; the adverb *shangxin-de* 'sadly' describes the person's mood as his tears fell. But in our conceptual world, tears can also be sad. Thus, in (20), the expression *shangxin-de* 'sad' is used as an adjective modifying the head noun *yanlei* 'tears'. An objectivist view of meaning, which does not allow for human imagination and creativity, would treat (20) as a case of syntax-semantics mismatch.[12] But a non-objectivist view of meaning, which incorporates human imagination, would treat (19) as a more imaginative conceptualizaton than (20). In this view, there would not be a syntax-semantics mismatch. One might argue that (20) is a more poetic version of (19). However, very few native speakers feel that (20) has a poetic effect. They judge (20) as a very common and ordinary daily expression. Furthermore, expressions such as "sad tears", "warm coat", or "quilty pleasures" are compressions of causal chains according to Fauconnier's theory of compression and emergent structure (Fauconnier & Turner 2002, and in this volume).

The same can be said about a well-known case of syntax-semantics mismatch in Chinese syntax that was first discussed in Huang (1982) and has since been widely cited in other works. The case involves sentences such as (21).

(21) Ta   nian-le   sange   zhongtou   de   shu.
      he   read-ASP   three-CLS   hour   DE   book
      'He studied for three hours.'

Here, the duration expression *sange zhongtou* 'three hours' is realized as an adjective phrase modifying the head noun *shu* 'book'. Intuitively, we know that the duration expression in question denotes the duration of the action of studying, and should be realized as an adverbial phrase modifying the verb 'study'. This phenomenon has been treated as a clear case of syntax-semantics mismatch. As a result, it has received "fabulous" syntactic analyses and re-analyses within the GB framework by James Huang and others. Upon deeper reflection, one wonders whether it is a genuine case of

---

[12] See Lakoff (1987) for a detailed discussion of objectivist view of cognition and meaning.

syntax-semantics mismatch, or simply a conventionalized metonymical expression associated with activities involving reading books. It can be treated on a par with expressions such as *long books* or *boring books*. Again, they are all compressions in terms of Faconnier's theory. As with *shangxinde yanlei* 'sad tears' in (20), native speakers do not feel that the expression *sange zhongtou* 'three hours' in (21) is used metonymically or metaphorically.[13]

Similarly, consider the following sentences taken from Lakoff & Johnson (1980:8).

(22) a. You need to budget your time.
      b. I have invested a lot of time in her.
      c. He is living on borrowed time.

Here time is treated as money under the TIME IS MONEY metaphor. Of course, they are not poetic or even metaphorical to people who live in a fast-paced, modern, commercial society. But they would sound poetic to people in a culture which does not value time as a kind of concrete commodity, similar to money or gold.

We have endorsed a relativist view of conceptual structure that permits different languages to have language-specific conceptual structures, in addition to those conceptual structures that are universal. The language-specific conceptual structures are derived from different construals of the real world in different cultural experiences. This relativist view would not be able to accept a universal conceptual structure that Jackendoff has been advocating for years.

As mentioned earlier in §2.2, Jackendoff's conceptual structure is designed to be at the level where linguistic structure interfaces with visual and motor information. The question to be raised for the proposed relativist view then is: If conceptual structure is not universal, how is this highest level of interface to be achieved? One possible answer is that, contrary to the generally accepted assumption, we do not think, reason and act solely in terms of conceptual structure. Instead, we can also think, reason and act by using our knowledge of the real world that we experience. Obviously, non-linguistic primates can store spatial relations in their long-term memory, allowing them to get back to the trees they live in. There is ample evidence supporting the view that thinking is partly independent of human language. Here, it suffices to give a few simple examples as evidence. First, we all know that monkeys can reason very well without language. For instance, a monkey knows how to stand on a box and use a stick to get bananas hung too high for his reach. In addition to deceiving other monkeys, they also know

---

[13] See Hsieh (1997) and Tang (1991) for more examples of syntax-semantics mismatches. Also see Hsieh (1997) for a fresh look at several cases of syntax-semantics mismatches identified in recent literature on Chinese syntax.

how to redirect aggression. Therefore, if monkey A attacks monkey B, monkey B knows to attack a relative of monkey A as a form of retaliation.[14] Second, thinking can take place in other modalities. Artists can think using the visual modality. Music composers can think using the auditory modality. Conversely, language can be independent of thinking. Patients with Williams Syndrome can talk without making sense. Chinese Buddhists can recite transliterations of Sanskrit sutras without knowing their meaning.

Then, what is language for? It seems that language drives us to be more conscious of our thought. Language also serves to direct our attention to the part of our thoughts that we would like to articulate in order to convey those thoughts to our audience, be the audience others or ourselves. This is analogous to the fact that we need to focus our vision in order to see. Without focusing, we would *shi er bu jian* (視而不見) 'look but not see.' Similarly, we need to listen attentively in order to hear. Without attention, we would *ting er bu wen* (聽而不聞) 'listen but not hear.' In essence, visual signals need to be focused to form visual images, and auditory signals need to be focused to form auditory images. In the same vein, our thoughts need to be focused in order to form conceptual images that provide the bases for syntactic structure. Needless to say, language allows thought to be communicated and accumulated for human beings to continue expanding their knowledge and cultural activities.

5. Pragmatic inference and Chinese grammar

We have observed in §2.3 that pragmatic inferences help to map linguistic expressions into conceptual structures with which humans communicate and act. Pragmatic inferences also serve to shape linguistic forms required for effective communication. Individual languages employ different strategies of pragmatic inferences to simplify syntactic structures. Let us take a look at how pragmatics plays a role in word order in Chinese. As noted in §2.1, animacy is an object property contained in one of the sub-systems in conceptual structure. This object property is relevant for categorization in classifier systems (Allan 1977, Tai 1992), and also for word order in Chinese. When a sentence contains an animate subject and an inanimate object, native speakers of Peking Mandarin seem to accept any of the six possible orders except VSO. This can be illustrated in (23) with the intended meaning 'He ate the apple.'

---

[14] See Cheney & Seyfarth (1990) for a detailed discussion of monkeys' social behaviors.

(23) a.   Pingguo   ta   chi-le.
           apple   he   eat-Asp
           'He ate the apple.'
      b.   Ta pingguo chi-le.
      c.   Ta chi-le pingguo.
      d.   Chi-le pingguo, ta.
      e.   Pingguo chi-le, ta.
      f. *Chi-le ta, pingguo.

Note that there is a pause before the postposed subject *ta* in (23d) and (23e). The OSV order in (23a) can be taken as a sentence with topicalized object. Example (23c) illustrates the canonical SVO order. Our main concern here will be the SOV order in (23b). When both subject and object are animate, there are two scenarios. In the first scenario, the relation that the verb denotes is unlikely to be reversed. For example, in (24), in the real world, it is unlikely for the rabbit to eat the tiger. We would expect (24b) to be as acceptable as (23b). However, native speakers of Peking Mandarin still feel uncomfortable with it, even though there is no misunderstanding of the meaning of the sentence.

(24) a.   Tuzi   laohu   chi-le.
           rabbit   tiger   eat-ASP
           'The tiger ate the rabbit.'
      b. ?Laohu   tuzi   chi-le.
      c.   Laohu   chi-le   tuzi.
      d.   Chi-le   tuzi,   laohu.
      e. ?Tuzi   chi-le,   laohu.
      f. *Chi-le   laohu,   tuzi.

In the second scenario, both subject and object are animate and their relation denoted by the verb can be reversed in the real world as in the case of (25). In this situation, (25b) is ungrammatical with the intended meaning. It can only mean {*The lion ate the tiger*.}.

(25) a.   Shizi   laohu   chi-le.
           lion   tiger   eat-ASP
           'The tiger ate the lion.'
      b. *Laohu   shizi   chi-le.
      c.   Laohu   chi-le   shizi.
      d.   Chi-le   shizi,   laohu.
      e. ?Shizi   chi-le,   laohu.
      f. *Chi-le   laohu,   shizi.

Examples (23b), (24b), and (25b) taken together show that functional role word order arises to meet the need to avoid ambiguity in semantic functions such as agent vs. patient or syntactic functions such as subject vs. object. They also show that the object property of animacy plays an important role in Chinese word order. Our observation here is consistent with previous psycholinguistic findings that animacy as a validity cue weighs more than word order in the Competition Model proposed by Bates & MacWhinney (cf. Li & Bates 1993).

We now turn to argument selection in Chinese to see how pragmatics plays a role in argument selection in Chinese grammar. Consider the following verbal phrases in construction with the verb *chi* 'to eat.'

(26) Chi   niuroumian.
     eat   beaf noodles
     'Eat beef noodles.'
(27) Chi Sichuan   guan.
     eat   Sichuan   restaurant
     'Dine at a Sichuan restaurant.'
(28) Chi   da   wan.
     eat   large   bowl
     'Eat a large bowl (of food).'
(29) Chi   wanshang.
     eat   evening
     '(The banquet) is in the evening.'
(30) Chi   touteng.
     eat   headache
     '(The medicine) is for headache.'
(31) Zaijia   chi fumu,   chuwai   chi   pengyou.
     at home eat   parents   travel   eat   friends
     'One lives on his parents when at home, but on friends when traveling.'

Examples (26)-(31) show that a transitive verb in Mandarin Chinese like *chi* 'to eat', besides its regular theme object argument, can take location, instrument, time, reason, or other expressions as its object argument. Lin (2001) adopted light verb syntax proposed by Huang (1997) for Chinese and by Hale & Keyser (1991) for English to account for this and other kinds of unselected subject and object arguments in Mandarin Chinese. Thus, the surface transitive verb *chi* embedded under the empty higher light verb phrase and verb phrases containing abstract verbs such as AT, USE, or FOR. However, the formal account would not be able to explain why the transitive verb

he 'to drink' cannot have the same set of unselected object arguments as *chi* 'to eat'. It appears that eating is such an important activity in Chinese culture, and for communicative efficiency, its syntax is simplified with rich pragmatic inferences. In a frequency count by Tao (2000), the frequency of *chi* is much higher than *he* and other related verbs. In terms of Zipf's (1935) law, the more frequently a word is used in a language, the shorter the word. We can extend this law from the length of a word to the length of a phrase or sentence.

Now we turn to contextual expressions in Mandarin Chinese. Clark & Clark (1979) propose a pragmatic treatment of English denominal verbs such as 'to water' and 'to skin'. They treat innovative denominal verbs as in 'to porch a newspaper' and 'to Houdini one's way out of a closet' as contextual expressions, which are distinguished from denotational expressions (man, walk) and indexical expressions (he, there, the bachelor). Denotational expressions: fixed sense and denotation. Indexical expressions: fixed sense and denotation, but a shifting reference. Contextual expressions: shifting sense and denotation (an indefinite number of senses, depending on context and cooperation between speaker and listener). Although there is a paucity of denominal trantisitve versbs in Mandarin Chinese (Tai 1997), the language has a high productivity of innovative denominal intransitive verbs. This can be illustrated by the following examples.

(32) Zhe ge ren hen jiche.
    this Cl. person very motorcycle
    'This person is lacking (in some respect, depending on context of use).'

(33) FIN.K.L de Taiwan yinxiang hen jiche. (China Times 1999.7.10)
          GEN impression very JICHE
    'FIN.K.L's impression of Taiwan is quite negative.'

(34) Daxue hen jiche. (China Times 2004.11.10)
    university
    'There are too many motorcycles running around the university.'

(35) Zuotian Zhanghua huochezhan hen Ouzhou.
    yesterday ZH train-station very Europe
    'Yesterday Zhanghua train-station was full of European atmosphere.'

(36) Tamen bi Lidenghui geng Lidenghui.
    They compare LDH even more LDH
    'They are more of Li Denghui's spirit than Li Denghui himself.'

(37) Zhongzheng jintian hen huaxue.
    CCU today very chemistry
    'Today CCU is of chemistry.'

(38) Huang Shuanfan de   xuesheng yiding   hen   Huang Shuanfan.
     SFH   GEN   student   certainly very   SFH
     'Huang Shuanfan's students certainly behave like Huang Shuanfan in some
     manner (depending on the context of discourse).'

Zipf (1949) proposes the principle of least effort for all kinds of human behaviors, including language use. However, he notices that there are actually two competing forces in language use. On the one hand, there is the Force of Unification in the interest of Speaker's Economy. On the other hand, there is the Force of Diversification in the interest of Auditor's Economy. In a very insightful paper, Horn (1984) has demonstrated that these two competing forces are largely responsible for Grice's conversational maxims and pragmatic inference derived therefrom.

In our daily conversations, we use more fragments of segments than full sentences. For example, the following exchange is typical between the bar-tender (A) and a regular customer (B).

(39) A: The usual?
      B: The usual.

Four types of interface between fragments and conceptual structure can be identified: identity deletion, implication, interpretation, and conversational implicature. They can be illustrated by the following conversation. (ASP = aspect marker, Q = question particle)

(40) A: Ni   zuotian   wanshang   he   jiu   le   ma?
          you   yesterday evening   drink wine ASP   Q
          'Did you drink last night?'
      B: (i)   He   le.   (identity deletion)
                drink   ASP
                'Drank.'
          (ii) Zui-dao   le.   (implication)
                drink-fall   ASP
                'I got drunk.'
          (iii) Gen Lao-Wang qu   le   Brown Sugar. (interpretation)
                with Old-Wang go   ASP   Brown Sugar
                'I went to Brown Sugar with Old Wang.'
          (iv) Yujin   le   Lao-Wang.   (conversational implicature)
                run-into ASP   Old-Wang
                'I ran into Old Wang.'

6. Conclusion

In this paper, we propose a view of conceptual structure that departs from the I-language-based generative grammar as developed by Jackendoff (1990), and that concurs with the E-language-based cognitive grammar as developed by Langacker (1987). In this view, the central role of "creativity" resides in the conceptual component rather than in the syntactic component, as has been assumed in generative grammar since its inception. Various kinds of mappings (e.g., metaphorical, pragmatic function, mental space) in conceptual structure contribute greatly to the creativity of language. Furthermore, syntactic structure is construed as an inventory of "precompiled" forms that serve to symbolize conceptual contents for purpose of communication.

Syntactic forms reflect human conceptualization of reality in different physical and cultural environments. Some forms of conceptualization are universal and others are language-specific. Syntactic universals are reflections of universal conceptualization, while variations across languages are reflections of language-specific conceptualizations. Conceptualization specific to Chinese includes temporal sequence, action-result, part-whole, topic prominence, patient prominence, and mass nouns. In essence, we propose cognitive relativism for further verification by psycholinguistic experiments (Tai 2003).

With respect to the autonomy thesis of syntax in generative grammar, we propose a non-autonomous approach to syntax, which comprises the following set of principles:

A. Principles based on human perceptual and cognitive categories
B. Principles based on human processing/problem-solving strategies
C. Conversational Principles (e.g., speakers' minimization of effort, hearers' maximization of information)
D. Putative "innate" principles governing structures and operations specific to language faculty. (These principles are not necessarily of genotype.)

In terms of strategy, the proposed modification of Chomsky's innateness hypothesis represents a minimalist approach to linguistic innateness. The first four sets of principles form the foundation of a cognition-based functional approach to Chinese grammar as proposed in Tai (1989). Principles in A and B are cognition-based, while principles in C are functional communication principles and are in line with Zipf's law of least effort and Gricean conversational principles (Horn 1984). We feel confident that future research on the least-effort principle along with principles of avoiding ambiguities (including the principle of isomorphism) would make "Simple(r) Syntax" proposed by Culicover & Jackendoff (2005) even simpler.

References

Brown, Penelope. 1994. The INs and ONs of Tzetal locative expressions: the semantics of stative descriptions of location. *Linguistics* 32.4-5:743-90.

Chang, Jung-hsing, Shiou-fen Su, and James H-Y. Tai. 2005. Classifier predicates reanalyzed, with special reference to Taiwan Sign Language. *Language and Linguistics* 6.2:247-278.

Cheney, Dorothy L., and Robert M. Seyfarth. 1990. *How Monkeys See the World*. Chicago: University of Chicago Press.

Chomsky, Noam. 1957. *Syntactic Structures*. The Hague: Mouton.

Culicover, Peter, and Ray Jackendoff. 2005. *Simpler Syntax*. Oxford: Oxford University Press.

Davidson, Donald. 1967. The logical form of action sentences. *The Logic of Decision and Action*, ed. by N. Rescher, 81-85. Pittsburgh: University of Pittsburgh Press.

de Leon, L. 1993. Shape, geometry and location: the case of Tzotzil body part terms. *CLS* 29.2:77-90. Chicago: Chicago Linguistic Society.

Emmorey, Karen. 2002. *Language, Cognition, and the Brain: Insights from Sign Language Research*. Mahwah: Lawrence Erlbaum Associates.

Fauconnier, Gilles. 1985. *Mental Spaces: Aspects of Meaning Construction in Natural Language*. Cambridge: MIT Press.

Fauconnier, Gilles. 1997. *Mappings in Thought and Language*. Cambridge: Cambridge University Press.

Fauconnier, Gilles, and Mark Turner. 2003. *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (paperback edition). New York: Basic Book.

Fischer, Susan D., and Patricia Siple. (eds.) 1990. *Theoretical Issues in Sign Language Research*, Vol. 1: *Linguistics*. Chicago: University of Chicago Press.

Fodor, Jerry A. 1983. *The Modularity of Mind*. Cambridge: MIT Press.

Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.

Hansen, C. 1983. *Language and Logic in Ancient China*. Ann Arbor: University of Michigan Press.

Horn, L. R. 1984. Toward a new taxonomy for pragmatic inference: Q-based and R-based implicature. *Georgetown University Round Table on Languages and Linguistics 1984*, ed. by Deborah Schiffrin. Washington, DC: Georgetown University Press.

Hsieh, Hsin-I. 1997. Form and meaning: their distinction, intersection, and interplay. *Tsing Hua Journal of Chinese Studies*, New Series 27.1:103-123.

Huang, C.-T. James. 1982. *Logical Relation in Chinese and Theory of Grammar*.

Cambridge: MIT dissertation.

Huang, Shuanfan, and Michael Tanangkingsing. 2005. Reference to motion events in six western Austronesian languages: toward a semantic typology. *Oceanic Linguistics* 44.2:307-340.

Jackendoff, Ray. 1983. *Semantics and Cognition.* Cambridge: MIT Press.

Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge: MIT Press.

Jackendoff, Ray. 2002. *Foundations of Language: Brain, Meaning, Grammar, Evolution.* Oxford: Oxford University Press.

Klima, Edward, and Ursula Bellugi. 1979. *The Signs of Language*. Cambridge: Harvard University Press.

Lakoff, Geoge. 1971. On generative semantics. *Semantics: An Interdisciplinary Reader in Philosophy Linguistics and Psychology*, ed. by D. Steinberg and L. Jakobovits, 232-296. Cambridge: Cambridge University Press.

Lakoff, George. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal about the Mind*. Chicago: University of Chicago Press.

Lakoff, George, and Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.

Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*, Vol. 1. Stanford: Stanford University Press.

Langacker, Ronald W. 1991. *Foundations of Cognitive Grammar*, Vol. 2. Stanford: Stanford University Press.

Levinson, Stephen, and Sergio Meira. 2003. The language and cognition group: 'natural concepts' in the spatial topological domain-adpotional meanings in crosslinguistic perspective: an exercise in semantic typology. *Language* 79.3:485-516.

Li, Ping, Elizabeth Bates, and Brian Macwhinney. 1993. Processing a language without inflections: a reaction time study of sentence interpretation in Chinese. *Journal of Memory and Language* 32.2:169-192.

Li, Charles, and Sandra A. Thompson. 1981. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.

Lien, Chinfa. 1994. Synaesthetic words in Southern Min: their semantic structure and change. *Chinese Languages and Linguistics II: Historical Linguistics*, ed. by Paul Jen-kuei Li et al., 421-451. Taipei: Institute of History and Philology, Academia Sinica.

Liddell, Scott K. 1980. *American Sign Language Syntax*. The Hague: Mouton.

Liddell, Scott K. 2003. *Grammar, Gesture, and Meaning in American Sign Language*. Cambridge: Cambridge University Press.

Lin, Tzong-Hong. 2001. *Light Verb Syntax and the Theory of Phrase Structure*. Irvine:

University of California, Irvine dissertation.

Lucy, John A. 1992. *Grammatical Categories and Cognition: A Case Study of the Linguistic Relativity Hypothesis*. Cambridge: Cambridge University Press.

McCawley, James D. 1968. The role of semantics in a grammar. *Universals in Linguistic Theory*, ed. by E. Bach and R. Harms, 125-170. New York: Holt, Rinehart and Winston.

Meier, R. P., K. Cormier, and D. Quinto-Pozos. (eds.) 2002. *Modality and Structure in Signed and Spoken Languages*. Cambridge: Cambridge University Press.

Ortony, Andrew. (ed.) 1993. *Metaphor and Thought* (2nd edition). Cambridge: Cambridge University Press.

Pinker, Steven. 1989. *Learnability and Cognition*. Cambrdige: MIT Press.

Quine, William V. O. 1960. *Word and Object*. Cambrdige: MIT Press.

Siple, Patricia, and Susan D. Fisher. (eds.) 1991. *Theoretical Issues in Sign Language Research*, Vol. 2: *Psychology*. Chicago: University of Chicago Press.

Slobin, Dan. 2004. The many ways to search for a frog: linguistic typology and the expression of motion events. *Relating Events in Narrative: Typological and Contextual Perspectives*, ed. by Sven Stromqvist and Ludo Verhoeven, 219-57. Mahwah: Lawrence Erlbaum Associates.

Stokoe, William C. 1960. *Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf*. Buffalo: Department of Anthropology and Linguistics, University of Buffalo.

Stokoe, William C., D. C. Casterline, and C. G. Croneberg. 1965. *A Dictionary of American Sign Language on Linguistics Principles*. Washington, DC: Gallaudet University Press.

Sweetser, Eve. 1990. *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press.

Tai, James H-Y. 1985. Temporal sequence and Chinese word order. *Iconicity in Syntax*, ed. by John Haiman, 49-72. Amsterdam: John Benjamins.

Tai, James H-Y. 1989. Toward a cognition-based functional grammar of Chinese. *Functionalism and Chinese Grammar*, ed. by J. Tai and F. Hsueh, 186-226. Chinese Language Teachers Association Monograph Series No. 1. South Orange: Chinese Language Teachers Association.

Tai, James H-Y. 1993. Conceptual structures of Chinese spatial expressions. *CLS* 29.2:347-362. Chicago: Chicago Linguistic Society.

Tai, James H-Y. 2002. Temporal sequence in Chinese: a rejoinder. *Form and Function: Linguistic Studies in Honor of Shuanfan Huang*, ed. by Lily I-wen Su, Chinfa Lien, and Kawai Chui, 331-351. Taipei: Crane.

Tai, James H-Y. 2002.〈概念結構與非自主性語法：漢語語法概念系統初探〉，

《當代語言學》4.1:1-12。[Conceptual structure and non-autonomous syntax with special reference to conceptualization in Chinese grammar. *Contemporary Linguistics* 4.1:1-12.]

Tai, James H-Y. 2003. Cognitive relativism: resultative construction in Chinese. *Language and Linguistics* 4.2:301-316.

Tai, James H-Y. 2005. Modality effects: iconicity in Taiwan Sign Language. *Festschrift in Celebration of Professor William S-Y. Wang's Seventieth Birthday*. Taipei: Institute of Linguistics, Academia Sinica.

Talmy, Leonard. 2000. *Toward a Cognitive Semantics*, Vol. 1 & 2. Cambridge: MIT Press.

Talmy, Leonard. 2003. The representation of spatial structure in spoken and signed language: a neural model. *Language and Linguistics* 4.2:207-250.

Tang, Ting-chi. 1991. Incorporation in Chinese syntax. *Tsing Hua Journal of Chinese Studies*, New Series 21.1:1-63, 21.2:337-376.

Tao, Hongyin. 2000. 'Eating' and emergent argument structure. *Yuyan Yanjiu* 2000.3: 21-38.

Tsao, Feng-fu. 1979. *A Functional Study of Topic in Chinese: The First Step towards Discourse Analysis.* Taipei: Student.

Tsao, Feng-fu. 1990. *Sentence and Clause Structure in Chinese: A Functional Perspective.* Taipei: Student.

Tsao, Feng-fu. 2003. The five senses and their metaphorical extensions. *Lingua Tsing Hua: A 20th Anniversary Commemorative Anthology*, ed. by Hsin-chin Liou et al., 169-184. Taipei: Crane.

William, Joseph M. 1976. Synaesthetic adjectives: a possible law of semantic change. *Language* 52.2:461-478.

Zipf, George K. 1935. *The Psycho-biology of Language: An Introduction to Dynamic Philosophy.* Boston: Houghton Mifflin.

Zipf, George K. 1949. *The Least Effort Principle in Human Behaviors.* Boston: Houghton Mifflin.

Graduate Institute of Linguistics
National Chung Cheng University
Minhsiung, Chiayi 621, Taiwan
lngtai@ccu.edu.tw

概念結構與漢語概念化

戴浩一

國立中正大學

　　概念結構與語法的對應關係是當代不同語法學派都需要認真面對的課題。本文探討人類語言概念結構的基本組成部分，並以漢語語法為例，提出語法會大量反映概念化，如同詞彙。本文並提出語法相對論：不同語言可以有相同概念化原則，也可以有不同概念化原則；相同的語法反映相同的概念化，不同的語法反映不同的概念化。本文認為語言的「創造性」大部分源於概念結構的衍生，只有小部分源於句法結構的衍生；而句法與詞彙一樣，都是個別語言概念化的呈現。本文因此提出非自主性語法的哲學基礎與研究策略，進一步探求語言的異同及語言天生的認知機制。

關鍵詞： 概念結構，概念化，空間關係，句法化，語用推理，非自主性語法，漢語，英語