

## **Verbs of Contact by Impact in English and Their Equivalents in Mandarin Chinese**

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This paper explores semantic components of English Verbs of Contact by impact and identifies Contact, Motion, Force, Body Part, Sound Source, Frequency, and Instrument as conflated sense attributes of these verbs. The Mandarin Chinese equivalents of these verbs were collected from English-Chinese dictionaries. Some Chinese equivalents are monomorphemic words while many others are polymorphemic compounds and phrases. The semantic, morphological, and syntactic organizations of the Chinese equivalents show that many of the conflated semantic components in English are realized explicitly as nouns for Body Part or Instrument and as adverbs for Frequency. The formalized syntactic constructions of the Chinese equivalents are illustrated and discussed. The comparison of the two languages shows that some concepts are lexicalized in both languages and others are lexicalized in one or the other. Such a difference in lexicalized items is a challenge to the construction of bilingual word networks. In addition, from the prevalent appearance of the Chinese word *dǎ* in the sense of hitting, the concept of “word family” is proposed as an important element in understanding semantic relations and in building word networks in Chinese.

Key words: Contact, Motion, Force, Body Part, Sound Source, Frequency, Instrument, conflated semantic components, lexicalization, word family

### **1. Introduction**

Based on other researchers' work (Dixon 1991, Dowty 1991, Fillmore 1968, 1970, 1977a, 1977b, Guerssel, et al. 1985, Jackendoff 1990, Pinker 1989, Richardson 1983, Ruhl 1972, 1989, Sehnert and Sharwood-Smith 1973, Snell-Hornby 1983, Styan 1984), Levin in her book *English Verb Classes and Alternations* (1993) defines a class of verb as “Verbs of Contact by Impact” that includes four sub-classes of verbs: Hit Verbs, Swat Verbs, Spank Verbs, and Non-Agentive Verbs of Contact by Impact (Levin 1993:148-156). We find two of them, Hit Verbs and Spank Verbs, more cross-linguistically interesting, especially when compared with their Mandarin Chinese equivalents. In this paper we shall focus our discussion on these two sub-classes. The members of these classes include the following verbs:

**Hit Verbs:** bang, bash, batter, beat, bump, butt, dash, drum, hammer, hit, kick, knock, lash, pound, rap, slap, smack, smash, strike, tamp, tap, thump, thwack, whack

**Spank Verbs:** belt, birch, bludgeon, bonk, brain, cane, clobber, club, conk, cosh, cudgel, cuff, flog, knife, paddle, paddywhack, pummel, sock, spank, strap, thrash, truncheon, wallop, whip, whisk

According to Levin (1993:150-152), these verbs were grouped together as one class because syntactically they have the same set of frame involved. For instance, both groups of verbs are found in the “NP V NP with NP” pattern. They are grouped into two subclasses because the syntactic alternations illustrated by Levin (1993:25-109) are not shared by all members of the class; some alternations apply to all and some apply to only some members. Semantically, these verbs share a kernel of meaning. It is suggested that these semantically coherent verbs set up semantic restrictions on their syntactic alternations.

Besides the characteristics of the senses of contact by impact as indicated in the name given by Levin to the class, we find that these verbs are typical Verbs of Physical Action. They have a dominant agentive meaning encoded in the basic forms of the verbs, which are called “verb roots” in Talmy (1985:102-107) and “verb lemmas” in *WordNet* (Miller et al. 1990, Princeton University 1997, Fellbaum 1998). A general description of an event depicted by such a verb is “moving one entity in order to bring it into contact with another entity” (Levin 1993:150). This shows that each verb in both classes contains notions of Motion and Contact (Gao 2001a). These notions are embedded within the verb as the basic components of its semantic properties. Also, other components, such as Instrument, Force, Sound Source, and Body Part, may also be conflated in the verb root.

The various types of information encoded in the English verb root are encoded in the Chinese equivalents in different elements that combine to build an expression to describe an action event. Therefore, to illustrate what constitutes this particular type of verbal event that may be included in the two languages in question, it is practical to take English as the source and Chinese as the corresponding target for our comparison.

## 2. The English Verbs of Contact by impact

The essence of Levin’s hypothesis (1993:11-15) for English verb classification is the following: If the members of a class exhibit the same syntactic behavior, then they can be expected to share some meaning components; or, if the members of a class share some meaning components, then they can be expected to exhibit the same syntactic

behavior. Following this guideline, to take a look at the class of verb termed by Levin as “Verbs of Contact by Impact” (Levin 1993:148-156), we find that all the class members are agentive verbs that require at least two arguments for the sentence construction. The agent of the action mostly can only be an animate entity. This is one of the common features of this class of verb. Such a constraint reveals the fact that these verbs are typical Verbs of Physical Action that entail a certain body part of a subjective agent to enter into a direct or indirect contact with an objective patient (Gao 2001a). The compulsory agentive animate subject frames the syntactic structure as transitive verbs taking at least two arguments expressed as subject and object. It also makes the agent-patient pattern that describes an agent affecting a patient. Moreover, the key character that “Verbs of Direct Physical Contact” share is an act that causes a certain body part to have direct contact with the object involved (Gao 2001b).

The meaning components shared by this class of verb carry the notions that are characteristic of verbs of physical action in general (e.g., Body Part, Motion, Contact, Force, and Instrument). In particular, the instrument information is often explicitly encoded by the use of verb forms that are derived without variation from the instrumental nouns (e.g., *belt*, *club*, *drum*, *hammer*, *knife*, *whip*). These forms serve to specify the instrument and the agent’s body part involvement. For instance, once we know that the action of *hammer* is done with the instrument, hammer, we can understand that the part of the body that uses the instrument is implicitly the hand. For example, ‘He hammered the nail so hard that his hand hurt’.

Essentially, these notions normally restrict the functions of this class of verb to the description of the activities done by animate beings, rather than by any other type of agent. It is true that some basic verbs in the class, such as, *hit*, *strike*, and *beat*, are polysemous to such an extent that certain senses can refer to the descriptions of those actions done by inanimate agents (e.g., ‘The storm hit Hong Kong’, or ‘Hail was hammering down onto the roof’). When these verbs are used to describe actions done by inanimate agents, their senses used are either beyond the meaning scope of this class or metaphorical expressions of one type or another, as shown by the examples given above.

## 2.1 Syntactic “synonyms”

According to Levin, verbs that are grouped into one class are syntactic “synonyms” (Levin 1993:21). From Levin’s illustrations we find Hit and Spank verbs share certain syntactic alternations. These two subclasses of verbs are all found in the “NP V NP with NP” pattern:

Paula hit the fence with the stick.

Paula spanked the naughty child with her right hand.

They also have the Body-part Possessor Ascension alternation:

Paula hit Deirdre on the back.

Paula hit Deirdre's back.

Paula spanked the naughty child on the back.

Paula spanked the naughty child's back.

However, Spank verbs do not follow the “NP V NP *against* NP” pattern, which Hit Verbs do:

Paula hit the stick against the fence.

\*Paula spanked against the naughty child with her right hand.

These are some of the syntactic arguments for making a subclass distinction of Hit and Spank verbs. As we are interested in the sense components of these verbs, we shall not discuss the syntactic alternations further. Instead, we shall examine the semantic components of these verbs.

## 2.2 Synonym sets

Intuitively, we feel that not all verbs of the two classes are so closely related in meaning that they can belong to the same semantic classes. It seems that the English verbs grouped together based on shared syntactic behavior may not necessarily share all their semantic attributes. In other words, these verbs share some attributes but not all. Thus, they may not show a systematic picture of the organization of the shared lexical meaning components. As Levin agrees, this lack of semantic structure reflects the preliminary nature of the investigation. However, the author welcomes an open investigation to see “whether a complete hierarchical organization of English verb classes is possible or even desirable” (Levin 1993:23).

To illustrate how these words grouped into one class based on their syntactical features are related to one another in their semantic properties, an attempt has been made to show a complete hierarchical organization of the class members based on *WordNet* knowledge (Miller et al. 1990, Princeton University 1997, Fellbaum 1998). Our aim of using *WordNet* for the ranking was to see if a rich lexical database organized on the basis of the semantic hierarchical relations of words can demonstrate the semantic

correlations of Levin's organization of verbal classes. Not surprisingly, we did not find such a relation among all members of a single class. This is because most of the verbs in the class are not synonyms. Some of them, *kick* and *knife* for instance, can hardly be even called far-synonyms. However, according to Levin, these verbs must share some semantic relations. When the first attempt failed, we decided to put all the verbs of the two subclasses together and carried out a step-by-step non-straightforward search for a hyponymy relation among all the class members in the *WordNet* database.

We used the *WordNet* online interface and performed three search types step by step: 1) "overview", 2) "hypernyms", and 3) "synonyms, ordered by similarity". In performing the "overview" search, we easily found the right sense for each verb. However, in performing the "hypernym" search, we could not find for every verb its immediate hypernym that also belongs to the class. When the immediate hypernym search for a verb failed, we turned to search for its synonyms. After finding out its synonyms, we went back to the first two searches to find which of its synonyms have an immediate hypernym that belongs to the class. For some verbs, we repeated the search steps more than once before we found its hypernym within the class. Obviously hierarchies ranked in such a way would show that *WordNet* does not provide direct information for the semantic relation of a class of words grouped together with semantic constraints as a secondary consideration. Nevertheless, they do enlighten the underlying conceptual relations among the members of the class, as will be shown in Table 1 below. Furthermore such a search procedure brings out some significant information:

First of all, these members of the class could not be ranked in a single hierarchy to display their hypernym-hyponym relations. It turned out that two main hierarchies could be formed and various groups of hyponyms could be ranked in a conceptually guided and semantically related fashion. In the leading positions of the hierarchies could be *hit* and *strike* rather than *hit* and *spank*. This shows that these two verbs are the first level hypernyms in terms of hypernym-hyponym relations, or the "basic verbs" (Huang 2001) of the class in terms of synonymy relations. They introduce and represent the dominant features of the class in such relations. This finding made it possible for us to see the underlying conceptual relations among the class members.

The last step search of the *WordNet*: "synonyms, ordered by similarity" gives us a clearer picture of the synonymous relations among most members of the classes. There are 24 words listed in the Hit Verb class and 25 words in the Spank Verb class. Eighteen members of Hit Verbs and 12 members of Spank Verbs are found to be directly linked to one, or two, or even three members of the class as synonyms in the *WordNet* database. We also find that eight verbs (see those verbs preceded by an asterisk below) are synonyms of the cross-class members. Some of the verbs are the synonyms of more than one verb (e.g., *knock*, *thump*, *whip*, etc.). See the lists of the synonyms below:

Synonyms ordered by similarity:

**Hit Verbs**

bash, \*sock, bonk  
beat, pound, thump  
bump, knock  
clobber, batter  
drum, beat  
hit, strike  
\*whip, lash, \*flog  
smack, thwack  
smash, dash  
tap, rap, knock  
thump, pound  
whack, \*wallop

**Spank Verbs**

cane, flog  
club, bludgeon  
clobber, thrash  
flog, whip, \*lash, strap  
paddle, spank  
sock, bonk, \*bash  
\*whack, wallop  
\*whip, lash  
whisk whip

The synonymous relations found between the members of the classes can be considered as the strongest support for Levin's hypothesis that verbs of one class are semantically coherent. Those verbs that do not find their synonyms in their own class but in the other subclass may also be considered relevant regarding semantic relations, since after all the verbs in the two subclasses belong to one class. However, the counter-examples, such as *butt*, *kick*, *tamp* of Hit Verbs and *cuff*, *knife*, *pummel* of Spank Verbs, may not help complete the picture; they do not seem to belong to the class, though they are all found to have the basic verb *hit* or *strike* as their immediate hypernym. This shows that these verbs are not closely related with regard to semantic relations.

Ultimately, the non-synonymous members of the class attest that in Levin's classification the probe for linguistically relevant aspects of verb meaning in the determination of semantically coherent verb classes is based on syntactic behavior, or verb alternations, but not purely on semantic properties. However, according to Levin (1993:11-15), members of a class also share semantic components, but the number of synonyms, though including large members of the class, does not seem to satisfy us sufficiently. This shows that Levin's principles for verb classification may not provide an adequate approach when it comes to dealing with the subtleties of meaning properties and semantic relations of a verb class, even though such an approach in the classification of English verbs in general has proven to be successful and has been used as a research tool for investigating lexical items.

## 2.3 Meaning components

Regardless of the classification principles, if we turn our attention to the linguistically relevant aspects of verb meaning, we find that all members of the two subclasses share certain meaning components that are found to be conflated within the verb root. For example, *hit* and *strike* are explained as follows in some dictionaries:

**Hit:** to bring your hand, or an object you are holding, against somebody/something quickly and with force.

**Strike:** to hit something hard or with force. (*Oxford Advanced Learner's Dictionary of Current English*—Wehmeier 2000)

**Hit:** If you hit someone or something, you deliberately touch them with a lot of force, with your hand or an object held in your hand.

**Strike:** If you strike someone or something you deliberately hit them. (*Collins Cobuild English Dictionary for Advanced Learners*—Sinclair 2001)

The use of hand in the definition of *hit* indicates the meaning component of Body Part. We generalize 'touch' as Contact, 'force' as Force, and 'bring...quickly' as speedy Motion. The word *bang* has the following definition:

**Bang:** to hit something in a way that makes a loud noise. (*Oxford Advanced Learner's Dictionary of Current English*—Wehmeier 2000)

The 'loud noise' explanation indicates that the action is the Sound Source. The word *bludgeon* is given as:

**Bludgeon:** to hit somebody several times with a heavy object. (*Oxford Advanced Learner's Dictionary of Current English*—Wehmeier 2000)

Thus as 'heavy object' is involved we consider the word to have the meaning component of Instrument. Some verbs have the meaning of some results of action. For example,

**Smash:** to break something, or to be broken, violently and noisily into many pieces. (*Oxford Advanced Learner's Dictionary of Current English*—Wehmeier 2000)

As the action has some results, we assign Result as an attribute of the word. We use Frequency to characterize repeated action for the sense of the word *batter*:

**Batter:** to hit somebody/something hard many times, especially in a way that causes serious damage. (*Oxford Advanced Learner's Dictionary of Current English*—Wehmeier 2000)

Many members of the two subclasses are found to have the basic verbs *hit* or *strike* as their hypernyms. This relation suggests that there is a meaning network organized by the semantic properties of each individual class member. The dominant meaning components of this class of verb can be identified by the notions of Contact, Body Part, Motion, and Force. These are the shared notions generally represented by the two basic verbs, *hit* and *strike*. Each of the other members bears some idiosyncratic properties. Yet, all of them are linked to each other by the shared notions that are conflated within the verb roots. To illustrate these relations, their relevant meaning components are given in Table 1.

Table 1: Meaning components

Hit Verbs	Notions Conflated Within the Verb Root	Spank Verbs	Notions Conflated Within the Verb Root
Bang	Contact, Motion, Force, Body Part, Sound Source	belt	Contact, Motion, Force, Body Part, Instrument
Bash	Contact, Motion, Force, Body Part	birch	Contact, Motion, Force, Body Part, Instrument
Batter	Contact, Motion, Force, Body Part, Frequency	bludgeon	Contact, Motion, Force, Body Part, Instrument, Frequency
Beat	Contact, Motion, Force, Body Part	bonk	Contact, Motion, Force, Body Part
Bump	Contact, Motion, Force, Body Part, Instrument	brain	Contact, Motion, Force, Body Part, Patient's Body Part
Butt	Contact, Motion, Force, Body Part	cane	Contact, Motion, Force, Body Part, Instrument
Dash	Contact, Motion, Force, Body Part	clobber	Contact, Motion, Force, Frequency, Body Part
Drum	Contact, Motion, Force, Body Part, Instrument, Sound Source	club	Contact, Motion, Force, Body Part, Instrument



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Hammer	Contact, Motion, Force, Body Part, Frequency, Instrument, Sound Source	conk	Contact, Motion, Force, Body Part, Patient's Body Part
hit	Contact, Motion, Force, Body Part	cosh	Contact, Motion, Force, Body Part, Instrument
kick	Contact, Motion, Force, Body Part	cudgel	Contact, Motion, Force, Body Part, Instrument
knock	Contact, Motion, Force, Body Part, Instrument, Sound Source	cuff	Contact, Motion, Force, Body Part
lash	Contact, Motion, Force, Body Part, Instrument	flog	Contact, Motion, Force, Body Part, Instrument
pound	Contact, Motion, Force, Body Part, Instrument, Sound Source	knife	Contact, Motion, Force, Body Part, Instrument
rap	Contact, Motion, Force, Body Part	paddle	Contact, Motion, Force, Body Part, Instrument
slap	Contact, Motion, Force, Body Part, Sound Source	paddywhack	Contact, Motion, Force, Body Part, Instrument
smack	Contact, Motion, Force, Body Part, Sound Source	pummel	Contact, Motion, Force, Body Part, Frequency
smash	Contact, Motion, Force, Body Part, Result	sock	Contact, Motion, Force, Body Part
strike	Contact, Motion, Force, Body Part	spank	Contact, Motion, Force, Body Part, Patient's Body Part
tamp	Contact, Motion, Force, Body Part, Result	strap	Contact, Motion, Force, Body Part, Instrument
tap	Contact, Motion, Force, Body Part	thrash	Contact, Motion, Force, Body Part, Instrument

thump	Contact, Motion, Force, Body Part, Instrument, Sound Source	truncheon	Contact, Motion, Force, Body Part, Instrument
thwack	Contact, Motion, Force, Body Part	wallop	Contact, Motion, Force, Body Part
whack	Contact, Motion, Force, Body Part	whip	Contact, Motion, Force, Body Part, Instrument
		whisk	Contact, Motion, Force, Body Part, Instrument

The notions listed in Table 1 can usually be derived from the words themselves or from their senses as given in more comprehensive dictionaries. Naturally the notions listed do not serve to distinguish the specific meanings between the members of the class as a dictionary entry does. Hence, they do not tell, for instance, how exactly different the verb *flog* is from the other verbs *lash*, *strap*, *paddywhack*, and *whip*. Instead, they represent the most common meaning components of the class.

All these verbs contain the meaning components that are identified as Contact, Motion, Force, and Body Part. Other notions, such as, Instrument, and Sound Source are found in most of the other verbs. The verbs *hit* and *strike* are basic words without more detailed components specified.

Force is specified in all the verbs. This shows that as the name of the class, “Verbs of Contact by Impact”, indicates, actions depicted by these verbs are characteristic of exerting an obviously strong force in the performance.

Moreover, verbs that have more of the same meaning components specified are those that share at least one more extra component besides the commonly shared ones. For instance, verbs like *bludgeon*, *club*, *cosh*, etc., are distinguished by sharing the specific component Instrument, while verbs like *bang*, *pound*, etc. by Sound Source. These specified components make a verb conspicuous of its dominant feature. This specification of components helps us understand the semantic correlations between one class member and the other. For instance, many of the verbs in the Hit Verb class are marked as having Sound Source, while in the Spank Verb class there is none. This characteristic accords with Levin’s finding that the Hit verbs “describe types of contact that are associated with the emission of a characteristic sound” (Levin 1993:150).

Yet, given the information marked in Table 1, it is not informative enough to show a full representation of the senses of every member of the class. Such a full picture has to show the detailed senses of each of the verbs. That would go beyond our present goal. Our present analysis shown in Table 1 only identifies general principles that derive the

behavior of a verb from its related meaning components. The Chinese equivalents to be discussed in the section below will further clarify the dominant meaning components of this particular English verbal class.

### 3. Mandarin Chinese equivalents

The theoretical implications of the hypothesis of syntactic determination (e.g., Levin's pure alternation approach) have been proven not quite adequate in defining verb classes, especially for Mandarin Chinese (Liu 1997, Tsai et al. 1998, Huang et al. 2000). Our efforts will not go into the discussion of the adequacy of Levin's approach in Chinese verbal classification. We shall instead take Levin's classification of the English verbs as the lexical source and look at their equivalents in Chinese to find out the principles of their meaning representations in the two languages.

We looked up the Hit and Spank verbs in English-Chinese dictionaries for Chinese equivalents. The following were mainly taken from *Longman English-Chinese Dictionary of Contemporary English* (Longman Group 1988) and *The English-Chinese Dictionary (Unabridged)* (Lu 1992) with our own additions for a few words. The English words and Chinese equivalents are given below. As detailed explanations of the structure and formation of the equivalent Chinese words will be given later, the listing here does not provide English literal gloss or pronunciation for the Chinese characters.

#### Hit Verbs

Bang	重擊，砰地敲（或推）
Bash	猛敲，猛擊，重擊
Batter	連續猛擊，毆打，接連重擊
Beat	打，擊，敲
Bump	撞擊，碰，撞
Butt	用頭撞
Dash	猛撞，沖
Drum	打鼓
Hammer	用錘敲打，錘擊，反復敲打，捶
Hit	打，擊，打擊
Kick	踢
Knock	敲打，擊，打，敲，撞，碰
Lash	鞭打
Pound	連續猛擊，猛烈敲打，捶
Rap	叩擊，敲擊，輕敲
Slap	掌擊，摑，拍打

Smack	掌摑，摑，打
Smash	打碎，打破，（嘩啦一聲）打碎
Strike	打，擊，敲，撞擊
Tamp	搗固，搗實
Tap	輕打，輕叩，輕拍，輕敲
Thump	重擊
Thwack, whack	使勁打，重打，猛打

### Spank Verbs

Belt	用帶子打，抽，抽打
Birch	用樺樹條打
Bludgeon	用大頭棒連續打
Bonk	用力打
Brain	打碎腦部
Cane	以杖擊
Clobber	痛打，毆打，揍
Club	用棒打
Conk	敲…的頭
Cosh	用短棒打
Cudgel	用棍棒打
Cuff	用巴掌打，拍，打
Flog	鞭打
Knife	切割，切，割，用刀砍
Paddle	用槳打，用刑杖鞭打
Paddywhack	鞭打
Pummel	以拳連擊
Sock	重擊
Spank	用巴掌打屁股，打屁股
Strap	用皮帶捆紮
Thrash	鞭打，抽打
Truncheon	用警棍打
Wallop	猛擊
Whip	鞭打，抽，抽打
Whisk	攪打

We notice that in the Chinese equivalents there are more multi-word units than single words. Various morphemes are used to form polymorphemic words or phrases to build a description of an action event depicted by single English verbs. We shall discuss this matter in the next section.

### 3.1 Single words vs. multi-word units

In the listing of the English-Chinese equivalents, the various types of meaning information encoded in the English verb roots are explicitly given in Chinese with polymorphemes making up word compounds or phrases. For instance, the English verb *bang* is translated as 重擊 *zhòng jī* (hard-beat), *rap* as 輕敲 *qīng qiāo* (light-knock), and *pound* as 連續猛擊 *liánxù měng jī* (continuously-fiercely-beat). As can be seen, in each of the Chinese equivalents a verb is combined with one or two other morphemes that are used to further specify the particular manner of the action, such as strengthening the Force quality (e.g., 重 in *bang*, 輕 in *rap*, and 猛 in *pound*).

In terms of lexical entry from the viewpoint of lexicography, many of these Chinese multi-word units are not lexicalized terms that can be treated as lexicon entries in a dictionary. From the perspective of contrastive lexical semantics, an analysis between lexicalized words in one language and their definitions in paraphrased forms in another can be interesting and informative in terms of lexical conflation as well as semantic decomposition (cf. Talmy 1985). The equivalents given in the dictionaries seem to show that English and Chinese are lexically unparallel in expressing these particular action events. However, there are many monomorphemic words in Chinese that express body contact and motion (Gao 2001b). The use of compounds in dictionary explanations has to do with the use of polysyllabic words to avoid ambiguity in Chinese. Moreover, some of the phrases are simply translations of English definitions and not word equivalents. We shall elaborate on these points below.

Gao (2001b) lists many monomorphemic words for body action. Following are some of them that involve Body Part, Motion, Force, and Contact. Likely equivalents of the English verbs discussed here are added in *italics* for reference and comparison.

#### Head action

頂	dǐng	hit with the head; <i>butt</i>
磕	kē	knock with the head; <i>butt, knock</i>
叩	kòu	knock with the head; <i>butt</i>

#### Finger action

磕	kē	knock with fingers; <i>knock, rap, tap</i>
摳	kōu	dig out with a finger, scratch
叩	kòu	knock with fingers; <i>knock</i>
撓	náo	scratch
捻	niǎn	twist with fingers
捏	niē	pinch

擰	nǐng	pinch
掐	qiā	nip, pinch
搔	sāo	claw, scratch (more with nails)
彈	tán	flip
抓	zhuā	scratch

### **Fist action**

擊	jī	strike, hit, beat; <i>beat, strike, hit</i>
捶	chuí	beat, pound; <i>pound, hammer</i>

### **Foot action**

踹	chuài	kick; <i>kick</i>
踩	cǎi	step on
踢	tī	kick; <i>kick</i>
蹂	duò	stamp, feet, stomp
蹈	dǎo	tread on, step on
蹬	dēng	step on, tread on
蹂	róu	trample under foot, tread on
拖	tuō	drag, tow, haul
走	zǒu	walk

### **Arm action**

抱	bào	embrace, hug, hold in arms, enfold
摟	lǒu	embrace, hug, cuddle, enfold
挎	kuà	carry on the arm
擁	yōng	hold in one's arms, hug, embrace
挽	wǎn	pull, drag by the arm

### **Unspecified body action**

撞	zhuàng	bump against; <i>bump, knock</i>
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### **Striking action**

捶	chuí	beat, pound; <i>pound, hammer</i>
戳	chuō	poke
打	dǎ	hit, beat, strike; <i>hit, beat, strike</i>
擊	jī	strike, hit, beat; <i>hit, beat, strike</i>
磕	kē	knock with fingers; <i>tap, knock, rap</i>
扣	kòu	knock, strike, rap, tap; <i>knock, strike, rap, tap</i>

叩	kòu	knock; <i>knock</i>
搥	guāi	slap; smack; <i>slap, smack</i>
敲	qiāo	knock, strike; <i>knock, strike</i>

### Cutting action

剁	duò	chop, cut; <i>knife</i>
割	gē	cut, slice; <i>knife</i>
剪	jiǎn	cut with scissors
砍	kǎn	chop, hack, cut; <i>knife</i>
刻	kè	engrave
劈	pī	hack, split
剖	pōu	cut open
切	qiē	cut; <i>knife</i>
削	xiāo	pare, peel
宰	zǎi	butcher
鋤	zhá	cut up with a hay cutter

These lists show abundant morphemes involving Action, Motion, Force, and Body Part. But dictionaries often give Chinese polysyllabic words as equivalents. For example, 敲 *qiāo* is a good enough word for the sense of *knock*, but 敲打 *qiāodǎ* is given in dictionaries to make a dimorphemic word to conform with the tendency of using polysyllabic words. Another reason for not using monomorphemic words is avoidance of polysemy. For example, the *New Age Chinese-English Dictionary* (Wu and Cheng 2001) has the sense of ‘lash, whip, thrash’ for the word 抽 *chōu*. But it also gives the senses of ‘draw, take a part from a whole, (plants) put forth (buds)’. Thus it would create ambiguity to give the single word 抽 *chōu* for *whip*.

The phrases in the Chinese equivalents are often translations of English definitions and are not corresponding words. For example, 毆打 *ōudǎ* is a word for *batter*, but the *Longman English-Chinese Dictionary of Contemporary English* (Longman Group 1988) gives it as 接連重擊 *jiēlián zhòngjī* translating the English definition ‘to beat hard and repeatedly’.

## 3.2 Syntactic formations and unpacking of conflated sense components

These multi-word items, or phrases, in Mandarin Chinese are formed with six different syntactic patterns. Contact, which forms the basic component in the English verbs is the core of the lexical units. Other components are expressed mainly by other words.

The Chinese syntactic formations of the corresponding lexical elements involved in the Chinese equivalents given below in parallel to each English verb reveal very much the conflated components in the English verb root. For instance, in the formation below, the semantic component of manner of Force in English is generally exemplified with a Chinese adverb, marked as “Adv”. Information about patient object or instrument is revealed by a noun, marked as “N”, and effect to the patient object by a coverb, marked as “Cov”. The gloss of each of the morphemes that are rendered explicitly in Chinese and the associated components are given in parentheses.

### Formation 1

V: V

hit	打	dǎ
beat	打	dǎ
strike	打	dǎ
kick	踢	tī

### Formation 2

V: V V

bump	撞擊	zhuàngjī	(bump-beat)
knock	敲打	qiāodǎ	(knock-hit)
whisk	攪打	jiǎodǎ	(stir-hit)
knife	切割	qiēgē	(cut-cut)

### Formation 3

V: V N

drum	打鼓	dǎgǔ	(hit-drum, Instrument)
brain	打碎腦部	dǎsuì nǎo bù	(hit-break head-part, Patient’s Body Part)
conk	敲…的頭	qiāo...de tóu	(knock... head, Patient’s Body Part)

### Formation 4

V: V Adv

tamp	搗固	dǎogù	(smash-fixed, Result)
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**Formation 5**

V: Adv (Adv) V

bang	重擊	zhòng jī	(hard-beat, Force)
bash	猛擊	měng jī	(fiercely-beat, Force)
dash	猛撞	měng zhuàng	(fiercely-strike, Force)
smash	猛撞	měng zhuàng	(fiercely-strike, Force)
rap	輕敲	qīng qiāo	(light-knock, Force)
tap	輕打	qīng dǎ	(light-hit, Force)
thump	重擊	zhòng jī	(hard-beat, Force)
thwack	重擊	zhòng jī	(hard-beat, Force)
whack	猛打	měng dǎ	(fiercely-beat, Force)
batter	連續猛擊	liánxù měng jī	(continuously-fiercely-beat, Frequency, Force)
pound	連續猛擊	liánxù měng jī	(continuously-fiercely-beat, Frequency, Force)
bonk	用力打	yòng lì dǎ	(use-strength hit, Force)
clobber	痛打	tòng dǎ	(pain-hit, Force)
sock	重擊	zhòng jī	(hard-beat, Force)
wallopp	猛擊	měng jī	(fiercely-beat, Force)

**Formation 6**

V: (Cov) N (Adv) V / V V (N)

belt	用帶子打	yòng dài zi dǎ	(use belt hit, Instrument)
birch	用樺條打	yòng huà tiáo dǎ	(use birch hit, Instrument)
bludgeon	用大頭棒連續打	yòng dà tóu bàng liánxù dǎ	(use bludgeon continuously-hit, Instrument, Frequency)
cane	以杖擊	yǐ zhàng jī	(use cane hit, Instrument)
club	用棒打	yòng bàng dǎ	(use club hit, Instrument)
cosh	用短棒打	yòng duǎn bàng dǎ	(use cosh hit, Instrument)
cudgel	用棍棒打	yòng gùn bàng dǎ	(use cudgel hit, Instrument)
cuff	用巴掌打	yòng bā zhǎng dǎ	(use hand hit, Body Part)
strap	用皮帶捆紮	yòng pí dài kǔn zā	(use strap tie up, Instrument)
spank	用巴掌打屁股	yòng bā zhāng dǎ pì gu	(use hand hit, Body Part, Patient's Body Part)
paddle	用槳打	yòng jiǎng dǎ	(use paddle hit, Instrument)

pummel	以拳連擊	yǐ quán lián jī	(use fist continuously-beat, Body Part, Frequency)
flog	鞭打	biān dǎ	(whip-hit, Instrument)
paddywhack	鞭打	biān dǎ	(whip-hit, Instrument)
thrash	鞭打	biān dǎ	(whip-hit, Instrument)
whip	鞭打	biān dǎ	(whip-hit, Instrument)
truncheon	用警棍打	yòng jǐnggùn dǎ	(use truncheon hit, Instrument)
butt	用頭撞	yòng tóu zhuàng	(use head strike, Body Part)
hammer	錘擊	chuí jī	(hammer-beat, Instrument)
lash	鞭打	biān dǎ	(whip-hit, Instrument)
slap	掌擊	zhǎng jī	(palm-beat, Body Part)
smack	掌摑	zhǎng guāi	(palm-beat, Body Part)

The Mandarin Chinese syntactic formations unpack the semantic components in the English single verbs. Each formation is given on the basis of a single English verb and the corresponding rendition in Chinese by the grammatical units representing a specified semantic complex. The syntactic formation patterns of the Mandarin Chinese multi-word units reveal very much the conflated semantic components in the English single verbs. The semantic components conflated in the English verb roots are expressed by attached elements. These attached elements can be (1) another single verb that forms a compound verb with the core verb such as 撞擊 *zhuàngjī* (bump-hit) showing the use of polysyllabic words, (2) an adverb that modifies the verbal element to express the manner of Force such as 輕打 *qīngdǎ* (tap-hit), (3) two adverbs attached to the basic verb explicitly specifying Frequency and manner of Force such as 連續猛擊 *liánxù měng jī* (continuously hard hit), and (4) a coverb plus a noun placed before the verbal element such as 用棍棒打 *yòng gùnbàng dǎ* (use club hit) to show the Instrument component in the action.

#### 4. Implications for bilingual word-networks

Some concepts are lexicalized in one language, but not in another. We have seen above that English and Chinese do not have identical lexical items for the verbs of contact by impact. In bilingual dictionaries it is not of major concern when there are no corresponding lexicalized items. Words in one language can be explained in words or phrases in another. However in building bilingual word networks phrases are inappropriate in word networks. For example, in English-Chinese bilingual word networks the word *spank* can only correspond to the Chinese word 打屁股 and not 用巴掌打屁股. The *Xiandai Hanyu Cidian* (Linguistics Institute of Chinese Academy of Social Science

1997) has the entry 打屁股 indicating that the string is a word. The word *brain* explained as 打碎腦部 in Chinese will be a major challenge for such word networks as it is not a word.

As we see in the Chinese equivalents above, the word 打 *dǎ* appears frequently. Many words have this morpheme as a verbal element. Thus it forms some association network. We may call networks so formed as “word families” (Cheng 2001). Such networks reflect a significant phenomenon in Chinese word classification. For instance, the verb 打 *dǎ* can be classified as a verb of contact by impact, but, as a morpheme itself, 打 *dǎ* is versatile in combining with other morphemes to make up compound words that can be nouns, verbs, or other classes of words. In Mei et al. (1996) there are over 270 compounds consisting of this morpheme. These compounds include words in the semantic categories of people (打字員 *dǎzìyuán*, typist), things (打氣筒 *dǎqìtǒng*, air pump), space (打橫 *dǎhéng*, sidelong), abstract matters (打算 *dǎsuan*, plan), characteristics (不打緊 *bùdǎjǐn*, unimportant), body action (打擊 *dǎjī*, to hit), mental activities (打主意 *dǎzhuyi*, to plan), activities (攻打 *gōngdǎ*, to attach), state (打赤腳 *dǎchíjiǎo*, barefoot), association (打消 *dǎxiāo*, to cancel), and particle word (從打 *cóngdǎ*, since). It appears in 11 of the 12 major semantic categories given in Mei et al. (1996). A recent corpus-based investigation done by Gao (2001b) of *dǎ* combinations with other morphemes further reveals that *dǎ* has extended its family network up to 27 subcategories of more specified semantic domains. Nevertheless, the combinations that form the largest category are body-action compounds that include the equivalents of the English *hit* and *spank* verbs under discussion. We shall illustrate the compound verbs involving 打 *dǎ* that can be grouped into one class with respect to their impact actions depicted to show word family with explicit morphological identity for comparison with English.

打 (beat) compound with the meaning component of Instrument

鞭打 *biāndǎ* (thrash), 抽打 *chōudǎ* (lash), 拷打 *kǎodǎ* (torture), 捶打 *chuídǎ* (thump), 敲打 *qiāodǎ* (knock), 摔打 *shuāidǎ* (knock), 磕打 *kēdǎ* (knock against something hard), 打針 *dǎzhēn* (have an injection)

打 (beat) compound with the manner of action

撲打 *pūdǎ* (beat), 拍打 *pāidǎ* (beat on flat surface), 攪打 *jiǎodǎ* (whisk)

打 (beat) compound with the Force degree

毒打 *dúdǎ* (beat up), 痛打 *tòngdǎ* (clobber)

打 (beat) compound with the Patient or Patient's Body Part specified

打嘴 *dǎzuǐ* (slap someone in the face), 打嘴巴 *dǎzuǐba* (slap someone in the face), 打耳光 *dǎěrguāng* (box someone's ear), 打屁股 *dǎpìgu* (spank),

打巴掌 dǎ bāzhǎng (beat the palm),

打門 dǎmén (knock at the door), 打鼓 dǎ gǔ (drum), 打蛋 dǎ dàn (break an egg)

打 (beat) compound with the Result specified

打字 dǎzì (type), 打草 dǎcǎo (cut grass)

打 (beat) compound with the patient object specified as a game

打球 dǎ qiú (play a ball game), 打牌 dǎpái (play a card game)

As can be seen in the compound verbs above, the morpheme 打 *dǎ* still keeps its prototypical sense as a verb of contact by impact, while the sense of the compound is modified by the other morphemes in one way or another. In English as given earlier and here, the words in the hyponym hierarchy are not morphologically related. Chinese, on the other hand, has explicit morphological associations in a word family. Thus in bilingual word networks the structures of English word sense hierarchy, such as that built with synonym sets in *WordNet*, will be quite different from those of Chinese words that form explicit families with particular morphemes. How the two hierarchical structures can be matched in bilingual word networks will be another challenge.

## 5. Conclusions

In examining the differences between English and Mandarin Chinese at the basic verbal lexicon level, verbs defined by Levin (1993) as “Verbs of Contact by Impact” have been compared with their Chinese equivalents. The comparison has shown that Chinese has a lower degree of monomorphemic lexicalization for the meanings expressed by these English verbs. Instead, for expressing a contact action depicted by a single English verb, an expression with a specific noun as the object or instrument and an adverb as the manner of action is combined with the action verb to fully express the concept. The formalized syntactic patterns of the Chinese multi-word units are arranged in a principled manner to serve the illustration of the meaning components within the English verb roots. It is believed that such an approach for the investigation of the lexical information between two languages also has its implications in the construction of bilingual word networks. Moreover, we feel that the Chinese word networks that more fully represent the word relations should take into account the notion of word family. We see word family as an important concept in studying the mental networks of Chinese words.

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[Received 5 September 2002; revised 3 May 2003; accepted 26 May 2003]

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## 英文的衝擊接觸動詞及其對應的中文詞語

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本文探討英文的“衝擊接觸”動詞，提出接觸、動作、動力、肢體、聲源、頻率與器具等語義成分是這類動詞的隱性的內涵屬性。這類動詞所對應的中文詞語從英漢字典中收集排比，有些是單純詞素，大多是多音節的複合詞或詞組。在複合詞和詞組的語義、構詞與語法結構中，英文隱性的成分具體以名詞顯示肢體或器具，以副詞顯示頻率。中文對應詞的語法結構有詳細的分析和討論。從中英兩種語言的比較可以看出同一概念有的語言辭彙化成詞，有的語言沒有辭彙化。這種差異對建構雙語詞網是一項挑戰。同時，從“打”字的多處出現與搭配，我們提出“詞族”是理解漢語語義關係與詞網的重要概念。

關鍵詞：接觸，運動，動力，肢體，聲源，頻率，器具，內涵語義成分，辭彙化，詞族