PROSODICALLY CONSTRAINED BARE-VERB
IN _BA_ CONSTRUCTIONS

Shengli Feng
The University of Kansas

ABSTRACT

There is a traditional belief that a bare verb in the *ba* construction is never allowed. While often observed, the rule does not always hold true, as I propose to show in this paper. In poems, for example, bare verbs are commonly used to form *ba* constructions. In everyday speech, disyllabic bare verbs in the *ba* construction are also allowed, whereas a monosyllabic counterpart is strictly banned in the same environment. Given this, it is argued that the Bare Verb Effect in *ba* constructions is constrained neither by syntax nor by semantics, but primarily by prosody. The argument made here strongly supports the proposal made in Feng (1995) that the interactions between syntax and prosody are bi-directional: Syntax governs prosody and prosody also constrains syntax. The prosodic constraints developed in this paper can also be viewed as well-formed conditions on all *ba* sentences which cannot surface until all of the relevant types of structural constraints (syntactic, semantic and prosodic) are satisfied. The prosodic constraints could, therefore, be one type of interface condition under the assumption that all conditions are interface conditions and that a linguistic expression is the optimal realization of the interface conditions.

1. INTRODUCTION

Although Chinese is an SVO language, the objects of (affective action) verbs can be preposed in the *ba* construction. For example:

(1)   a.   Wo ba fan chi le.
                I   ba food eat prt.
                `I ate the food.'

b.   *Ta ba shu   na   zou   le.*
he ba book take away prt.
'He took the book away.'

c.   Ta ba shu   fang hao .le.
He ba book put well prt.
'He put down the book.'

d.   Ni   neng bu neng ba di   sao   yixia?
You can not can   ba floor sweep a little
'Would you clean the floor?'

Since Wang (1945), many linguists have tried to generalize the conditions that a VO structure can undergo during the *ba* construction (Lü 1948; Chao 1968; Li & Thompson 1981 and many others. See Liu 1997 for more references). However, a striking problem with the *ba* sentences in Chinese syntax still remains: Why is a bare verb in *ba* construction strongly disfavored? For example:

(2)   a.   *Wo ba ta da.*
I   ba him hit
'I hit him.'

b.   *Ta ba shu   na.*
he ba book take
'He took the book.'

c.   *Ta ba shu   fang.*
He ba book put
'He put down the book.'

d.   *Ni   neng bu neng ba di   sao.*
You can not can ba floor sweep
'Can you clean the floor?'

All of the examples in (2) are very awkward, and have been considered ill-formed sentences in the literature (Chao 1968:346). On the other hand, if an element is added next to the bare verb and makes sense in that environment, the sentences in (2) will become fully acceptable:

(3)   a.   Wo ba ta da le.
               I   ba him hit asp. (accomplish)
               `I hit him.'

       b.   Ni ba shu   na   zhe.
               You ba book hold asp. (progressive)
               `You hold the book.'

       c.   Ta ba shu fang xia   le.
               He ba book put down asp.
               `He put down the book.'

The contrast between examples in (2) and (3) demonstrates that a bare verb cannot occur in the *ba* construction, as generally believed (Hsueh 1987; Liu 1997 and reference cited there):

(4)   *[....[*ba* NP V]]

I will call the ungrammatical structure (4) the Bare-Verb Effect (hence BV Effect). The BV Effect can be seen from the fact that although there is a strong tendency for the *ba* construction to be grammatically affected by a bare verb at the end of the sentence, there are some contexts where the BV Effect disappears. When certain types of adverbs[1] are inserted between the *ba* phrase and the verb, the bare verb in *ba* sentences becomes grammatical. For example (the capital letter represents stress):

(5)   a.   *Ni neng bu neng ba wan xi?
               You can not can ba bowl wash?
               `Can you wash the bowls?'

a'   Ni neng bu neng ba wan YIGE yige de xi?
        you can not can ba bowl one   one prt. wash
        `Can you wash the bowls ONE by one?'

b.   *Ni   neng bu neng ba shu   fang?
        You can   not can   ba book put
        `Can you put the book?'

b'   Ni   neng bu neng ba shu   ZHENGzheng qiqi de   fang?
        You can   not can   ba book neatly   prt. put
        `Can you put the book NEATly?'

c   *Wo bu neng ba zi   xie.
        I   not able ba character write
        `I am not able to write characters.'

c'   Wo bu neng ba zi   YI bi   yi huar de xie.
        I   not can ba character one stroke one stroke prt. write
        `I can't write characters STROKE by stroke.'

d.   *Ta ba yan deng, shuo: "wo bu hui!"
        He ba eyes open, said: "I not know how"
        `As soon as he opened his eyes he said: "I don't know how!"'

d'   Ta ba yan YI DENG, shuo: "Wo bu   hui!"
        He ba eye one open, said: "I   don't know how."
        `As soon as he opened his eyes he said: "I don't know how!"'

Sentences in (5) shows that a bare verb will not affect the grammaticality of *ba* sentences as long as the *ba* NP is separated from the verb by adverbs. This can be seen clearly from the following facts:

(6)   a.   Nimen yinggai [ba chuan] cong shui li   wang   anshang la
                you   should ba boat from water inside toward bank   pull
                `You should pull the boat from the water to the bank.'

  b.   *Nimen yinggai cong shui li wang anshang [ba chuan] la.
      you should from water inside toward bank ba boat pull
      `You should pull the boat from the water to the bank.'

The contrast between (6a) and (6b) shows that although the presence of the adverbial phrase _wang an shang_ could save the bare verb _la_ in _ba_ construction, the same adverbial phrase cannot do so if it appears before the [ba NP V]. In other words, the structure *[....[_ba_ NP V]] given in (4) is ungrammatical regardless of what happens to the rest of the sentence. Sentences in (6) also imply that the grammaticality of sentences in (5) is not simply due to the presence or absence of the adverbs, because even though the same adverbs are present, the sentences are still ungrammatical if the [ba NP V] structure remains intact. For example:

(7) a.   *Ni neng bu neng YIge yige .de [ba wan xi]?
      you can not can one one prt. ba bowl wash
      `Can you wash the bowls one by one?'

  b.   *Ni neng bu neng ZHENGzheng qiqi de [ba shu fang]?
      You can not can neatly   prt. ba book put
      `Can you put the book neatly?'

  c.   *Wo bu neng YI bi yi huar de [ba zi xie].
      I not can one stroke one stroke prt. ba character write
      `I can't write characters stroke by stroke.'

Based on the ungrammatical sentences in (6) and (7), I would like to conclude, first, that it is not the bare verbs themselves that caused the ungrammatical sentences in (2) but the [...[[_ba_ NP] V]] structure that is responsible for the ungrammatical results. Secondly, it is not the adverbs themselves that could save the ungrammatical sentences but the structure [...[_ba_ NP]...V] that these adverbs create. Furthermore, the argument that the grammaticality of _ba_ sentences is not directly attributed to the bare verbs can also be seen from the fact that only monosyllabic bare verbs, but not disyllabic bare verbs, would result in ungrammatical sentences as in (4). This is because disyllabic bare verbs could make a grammatical sentence successfully in the

same environment, or at least could improve the grammaticality of the sentences a great deal. Compare the following three groups of sentences (the (a-f) sentences are formed by monosyllabic verbs while the (a'-f') by disyllabic verbs; the (a"-f") sentences show that the monosyllabic verbs used in (a-f) can all be used in the same environments alone without the *ba*):

(8)   a.   *Women yinggai ba mubiao zhuan.

                   we   should ba target turn

                   'We should switch (our) target.'

    b.   *Women yao   ba jiu zhidu chedi   gai

                   we   need ba old system completely change

                   'We need to change the old system completely.'

    c.   *Ni yinggai jinkuai ba zhepian wenzhang fa.

                   you should quickly ba this   article   publish

                   'You should publish this article quickly.'

    d.   *ba wenti   ti

                   ba question raise

                   'raise questions'

    e.   *ba dongxi huan

                   ba things return

                   'return things'

    f.   *ba tamen wei.

                   ba them surround

                   'surround them'

    a'   Women yinggai ba mubiao zhuan-yi.

                   we   should ba target turn-move

                   'We should switch (our) target.'

b'   Women yao ba jiu zhidu   chedi   gai-bian
      we   need ba old system completely change-change
      `We need to change the old system completely.'

c.'   Ni yinggai jinkuai ba zhepian wenzhang fa-biao.
      you should quickly ba this   article   publish
      `You should publish this article quickly.'

d'.   ba wenti   ti-chu
      ba question raise-out
      `raise questions'

e'.   ba dongxi gui-huan
      ba things return-return
      `return things'

f'.   ba tamen bao-wei
      ba them surround-surround
      `surround them'

a"   Nimen de   mubiao zenme hai   mei zhuan?
      you   prt. target why   still not turn
      `Why haven't you switched (your) target.'

b"   Jiu zhidu   rengran mei gai.
      Old system still   not change.
      `The old system still hasn't been changed.'

c."   Ni yinggai jinkuai fa   zhepian wenzhang.
      you should quickly publish this   article
      `You should publish this article quickly.'

d".   ti   wenti.
      `raise questions'

e".   huan dongxi
       `return things'

f".   zhexie diren xianzai hai bu neng wei.
       these enemy now   still not can surround
       `(We) cannot surround these enemy now.'

       women yinggai fen   liang lu   bao   guo-qu.
       we   should divide two   way surround over-there
       `We should divide our men into two teams to surround there.'

(9)   Ni dei xian ba qingxing diaocha,   zai ba wenti   fenxi,
       you must first ba condition investigate, next ba problem analyze,
       ranhou cai neng ba jihua   jinxing. (taken from Chao, 1968:348)
       then   only can ba project proceed
       `You must first investigate the conditions, next analyze the problem, only
       then can you proceed with the project.'

The sentences with disyllabic bare verbs in (9) have been treated as grammatical by
Chao, with an additional statement: "(in these sentences) it would even be more
natural to add something after the disyllabic verb, such as *diaocha.diaocha*
(investigate a little) and *fenxi.fenxi* (so some analysis on)." Therefore, disyllabic bare
verbs show a degree of acceptability. The question is, if disyllabic bare verbs could
make the *ba* sentence grammatical or improve the grammaticality a great deal, and if
the disyllabic bare verbs are semantically the same as their counterpart of
monosyllabic verbs as seen in (8), why is a monosyllabic verb not allowed in structure
(4) and why does the BV Effect disappear when the bare verbs are formed
disyllabically? A purely syntactic account would not work because in order to rule out
the bare verbs in (3) it would result in ruling out a class of well-formed cases in (5).
It is also difficult for a semantic analysis to account for the facts that the [...[[*ba* NP]
ADV V]] structure is grammatical but the [[...ADV [[*ba* NP] V]] sentences are not,
and that the [...[[*ba* NP] V_{oo}]] sentences are acceptable but the [...[[*ba* NP] V_o]] ones
are not. All of the examples given above call for an analysis that is neither syntactic
nor semantic. In what follows I will propose a different account to explain the BV

Effect in _ba_ constructions, namely, the prosodic analysis proposed in Feng (1996a) for Classical Chinese and (1996b) for Modern Chinese. The argument made here claims that prosody not only affects the grammar of natural sentences but also constrains the syntax of the language.

This paper is organized as follows. Section 2 briefly reviews some previous accounts in terms of semantics. Section 3 proposes a prosodic analysis for the problems involved in the BV Effect. Section 4 provides more evidence for the present hypothesis and section 5 is a summary of this study.

2. PREVIOUS ACCOUNTS

The apparent impossibility of a syntactic account for the characteristics of the BV Effect in _ba_ constructions has made linguists look for explanations in terms of semantics. Chao (1968) answers the question of why a bare verb cannot appear at the final position in the _ba_ constructions:

> "Since a pretransitive (i.e., _ba_) is employed to advance the position
> of the object and get it out of the way, something more elaborate is
> presumably meant to be said than can be expressed by just one
> morpheme, which would have the effect of an anticlimax." (Chao
> 1968:346)

This explanation consists of two basic parts: the advance of the object and the effect of an anticlimax. According to Chao, if the object is advanced (is moved out of the object canonical position), there must be something more elaborate added to the empty position. One morpheme (the bare verb) is not elaborate enough and, because of the Anticlimax-Effect (AE for short), the sentence is ruled out. This explanation tells us why a bare verb is not allowed in the _ba_ construction. However, many points in this explanation are not clear.[2] First, why does the AE result in ungrammaticality? Secondly, if it is true that when the object is out of the way, there must be "something more elaborate to be said after the verb", why are the following sentences still fully grammatical, when there is nothing "more elaborate to be said after the verb":

(10)   a.   Zheben shu, wo jintian bu xiang kan ___.
              this   book, I   today not want read___
              `I don't want to read this book today.'

        b.   Shui, wo he ___; fan jiu bu chi le.
              Water, I drink___, meal then not eat prt.
              `I will drink the tea but would not eat the meal.'

Thirdly, as the examples in (3) show, the further elaboration may be only a verbal suffix. Since these suffixes commonly appear right after the verb in a VO structure, why does the object have to be moved out of the way for them?

Ever since Chao, looking for semantic accounts, in the past 40 years, has been the main stream of searching for the causes of the BV Effect (as well as conditions on the *ba* sentences in general). Due to the length of this paper I am not able to introduce all the semantic accounts developed in the literature, but only the most recent one proposed by Liu (1997). The reader is referred to Liu's paper for a detailed review of previous accounts.

Liu (1997) follows previous observation and proposes that one of the basic requirements on the well-formedness of a *ba* sentence is:

(11)   There must be some element other than the basic verb in the predicate.

The notion of `basic verb' is what we have called `bare verb', and it refers to, in Liu's terms, the verbs like *xie* `write', *shuo* `speak', but not *xie-wan* `write and finish' or *shuo-qingchu* `speak clearly', which combines a basic verb and a verb or adjective expressing a resultative state (see Liu 1997:footnote 4). This is to say that once the basic verb in a *ba* sentence is formed with an extra element, the *ba* sentence will be grammatical. The extra elements in the *ba* environment can be classified into nine types according to Liu:

(12)   a.   V + resultative verb complement
        b.   V + _de_ (resultative)
        c.   V + retained object
        d.   V + perfective marker -_le_
        e.   V + PP (dative or locative)
        f.   V + quantified phrase
        g.   V + _yi_ + V (the tentative construction)
        h.   V + durative marker -_zhe_
        i.   Adv + V

To explain why there must be some element added to the bare verb in order to make the _ba_ sentence grammatical, Liu argues, essentially, that the _ba_ predicate describes a bounded event, therefore the extra elements function just to serve this purpose. In other words, all the materials that are added to the verb are elements that, when combined with the verb, denote bounded events, in the following two ways: either the extra elements may lead to bounded situations (12a-c, e-g, i), or they may mark the aspect of the situation (12d, h) (see Liu, 1997 for more detailed analyses).

There is no doubt that the grammaticality of _ba_ sentences involves semantic constraint and that Liu has provided a consistent analysis based on the semantic principle of boundedness, which works very well for the examples listed in (12). However, this does not mean that the semantic analysis could account for all the BV Effect in _ba_ constructions. First, if, as in examples (12-i), the adverbs function to denote a bounded situation, why must the adverbs occur between the BaP and the V, but not before the [_ba_ NP V] as in (6) and (7). In other words, why cannot the adverbs denote a bounded event in the position of [_ADV_ [_ba_ NP V]]? Furthermore, if the adverbs have to appear between the BaP and the V, for whatever reason, why are the following sentences still grammatical when the adverbs appear before the [BaP V]?

(13)   a.   Women yao   yi   bu   yi   bu de   ba tamen bao-wei.
                we   must   one step one step prt.   ba them   surround
                We must surround them one step by one step.

        b.   *Women yao yi   bu   yi   bu   de ba tamen wei.
                we   must one step one step prt. ba them surround/surround
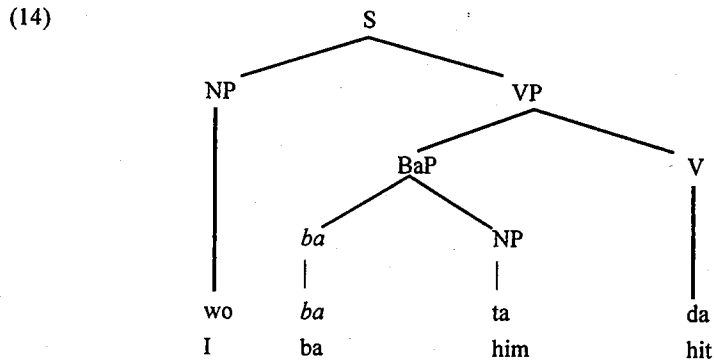   We must surround them one step by one step.

The adverbial phrase *yi bu yi bu de* occurs before the [ba NP V], and the sentence is grammatical. What, then, is the difference between sentences in (7) and that in (13a)? Obviously, the only difference is this: the verbs in (7) are all monosyllabic verbs, but the verb in (13a), is disyllabic This contrast can be seen clearly from the example given in (13b). (13b) and (13a) are exactly the same except that the verb in (13b) is monosyllabic. The contrast between (13a) and (13b) is the same as between (13a) and (7), that is, the [ADV ba NP V] is grammatical if the verb is disyllabic, but ungrammatical if the verb is monosyllabic. A question arises: Why could disyllabic verbs make the *ba* sentence grammatical while monosyllabic verbs cannot? Note that the disyllabic verb *bao-wei* in (13a) is not a verb-resultative combination and it does not express a resultative state. Actually the two verbs *bao* and *wei* are synonyms or near synonyms. Under the semantic consideration, the question is why disyllabic verbs should denote a bounded event while a monosyllabic verb cannot, given that both of them are semantically the same or at least similar. As seen in (8), the *ba* sentences are extremely sensitive to the distinction between monosyllabic and disyllabic verbs. But the semantic principles such as boundedness cannot make a proper distinction between the (disyllabic and monosyllabic) synonym-pairs that behave differently on the grammaticality of *ba* sentences.

This is, of course, not to say that the semantic analysis would not work at all, but it is obvious that the semantic explanation is not sufficient to account for the BV Effect in *ba* sentences, even though semantics is involved. Therefore, I will conclude that although semantic issues are indeed involved in the well-formedness of *ba* constructions, a purely semantic account cannot be considered a principled explanation for the problems caused by the BV Effect.

3. PROSODIC ACCOUNT

3.1. Syntactic Structure and Prosodic Constraints

In order to see how prosody interacts with syntax in the *ba* constructions, we must first determine what is the syntactic structure of *ba* sentences. Since the BaP is a complement of the verb, the basic structure of *ba* sentences must be construed by a verb with its BaP complement, as shown in (14):

(14)

```
                      S
            _____|_____
          NP                       VP
          |              _____|_____
          |            BaP                    V
          |          ___|___                  |
          |        ba       NP                |
          |        |        |                 |
         wo       ba        ta               da
          I        ba       him              hit
```

The BaP and its verb are simultaneously present in the tree which can be viewed as an idiomatic structure of the language. Note that (14) is different from an adjunct-head structure in that an adjunct is adjoined to, but not simultaneously presented in a simple sentence (see 3.2. below). Given the tree structure of the _ba_ construction, it is easy to see that the rightmost node, i.e., the V, is sister to its complement BaP, and the complement node BaP contains a branching structure, while the head V consists only of a non-branching node.

It is crucial to note that the tree in (14) is well-formed syntactically. This is to say that, according to syntactic rules or principles, every _ba_ sentence generated by (14) must be a legitimate output. However, a legitimate syntactic tree may not always produce well-formed sentences in natural languages. The argument made here claims that sentences of natural languages are determined not only by rules of syntax and semantics, but also controlled by prosodic constraints. In other words, a sentence is not only governed by syntax and semantics, but also constrained by prosodic structures of the language. Prosody functions as a well-formedness condition for syntactic as well as semantic outputs. Hence, in our system, syntax, semantics and prosody interact to determine what is called a well-formed sentence.

The syntax of _ba_ sentences is the structure given in (14), and the semantic criteria for a well-formed _ba_ sentence are the ones proposed in the literature (see Liu, 1997 and references cited there). In addition to the syntactic and semantic rules or principles, I propose, in this paper, that a set of prosodic constraints are also responsible for well-formed _ba_ sentences. These are the Nuclear Stress Rule (NSR) and the Branching Node Condition (BNC), as seen in (15), respectively.

(15)   a.   **Nuclear Stress Rule (NSR)**[3]
                In a configuration $[_c$ A B $_c]$
                NSR: if C is a phrasal category, B is strong.

         b.   **Branching Condition (BC)**
                Given two sister nodes B (branching) and N (non-branching), B
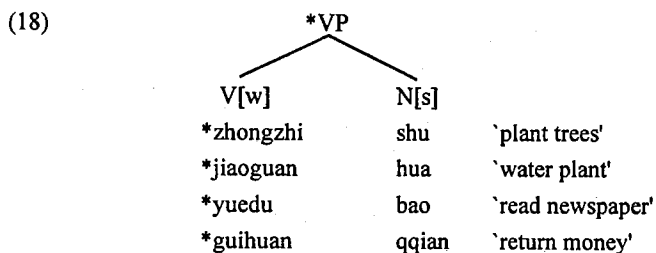   must not be labeled [w] in prosodic structure.

The Nuclear Stress Rule (NSR) was proposed for English by Liberman & Prince (1977:257). Here, I will assume, following Feng (1996a, 1996b), that Mandarin Chinese employs the same rule[4] and that the following sentences, taken from Chao (1968:35), demonstrates that Chinese does observe the NSR:

(16)   a.   Ren   ren   dou xiang **QU**.
                person person all want go
                'Everyone wants to go.'

         b.   Shang   hai **GUAN**.
                Mountain Sea Pass
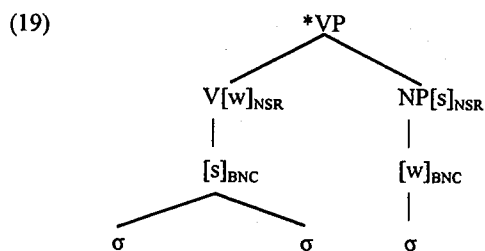   'Shan hai Pass'

In all the above examples, the most prominent stress falls on the last element of the (last) phrase. According to the NSR and the examples given in (16), the following prosodic structure in (17) must therefore be well-formed.[5]

(17)   XP
                    ╱‾‾‾‾‾‾╲
                X[w]   Y[s]
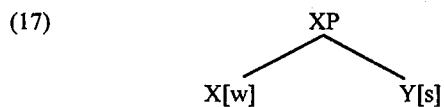
Next, consider the Branching Node Condition given in (15-b).[6] The BNC also works in Chinese and can be exemplified as in (18):

(18)   *VP
                              /\
                    V[w]   N[s]
                    *zhongzhi   shu   `plant trees'
                    *jiaoguan   hua   `water plant'
                    *yuedu   bao   `read newspaper'
                    *guihuan   qqian   `return money'

The disyllabic verbs represent a branching structure and the monosyllabic objects form only a non-branching structure. According to the NSR, the object must be labeled an [s]$_{NSR}$, whereas the V is labeled a [w]$_{NSR}$. However, (18) is unacceptable. This indicates that a violation of prosodic constraints must occur. According to Feng (1996b), the ungrammatical sentences in (18) can be explained in terms of a conflict between the NSR and the BNC, as seen in (19).
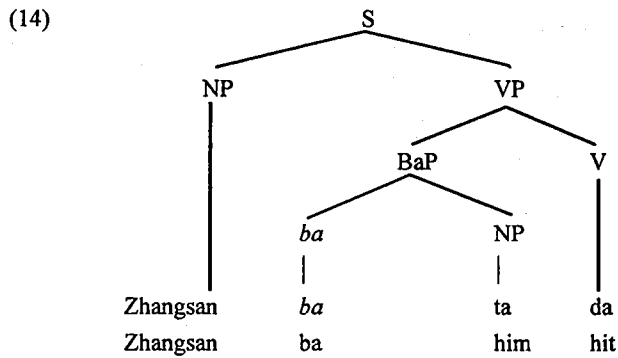
(19)   *VP
                              /\
                    V[w]$_{NSR}$ NP[s]$_{NSR}$
                       | |
                    [s]$_{BNC}$ [w]$_{BNC}$
                    /\ |
                 σ   σ   σ

The prosodic features of [s]$_{NSR}$ and [w]$_{NSR}$ are assigned by the NSR with the Relative Prominence Principle (Liberman & Prince, 1977). According to the BNC, a branching node must be heavier than a non-branching node, hence the V node in (19) must be labeled an [s] and the NP a [w], because the V node is branching while the NP is non-branching. However, the V node is assigned a [w] and the NP an [s] by the NSR. Obviously, a conflict between the NSR and the BNC occurs. By NSR, the NP must be stronger, but it must be weaker according to BNC. In order to satisfy the NSR the V will violate the BNC. On the other hand, if the BNC is satisfied, the NSR will be violated. As a result, the structure crashes due to the conflict of the two prosodic rules and this is why examples in (18) are all unacceptable. This is to say that, when NSR and BNC contradict each other, no well-formed sentences will be derived, unless

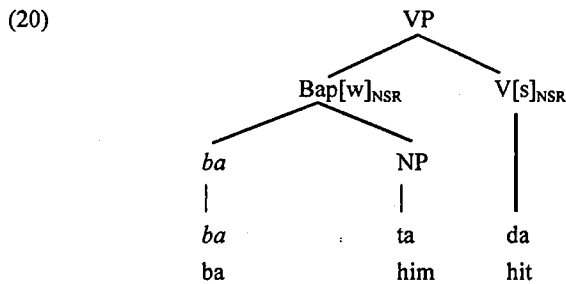some other factors play a role to resolve or to avoid the conflict (see 3.2. below).

Given the two prosodic constraints (15a-b) above and the crash situation in (19), the BV Effect in *ba* sentences, as we will see, can be captured systematically.
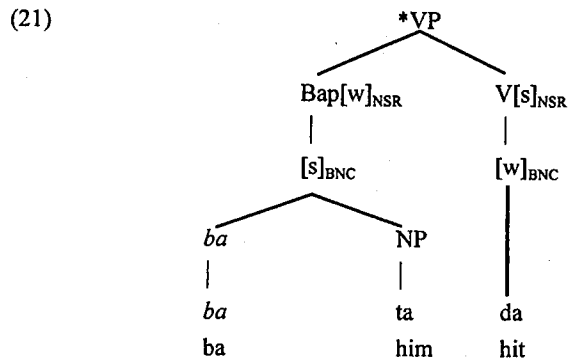
3.2. Deriving the BV Effect

It is not difficult to see how the two prosodic constraints work together to derive the complex BV Effects. First, according to (14), the *ba* sentences have the following structure:

(14)

```
                          S
              ┌───────────┴──────────┐
             NP                      VP
              │              ┌────────┴────────┐
              │             BaP                V
              │         ┌────┴────┐            │
              │        ba        NP            │
              │         │         │            │
          Zhangsan      ba        ta          da
          Zhangsan      ba       him         hit
```

The NSR must apply to the structure prior to other prosodic operations, because the NSR is syntactically determined: Once a syntactic structure is formed, the NSR will be automatically assigned to it. Secondly, the *ba* sentence is viewed as an idiomatic structure in the TAG system that I will assume here (see 3.2. below), and the BaP and its verb are simultaneously present in an INITIAL tree prior to any adjunction operations (see 3.2. below). Given this, we have:

(20)

```
                      VP
            ┌─────────┴─────────┐
        Bap[w]_{NSR}         V[s]_{NSR}
        ┌────┴────┐              │
       ba        NP              │
        │         │              │
       ba        ta             da
       ba        him            hit
```

After the assignment of NSR, the BNC comes to apply, and after the application of the BNC, we have the following result:

(21)

```
                            *VP
                         /        \
            Bap[w]NSR              V[s]NSR
               |                     |
            [s]BNC                 [w]BNC
            /      \                  |
        ba          NP                |
        |           |                 |
        ba          ta                da
        ba          him               hit
```
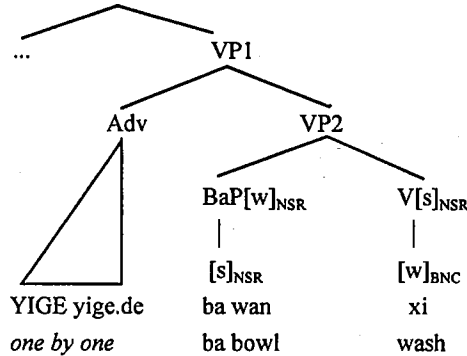
Obviously, a conflict appears between the NSR and the BNC, which is exactly the same as the one in (19). Given this, the ungrammatical [*ba* NP V] sentences we have seen before are, therefore, attributed to the ungrammatical prosodic structure (21). In other words, the BV Effect in *ba* sentences is due to the conflict between two prosodic rules, and it is the prosody, rather than the syntax or the semantics, that rules out the ill-formed sentences.

The correctness of this analysis can be seen from several perspectives. First, consider the ungrammatical sentences given in (6) and (7) (only one is repeated here as (22)):

(22)   *Ni neng bu neng YIGE yige de [ba wan xi]?
          you can not can   one   one prt. ba bowl wash
          'Can you wash the bowls one by one?'

This type of sentence would have the following structure (in these trees and in those to follow only the details relevant to the points under discussion are given):

(23)

```
                    _____
              ...              VP1
                        _____
                  Adv              VP2
                  /|          _____
                 / |     BaP[w]_NSR        V[s]_NSR
                /  |          |                |
               /___|      [s]_NSR           [w]_BNC
         YIGE yige.de    ba wan             xi
         one by one      ba bowl            wash
```

Clearly, the adjunction of adverbs like `one by one' onto the top node VP1 would not affect the [[*ba* NP] V]_VP2 generated by the original tree (14), hence the conflict between NSR and BNC remains as before regardless of what prosodic relation is established between the higher two nodes: [ADV] and the VP2. In other words, the BaP is still a sister node of the V, and the two nodes (BaP and V) are assigned [w] and [s] by the NSR, respectively. However, by BNC, the BaP should be stronger than the V, yet an opposite result is required by the NSR. Given this, the sentences generated by (23) would be prosodically as bad as the ones generated by (21), and in fact, all the sentences in (6) and (7) are ungrammatical, which strongly supports the present analysis. The present analysis also implies that [*ba* NP V] sentences cannot be saved by whatever means if the BaP and V remain in their original sister relation, because within that structure, the NSR and the BNC always contradict each other. This prediction is also borne out by the grammaticality of sentences in (7). And the correct prediction also confirms our hypothesis that it is prosody (i.e., the conflict between two prosodic rules) that causes the sentence to be ungrammatical.

Secondly, the present theory not only predicts what would be ungrammatical, but also shows the way to make the ungrammatical ones acceptable. As seen above, if the BaP and V remain in their original sister relation, the ungrammatical result cannot be saved by whatever means. According to this, we would further predict that if the BaP and the V are separated by some appropriate material (an adjunct in general), then the unacceptable sentences will become grammatical. As seen in (5), this is exactly the case.
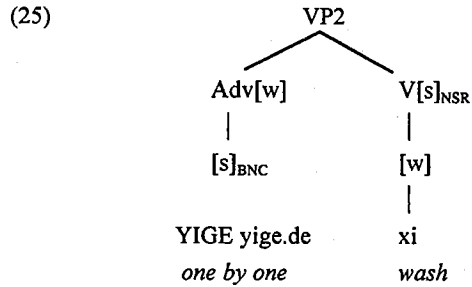
(5)   Ni neng bu neng ba wan YIGE yige de xi?
                       you can not can ba bowl one one prt. wash
                       `Can you wash the bowls ONE by ONE?'

This is because, when an adjunct is inserted into the [BaP V] structure the BaP will
be separated from the V, and the conflict between NSR and BNC will be avoided, as
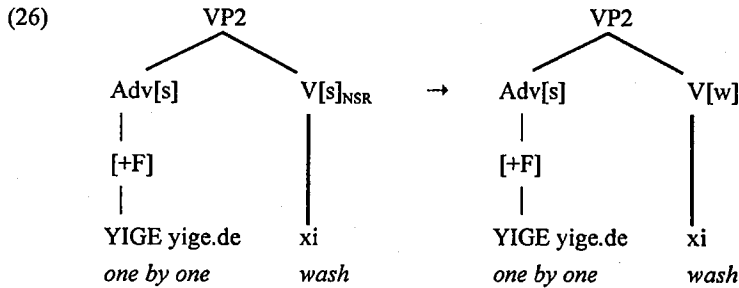seen in the following structure:

(24)
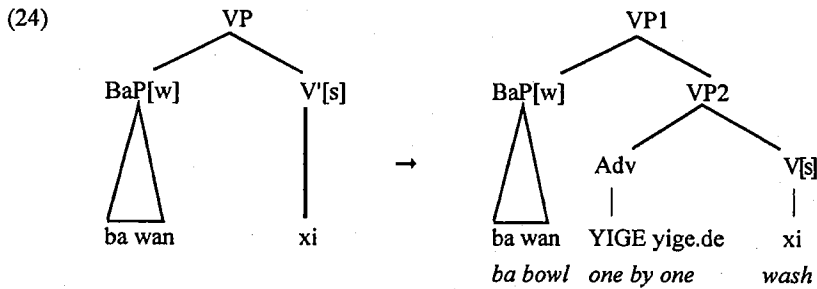
An adverb is adjoined to the V', creating a VP2 node. In this structure, the sister node
of the V is not the BaP, but the Adv. What happens then? First, the BaP[w] is not a
sister of V, but a sister of VP2. Note that the Bap[w] is assigned by the NSR, and the
[w] feature will not be a violation of the BNC in the new structure. This is because the
sister node of BaP now is also a branching structure (i.e., the VP2). The BNC only
prevents two sister nodes from being formed by a branching node with a non-
branching node. Since both the BaP and the VP2 are branching, there is no violation
of BNC at all. As a result, the conflict between the NSR and the BNC observed before
disappears now, and the sentences will become grammatical. As examples in (5)
shown, this is exactly what the theory predicts.

At this point, one may question what happens to the sister nodes [[Adv]
[V]] under the VP2. Since the V is assigned a [s] by the NSR, the [Adv] node must
therefore be assigned a [w] according to the Relative Prominence Principle. If this is
so, the result would also be a violation of the BNC, exactly like the BaP, because the
[Adv] consists of a branching node. Hence a conflict between the NSR and the BNC
will be created, given that the V is only a non-branching node:

(25)

```
                    VP2
                  /     \
            Adv[w]      V[s]_NSR
              |            |
            [s]_BNC      [w]
                           |
         YIGE yige.de    xi
         one by one      wash
```
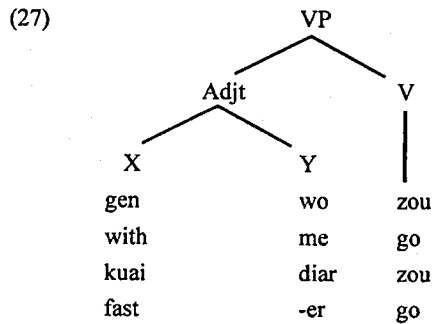
Actually, this is not a problem for the following reasons. First, as mentioned before, the adverbs that are inserted between the BaP and the V are usually focused adverbs, hence they are always stressed (cf. *YIGE yige de*). It is well known that the F-marked constituent of a phrase must contain the rhythmically most prominent word and this word must carry the stress nucleus of that phrase (Jackendoff, 1972). Most importantly, the F-marked stress (including contrastive and emphatic) is freely assigned by an independent rule (see Zubizarreta, 1998:44). Given this, if focal adverbs (i.e., adverbs that are F-marked) are inserted in the *ba* sentence, the F-marked adverbs in the VP2 must contain the stress nucleus of that phrase. As a result, by application of the Focus Stress Principle, we would have a correct prosodic structure as follows:

(26)

```
              VP2                                VP2
            /     \                            /     \
      Adv[s]      V[s]_NSR    →         Adv[s]      V[w]
        |            |                    |            |
       [+F]          |                   [+F]          |
        |            |                    |            |
   YIGE yige.de    xi              YIGE yige.de       xi
   one by one      wash            one by one         wash
```

This is to say that the NSR must yield to the Focus Stress Rule, for otherwise the Focus Stress (Emphatic and Contrastive) cannot be freely assigned to any elements (lexical words, function words and even subparts of words) in a sentence. In brief, phrases like *YIGE yige. de xi* `wash one by one' are generated by an independent rule.[7]

Another question arises immediately: what if an adjunct that is adjoined to the V is not a focused element, but an ordinary adverb or a PP. In other words, how can we explain a structure like the following:

(27)

```
                    VP
                   /  \
              Adjt     V
             /   \     |
           X      Y    |
          gen     wo   zou
          with    me   go
          kuai    diar zou
          fast    -er  go
```

The problem is: if BNC applies to the sister nodes [Adjt] and [V], then there would also be a conflict between NSR and BNC. As a result, there would be no such phrases like *gen wo ZOU* (go with me) and *kuai diar ZOU* (go faster), contrary to the fact. The answer can be given by a well-known fact that adjuncts which appear to the left of the head do not attract Nuclear Stress (NS) even if they have a complex structure. For example,

(28)   a.   Peter hat an einem PAPIER gearbeitet
                Pater has on a   paper   worked
                `Peter worked on a paper.'

        b.   Peter hat an einem kleinen Tisch GEARBEITET.
                Peter has on a   small   table   worked
                `Peter worked on a small table.'

in German (see, Truckenbrodt 1995; Subizarreta 1997:86), there are a number of modifier/complement asymmetries. Typically, in a [...PP V] structure, the PP will attract NS if it is an argument of the verb, but not if it is an adjunct. In (28a) the PP, which carries NS, is interpreted as an argument of the verb. In (28b) the NS falls on the verb and the PP is interpreted as a locative adjunct.
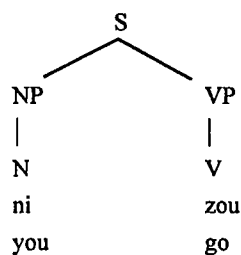
Obviously, the NS is also sensitive to the Modifier/complement distinction in Chinese. Thus, in *gen wo zou* `go with me' the NS falls on the verb *zou* `go', because the PP *gen wo* `with me' is an adjunct. If the adjuncts (no matter how complex they are) do not attract Nuclear Stress cross-linguistically, the BNC must not apply to adjunct constituents. This is to say that, the application of BNC is sensitive to the distinction between complements and adjuncts, not only in Chinese but also in other languages like German. This must be so, otherwise the adjuncts cannot be marked a [w] feature when they are formed by a complex structure.

A more systematic way to capture the distinction between (strong) complement and (weak) adjunct is proposed in Feng (1995) by using the Tree Adjoining Grammar (TAG).[8] To review briefly, the TAG formalism derives complex sentences by composing simple structures. These structures are phrase-structure trees, called ELEMENTARY TREES in this theory. Elementary trees are of two types: INITIAL TREES, and AUXILIARY TREES. Initial trees represent sentences projected by a head and its complement(s), while auxiliary trees represent adjuncts of simple sentences. Therefore, the adjunct and its head are generated by two pieces of tree structures:
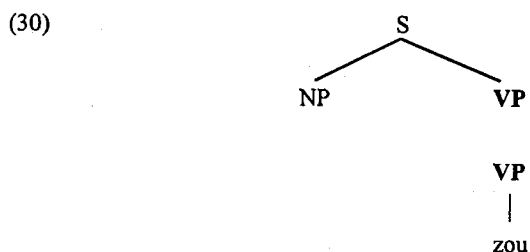
(29)   a. **Auxiliary Tree**   b. **Initial Tree**

```
             VP                                        S
           /    \                                    /    \
         PP      VP                                NP      VP
        /  \                                       |        |
       P    NP                                     N        V
      gen   wo                                     ni       zou
      with   me                                    you      go
```
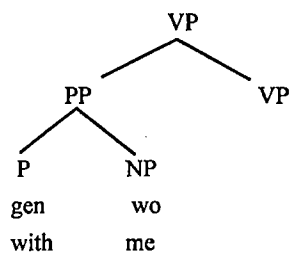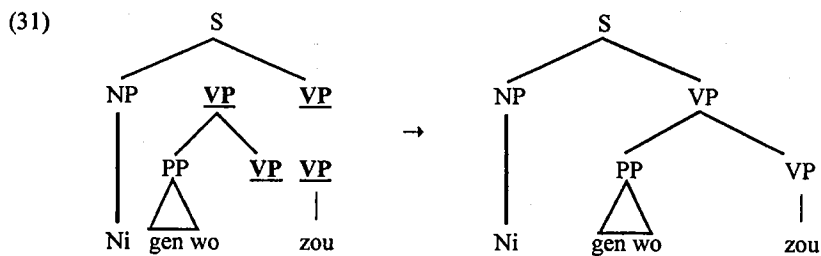
Auxiliary trees are joined with an initial tree, by a tree combining-operation called ADJUNCTION, which inserts the auxiliary tree into the initial tree. As we can see, an auxiliary tree has a root node which may be of any phrasal category. On its frontier, all nodes are expanded to terminal symbols except one, called the FOOT node, which is identical to the root node. The adjunction operation works in the following way: first break an elementary tree at a phrasal node, so that each resulting piece contains

a copy of the node at the breaking point. For example, the boldface VPs in the following trees are the result of the first operation on (29b):

(30)

```
              S
           /     \
         NP       VP

                  VP
                  |
                  zou
```
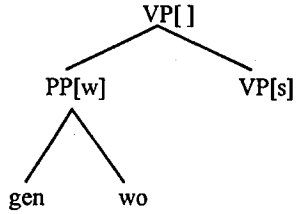
The auxiliary tree (29a), whose root node is identical in category to this doubled node, is inserted at the broken node. This insertion is conditioned by the identification of the root and foot node of the auxiliary tree with the two instantiations of the doubled node. In the present example, the result of the insertion will be the tree below:
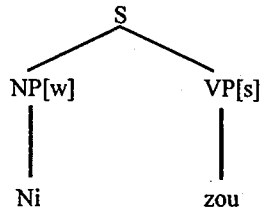
(31)

```
            S                              S
         /     \                        /     \
       NP  VP    VP                   NP        VP
       |    /\    |           →       |        /  \
       |  PP  VP  VP                  |      PP     VP
       |  /\   |  |                   |     /\       |
      Ni gen wo  zou                 Ni   gen wo    zou
```

As seen before, the NSR is assigned to each of the elementary trees, hence we have:

(32)   a. Auxiliary Tree   b. Initial Tree

```
        VP[ ]                              S
       /    \                            /   \
   PP[w]    VP[s]                    NP[w]    VP[s]
   /  \                               |         |
 gen   wo                            Ni        zou
```
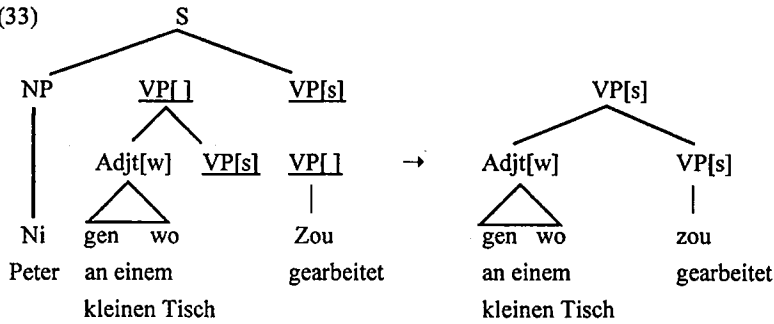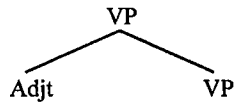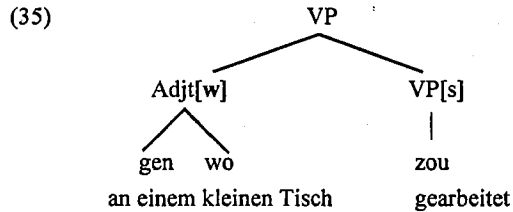
After the adjunction operation takes place, we have:

(33)

```
              S
          /   |    \
       NP   VP[ ]   VP[s]                          VP[s]
        |   /  \      |                           /     \
        |  Adjt[w] VP[s] VP[ ]     →         Adjt[w]     VP[s]
        |   /\     /\    |                    /\           |
       Ni  gen  wo      Zou                 gen  wo       zou
    Peter  an einem    gearbeitet          an einem    gearbeitet
           kleinen Tisch                   kleinen Tisch
```

What is crucial in the present analysis is that the auxiliary trees in languages like Chinese and German will always right-open (with a rightwarded FOOT node):

(34)

```
           VP
          /  \
       Adjt   VP
```

Under the NSR, the adjunct structure will always be right-strong, and according to the Relative Prominence Principle, the Adjt node is always assigned a [w] feature:

(35)

```
                          VP
                    ┌──────────┴──────────┐
                Adjt[w]                  VP[s]
                 ╱  ╲                      │
              gen    wò                   zou
         an einem kleinen Tisch        gearbeitet
```
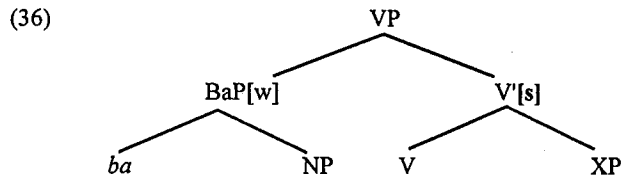
This is why adjuncts, regardless of how complex they are, do not attract Nuclear Stress, because they are always generated in a prosodically weak position in an auxiliary tree. Within this theory, the application of NSR and the BNC operates only on elementary trees, prior to adjunction operations. In other words, when adjunction operation takes place, there is no NSR and BNC available. Only other prosodic rules (such as Contrastive and Emphatic Principles) apply to the prosodic structure created by the NSR and BNC.

The above analysis captures the adjunct-complement distinction not only in Chinese but also in other languages observed in the literature, and it also answers the question quite nicely why there is a conflict occurring in [*ba* NP V], but not exhibited in [PP V], because the BaP is a complement hence the [*ba* NP V] is generated in an initial tree, while the PPs in [PP V] are adjuncts, which are derived by an adjunction operation combining two pieces of trees.

4. FURTHER EVIDENCE
4.1. The Branching V′ Node

The prosodic analysis of the BV Effect in *ba* constructions, as seen above, is crucially based on the conflict between the NSR and the BNC, and the conflict is essentially caused by the non-branching V node with a branching BaP. If this analysis is correct, we also predict that a syntactically branching V′ structure will always preserve a *ba* sentence from being ungrammatical.[9] This is because in the relevant structure (36), the NSR and the BNC are all satisfied, yielding a prosodically well-formed output:

(36)

```
                        VP
             /                    \
        BaP[w]                   V'[s]
        /      \                /      \
      ba        NP          V            XP
```

In (36), a prosodically branching structure is formed with the bare verb by placing a complement or other type of materials to the right of the verb. What is important is that the sister node of BaP (i.e., the node V') is also branching. The metrical weight of the prosodic unit [V XP] will now be equal to, or exceed the metrical weight of the BaP, satisfying both the NSR and the BNC. There are many possibilities to add extra material to the verb. Elements such as aspect markers, reduplication of the verb itself, resultative complements and the D/F adjunct...etc., all can serve as branching structures for the bare verb in *ba* constructions. Therefore, as long as those elements (if semantically acceptable) are added to the verb, the V node will be branching, making the BNC irrelevant in this situation. In this way, the metrical power of the bare verb is strengthened and the last V' structure will be heavy enough to realize the [s] feature assigned by the NSR, and the sentences that are generated in this way will all be grammatical, as exemplified in (37).

(37)   Ta xiang [Ba fan]   [*chi]
        He wants [Ba food]   [eat]
        Ta xiang [Ba fan]   [chi liang kou] (two bites)
                  [Ba fan]   [chi dao shenme shihou] (till what time)
                  [Ba fan]   [chi ge yita hutu] (a mess)
                  [Ba fan]   [chi de yi dian bu sheng] (nothing left)
                  [Ba fan]   [chi le] (aspect marker)
                  [Ba fan]   [chi chi] (eat.eat/eat a little)

In our system, the constraint given in (11) (i.e., Liu 1997) can be derived as a natural consequence of the prosodic satisfaction.

4.2 The Syllabic Branching Node V

        Based on the above analysis, the BV Effect can be characterized

prosodically as follows:

(38)   **Bare Verb Effect In _ba_ construction**
        A bare verb cannot co-occur with its _ba_ complement without a prosodic
        branching structure.

This implies that if the bare verb in a _ba_ construction consists of a branching prosodic
node, but not necessarily a branching syntactic node, the _ba_ construction would also
be acceptable, as illustrated in (39):

(39)
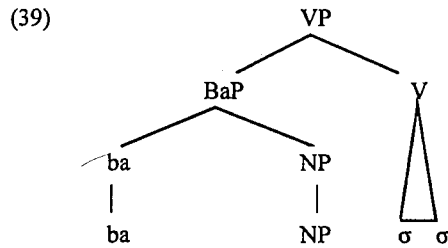
Because the sister node of BaP is also branching, no conflict exists between the BNC
and the NSR and sentences that are generated this way should be grammatical. This
is exactly the case as seen in (8) and more in (40-41):

(40)   a.   ba yecao *(chan)-*(chu)
                ba weeds eradicate
                `eradicate the weeds.'

        b.   ba shiti   mai-*(zang)
                ba corpse bury
                `bury the corpse.'

        c.   ba cheng-qiang chai-*(chu).
                ba city-wall   demolish
                `demolish city's walls.'

d.   ba gongzuo ci-*(tui)
ba job   resign
'resign the job'

e.   ba gongchang *(guan)-*(bi)
ba factories   close
'close the factories.'

f.   ba jihua ting-*(zhi)
ba plan stop
'stop the project.'

g.   ba shijian tuo-*(yan)
ba time   delay
'delay the schedule.'

h.   ba zhizhao *(diao)-xiao
ba license   revoke
'revoke the license.'

I.   ba jushi *(niu)-zhuan
ba tide   turn
'turn the tide.'

(41)   a.   ba jihua fang-qi
ba plan give up
'give up the project.'

b.   ba guanxi   he-jie
ba relations relieve-relax
'reconciliate the relation.'

c.   ba budui he-long
ba troops gather
'gather the troops.'

d.   ba haiguan kai-fang
    ba custom open
    `open the custom.'

e.   ba pengyou pao-qi
    ba friends abandon
    `abandon friends.'

f.   ba ren   shu   suo-jian
    ba person number reduce
    `reduce staff.'

g.   ba jihua tao-tai
    ba plan eliminate
    `eliminate the plan.'

All the disyllabic verbs are coordinating (rather than Verb-Resultative) compounds in (40) & (41). Even though the disyllabic verbs are slightly different stylistically from their counterpart of monosyllabic verbs (disyllabic verbs are more formal than monosyllabic verbs), there should be no significant semantic difference between the monosyllabic and disyllabic verbs in the way to affect the grammar of _ba_ sentences. In other words, if _chan-chu_ `eradicate' could make the [_ba_ NP V] grammatical in terms of semantics, there is no reason why _chu_ `eradicate' cannot do so according to the same meaning. In fact, both _chan-chu_ and _chu_ are conceptually the same, and this is also true for other pairs in (40) such as _ting_ `stop' and _ting-zhi_ `stop', _guan_ `close' and _guan-bi_ `close'...etc. Obviously, there is no reason to rule out the monosyllabic but not the disyllabic ones in terms of semantics.[10] However, under the prosodic analysis given here, it is natural to see why disyllabic verbs should behave differently from monosyllabic verbs, because disyllabic verbs represent a branching category while the monosyllabic ones consist of only a non-branching node. The fact is, disyllabic verbs (if not all) could make the [_ba_ NP V] grammatical, whereas monosyllabic verbs can never do so. Furthermore, even if some disyllabic verbs can only make the [_ba_ NP V] partially acceptable, they could improve the grammaticality a great deal while a monosyllabic verb can just make the sentence worse. Given the

obvious distinction between disyllabic and monosyllabic verbs, we have good reasons
to conclude that the BV Effect in *ba* sentences is essentially a prosodic effect and that
it can be accounted for by our analysis that a bare verb can make a *ba* sentence
grammatical only if it is syllabically branching.[11]

4.3 The Pro-verb in *ba* Sentences

The Pro-verb in *ba* sentences, as pointed out first by Chao (1968), can also
be taken as an evidence for the present analysis. For example (taken from Chao
1968:349):

(42)   *ba* ni zeme, ni   ye   bu xihuan, ba ni name, ni   ye   bu xihuan,
        ba you this, you also not like,   ba you that,   you also not like,
        name ni   yao wo ba ni zen.me ne?
        then you want me ba you what   prt.
        `I do this to you and you don't like it, I do that to you and you don't like it,
        what do you want me to do to you, then?'

As mentioned above, some disyllabic bare verbs show partial acceptability in the *ba*
construction. However, in (42), the pro-verbs *zèn.me* `do this', *nà.me* `do that' and
zěn.me `do what', are perfectly acceptable at the end of the sentence. Why is this so?
The reason cannot be syntactic. For a semantic account, one may have to add an
additional rule only for pro-verbs in *ba* sentences. However, there is no additional cost
in the prosodic account. It is well-known that when demonstrative pronouns *zèn.me*
`this' and *nà.me* `that' are used as pro-verbs, they are all stressed. The same holds true
for the interrogative pro-verb *zěn.me* (or *zěn yang*) `do what', which is a lexically
strong form, no matter where it occurs. For example:

(43)   Wo bu qu, ni   neng ZEM YANG wo?
        I   not go, You can do-what   me
        `If I don't go, what will you do to me?'

Since *zèn.me*, *nà.me* and *zěn yang* are all lexically strong forms, they have the ability
to overcome their sister node BaP and to realize the primary stress at the end of the
sentence. In other words, since pro-verbs are prosodically strong forms (being a

lexical property or being a focus element listed in the lexicon), the BNC could not rule them out as not being strong enough, and the NSR is also satisfied. This is why all the sentences in (42) are grammatical. Note that the grammaticality of sentences in (42) would cause difficulties to both a syntactic and a semantic account for the lacking of BV Effect. The fact, that only prosodically strong verbs like *zěn yang* can freely appear in the *ba* construction, shows once again that prosody is the paramount reason for the BV Effect, and the grammaticality of the *ba* sentences can therefore be explained adequately in terms of the metrical theory proposed in this paper.

4.4 [[*ba* NP] V] in Verse

We have seen that a monosyllabic verb cannot co-occur with the BaP in [*ba* NP V], and that this has been attributed to a conflict of prosodic, rather than syntactic or semantic rules. However, according to the following examples first noticed by Chao (1968:435), we cannot simply say that the [*ba* NP V] sentences does not exist at all in Modern Chinese.

(44)   a.   Yi.ge.ge shen   chu muzhi [ba ni   kua].
                one one stretch out thump ba you praise
                Every one praises you with their thumps up. (Modern Beijing
                Opera *Shajiabang*)

        b.   Fuqi   shuang-shuang [ba jia   huan].
                couple pair-pair   ba home return
                The couples return their home pair by pair. (Modern Opera
                Huangmeixi)

How can a syntactic or semantic principle account for the fact that in verse plays, there is no BV Effect? One may argue that the BV Effect does not show up in verse plays because the syntax of verse plays deviates from that of spoken Chinese. However, there is no much reason to assume that the [*ba* NP V] in spoken Chinese is syntactically different from the [*ba* NP V] in verse plays. On the other hand, according to the Prosodic Hypothesis given here, the different effects of the BV between verse plays and spoken Chinese in *ba* sentences are expected. It is clear that verse plays represent a different register from spoken Chinese most prominently in their prosodic structures. The rhythmic structure of verse plays is independent of ordinary sentences

in spoken Chinese. It is well-known that sentences in verse plays are set to music, and that the ordinary sentence prosody may be modified by lengthening or shortening of certain words in order to meet the musical structures. This is to say that the prosodic rules, such as the BNC and the NSR, may not function in musical prosody as they do in spoken language. Obviously, the structure of a musical score has its own system and within that system the BNC and the NSR (or even other prosodic rules) does not play a central role (or may have different representations). As a result, the prosodically motivated BV Effect that appears in spoken language will inevitably be countervailed by the force of the musical structure. Accordingly, the evanescent BV Effect in verses strongly supports my analysis that the BV Effect in Chinese is a corollary of the prosodic constraint.

The correctness of this analysis can further be seen from its prediction that in contexts where the prosodic structure deviates from spoken language, there would be no BV Effect, hence a grammatical *ba* sentence in the [be NP V] structure will be formed in that environment. This is exactly what the theory predicts, as shown in the following modern poems, taken from the Column of *Study Chinese* in *Peoples' Daily* (Overseas Edition, from 1995-1996. Since the they are poems, I will only provide a literary translation for each lines):

(45)   a.   Xiao   pangxie, piqi   da,
              little   crab,   temper big

              Bu zhi   zou, heng-zhe pa.
              not know walk, across-ly crawl

              dong-bu-dong-de   tu   momor,
              move-not-move-PRT spit foam (frequently saliva)

              shen chu liang ao   [ba ren   jia].
              put out two claws **ba people pinch**.
                        ---- *Xue Zhongwen*: Lesson 9, *People's Daily*

        b.   Yizhi xiao shanyang,
              one   little goat

huzi   chang you chang,
beard long and long

bai   tu   jiao ta lao yeye,
white rabbit call him old grandfather

xiao yang xiu   de   [ba tou   huang].
little goat shame prt.   ba head shake
            ---- *Xue Zhongwen*: Lesson 11, *People's Daily*

c.   Baba   na jingzi [ba ta   zhao],
        Father take mirror ba him reflect/look

ta bi-shang yanjing gege-de   xiao.
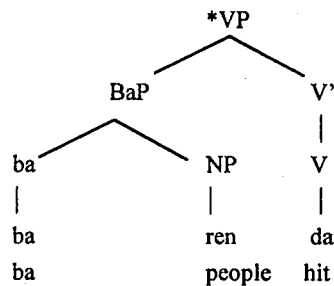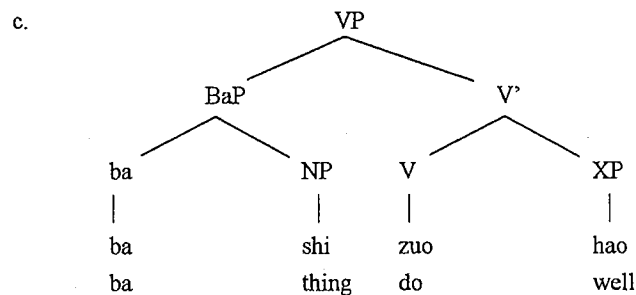he close-up eyes   chuckle-ly giggle
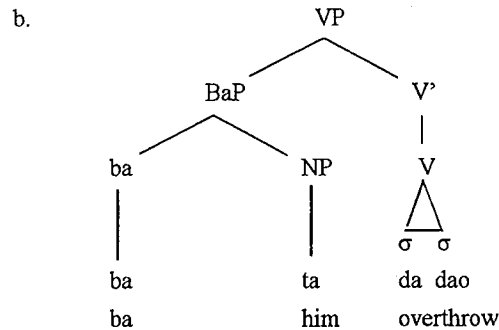   ----*Xue Zhongwen*: Lesson 26, *People's Daily*

It is obvious that the prosodic structure of poem is different from that of ordinary speech, hence it is expected that a monosyllabic verb can appear in the [*ba* NP V] structure in a poetic environment, prosodically deviating from spoken language.

5. SUMMARY

Regarding the V' position in *ba* constructions, the three potential structures are:

(46)   a.   *VP
                          BaP   V'
                                              |
                ba   NP   V
                | | |
                ba   ren   da
                ba   people   hit

b.

```
                        VP
                       /  \
                 BaP       V'
                /  \        |
             ba     NP       V
              |      |       /\
              |      |      σ  σ
             ba     ta    da dao
             ba     him   overthrow
```

c.

```
                        VP
                      /    \
                BaP         V'
               /  \        /  \
            ba     NP   V      XP
             |      |   |       |
            ba     shi zuo     hao
            ba     thing do    well
```

Structure (46a) has a branching node on the left with a non-branching sister node on the right. Since a branching node is heavier than a non-branching node, (46a) must be ruled out as an ill-formed prosodic structure by (15a-b). Structures (46b) and (46c) each have a branching node on both sides, and thus satisfy the prosodic requirements of the BNC and the NSR. However, the branching right-node in (46b) is different from that in (46c). In structure (46b), the branching right-node represents a lexical category, while in structure (46c), the branching right-node represents a phrasal category. Since not every disyllabic verb can make the *ba* sentence grammatical, structure (46b) exhibits various grammaticality judgements.[12] Given the distinction between lexical and phrasal categories, it follows that the prosodic ability for offsetting the BV Effect would also be different between (46b) and (46c). That is, sentences that are generated by structure (46c) will always be grammatical because the branching structure is syntactically licensed while those generated by (46b) require more prosodic restrictions. The theory presented here not only captures the prosodic differences between these three types of structures, but also provides an account for

their differences in grammaticality.

If all analysis given here is correct, the present study supports the hypothesis that syntax governs prosody and prosody also constrains syntax (Feng, 1995, 1999). If this is so, the prosodic constraints given in (15) can be viewed as well-formedness conditions on all _ba_ sentences which cannot surface until all of the relevant types of structural constraints (syntactic, semantic and prosodic) are satisfied. The prosodic constraints can also be viewed as types of interface conditions given the assumption that all conditions are interface conditions and that a linguistic expression is the optimal realization of the interface conditions.

NOTES

1. Although not every adverb can co-occur with bare-verbs in _ba_ constructions, the ones that do are usually stressed. For this reason, I will call them the `focused adverbs'.

2. Note that the term "Anticlimax" used by Chao refers to the semantics of the _ba_ construction, i.e. "something more elaborate is presumably meant to be said than can be expressed by just one morpheme". However, the term "Anticlimax" can also refer to the prosody of the _ba_ construction. As we will see below, the crucial reason for the BV-Effect is not a semantic anticlimax, but a prosodic anticlimax. That is, the Anticlimax Effect (AE) is disallowed by prosodic constraints: the Branching Node Condition and the Nuclear Stress Rule (see Section 3).

3. The NSR in Cinque (1993) is stated as follows: NS falls on the most embedded element on the recursive side of the tree" which has the same effect as (15a).

4. The statement `the last (element of a phrase) being the strongest' given by Chao (1968) can also be considered as an instance of the NSA.

5. The [s] and [w] features are hierarchically assigned from right to left according to the NSR and the Relative Prominence Principle (Liberman & Prince 1977).

6. Zec and Inkelas (1990) have also proposed a Heaviness Condition to capture the fact that a branching node (syllabically or syntactically) in metrical theory is heavier than a non-branching node:

> **Condition on Constituent Heaviness** (Zec and Inkelas, 1990:373)
> A prosodic constituent is heavy iff it branches.

7. One may question why the F-marked adverbs could not make the sentences (6) and (7) grammatical by the same Focus Stress Principle. As seen below, the NSR and the BNC, in the present system, apply only to elementary trees prior to the Adjunction Operation (i.e., adjoining the F-marked adverbs with an initial tree). This is to say that, the conflict between NSR and BNC exists in the initial tree ([ba

NP V]) and it cannot be resolved unless the structure [ba NP V] is reorganized by later (adjunction) operations that could make the BNC irrelevant in the environment. In other words, the Focus Stress Principle could not save the [ba NP V] structure, unless it solves the inherent conflict.

8. The reader is referred to Joshi (1985) and Kroch (1989) for a detailed introduction to the formalism.

9. Of course, the elements under the V' structure must also observe the semantic restrictions, otherwise the sentence will not be grammatical semantically.

10. As seen clearly from examples in (40) and (41), the verbs used there may all be considered as denoting a bounded event, which conforms to Liu's (1997) analysis that the *ba* predicate expresses a bounded event. However, it is also clear that only disyllabic verbs, but not monosyllabic verbs, can make the *ba* sentence grammatical with the boundedness denotation. In other words, it is highly unlikely that only disyllabic verbs such as *ting-zhi* `stop', *guan-bi* `close', *fa-biao* `publish', *bao-wei* `surround'...etc., could denote a bounded event, whereas the monosyllabic counterparts such as *ting* `stop', *guan* `close', *fa* `publish', *wei* `surround'...etc., are unable to do so.

11. The following sentences, taken from earlier Mandarin documents, provide further evidence for the well-formed disyllabic verbs in ba sentences:

a.　　老 身 见 你 是 金 枝 玉 葉 ， 须 不 把 你 作 踐 。 話 本 《 十 三 朗
五 岁 朝 天 》
Laoshen jian ni shi jin   zhi   yu ye,   xu   bu ba ni zuojian
I   see you are gold branch jade leaves, shoud not ba you harm.
I see you are imperially linked, (so) I should not harm you.

b)　　把 妻 子 調 戲 。 《 水 浒 · 八 》
Ba qizi tiaoxi. (Shuihu.8)
ba wife take liberties with
take liberties with (his) wife.

12. The reason may be attributed to a prosodic variation among disyllabic lexical items, i.e., the prosodic weight of disyllabic forms varies, so some disyllabic verbs are not strong enough to hold a prosodically strong position. For example, some weak disyllabic forms (i.e., the second syllable is neutralized or weakened, see Kratochvil (1987)) may not be able to form a standard branching category (see Feng (1995) for detailed discussions on this topic).

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韵律控制的把字句
冯胜利
堪萨斯大学

在汉语的句法研究中，一般认为把字句中的动词不能挂单。本文提出：这一规则尽管一般如此，但并不绝对。譬如，在诗歌韵文中，把字句的动词，无论双音节还是单音节，挂单均屡见不鲜；在口语里，双音节的挂单动词同样允许。口语里只有单音节动词决不挂单，即使其意义与双音节动词完全相同。据此，本文提出，动词挂单的把字句，既不能从句法上来解释，也很难从语义上来说明。这里真正起作用的是"韵律"。韵律是制约把字句动词的根本所在。这一分析，为"句法控制韵律，韵律也制约句法"(Feng, 1995) 的理论，提供了有力的证据。本文认为：韵律规则可以看作一种不同类型的交接条件 (Interface Condition)。如果语法规则可以视为交接条件，如果语言表达都是交接条件相互作用的最佳条件，那么，把字句的表达，同样必须在其韵律条件与其它交接条件的相互满足中，才得以实现。