Obligatory event modifiers and lexical licensing in the Chinese ba-construction

Introduction The paper targets the limited lexical productivity of the Chinese ba-construction (BC). The observation is that constraint formulation in terms of semantic verb classes is unreliable: the acceptability of verbs is often conditioned by the presence of additional elements in the sentence. The proposed analysis reduces reference to verb classes, focussing instead on the additional licensing elements and showing how their lexical entries or structural specifications constrain the choice of possible verbs in the BC. The analysis is modelled in HPSG; the possibility of moving the relevant selectional information into the lexicon as well as representing licensing relations between grammatical constructions via multiple inheritance allows for a minimally redundant constraint formulation.

Problem In its canonical form, the BC is a transitive clause pattern with preposed object. It is frequently characterized as a partially productive deviation from the basic SVO word order. In this paper, I address the variations in grammaticality that can be observed for BC-instantiations with different verbs. The following examples show three atelic verbs that occur in simple SVO sentences, but vary in acceptability in the BC:

(1) SVO:

Zhāngsān dǎ / kàn / xiàng   Lǐsī.
Zhangsan hit / see / ressemble Lisi

'Zhangsan hits / looks at / resembles Lisi.'

(2) *ba*-construction:
  a. Zhāngsān bǎ Lǐsī **dǎ** le   (yī xià).
     Zhangsan BA Lisi hit PRT a-bit
     'Zhangsan hit Lisi (a bit).'
  b. Zhāngsān bǎ Lǐsī **kàn** le   *(yī xià).
     Zhangsan BA Lisi look PRT a-bit
     'Zhangsan caught a glimpse of Lisi.'
  c. * Zhāngsān bǎ Lǐsī **xiàng**   le   (yī xià).
     Zhangsan BA Lisi resemble PRT (a-bit)
     'Zhangsan resembled Lisi (a bit).'

(2) shows that *dǎ* (hit) can be used as bare, aspectually marked verb. *Kàn* (see) is not licensed unless it is complemented by an appropriate lexical dependent, and *xiàng* (resemble) does not occur with *bǎ* at all. The variability correlates with a decreasing degree of transitivity contained in the lexical meaning of the verbs.

A related observation frequently stated in the literature is that the BC cannot be formed with a bare verb; this constraint has been given syntactic (Li, 1990) and prosodic (Feng, 2001) explanations. However, most authors do not make two distinctions which will be relevant for the present analysis: on the one hand, they do not sufficiently differentiate between types of dependents, specifically between grammatical aspect markers and lexical dependents. On the other hand, it is not pointed out which additional dependents can actually make the wellformedness contrast. In this paper, I focus on those kinds of additional verbal dependents that can make a wellformedness contrast (henceforth AVDs); the following examples show further instantiations of the BC with obligatory AVDs:

(3) a. *extent/degree adverb*:
     Zhāngsān bǎ zhè shì   xiǎng *(de tài jiǎndān).
     Zhangsan BA this affair think DE   too simple

     'Zhangsan thinks too plainly about this affair.'
   b. *resultative predicate*:
     Zhāngsān bǎ Lǐsī kàn*(tōu)   le.
     Zhangsan BA Lisi look.through-RES PRT

     'Zhangsan had understood Lisi s intentions.'
   c. *verb copy, indicating short duration/punctuality*:
     Zhāngsān bǎ Lǐsī děng le   *(děng).
     Zhangsan BA Lisi wait PRT wait

     'Zhangsan waited a moment for Lisi.'

The variability with different classes of verbs calls for a semantic explanation. Descriptively, I stick to the traditional characterization of the BC in terms of strong transitivity; thus, highly transitive verbs may occur without lexical dependents, whereas verbs with low transitivity must combine with a re-inforcing ADV that contributes additional transitivity components, such as delimitedness, punctuality, telicity, volitionality etc. (following Hopper and Thompson (1980)).
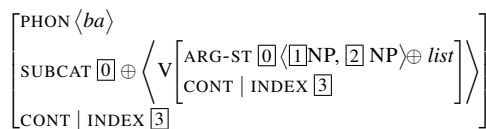
Approach The analysis models the interaction between the use of different verbs and changes in the surface form of the BC. I provide a semantic explanation of the facts: *ba* is associated with an underspecified relation that must be resolved by an element in its lexical instantiation. This element is analyzed as a semantic complement to *ba*; it corresponds either to the verb (2a) or to an AVD of the verb (2b, 3). In the latter case, the verb must be licensed by the selectional restrictions in the lexical type or entry of this additional modifier, thus ruling out verbs whose event structure is not compatible with the argument position of the modifier (2c).

The proposed approach allows to minimize reference to verb classes at the level of *bǎ*. The assumption is that a characterization of possible AVDs sufficiently predicts the wellformedness of sentences as in (2b) and (3): *bǎ* only needs to specify the types of compatible AVD types. By semantic selection, these AVDs constrain the choice of appropriate verbs.
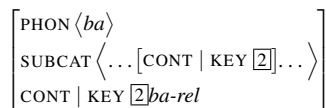
The analysis is modelled in HPSG. Partial structure sharing allows to isolate the representations of syntactic dependency and semantic selection; thus, whereas the AVDs are syntactically adjoined to the verb, they can be semantically selected by *bǎ* in order for the lexical instantiation to obtain the required event structure of the BC.

Formalization in HPSG In the literature, the syntactic status of *ba* has been discussed between prepostion, Case marker, functional head and verb. Constraint-based approaches have treated *bǎ* as marker (Gang, 1997; Gao, 2000) and head verb (Bender, 2000). The issue considered here, namely that *bǎ* may impose the presence of additional dependents on the verb, provides further support for a head analysis.

I analyze *bǎ* as a head that selects for a verbal complement and attracts the first two arguments on its argument structure:

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$$\begin{bmatrix} \text{PHON}\ \langle ba \rangle \\ \text{SUBCAT}\ \boxed{0} \oplus \left\langle V \begin{bmatrix} \text{ARG-ST}\ \boxed{0}\ \langle \boxed{1}\text{NP},\ \boxed{2}\ \text{NP} \rangle \oplus \textit{list} \\ \text{CONT} \mid \text{INDEX}\ \boxed{3} \end{bmatrix} \right\rangle \\ \text{CONT} \mid \text{INDEX}\ \boxed{3} \end{bmatrix}$$
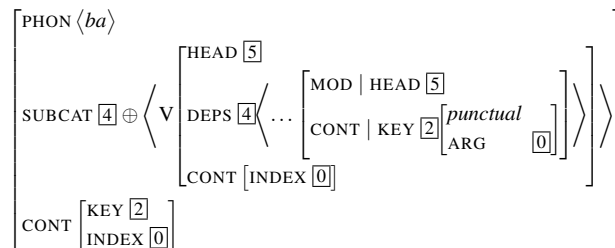
In the argument distribution considered here ([Agent *ba* Theme V XP]), *ba* identifies its index (= event variable) with the index introduced by the verb . The main semantic contribution (KEY) of *ba* is constrained to the type *ba-relation*; in order to ensure a correct lexical instantiation, it must be retrieved from the KEY-value of a dependent:

$$\begin{bmatrix} \text{PHON}\ \langle ba \rangle \\ \text{SUBCAT}\ \langle \dots \begin{bmatrix} \text{CONT} \mid \text{KEY}\ \boxed{2} \end{bmatrix} \dots \rangle \\ \text{CONT} \mid \text{KEY}\ \boxed{2}\textit{ba-rel} \end{bmatrix}$$

Ba-rel is the supertype of a hierarchy containing transitivity components or their combinations which are acceptable in the BC. It can be formulated on the basis of a decompositional approach to transitivity, e. g. as proposed in Hopper and Thompson (1980). The grammar does not say which surface element must contribute the relation. Thus, it may be contributed either by the verb or by additional elements. As shown in (3), dependents that add punctuality, telicity or an extent specification may cause a wellformedness contrast.

Going back to the surface form, it must be specified how the dependent contributing the *ba-rel* gets included into the selectional features of *ba* in order to impose its obligatory realization. The verb is directly selected by *ba*; thus, its main relation (KEY) naturally appears in the argument structure of *ba*, from where it may unify with the underspecified *ba-rel*.

The treatment of AVDs is slightly more complicated. The standard HPSG approach (Pollard and Sag, 1994) treats modifiers as well as resultative complements as syntactic non-heads and semantic heads: they attach to a syntactic head and take its content value as semantic argument. It has been observed that this approach is problematic for phenomena which require an equal treatment of adjuncts and complements at least at certain levels of representation (e. g. case assignment: Przepiórkowski (1997), extraction: Bouma et al. (2001), diachronic adjunct-to-complement change: Bender and Flickinger (1999)); these analyses have proposed extended valence lists which include the adjuncts of a given projection of the lexical head. In Chinese, elements that are interpreted as modifiers show a complement-like syntactic behavior: they cannot be iterated, have a relatively fixed position and do not undergo *do-so* replacement. For the BC, we have seen that the modifiers can be semantically required by *ba*; syntactically, they are optional dependents of the lexical verb. In order to represent their obligatory realization in the BC, I use the extended argument structure as proposed in Bouma et al. (2001) (extra combinatorial level DEPS, concatenating the selected arguments and adjuncts that are locally realized in a projection of the item) and allow *ba* to attract the dependents of the verb, analogously to the common argument attraction mechanism for raising verbs. Thus, in the case where no *ba-rel* is contributed by the verb, *ba* semantically selects for an appropriate AVD which, in turn, constrains the class of appropriate verbs. To illustrate, the following structure shows the selectional and semantic properties of *ba* for (2b):

$$\begin{bmatrix} \text{PHON}\ \langle ba \rangle \\ \text{SUBCAT}\ \boxed{4} \oplus \left\langle V \begin{bmatrix} \text{HEAD}\ \boxed{5} \\ \text{DEPS}\ \boxed{4}\ \left\langle \dots \begin{bmatrix} \text{MOD} \mid \text{HEAD}\ \boxed{5} \\ \text{CONT} \mid \text{KEY}\ \boxed{2}\begin{bmatrix} \textit{punctual} \\ \text{ARG}\ \ \boxed{0} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{CONT}\ \begin{bmatrix} \text{INDEX}\ \boxed{0} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{CONT}\ \begin{bmatrix} \text{KEY}\ \boxed{2} \\ \text{INDEX}\ \boxed{0} \end{bmatrix} \end{bmatrix}$$

By a unification of the DEPS element of the verb with a SUBCAT element of *ba*, the structure models a switch of the optional status of the AVD at the level of the verb to an obligatory complement status at the level of selection by *ba*.

Conclusion It has been shown how a semantic characterization of the BC in terms of transitivity components can be recasted into wellformedness constraints on the surface form of the construction: the *ba*-construction can be licensed by other transitivity-reinforcing constructions, which themselves ensure the choice of appropriate verbs. The analysis is based on a specific kind of nonlocal selection: *ba* is a head that combines with a verb. In case of a semantic mismatch, it requires the realization of an additional dependent to this verb that restores semantic wellformedness. Thus, dependents that are optional on one head become obligatory through its syntactic selection by another head and are reanalyzed as semantic complements of this higher head.

References

Bender, Emily. 2000. The Syntax of Mandarin ba: Reconsidering the Verbal Analysis. *Journal of East Asian Linguistics* 9, 100–145.

Bender, Emily and Flickinger, Dan. 1999. Diachronic Evidence for Extended Argument Structure. In Gosse Bouma, Erhard Hinrichs, Geert-Jan Kruijff and Richard Oehrle (eds.), *Constraints and Resources in Natural Language Syntax and Semantics*, pages 3–19, Stanford, CA: CSLI.

Bouma, Gosse, Malouf, Robert and Sag, Ivan A. 2001. Satisfying Constraints on Extraction and Adjunction. *Natural Language and Linguistic Theoryhashimoto* 19(1), 1–65.

Feng, Shengli. 2001. Prosodically constrained bare-verb in ba-constructions. *Journal of Chinese Linguistics* 29.

Gang, Liu. 1997. *Eine unifikations-basierte Grammatik für das moderne Chinesisch – dargestellt in der HPSG*. Ph. D.thesis, University Constance, SFB 471, FG Sprachwissenschaft, Universität Konstanz, Germany.

Gao, Qian. 2000. *Argument Structure, HPSG and Chinese Grammar*. Ph. D.thesis, Ohio State University.

Hopper, P. J. and Thompson, S. A. 1980. Transitivity in Grammar and Discourse. *Language* 56, 251 – 299.

Li, Audrey Yen-Hui. 1990. *Order and Constituency in Mandarin Chinese*. Studies in Natural Language and Linguistic Theory, Dordrecht: Kluwer Academic Publishers.

Pollard, Carl J. and Sag, Ivan A. 1994. *Head-Driven Phrase Structure Grammar*. Studies in Contemporary Linguistics, Chicago, London: University of Chicago Press.

Przepiórkowski, Adam. 1997. Adjuncts as Complements: Evidence from Case Assignment, paper delivered at the 4th International Conference on HPSG, 18–20 July 1997, Ithaca, New York.