

# Non sentential coordination with *he/gen/yu/ji/tong* in Mandarin Chinese

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# Plan

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3. Coordination of other categories with *he/gen/yu/ji*
4. Coordination of sequences with *he/ji*
5. HPSG analysis



# 1. Introduction

## – Three types of conjunctions in Mandarin (Ma 1994):

### – Type I: with non-sentential elements: *he/gen/yu/ji/tong* (and)

- (1) a. Wo **he/gen/yu/tong/ji** Zhangsan qu xuexiao.      “Zhangsan and I go to school.”  
I and Zhangsan go school.  
b. \* Wo qu xuexiao **he/gen/yu/tong/ji** Zhangsan qu xuexiao  
\* I go school and Zhangsan go school.

### – Type II: with phrases (except NP) and sentences: *bingqie* (and more)

- (2) a. Tade jifu yuchun **bingqie** nuoruo.      “His stepfather is stupid and weak.”  
his stepfather stupid and weak.  
b. Ta kanqilai jinzhangbuan, **bingqie** jizhe likai.      “He looks like nervous, and anxious to leave”  
he look like nervous, and anxious leave.

### – Type III: with sentences: *ke (shi)* (but)

- (3) Baoyu yao tiaowu, **ke(shi)** wo yao hui-jia.      “Baoyu wants to dance, but I want to go home.”  
Baoyu want dance, but I want go-home.



# Prepositions or conjunctions?

- Mandarin is classified as a with-language (Stassen 2000).
- *He/gen/yu/tong* can be **conjunctions** (4) or **prepositions** (5)
- *Ji* can only be used as conjunction (Zhang 2009).

(4) Wo xihuan chengzi he/gen/yu/tong/ji xiagjiao.

I like orange and banana

“I like oranges and bananas”

(5) Zhangsan he/gen/yu/tong/\*ji Lisi chaojia.

Zhangsan with Lisi quarrel.

“Zhangsan quarrels with Lisi.”



# *He /gen/yu/ji/tong*

## **Previous studies:**

Lv (2002): register and regional differences:

- ✦ *he* - commonly used.
- ✦ *gen* - preferred in Beijing dialect
- ✦ *tong* - mostly in East China
- ✦ *yu* - in written language.
- ✦ *ji* - literary register

Coyaud and Paris (1976) : syntactic differences

- ✦ *He/yu* – with nouns and infrequently with verbs
- ✦ *tong/gen* - only with nominals

Chen *et al* (1983): syntactic differences

- ✦ *Gen/tong/yu/ ji* - nominals only
- ✦ *He* - not only nominals, but also adjectives and verbs



## 2. Nominal coordination with *he/gen/yu/ji/tong*

Nouns can be coordinated by *he/gen/yu/ji/tong* in their three possible functions : argument (6), predicate (7) and adjunct (8)

(6) Xiaozhang, laoshi, he/gen/yu/ji/tong tongxue-men yiqi kanwang-le ta.  
school president, teacher and classmate-PL together visite-PRF him/her  
“School president, teacher et classmates have visited him/her together.”

(7) Ta shi zhengzhijia, jingjixuejia, he/gen/yu/ ji/ tong sixiangjia.  
s/he is politician, economiste and thinker  
“S/he is a politician, economiste and thinker.”

(8) Women jintian he/gen/yu/ji/tong mingtian dou xiuxi.  
we today and tomorrow all be off.  
“We will be off today and tomorrow. ”



# Interpretation of *he/gen/yu/ji/tong*

The conjunctions, for instance *and* in English and *et* in French have two main readings:

=> a **propositional** or **boolean** reading (9)

=> a **non-propositional** or **non-boolean** reading (10, 11).

(9) John and Mary have blue eyes.

=John has blue eyes and Mary has blue eyes.

(10) John and Mary make a beautiful couple.

≠ John makes a beautiful couple and Mary makes a beautiful couple.

(11) John and Mary earned a total of 50 000 € last year.

≠ John earned a total of 50 000 € last year and Mary earned a total of 50 000 € last year.



# Semantics of *he/gen/yu/ji/tong*

- *He/gen/yu/tong* are compatible with **distributive** predicates (12) and **collective** predicates: group (13a), sum (13b), or reciprocal (13c)

(12) Zhangsan *he/gen/yu/tong* Lisi dou hen congming.

Zhangsan and Lisi all very clever.

Zhangsan and Lisi are very clever. =Zhangsan is clever and Lisi is clever.

(13) a. Zhangsan *he/gen/yu/tong* Lisi shi yi-dui xingfu de fuqi.

Zhangsan and Lisi are a-CL happy De couple.

Zhangsan and Lisi form a happy couple.

b. Zhangsan *he/gen/yu/tong* Lisi yigong zhuan-le 1000 ouyuan.

Zhangsan and Lisi together earned-PRF 1000 €

Zhangsan and Lisi have earned 1000€ together.

c. Zhangsan *he/gen/yu/tong* Lisi shi xiongdi.

Zhangsan and Lisi be brother.

Zhangsan and Lisi are brothers.





# Interpretation of *he/gen/yu/ji/tong*

– *ji* only has a **distributive** reading (Zhang 2010):

(14)\* Zhangsan     **ji**     Lisi shi yi-dui     xingfu     de     fuqi.  
Zhangsan     and     Lisi is     a-CL     happy DE couple

(15)\* Zhe-jia     canguan     hunhe-le     zhongshi     ji     meishi     de     fengge.  
this-CL     restaurant     mix-PRF     Chinese     and American DE style.

=> Only propositional (boolean) reading



## 3. Coordination of other categories (Not with *tong*)

### 3.1 Coordination of Adjectives

- Paris (1979) distinguishes **scalar** adjectives (16) and **absolute** adjectives (17).

(16) Zhangsan **hen** piaoliang. “Zhangsan is very beautiful.”

Zhangsan very beautiful.

(17) Zhe-ge zhuozi **shi** fang **de**. “This table is square.

this-CL table be square DE

- Absolute adjectives may be coordinated by *he/gen/yu/ji in* both predicative (18) and attributive (19) position.

(18) Zhe-liang-ge qizi fenbie shi hong de he/gen/yu/ji lan de.  
these-two-CL flag respectively be red DE and blue DE

“These two flags are respectively red and blue.”

(19) Guangchang shang gua-zhe hongse de he/gen/yu/ji lanse de qizi.  
place on hang-duratif red DE and blue DE flag

“Red and blue flags are hanging in the square.”



## 3.1 Coordination of adjectives

- Scalar adjectives are difficult to coordinate. Most speakers accept attributive ones with *he/yu/ji* (20) but not predicative ones (21)

- (20) a. Zai heian he bingleng de xiaomuwu (cncorpus)  
in dark and cold DE cabins
- b. Renzhen yu yansu de jingshen (cncorpus)  
conscientious and serious DE spirit
- c. Gaoshen ji xinying de kecheng (cncorpus)  
advanced and new DE course

- (21) ? Zhangsan hen chengshi he/yu/ji shanliang.  
Zhangsan very honest and kind.  
“Zhangsan is very honest and kind.”



# Semantics of *he/gen/you*

- Booelan reading
- “non-boolean” readings are confined to color predicates and material adjectives where the predicate is singular (Lasersohn 1995, Winter 1998)

(22) The flag is green and white = Part of the flag is green and the rest of it is white.

≠ The flag is white and the flag is red.

(23) a glass and chrome table = Part of the table is made of glass and the rest is made of chrome

≠ a glass table and a chrome table

## – Not possible in Mandarin

(24) a. \* Na-ge qizi shi hongse de he/gen/you/ji lanse de.

that-CL flag be red DE and blue DE.

b. \*Na-ge hongse de he/gen/you/ji lanse de qizi bei mai-le

that-CL red DE and blue DE flag passif sell –PRF.

(25) a. \* Zhe-ge-jiezhi shi jin de he/gen/you taoci de.

this-CL-ring be gold DE and ceramic DE

b. \* Ta hen xihuan na - ge jin de he/gen/you taoci de jiezhi.

s/he very like that-CL gold DE and ceramic DE ring.



## 3.2 Coordination of verbs

- *He/you* can infrequently coordinate verbs (Coyaud et al. 1976).
- *He* can coordinate verbs, it can be in the position of predicate only when there are some elements before or after it (Chen *et al* 1983) .

(26) Mei tian zaochen, women bixu pao he tiao. (Chen 1983)  
every day morning, we must run and jump  
“Every morning, we have to run and jump.”

(27) Huiyi taolun he jue ding-le xia jidu de shengchan renwu he juti zhibiao. (Chen 1983)  
meeting discuss and determine-PRF next quarter DE production task and concrete target.  
“ At the meeting, they discussed and determined the production task and concrete objective of the next quarter.”

(28) Huiyi taolun-le \*he/bingqie jue ding-le xia jidu de shengchan renwu he juti zhibiao.  
meeting discuss-PRF and determine-PRF next quarter DE production task and concrete target.  
“At the meeting, they discussed and determined the production task and concrete objective of the next quarter.”



## 3.2 Coordination of verbs

=> **Hypothesis:** finite/nonfinite contrast in Mandarin clauses (Huang 1982, Hu, Pan & Xu 2001, Lin 2012), *he/you/ji* can only coordinate non finite verbs.

(29) Tamen zhengzai [bianji “Zhou Enlai xuanji”] he [yanjiu zhengli Enlai tongzhi de shengping  
they be doing write Zhou Enlai antology and research arrange Enlai comrade DE life-time  
shiji] (cncorpus)  
achievement

“They are writing ‘Zhou Enlai antology’ and researching Comrades Enlai’s life-story.”

(30) Zhan hou yingguo wei [baohu qi gongye] ji [weichi muqian shenghuo biao zhun],  
war after UK for protect its industry and maintain present living standard,  
shibi shixing baohu maoyi zhengce. (cncorpus)  
inevitably apply protect trade principe

“After War, in order to protect its industry and maintain the present standard of living, UK has to apply the trade protection policy.”

(31) [Ganshou] yu [siwei] de fangshi ye qi-le bianhua (cncorpus)  
experience and think DE way also happen-PRF change

“The way of experiencing and thinking mode has also changed.”





## 3.3 Coordination of adverbs

Ernst (2014) distinguishes **predicational** (manner, degree...) and **functional** adverbs (aspect, temporal, locative) in Mandarin.

Predicational adverbs must be coordinated by *bingqie* (28), a sentential conjunction.

(33) Ta [manmande], \*he/\*gen/\*yu/bingqie [wenroude] shuo.

s/he slowly and kindly speak.

“S/he speaks slowly and kindly.”

Functional adverbs can be coordinated by *he/gen/yu/ji* (29)

(34) Wukelan yi dong [yiqian] he/gen [xianzai] dou mei you erluosi junren  
Ukraine from East before and now all Neg. have Russian soldier

“There hasn’t been Russian soldiers in East Ukraine before and there isn’t now neither.”

(35) Zhibiao keyi zhishi ni [muqian] ji/yu [zuijin] keneng zaoyu de qingkuang.  
index can indicate you present and recent maybe meet DE situation

“Index can indicate the problems that you may be facing right now or going to face shortly.”





## 3.2 Coordination of PPs

– PPs can be coordinated by *he/gen/you/ji*, as modifiers (36, 37) and complements (38, 39)

(36) Ni [zai xuexi shang he [zai shenghuo shang dou yao bangzhu ta.  
you at study on and at life on all need help him  
“You should help him both in study and in life.”

(37) Wo [zai-jia] gen [zai-xuexiao] dou mei chifan.  
I at-home and at school all Neg. eat  
“I haven’t eaten neither at school nor at home.”

(38) Jizhong fenxi yaowu [dui qi shouti] ji [dui pinghuaaji] de zhijie zuoyong (cncorpus)  
concentrate analyse medicines to his receptor and to smooth muscle DE direct effect  
“Analysing primarily the direct effect of medicine on its receptor and smooth muscle.”

(39) Shi [dui cuowu de xingzhi] yu [dui fan cuowu hou hui zaocheng zenmeyang de yanzhong  
be to mistake DE nature and to make mistake after will bring how DE serious  
houguo] mei you renshi er zaocheng de (cncorpus)  
result NEG. have knowlege then cause DE  
“Is caused by misunderstanding the nature of the issue and ignoring the serious impact after mistakes.”



## 4. Coordination of sequences

*Bob gave a record to Mary and a book to Jean.*

- Such sequences may involve complements, modifiers, or mix of these two.
- VP coordination with ellipsis (Wilder 1997, Beavers & Sag 2004) (40a) or Argument Cluster Coordination (Maxwell & Manning 1996, Mouret 2006) (40b)

(40) a. Bob [gave a record to Mary] and [~~gave~~ a book to Jean].

b. Bob gave [a record to Mary] and [ a book to Jean]

- In English, *as well as* may coordinate two sequences while it is excluded with finite VP or S => there cannot be verbs inside of the second conjunct. (Mouret 2006)

(41) a. Bob gave a record to Mary as well as a book to Jean.

b. \*Bob gave a record to Mary as well as gave a book to Jean.



# 4. Coordination of sequences

- In Mandarin, sequences can be coordinated by *he/ji*

(42) 1990nian wuyue zai zhongguo faxue jichu lilun yanjiuhui disi\_ci nian hui he tong nian  
1990year May at China law fundamental theory conference fourth\_CL annual conference and same year  
shiyue youguan danwei zai Dalian zhaokai de minzhu, fazhi, quanli, yiwu taolunhui shang, yuhuizhe  
October related unit at Dalian conven DE democracy, legal, right, duties workshop on, conference participant  
dui quanli he yiwu de guanxi wenti dou jinxing-le relie de taolun (cncorpus)  
about rights and duties DE relation question all conduct-PRF lively DE discussion

“In the 4th annual conference of Chinese fundamental law theory in May 1990 and the workshop about democracy, legal, right and duties held by related units in Dalian in October of the same year, the conference participants discuss the relation about rights and duties lively”



# 4. Coordination of sequences

- (43) Tade guimo jiang shi quan sheng diyi da **ji** quan guo daer da (sinica corpus)  
Its scale will be whole province first big and whole nation second big  
“Its scale ranks the first within province and the second national wide.”

- (44) a. Jinnian xinnian, wo mai-le yi-tiao-weijin gei mama he yi-fu-shoutao gei baba.  
this year New Year, I buy-PRF a-CL-scarf for mother and a-CL-glove for father  
“This New Year, I have bought a scarf for my mother and a pair of gloves for my father.”
- b. Jinnian xinnian, wo mai-le yi-tiao-weijin gei mama \***he/bingqie** mai-le yi-fu-shoutao gei  
this year New Year, I buy-PRF a-CL-scarf for mother and buy-PRF a-CL-glove for  
baba.  
father  
“This New Year, I have bought a scarf for my mother and bought a pair of gloves for my father.”

=> cannot be elliptical coordination of clauses or finite VPs



# 5. HPSG analysis

- In a Head-driven Phrase structure grammar (Pollard and Sag 1987, 1994, Sag et al. 2003), words and phrases are organized in a hierarchy of types.

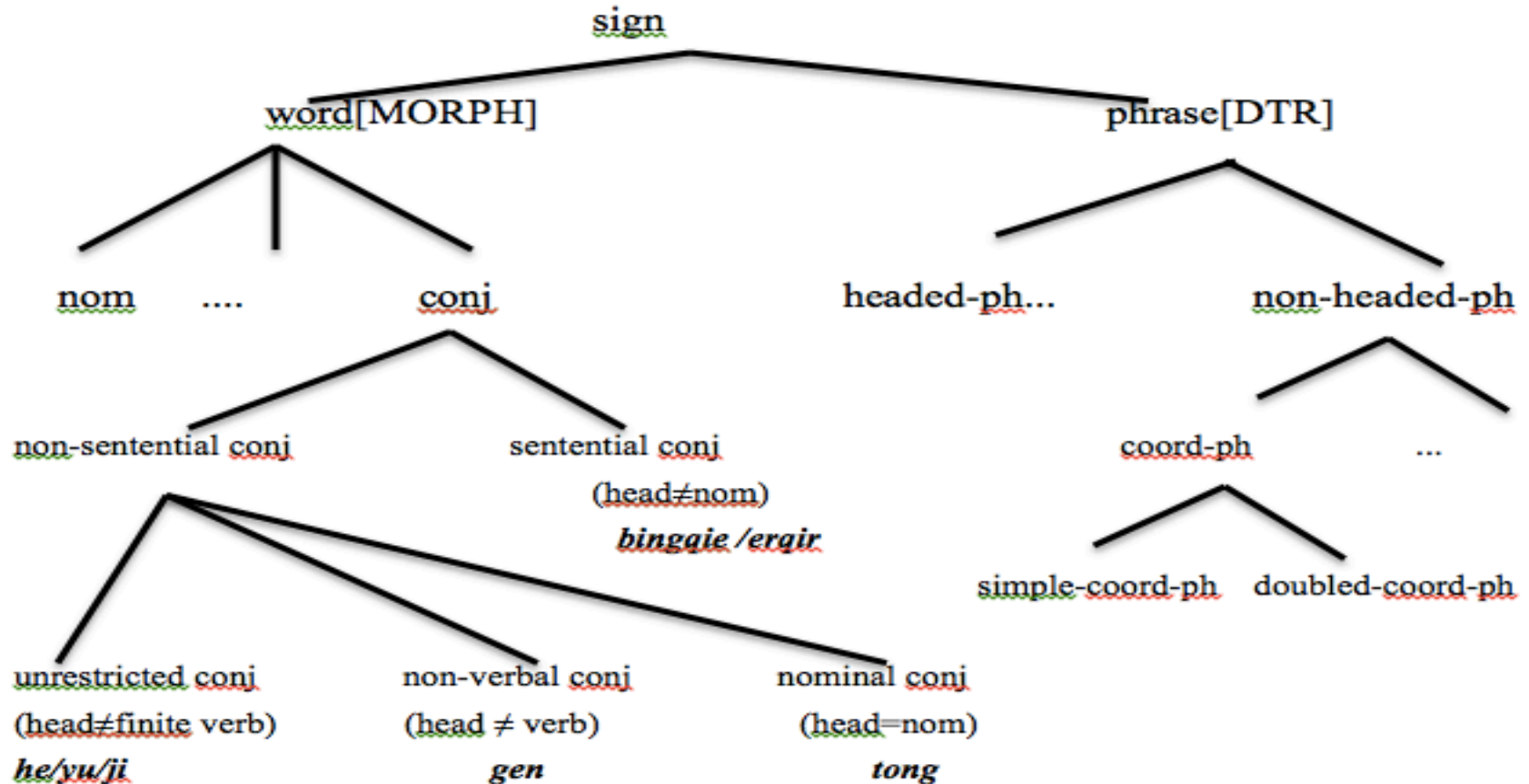


Figure.1 The hierarchy of linguistic signs in HPSG

# 5.1 HPSG analysis of coordinated phrase

- The coordinated phrase is analyzed as an n-ary unheaded phrase (Sag et al. 2003, Abeillé 2006 and Mouret 2005).

$$\text{Coord-phrase} \Rightarrow \left[ \begin{array}{l} \text{SYN} \left[ \begin{array}{l} \text{CONJ nil} \\ \text{HEAD [1]} \\ \text{VALENCE [2]} \\ \text{SLASH [3]} \end{array} \right] \\ \text{SEM}[\text{INDEX [4]}] \\ \text{NON - HEAD - DTRS ne - list} \left( \left[ \begin{array}{l} \text{HEAD [1]} \\ \text{VALENCE [2]} \\ \text{SLASH [3]} \end{array} \right] \right) + \left[ \begin{array}{l} \text{HEAD [1]} \\ \text{VALENCE [2]} \\ \text{SLASH [3]} \\ \text{INDEX [4]} \end{array} \right] \end{array} \right]$$



## 5.1 HPSG analysis of coordinated phrase

- In simplex coordinated phrases (*Paul, John and Mary*), a conjunction must appear at least on the last conjunct.

*simplxe-coord-phrase* => *coord-phrase* & [*nelist*  
*CONJ nil+nelist (CONJ≠nil)*]



## 5.2 HPSG analysis of coordinating conjunctions

- In HPSG, coordinating conjunctions can be analysed as « weak » heads (Abeillé 2005, Mouret 2007), inheriting most of their syntactic features from their complement.

$$(43) \text{conj-word} \Rightarrow \left[ \begin{array}{l} \text{CONJ} \neq \text{nil} \\ \text{HEAD} [1] \\ \text{VALENCE} \left[ \begin{array}{l} \text{SPEC} [2] \\ \text{SUBJ} [3] \\ \text{COMPS} < [\text{SYN} \left[ \begin{array}{l} \text{HEAD} [1] \\ \text{VAL} \left[ \begin{array}{l} \text{SPEC} [2] \\ \text{SUBJ} [3] \\ \text{COMPS} [4] \end{array} \right] \right] > +[4] \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right]$$





## 5.2 HPSG analysis of coordinating conjunctions

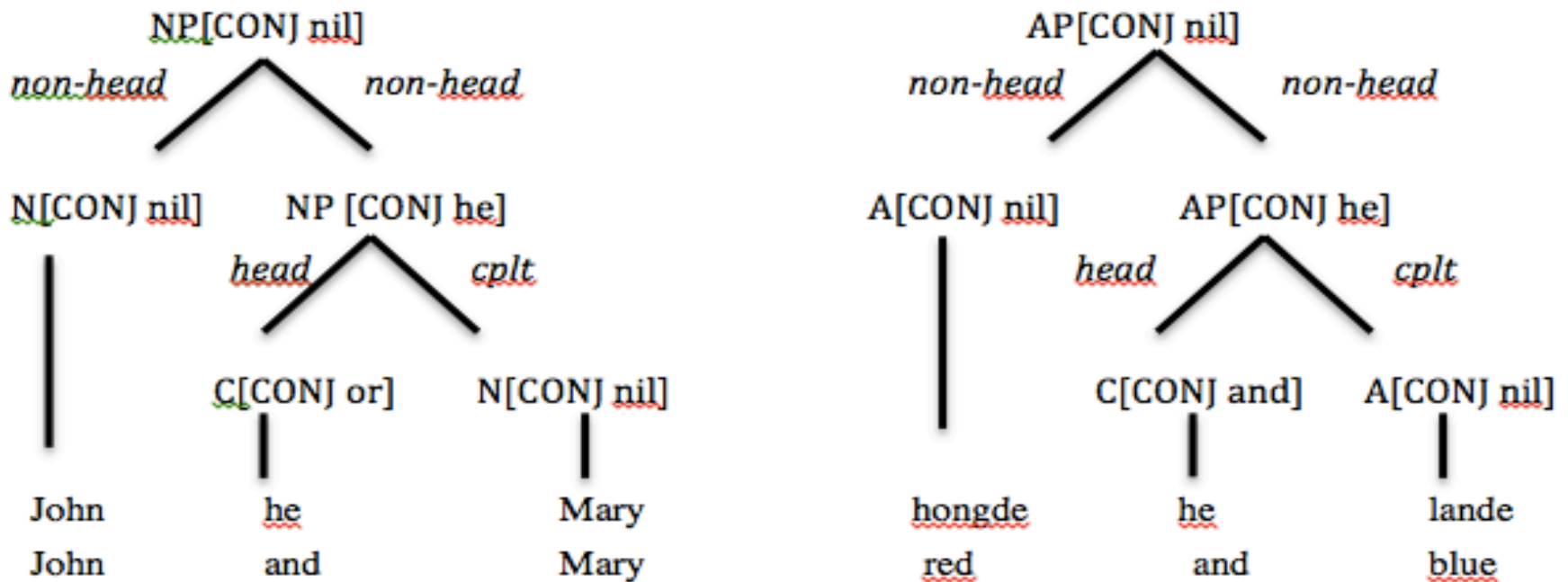


Figure 2. Two coordinated phrases in HPSG



## 5.2 HPSG analysis of coordinating conjunctions

– Three subtypes conjunction words :

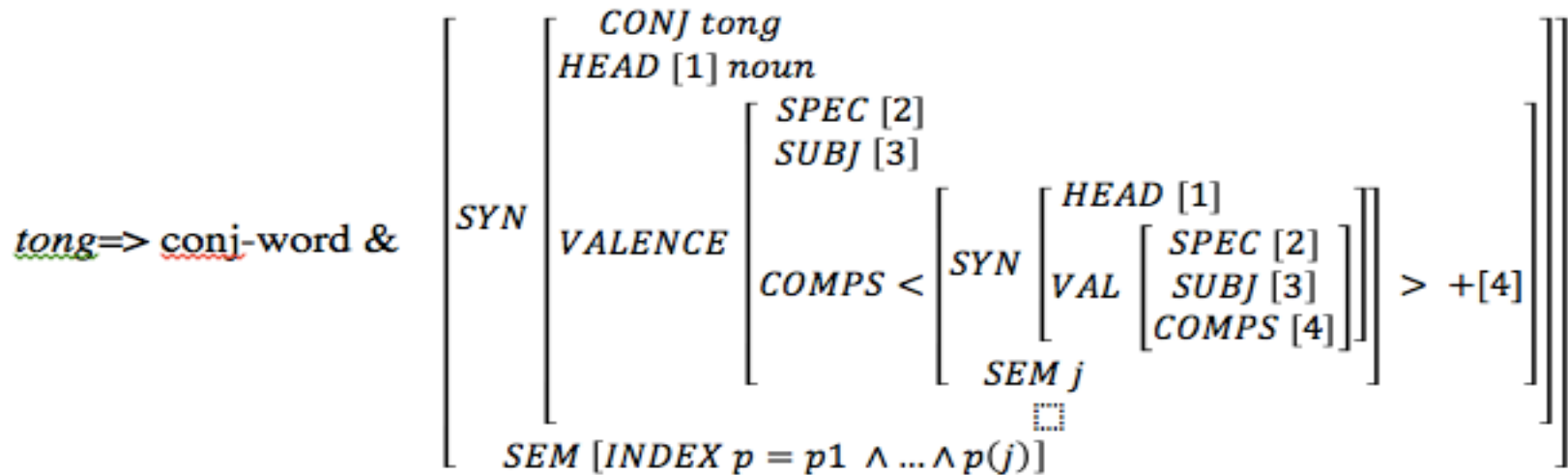
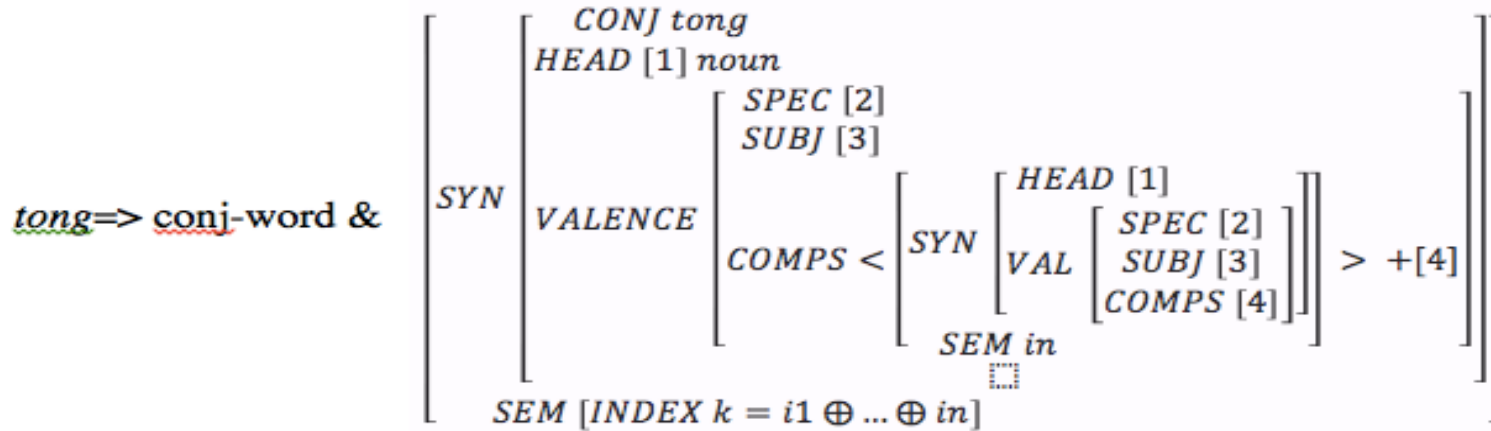
(39) nominal-Conj => conj-word & [HEAD noun]

non-verbal-Conj => conj-word & [HEAD ≠ verb]

unrestricted-Conj => conj-word & [HEAD ≠ verb [finite]]



# Analysis of *tong*



# Analysis of *tong*

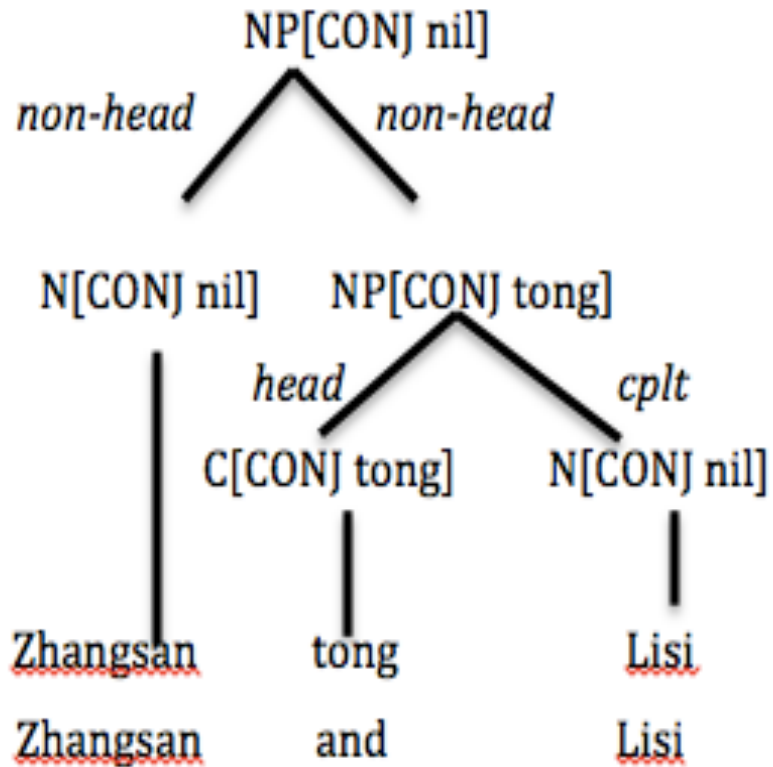


Fig. 3 Simple coordination with *tong*



# Analysis of *gen*

gen-1 => nominal conj & 
$$\left[ \begin{array}{c} \square \\ \text{SYN} \left[ \begin{array}{c} \text{CONJ } gen \\ \text{VALENCE } [\text{COMPS } \langle [\text{INDEX } in] \rangle] \end{array} \right] \\ \text{SEM } [\text{INDEX } k = i1 \oplus \dots \oplus in] \end{array} \right]$$

gen-2=> non-verbal conj & 
$$\left[ \begin{array}{c} \text{CONJ } gen \\ \text{SYN} \left[ \begin{array}{c} \text{VALENCE } [\text{COMPS } \langle \text{SYN} \left[ \begin{array}{c} \square \\ \text{TETE } \neq \text{verbe} \square \end{array} \right] \rangle] \\ \text{SEM } [\text{INDEX } j] \end{array} \right] \\ \text{SEM } [\text{INDEX } p = p1 \wedge \dots \wedge p(j)] \end{array} \right]$$



# Lexical entry for *he/yu/ji*

$$\underline{\text{he-1}} \Rightarrow \text{nominal } \underline{\text{conj}} \ \& \ \left[ \begin{array}{c} \text{CONJ } \textit{he} \\ \text{SYN} \left[ \begin{array}{c} \text{VALENCE} \left[ \text{COMPS} \langle \text{SEM} [\text{INDEX } \textit{in}] \rangle \right] \\ \text{SEM} [\text{INDEX } k = \textit{i1} \oplus \dots \oplus \textit{in}] \end{array} \right] \end{array} \right]$$

$$\underline{\text{he-2}} \Rightarrow \text{unrestricted } \underline{\text{conj}} \ \& \ \left[ \begin{array}{c} \text{CONJ } \textit{he} \\ \text{SYN} \left[ \begin{array}{c} \text{VALENCE} \left[ \text{COMPS} \langle \text{SEM} [\text{INDEX } \textit{j}] \rangle \right] \\ \text{SEM} [\text{INDEX } p = \textit{p1} \wedge \dots \wedge \textit{p(j)}] \end{array} \right] \end{array} \right]$$



# Lexical entry for *he/you/ji*

ji => unrestricted conj &

$$\left[ \begin{array}{l} \text{CONJ } ji \\ \text{SYN} \left[ \begin{array}{l} \text{VALENCE} [\text{COMPS} \langle \boxed{\phantom{x}}, [\text{SEM} [\text{INDEX } j]] \rangle] \end{array} \right] \\ \text{SEM} [\text{INDEX } p = p1 \wedge \dots \wedge p(j)] \end{array} \right]$$


# Conclusions

- Syntactic distinctions between *he/gen/yu/ji/tong*:
  - all coordinate nouns, not clauses nor finite VP
  - he/gen/yu/ji* may coordinate adjectives, PPs, functional adverbs and non finite verbs
  - he/ji* may coordinate sequences
- Semantic distinctions between *he/gen/yu/ji/tong*:
  - he/gen/yu/tong* compatible with boolean and non boolean reading
  - ji* only compatible with distributional (boolean) reading
- HPSG well suited for capturing these differences

