

Compound Event Nouns of the ‘Modifier-head’ Type in Mandarin Chinese

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Abstract. Event nouns can lexically encode eventive information. Recently these nouns have generated considerable scholarly interest. However, little research has been conducted in their morphological and syntactic structure, qualia modification, event representing feature, and information inheritance characteristics. This study has these main findings. 1) Morphologically, the modifier and the head is either free or bound morpheme. Syntactically the modifier is a nominal, adjectival, verbal or numeral morpheme, while the head is a nominal morpheme. 2) The modifier acts as a qualia role of the head. 3) All heads represent events, while the modifier is or is not an event. 4) The semantic information of a compound event noun can be inherited from the modifier or the head.

Keywords: compound event noun, modifier, head, qualia structure, information inheritance

1 Introduction

Event nouns are a subtype of nouns that lexically encode eventive information (Wang et al. 2011). In recent years, there has been growing interest in these nouns. Previous research in Mandarin Chinese includes patterns that they usually appear (Chu 2000; Han 2010; Ma 1995), their classifiers (Ma 1995; Wang & Zhu 2000; Wang & Huang 2011), internal and external temporal attributes (Liu 2004), semantic type system of the event noun *huìyì* (Wang et al. 2011). However, little attention has been devoted to the morphological and syntactic structure, qualia modification, event representing feature, and information inheritance characteristics of event nouns.

Compound nouns can be divided into seven groups according to their syntactic structure: modifier-head, coordinative, predicate-object, predicate-complement, subject-predicate (topic-comment), reduplicative, and abbreviatory compound nouns (Chang 1995). This study focuses on ‘modifier-head’ compound nouns that represent events.

The data in this study are from three sources. 1) The balanced modern Chinese corpus *Sinica Corpus*¹. 2) *The Grammatical Knowledge-base of Contemporary Chinese—A complete Specification*. It is compiled by (Yu et al. 2003) and includes more than 400 event nouns. 3) A few example sentences are searched online by using the search engines Google and Baidu.

The following sections are organized as follows. Section 2 discusses the structure of compound event nouns of the ‘modifier-head’ type. Section 3 examines the qualia role in an event noun. Section 4 is about the event representing ability of the modifier and the head. Section 5 demonstrates event ordering. Section 6 analyses information inheritance from the modifier and the head. Finally Section 7 draws the main conclusion and suggests future work.

2 Structure of the ‘Modifier-head’ Type Event Nouns

2.1 Morphological Structure

Either the modifier or the head can be a free or bound morpheme in a ‘modifier-head’ type event noun. 1) bound morpheme + free morpheme: 瑞雪 *rùi-xu* ‘auspicious snow’, 劇痛 *jù-*

¹ <http://db1x.sinica.edu.tw/kiwi/mkiwi/>

tòng ‘sharp pain’. 2) free morpheme + bound morpheme: 工作餐 *g ngzuò-c n* ‘working lunch’, 書法展 *sh f -zh n* ‘handwriting exhibition’. 3) bound morpheme + bound morpheme: 便宴 *biàn-yàn* ‘informal dinner’, 蝗災 *huáng-z i* ‘plague of locusts’. 4) free morpheme + free morpheme: 海風 *h i-f ng* ‘sea breeze’, 團圓飯 *tuányuán-fàn* ‘reunion dinner’.

2.2 Syntactic Structure

The modifier can be a nominal, adjectival, verbal or numeral morpheme, while the head is a nominal morpheme. 1) N+N: 核戰爭 *hé-zhànzh ng* ‘nuclear war’, 直腸炎 *zhícháng-yán* ‘rectitis’, 春汛 *ch n-xùn* ‘spring flood’. 2) Adj+N: 大雨 *dà-y* ‘heavy rain’, 美餐 *m i-c n* ‘delicious meal’. 3) V+N: 團圓飯 *tuányuán-fàn* ‘reunion dinner’, 搖擺舞 *yáob i-w* ‘rock and roll’. 4) Numeral+N: 百戰 *b i-zhàn* ‘hundreds of battles’.

2.3 Productive Right Morphemes

Compound event nouns are morphologically productive, with the right morpheme as an event stem. Examples are shown below.

~戰 *zhàn* ‘battle’: 資訊戰 *z xùnzhàn* ‘information warfare’, 細菌戰 *xìj nzhàn* ‘germ warfare’, 化學戰 *huàxuézhàn* ‘chemical warfare’, 貿易戰 *màoyìzhàn* ‘trade war’

~賽 *sài* ‘match’: 世乒賽 *shìp ng sài* ‘the world Table Tennis game’, 象棋賽 *xiàngqísài* ‘chess match’

~餐 *c n* ‘meal’: 番茄餐 *f nqiéc n* ‘tomato meal’, 法國餐 *f guóc n* ‘French food’, 學生餐 *xuéshengc n* ‘student meal’

~會 *huì* ‘meeting, gathering; council’: 舞蹈會 *w d ohuì* ‘dance council’, 校董會 *xiàod nghuì* ‘school direct council’, 哲學會 *zhéxuéhuì* ‘philosophy council’

~病 *bìng* ‘disease’: 心臟病 *x nz ngbìng* ‘heart disease’, 心血管病 *x nxuègu nbìng* ‘cardiovascular disease’, 胃病 *wèibìng* ‘gastric disease’

These examples show that compound event nouns have double roots. The right root is the head of an event noun, expressing generic event types, while the modifying left root elaborates information on the event.

3 Qualia Modification of the ‘Modifier-head’ Type Event Nouns

Pustejovsky (1991, 1995) shows how lexical items encode semantic information in the qualia structure. There are four roles in the qualia structure, and each is associated with some values. 1) The constitutive role is the relation between an object and its constituents or parts. The role values include material, weight, parts and component elements. 2) The formal role can distinguish the object within a larger domain. Orientation, magnitude, shape, dimensionality, color, and position are its role values. 3) The telic role is about the purpose and function of the object. 4) The agentive role describes factors involved in the origin of an object, such as creator, artifact, natural kind, causal chain.

Under the theoretical framework of qualia structure, Johnston & Busat (1996) analyze the nominal compounding phrases in English and Italian. They find that the modifier can specify the type of an argument to a predicate in a telic, agentive or constitutive role. Lee et al. (2010) demonstrate the qualia modification within a noun-noun compound. Following (Johnston & Busat 1996; Lee et al. 2010), we examine the qualia roles involved between the modifier and head in event nouns.

Telic modification: the modifier is the function or aim of the head. For example, 淘汰賽 *táotài-sài* ‘elimination game’, 選拔賽 *xu nbá-sài* ‘selective trial’, 衛冕賽 *wèimi n-sài* ‘championship fight’.

Agentive modification: the modifier is origin or cause of the head. For instance, 訂婚宴 *dìng hūn yàn* ‘a betrothal party’, 答謝宴 *dáxiè-yàn* ‘return Banquet’.

Constitutive modification: the modifier is the component of the head. For example, 橄欖球賽 *gǎnlǎn qiú-sài* ‘rugby match’, 帆船賽 *fān chuán-sài* ‘yacht match’.

Formal modification: one type is the modifier is a subtype of the head, such as 鼾聲 *hān shēng* ‘snoring sound’, 喊聲 *hǎn shēng* ‘shouting sound’, 吼聲 *hǒu shēng* ‘roaring sound’, 歡呼聲 *huān hū shēng* ‘acclamation sound’. The other type is the modifier is the scale of the head, such as 中雨 *zhōng yǔ* ‘moderate rain’, 大風 *dà fēng* ‘strong wind’.

4 Event Representing Ability of the Modifier and Head in Event Nouns

‘Modifier-head’ type event nouns have three types of event-representing patterns, depending on whether the modifier or the head represents an event.

1) Both the modifier and the head refer to events, such as 歌舞劇 *gē wǔ jù* ‘song and dance opera’. The modifier 歌舞 *gē wǔ* ‘song and dance’ is about the singing and dancing event. The head 劇 *jù* ‘opera’ is a performing event.

2) Only the head refers to an event, such as 海水浴 *hǎi shuǐ yù* ‘sea bath’, 木偶戲 *mù ǒu xì* ‘puppetoon’. The heads 浴 *yù* ‘bath’ and 戲 *xì* ‘drama’ are events themselves, while the modifiers 海水 *hǎi shuǐ* and 木偶 *mù ǒu* ‘puppet’ are entities.

3) The head refers to an event, and the modifier is coerced to be an event. An instance of this type is 冠軍賽 *guānjūn sài* ‘championships’. 賽 *sài* ‘game’ is an event in itself while 冠軍 *guānjūn* ‘champion’ is coerced to be an event through the telic role ‘competing for the champion’.

5 Event Ordering of Compound Event Noun with Two Events

When there are two events in a ‘modifier-head’ type event noun, there is an ordering issue between them.

TLINK is one type of the Time Markup Language tags. It is a temporal link which represents two temporal elements' relation. TLINK distinguishes 14 relation types: Before | After | Includes | Is_Included | During | Simultaneous | I-after | I-before | Identity | Begins | Ends | Begun_By | Ended_By | During_Inv². TimeML does not have overlap relation, as this relation does not naturally occur in real texts (Verhagen 2004). However, in compound event nouns, overlap relation is common. We have detected two kinds of overlapping events in compound event nouns.

The first type is partially overlapping. For instance, 雪災 *xuě zāi* ‘snow disaster’ contains both a snowing event and a disaster event. Snowing happens first. As time goes on, the heavy snow continues and consequently it becomes a disaster. The disaster lasts even after snowing ends. The relation between the two events is demonstrated in (1).

(1) 雪 *xuě* ‘snow’ _____
 災 *zāi* ‘disaster’ _____

The second type is completely overlapping. In 冠軍賽 *guānjūn sài* ‘championship’, 冠軍 *guānjūn* ‘champion’ is coerced to be an event, meaning competing for the champion, and 賽 *sài* ‘game’ is having a match. The two events completely overlap with each other.

6 Information Inheritance of the ‘Modifier-head’ Type Event Nouns

6.1 Inheriting Information from the Modifier

² http://www.timeml.org/site/publications/timeMLdocs/timeml_1.2.1.html#tlink

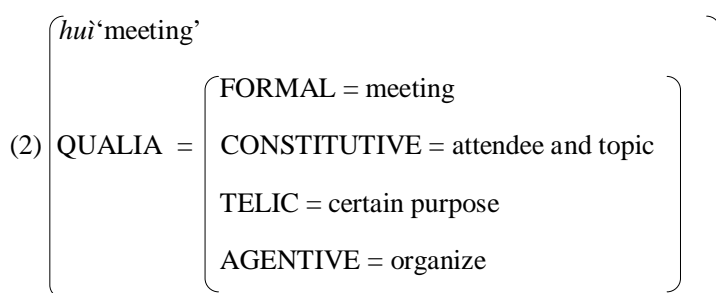
Righthand Head Rule (RHR) states that the head of a morphologically complex word is the righthand member of that word (Williams 1981). This entails that the properties of a word is determined by the rightmost constituent. This section examines the compound 音樂會 *y nyuèhuì* ‘concert’. Different from RHR, the results demonstrate that in many cases the left side modifier contributes more semantic information than the right side head.

In ‘*Modern Chinese Dictionary*’ (*Dictionary Editing Room of the Language Institute 2005*), 會 *huì* ‘meeting’ has the following 6 senses, out of which only the first one is an event.

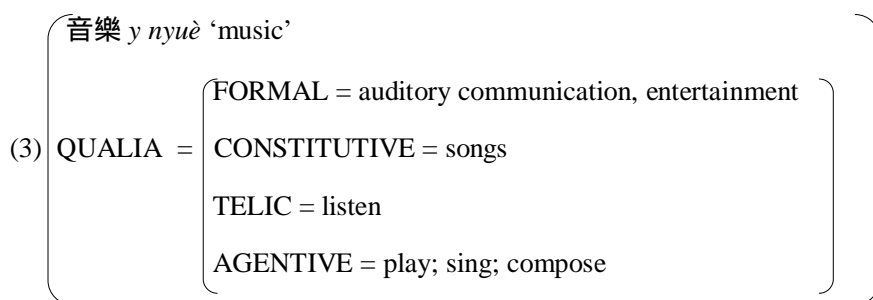
會 *huì* ‘meeting’

1) Gathering with certain purpose. 2) Certain groups. 3) Temple fair. 4) Collective activities that are organized for civil pilgrim or praying for harvest, such as incense will, temple events, etc. 5) Small-scale mutual assistance economic organization that the joined members pay on average on schedule and they can use the organization in turn. 6) Primary cities.

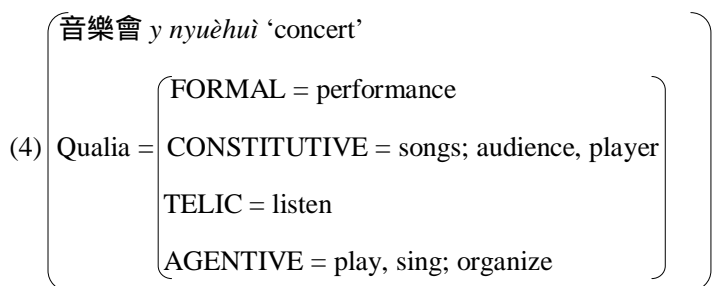
The qualia structure of 會 *huì* ‘meeting’ is depicted below.



The qualia structure of 音樂 *y nyuè* ‘music’ is illustrated below.



The qualia structure of 音樂會 *y nyuèhuì* ‘concert’ is shown below.



In the following part, seven evidences show that 音樂會 *y nyuè huì* ‘concert’ usually inherits information from the modifier 音樂 *y nyuè* ‘music’.

1) Nominal Modifier of 音樂會 *y nyuè huì* ‘concert’

If we utter 貝多芬音樂會 *Bèidu f n y nyuèhuì* ‘Beethoven concert’ at present time, the nominal modifier 貝多芬 *Bèidu f n* ‘Beethoven’ is the composer.

貝多芬音樂會 *Bèidu f n y nyuèhuì* ‘Beethoven concert’ is a concert which plays the music composed by 貝多芬 *Bèidu f n* ‘Beethoven’. That is, 貝多芬 *Bèidu f n* ‘Beethoven’ is the composer.

- (5) $\left(\begin{array}{l} \text{貝多芬音樂會 } \underline{Bèidu f n} y nyuèhuì \text{ ‘Beethoven concert’} \\ \text{Qualia} = \left[\text{AGENTIVE} = \text{play music composed by } \underline{Bèidu f n} \text{ ‘Beethoven’} \right] \end{array} \right)$

(5) shows that the agentive role of 貝多芬音樂會 *Bèidu f n y nyuèhuì* ‘Beethoven concert’ is the same as the ‘compose’ agentive role of 音樂 *y nyuè* ‘music’ as shown in (3). This indicates that Beethoven modifies the modifier 音樂 rather than the head 會 in the compound 音樂會.

In 陳奕迅音樂會 *Chén yìxùn y nyuèhuì* ‘the concert of Eason Chan’, the nominal modifier 陳奕迅 *Chén yìxùn* ‘Eason Chan’ is the singer. 陳奕迅音樂會 *Chén yìxùn y nyuèhuì* ‘the concert of Eason Chan’ is a concert on which 陳奕迅 ‘Eason Chan’ sings.

- (6) $\left(\begin{array}{l} \text{陳奕迅音樂會 } \underline{Chén yìxùn} y nyuèhuì \text{ ‘the concert of Eason Chan’} \\ \text{Qualia} = \left[\text{AGENTIVE} = \text{陳奕迅 } \underline{Chén yìxùn} \text{ ‘Eason Chan’ sings on the concert} \right] \end{array} \right)$

The agentive role of 陳奕迅音樂會 *Chén yìxùn y nyuèhuì* ‘the concert of Eason Chan’ is the same as the ‘sing’ agentive role of 音樂 *y nyuè* ‘music’ as shown in (3). Therefore, Eason Chan modifies 音樂 *y nyuè* ‘music’ rather than 會.

In 小提琴音樂會 *xì otíqín y nyuèhuì* ‘violin concert’, the nominal modifier 小提琴 *xì otíqín* ‘violin’ is the exclusive instrument used to play music on a concert. The constitutive role of 小提琴音樂會 *xì otíqín y nyuèhuì* ‘violin concert’ is the songs played by violin, which is identical with the constitutive role ‘songs’ of 音樂 *y nyuè* ‘music’. Thus 小提琴 *xì otíqín* ‘violin’ modifies 音樂 *y nyuè* ‘music’ instead of 會.

2) Adjectival Modifiers of 音樂會 *y nyuèhuì* ‘concert’

精彩的音樂會 *jngc ide y nyuèhuì* ‘splendid concert’ expresses the splendid music on a concert, not a splendid meeting. Thus, 精彩 *jngc i* ‘splendid’ inherits information from 音樂 *y nyuè* ‘music’ rather than 會 *huì* ‘meeting’.

3) Verbal Modifier of 音樂會 *y nyuèhuì* ‘concert’

The agentive role of 獨唱音樂會 *dúchàng y nyuèhuì* ‘vocal recital’ is ‘sing’; the agentive role of 獨奏音樂會 *dúzòu y nyuèhuì* ‘instrumental recital’ is ‘play’. They are the same as agentive role of 音樂 *y nyuè* ‘music’ as depicted in (3).

4) Nouns Modified by 音樂會 *y nyuèhuì* ‘concert’

The constitutive role of 音樂會曲目 *y nyuèhuì q mù* ‘concert songs’ is the songs on a concert, which is the same as the constitutive role of 音樂 *y nyuè* ‘music’.

5) 音樂會 *y nyuèhuì* ‘concert’ as a Subject

In 音樂會演出 *y nyuèhuì y nch /dúzòu* ‘concert performance’, the agentive role is ‘play’, which is identical with the agentive role of 音樂 *y nyuè* ‘music’, not 會 *huì* ‘meeting’.

6) 音樂會 *y nyuèhuì* ‘concert’ as an Object

In 聆聽音樂會 *língtīng nyuèhuì* ‘listen carefully to a concert’, the constitutive role is songs, which shares the same constitutive role with 音樂 *y nyuè* ‘music’.

7) Classifiers of 音樂會 *y nyuèhuì* ‘concert’

In 這台音樂會 *zhè tái y nyuèhuì* ‘this concert’, 台 *tái* is a stage where the performance takes place. Thus it is related to 音樂 *y nyuè* ‘music’. For 會 *huì* ‘meeting’, it is related to the gathering of audience who seats in the concert hall, not the 台 *tái* ‘stage’.

In sum, contrary to RHR, the ‘modifier-head’ event noun 音樂會 *y nyuèhuì* ‘concert’ indicates that the modifier, which is on the left, holds more semantic information gives the event structure of the whole noun, while the head, which is on the right, is more bleached and generic in meaning. Other similar examples are 舞蹈會 *w d o huì* ‘dance party’, 演奏會 *y n zòu huì* ‘playing concert’, 圖片展 *túpiàn zh n* ‘photo exhibition’.

6.2 Inheriting Information from the Head

It is more conventional that the main information is inherited from the head, which is in conformity with RHR. Examples are shown in (7) and (8).

(7) 陽春 三月 京城 普 降 鵝毛 雪。

yángchūn n s nyuè j ngchéng p jiàng émáo xu 。

spring March capital city widespread fall goose feather snow

‘Goose feather like snow falls widely in the capital city in Spring March.’

(8) 成都 下起了 鵝毛 雪。

chéngdū xiàq le émáo xu 。

Chengdu begin ASP goose feather snow

‘It began to snow goose feather like snow in Chengdu.’

In both (7) and (8), 降 *jiàng* ‘fall’ and 下 *xià* ‘fall’ selects 雪 *xu* ‘snow’ rather than 鵝毛 *émáo* ‘goose feather like snow’ as their arguments. 鵝毛 *émáo* ‘goose feather’, as a modifier, gives the shape of the snow, which is the formal quale of snow.

6.3 Inheriting Information from Either the Modifier or the Head

The semantic information of some compound event nouns can be inherited either from the modifier or the head.

1) Inheriting information from the head

(9) 地雷 戰 英雄

dìléi zhàn y ngxióng

landmine warfare hero

‘heroes in the landmine warfare’

(10) 地雷 戰 越 打 越 大

dìléi zhàn yuè d yuè dà

landmine warfare more fight more large

‘The Landmine warfare becomes larger and larger.’

In 地雷戰 *dìléi zhàn* ‘landmine war’, the left morpheme 地雷 *dìléi* ‘landmine’ is a physical object, while the right morpheme 戰 *zhàn* ‘war’ is an event. (9) refers to heroes in 戰 *zhàn* ‘wars’ rather than 地雷 *dìléi* ‘landmine’. In (10), 大 *dà* ‘large’ modifies the right morpheme 戰 *zhàn* ‘wars’ rather than the left morpheme 地雷 *dìléi* ‘landmine’.

2) Inheriting information from the modifier

- (11) 地雷 戰 炸 破 敵 膽
dìléi zhàn zhà pò dí dǎn
 landmine warfare explode broken enemy gallbladder

‘The landmine warfare frightens the enemy and defeats their morale.’

In (11), 炸 *zhà* ‘explode’ indicates the exploding event of 地雷 *dìléi* ‘landmine’ rather than the warfare event of the head 戰 *zhàn* ‘wars’.

The above examples illustrate that the semantic information of 地雷戰 *dìléi zhàn* ‘landmine warfare’ can be inherited either from the modifier or the head. A similar example is 地道戰 *dìdào zhàn* ‘tunnel warfare’.

7 Conclusion and Future Work

This study has the following findings for compound event nouns of the ‘modifier-head’ type. 1) Both the modifier and the head can be free or bound morphemes. Moreover, the modifier can be a nominal, adjectival, verbal or numeral morpheme, while the head is a nominal morpheme. Some compound event nouns have a morphologically productive right-side event morpheme. 2) The modifier is a telic, agentive, constitutive or formal role of the head. 3) The modifier can directly or be coerced to represent an event, while the head represents an event all the time. 4) In a compound, the head usually provides the semantic and syntactic information. However, this research finds that the modifier can sometimes provide more semantic information and gives the event structure.

For future work, compound event nouns with other syntactic structures, such as coordinative, subject-predicate, need to be investigated in order to get an overall view of event nouns.

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