





























- ‘(Unexpectedly,) the younger brother is eating beef noodles now!’  
 c. 太稀奇了  
 tai xiqi le  
 too rare Prc  
 ‘It’s too rare.’

In (17), the sentence *jingran* presents, i.e. (17b), temporally follows (17a). This temporal relation is determined by the temporal adverbial *ganggang* ‘just now’ and *xianzai* ‘now’ in these two sentences. *Jingran* has nothing to do with the temporal relation.

Let’s look at another example. Assume the following scenario for (25). Xiaozhang is my classmate. He always does things more slowly than I do.

- (18) a. 我 明天 才 開始 準備 期末考  
 wo mintian cai kaishi zhunbei qimokao  
 I tomorrow not until begin prepare final exam  
 ‘I will not start preparing for the final exam until tomorrow.’  
 b. 小張 竟然 已經 開始 了  
 xiaozhang jingran yijing kaishi le  
 Xiaozhang JINGRAN already begin Prc  
 ‘Xiaozhang has already started (contrary to the expectation)!’

In the example above, (18b) is a sentence presented by *jingran*. However, (18b) temporally precedes (18a). Again, this temporal relation is determined by the temporal adverbials *mintian* ‘tomorrow’ and *yijing* ‘already’, not the evaluative modal.

The first two sentences in (17) are connected by *Contrast* and so are the two sentences in (18). But the temporal relations between them are just the opposite: in (17) the sentence *jingran* presents temporally follows the preceding sentence, while in (18) the sentence presented by *jingran* temporally precedes the previous sentence. These two examples show clearly show that *jingran* dose not have any temporal influence.

Let’s look at a few other examples of *jingran* and see how the temporal relations involving sentences with *jingran* are determined, in addition to the help of temporal adverbials.

- (19) a. 陳 君 出身 某 國立 大學  
 chen jun chushen mo guoli daxue  
 Chen Mr. graduate from certain national university  
 ‘Mr. Chen graduated from a national university.’  
 b. 其 妻 為 他 的 同班 同學  
 qi qi wei ta de tongban tongxue  
 his wife be he Poss classmate  
 ‘His wife was his classmate.’  
 c. 當 他 赴 英 攻讀 博士 時  
 dang ta fu ying gongdu boshi shi  
 when he go to England study Ph.D. time  
 ‘When he went to England to pursue a Ph.D. degree,’  
 d. 太太 竟然 紅杏出牆  
 taitai jingran hongxingchuqiang  
 wife JINGRAN a romantic affair

‘(his) wife had a romantic affair (contrary to the expectation)!’

In this example, *jingran* appears in (19d). The cue phrase *dang ... shi* ‘when’ indicates that (19d) is connected to (19c) by *Background*, which means that (19c) serves as a temporal background for (19d) and that (19c) and (19d) are temporally overlapping. This temporal relation is specified by the cue phrase and *jingran* plays no role here. Since the proposition that *he went to England to pursue a Ph.D. degree* is not an expectation required by the proposition in (19) presented by *jingran*, temporal overlapping is allowed.

Let’s look at another example.

- (20) a. 當初 我們 考慮到 既然是 鼓勵 辦法  
 dangchu women kaolüdao jiran shi guli banfa  
 at that time we take into consideration since be encouragement regulation  
 就 放寬 一些 限制  
 jiu fangkuan yixie xianzhi  
 then relax some constraint  
 ‘At that time, we took it into consideration that some constraints were relaxed since it was an encouragement regulation.’
- b. 沒想到 竟然 被 投機者 利用  
 meixiangdao jingran bei toujizhe liyong  
 unexpected JINGRAN Pass risker take advantage of  
 ‘Unexpected, (the regulation) was taken advantage of by riskers.’

In the example above, (20b) is connected to (20a) by *Result*, i.e. (20b) is the result of (20a), because the relaxation of constraints leads to the regulation being taken advantage of. *Result* indicates temporal precedence, i.e. the cause temporally precedes the result. In this example, this rhetorical relation indicates that (20a) temporally precedes (20b). Since the expectation required by *jingran* does not surface here, the temporal constraint of *jingran* does not apply. Therefore, the temporal relation specified by *Result* is legitimate here.

Let’s look at an example of *Elaboration*.

- (21) a. 大學生 擁有 電腦 的比例 很高  
 daxuesheng yongyou diannaode bili hen gao  
 college student own computer DE ratio very high  
 ‘Many college students have computers.’
- b. 理工 科系 更 幾乎 人手 一台  
 ligong kexi gen jihu renshou yitai  
 science and technology department especially almost everyone one CL  
 ‘Especially, almost every student majoring in science or technology owns a computer.’
- c. 很多 學生 的 設備 竟然 比 老師 還 強  
 henduo xuesheng de shebei jingran bi laoshi hai qiang  
 many student Poss equipment JINGRAN compare teacher still better  
 ‘Many students’ equipment is even better than teachers.’

(21) is an example of a different kind of *Elaboration*. (21c) actually elaborates on the computers owned by students. This kind of elaboration is referred to as *Elaboration<sub>NP</sub>* in Wu (2007b), different from *Elaboration* discussed in Asher and Lascarides (2003), which indicates an elaboration on events.

Wu (2007b) distinguishes these two kinds of *Elaboration* by referring to the elaboration on NPs as *Elaboration<sub>NP</sub>* and the one on events as *Elaboration<sub>E</sub>*. Wu (2007b) also argues that *Elaboration<sub>NP</sub>* is one of the rhetorical relations that do not specify any temporal relation, different from *Elaboration<sub>E</sub>*, which specifies temporal inclusion. He also argues that if there is a temporal relation between two sentences connected by *Elaboration<sub>NP</sub>*, the temporal relation is determined by other factors, such as temporal adverbials, sequence of events, etc.

In the example above, (21c) elaborates on the computers of students mentioned in (21b). This is a typical example of *Elaboration<sub>NP</sub>*. Since this rhetorical relation does not specify any temporal relation, as we can see, no temporal relation can be observed between (21b) and (21c).

Let's look at an example of *Elaboration<sub>E</sub>*.

- (22) a. 小張 剛剛 繞 著 校園 跑 了 一 圈  
 xiaozhang ganggang rao zhe xiaoyuan pao le yi quan  
 Xiaozhang just now around Dur campus run Prf one lap  
 'Xiaozhang just ran around the campus.'
- b. 本來 以為 會 很 輕鬆  
 benlai yiwei hui hen qingsong  
 originally mistakenly think will very easy  
 'Originally, (he) mistakenly thought that it would be easy.'
- c. 沒想到 竟然 被 狗 追 被 蜜蜂 叮 又 跌倒  
 meixiangdao jingran bei go zhui bei mifeng ding you diedao  
 unexpectedly JINGRAN Pass dog chase Pass bee bite and fall down  
 'Unexpectedly, he was chased by dogs, bitten by bees and fell down.'
- d. 真是 太 慘 了  
 zhenshi tai can le  
 really too miserable Prc  
 '(It) was really too miserable.'

In (22), (22b-c) elaborate on the process of (22a). This is an example of *Elaboration<sub>E</sub>* because what is elaborated on is the process of the *Xiaozhang ran around the campus* event. Obviously, (22b-c) are temporally included in (22a). This temporal relation is specified by *Elaboration<sub>E</sub>* and matches native speaker's intuition about the temporal relation in this example. *Jingran* does not play a role in the temporal relation here.

One might ask whether directionality is also an issue for *jingran*. As a matter of fact, it is not. This is because *Explanation* involves directionality whereas *Contrast* does not. Whether  $\alpha$  explains  $\beta$  or  $\beta$  explains  $\alpha$  makes a semantic difference because in the previous case  $\alpha$  is the cause and  $\beta$  is the effect and vice versa in the latter. *Contrast* does not have this distinction. It makes no semantic difference whether  $\alpha$  contrasts with  $\beta$  or  $\beta$  contrasts with  $\alpha$ .

Finally, I provide an example where the temporal constraint for *jingran* is violated. Examples of this kind are infelicitous.

- (23) a. 這 部 電腦 昨天 壞 了  
 zhe bu diannaο zuotian huai le  
 this CL computer yesterday broken Pfv  
 'This computer became broken yesterday.'



- b. !前天 竟然 還 有 人 借  
!qiantian jingran hai you ren jie  
the day before yesterday JINGRAN still there be person borrow  
‘The day before yesterday, someone still borrowed it (contrary to the expectation)!’

(23) is not a coherent discourse. The reason for this incoherence is that the temporal constraint of *jingran* is violated. The computer became broken yesterday, as described by (23a). However, the computer was borrowed the day after tomorrow. Since the computer became broken yesterday, it does not make sense to expect that people would not want to borrow the computer the day before yesterday because the computer was still functional then! That is, the temporal constraint is not obeyed that the expectation required by *jingran* must temporally precede the proposition presented by *jingran*.

In sum, *jingran* by default indicates *Contrast*, which does not specify a temporal relation. It imposes the same temporal constraint as *guoran*: the proposition *jingran* presents cannot temporally precede the expectation based on which *jingran* is used. *Jingran* does not involve directionality because the rhetorical relation it specifies does not have this property. The other rhetorical relations can connect a sentence with *jingran* to another sentence as long as the temporal relations they specify obey the temporal constraint imposed by *jingran*.

#### 4. An SDRT Model

In SDRT, one of the most important theoretical issues is to determine which rhetorical relation connects sentences together. Once a rhetorical relation is determined, a temporal relation follows from it. SDRT uses axioms to decide a rhetorical relation and meaning postulates to specify a temporal relation.

Based on the discussion in Section 3, I propose axioms, the temporal constraint and meaning postulates as below.

(24) Axioms for *jingran* and *guoran*:

Suppose that  $\alpha, \beta, \gamma, \delta$  are labels for sentences.  $B(w)$  is the modal base for *guoran* or *jingran*. For (24a) and (24c), either  $\alpha \subseteq B(w)$  or  $\alpha \rightarrow \delta$  and  $\delta \subseteq B(w)$ . For (24b), either  $\beta \subseteq B(w)$  or  $\beta \rightarrow \delta$  and  $\delta \subseteq B(w)$ .

- a.  $(?(\alpha, \beta, \lambda) \wedge \text{guoran}(P)(\beta) \wedge (\alpha \rightarrow \beta)) > \text{Explanation}(\beta, \alpha)$ .
- b.  $(?(\alpha, \beta, \lambda) \wedge \text{guoran}(P)(\beta) \wedge (\beta \rightarrow \alpha)) > \text{Explanation}(\alpha, \beta)$ .
- c.  $(?(\alpha, \beta, \lambda) \wedge \text{jingran}(P)(\beta)) > \text{Contrast}(\alpha, \beta)$ .

(25) Temporal Constraint for *jingran* and *guoran*:

Suppose that  $\alpha, \beta, \gamma, \delta$  are labels for sentences.  $B(w)$  is the modal base for *guoran* or *jingran*. Either  $\alpha \subseteq B(w)$  or  $\alpha \rightarrow \delta$  and  $\delta \subseteq B(w)$ .  
 $(?(\alpha, \beta, \gamma) \wedge \text{guoran/guoran}(P)(\beta)) \rightarrow \neg(\beta \prec \alpha)$

(26) Meaning Postulates for *Explanation*

- a.  $\Phi_{\text{Explanation}(\alpha, \beta)} \Rightarrow (\text{generalizing}(\beta) \rightarrow \neg(e_\alpha \prec e_\beta))$
- b.  $\Phi_{\text{Explanation}(\alpha, \beta)} \Rightarrow (\neg\text{generalizing}(\beta) \rightarrow e_\beta \prec e_\alpha)$

The premise of (24) says the following.  $\alpha, \beta, \gamma, \delta$  are labels for propositions.  $B(w)$  is the set of propositions representing expectation for *jingran/guoran*. For (24a),  $\alpha$  is either an

expectation or an antecedent from which one can infer an expectation  $\delta$ . For (24b),  $\beta$  is either an expectation or an antecedent from which one can infer an expectation  $\delta$ .

(24a) says that if  $\alpha$  and  $\beta$  are connected by an underspecified rhetorical relation to form a discourse  $\lambda$ , and  $\beta$  is a sentence presented by *guoran*, then by default the explanation of  $\beta$  is  $\alpha$ , i.e.  $\alpha$  explains  $\beta$ .  $>$  represents a default inference.

(24b) says that if  $\alpha$  and  $\beta$  are connected by an underspecified rhetorical relation to form a discourse  $\lambda$ , and  $\beta$  is a sentence presented by *guoran*, then by default the explanation of  $\alpha$  is  $\beta$ , i.e.  $\beta$  explains  $\alpha$ .

(24a) and (24b) capture the directionality of *guoran*. The different inference patterns are represented by  $\alpha \rightarrow \beta$  and  $\beta \rightarrow \alpha$ .  $\alpha \rightarrow \beta$  represents ‘forward’ reasoning and  $\beta \rightarrow \alpha$  stands for ‘backward’ reasoning. The difference in the directionality of reasoning results in the different directionality of *Explanation*, represented as *Explanation*( $\alpha$ ,  $\beta$ ) and *Explanation*( $\beta$ ,  $\alpha$ ) respectively in (24a) and (24b).

(24c) says that if  $\alpha$  and  $\beta$  are connected by an underspecified rhetorical relation to form a discourse  $\lambda$ , and  $\beta$  is a sentence presented by *jingran*, then it is *Contrast* that connects  $\alpha$  to  $\beta$ .

(25) says that if  $\alpha$  and  $\beta$  are connected by an underspecified rhetorical relation to form a discourse  $\lambda$ , and  $\beta$  is a sentence presented by *jingran/guoran*, then the event described by  $\beta$  cannot temporally precede the event described by  $\alpha$ .

(26a) is the weak version of temporal relation specified by *Explanation* and (26b) the strong version. (26a) says that, given that the explanation of  $\alpha$  is  $\beta$ , if  $\beta$  is a generalizing sentence, then the event expressed by  $\alpha$  cannot temporally precede the event expressed by  $\beta$ . (26b) says that, given that the explanation of  $\alpha$  is  $\beta$ , if  $\beta$  is not a generalizing sentence, that is, it describes an event anchored to a specific time, then the event described by  $\beta$  temporally precedes the event described by  $\alpha$ .

Next, I demonstrate how the axioms (24), the temporal constraint (25) and the meaning postulates (26) work to derive the temporal relations and to block infelicitous discourse. (8) is repeated below as (27).

- (27) a. 小明 本來 行為不檢  
xiaomin benlai xingweibujian  
Xiaomin originally misbehave  
‘Originally, Xiaomin misbehaved.’
- b. 可是 他很聽 媽媽 的話  
keshi ta hen ting mama de hua  
but he very listen mom Poss words  
‘But he listened to his mom.’
- c. 他 媽媽 跟他 談了 幾次  
ta mama gen ta tan le ji ci  
he mother with he talk Pfv several time  
‘His mother talked to him several times.’
- d. 果然 他 比較 有 改善 了  
guoran ta bijiao you gaishan le  
GUORAN he compare have improve Prc  
‘As expected, his behavior was improved.’

In order to avoid unnecessary complicated formalism, only the most relevant sentences

are formalized here and in the following examples.<sup>7</sup> In (27), there is no information saying otherwise, and this is a case of forward reasoning. Therefore, (24a) is applied and it is decided that *Explanation* connects (27c) to (27d). Then, a Segmented Discourse Representation Structure (SDRS, henceforth) is formed, as in (28). And the rhetorical relation is interpreted in the Satisfaction Schema as in (29).

$$(28) \begin{array}{l} \pi_1 \pi_2 \\ \pi_1: le'(talk'(Xiaomin', Xiaomin's\_mother')) \\ \pi_2: guoran'(improve'(Xiaomin's\_behavior')) \\ Explanation(\pi_2, \pi_1) \end{array}$$

$$(29) (w, f) [Explanation(\pi_2, \pi_1)]_M(w', g) \\ \text{iff } (w, f) [K_{\pi_1} \wedge K_{\pi_2} \wedge \Phi_{Explanation(\pi_2, \pi_1)}]_M(w', g)$$

$\pi_1$  and  $\pi_2$  are labels for sentences. In (28),  $\pi_1$  represents (27c) and  $\pi_2$  (27d). The Satisfaction Schema (29) says that *Explanation*( $\pi_2, \pi_1$ ) is true if and only if the semantic content of  $\pi_1$ , represented as  $K_{\pi_1}$ , the semantic content of  $\pi_2$ , represented as  $K_{\pi_2}$ , and the meaning postulate for *Explanation* are all true. It goes without saying that  $\pi_1$  (27c) and  $\pi_2$  (27d) must be true because otherwise the discourse would contain false information and would become meaningless. Since  $\pi_1$  is not a generalizing sentence, the meaning postulate (26b) applies and specifies that  $\pi_1$  temporally precedes  $\pi_2$ .

Let's look at an example with backward reasoning.

- (30) a. 他 今天 回答 得 很好  
ta jingtian huida de hen hao  
he today answer Deg very good  
'Today, he answered very well.'
- b. 果然 準備 充分  
guoran zhunbei chongfen  
GUORAN prepare adequately  
'He prepared adequately (as expected).'

Again, there is no information indicating otherwise, but this is a case of backward reasoning. So, the axiom (24b) applies and specifies that (30b) explains (30a). An SDRS for (30) is formed as in (31) and the Satisfaction Schema is given in (32).

$$(31) \begin{array}{l} \pi_1 \pi_2 e e' \\ \pi_1: answer'(he, e) \wedge well'(e) \\ \pi_2: guoran'(prepare'(he, e') \wedge adequately'(e)) \\ Explanation(\pi_1, \pi_2) \end{array}$$

<sup>7</sup> For the same reason, formalisms for some structures are simplified. For example, possessive is represented the ways such as *Xiaomin's\_mother* in (35). Tense and pronouns are not fully represented either. These are simplifications. Readers' attention is directed to the main issues discussed in this paper.

$$(32) (w, f) [Explanation(\pi_1, \pi_2)]_M (w', g) \\ \text{iff } (w, f) [K_{\pi_1} \wedge K_{\pi_2} \wedge \Phi_{Explanation(\pi_1, \pi_2)}]_M (w', g)$$

(32) is very similar to (29). But, because  $\pi_1$  and  $\pi_2$  represent different sentences, (29) and (32) have different semantics. (32) says that *Explanation*( $\pi_1, \pi_2$ ) is true if and only if the semantic content of  $\pi_1$ , represented as  $K_{\pi_1}$ , the semantic content of  $\pi_2$ , represented as  $K_{\pi_2}$ , and the meaning postulate for *Explanation* are all true. Needless to say,  $\pi_1$  (32a) and  $\pi_2$  (32b) must be true because otherwise the discourse would contain incorrect information and would become infelicitous. Since  $\pi_1$  is not a generalizing sentence, the meaning postulate (26b) applies and specifies that  $\pi_2$  temporally precedes  $\pi_1$ .

Let's look at an example of *jingran*.

- (33) a. 哥哥 剛剛 吃 了 水餃  
gege ganggang chi le shuijiao  
elder brother just now eat Pfv dumpling  
'The elder brother ate dumplings just now.'
- b. 弟弟 現在 竟然 在 吃 牛肉 麵  
didi xianzai jingran zai chi nirou mian  
younger brother now JINGRAN Prg eat beef noodles  
'The younger brother is eating beef noodles now (contrary to the expectation)!'
- c. 太 稀奇了  
tai xiqi le  
too rare Prc  
'It's too rare.'

There is nothing in (33) specifying otherwise, and hence the axiom (24c) applies and says that (33a) is connected to (33b) by *Contrast*. The SDRS for (33a-b) is formed as in (34). The Satisfaction Schema is given in (35). Since *Contrast* does not specify any temporal relation, the temporal phrases *ganggang* 'just now' and *xianzai* 'now' determines the temporal relation between (33a) and (33b).

$$(34) \begin{array}{l} \pi_1 \pi_2 x y e e' \\ \pi_1: \text{dumpling}'(x) \wedge \text{eat}'(\text{the\_elder\_brother}', x, e) \wedge \text{just\_now}'(e) \\ \pi_2: \text{jingran}'(\text{beef\_noodles}(y) \wedge \text{zai}'(\text{eat}'(\text{the\_younger\_brother}', y, e'))) \\ \text{Contrast}(\pi_1, \pi_2) \end{array}$$

$$(35) (w, f) [Contrast(\pi_1, \pi_2)]_M (w', g) \text{ iff } (w, f) [K_{\pi_1} \wedge K_{\pi_2} \wedge \Phi_{Contrast(\pi_1, \pi_2)}]_M (w', g)$$

Finally, let's look at an infelicitous example. The temporal relation between (36c) and (36d) is specified by the temporal phrase *zai ... zhiqian* 'before ...' and the SDRS for (36c-d) is provided in (37).

- (36) a. 小明 本來 行為不檢  
xiaomin benlai xingweibujian  
Xiaomin originally misbehave  
‘Originally, Xiaomin misbehaved.’
- b. 可是他 很聽 媽媽 的話  
keshi ta hen ting mama de hua  
but he very listen mom Poss words  
‘But he listened to his mom.’
- c. 在他 媽媽 跟他 談 之前  
zai ta mama gen ta tan zhiqian  
at he mother with he talk before  
‘Before his mom talked to him,’
- d. ???果然 他 比較 有 改善 了  
???guoran ta bijiao you gaishan le  
GUORAN he compare have improve Prc  
‘As expected, his behavior improved.’

(37)

$\pi_1 \pi_2 e t$ $\pi_1: \text{talk\_to}'(\text{his\_mom}', \text{him}, e) \wedge t \prec e$ $\pi_2: \text{guoran}'(\text{improve}'(\text{his\_behavior}'))$ Background( $\pi_2, \pi_1$ )
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In (37), the temporal phrase *zai ... zhiqian* ‘before ...’ provides the time before the *his mom talk to him* event as a temporal background, and this time is represented as  $t$  in  $t \prec e$  in (37).  $t$  serves as the temporal background for  $\pi_2$ , which means that  $\pi_2$  temporally overlaps  $e$ , i.e. the time before the *his mom talk to him* event. However, this temporal relation violates the temporal constraint (25) because one expects that his mom talking to him would result in the improvement of his behavior. The effect cannot temporally precede the cause. Therefore, this discourse is ruled out as infelicitous.

To sum up, in this section, I formalize the default functions of *jingran* and *guoran* as the axioms in (24). I also formalize the temporal constraint in (25) and propose meaning postulates to determine temporal relations in (26). I demonstrate how the axioms, the temporal constraint and meaning postulates function to derive temporal relations and to block infelicitous discourse.

## 5 Conclusion

In this paper, I argue that, by default, *guoran* indicates *Explanation*. It also specifies a temporal constraint: the proposition *guoran* presents cannot temporally precede the proposition representing the expectation based on which *guoran* is used. The rhetorical relation specified by *guoran* has a ‘bidirectional’ behavior: that is, *guoran* depends on the inference pattern for *guoran* whether the proposition presented by *guoran* is explained or the other way around. I also propose that *Explanation* specifies a weak version of temporal relation and a strong version.

On the other hand, I propose that *jingran* by default indicates *Contrast*, which does not specify a temporal relation. It imposes the same temporal constraint as *guoran*. *Jingran* does not involve directionality because the rhetorical relation it specifies does not have this property. The other rhetorical relations can connect a sentence with *jingran* to another

sentence as long as the temporal relations they specify obey the temporal constraint imposed by *jingran*.

Finally, I formalize the default functions of *jingran* and *guoran* as axioms. I also formalize the temporal constraint and propose meaning postulates to determine temporal relations. I also demonstrate how the axioms, the temporal constraint and meaning postulates function to derive temporal relations and to block infelicitous discourse.

The results of this paper presented above can be summarized in Table 2 below:

	Semantics Given an expectation	Discourse Functions	
		Default rhetorical relation and temporal relations specified	Temporal constraint
<i>jingran</i>	A proposition contradicts the expectation	(i) <i>Contrast</i> (ii) Axioms: (24a) and (24b) (two axioms to capture bidirectionality)	(i) The proposition <i>jingran</i> or <i>guoran</i> presents cannot temporally precede the expectation (ii) Formalism: (25)
<i>guoran</i>	A proposition matches the expectation	(i) <i>Explanation</i> (ii) Axiom: (24c) (iii) Temporal relations induced by <i>Explanation</i> : (26a) and (26b).	

Table 2

This paper is consistent with Wu's (2003, 2007a, 2007b, 2009b, 2010) research on temporal relations in Mandarin Chinese. *Jingran* and *guoran* behave parallel to aspect markers and situation types in terms of temporal relations: First, based on their semantics, they specify a default rhetorical relation, which in turns decides a temporal relation, and second, they impose a temporal constraint.

An anonymous reviewer suggests that a research should be conducted on *suiran* 'although', *biran* 'necessarily', *chengran* 'it is true that', *danshi* 'but', etc. These phrases are left for future studies and this study can serve as a foundation for the future studies.

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### 6 References

- Asher, N., and Lascaides, A. Logics of Conversation. Cambridge: Cambridge University Press. 2003.
- Hobbs, J. R. On the coherence and structure of discourse. Technical Report CSLI-85-37, Center for the Study of Language and Information, Stanford University. 1985.
- Hsieh, C. Modal Verbs and Modal Adverbs in Chinese: an Investigation into the Semantic Source. UST Working Papers in Linguistics. 1, 31-58. 2005.

- Hsieh, C. A Study on Chinese Modal Expressions in Broad and Narrow Senses. *Chinese Teaching and Learning*. 3, 1-25. 2006a.
- Hsieh, C. The Semantic Categorization of Chinese Modal Expressions: A Corpus-based Analysis. *Zhongguo Yuwen Yanjiu (Chinese Language Studies)*. 21, 45-63. 2006b.
- Kratzer, A. The Notional Category of Modality. Eds. In Eikmeyer, H. and Reiser, H. (Eds.), *Words, Worlds and Context*. (pp 38-74). Berlin: Walter de Gruyter; reprinted 2003, *Semantics: Critical Concepts in Linguistics*, Ed. Javier Gutiérrez-Rexach, London: Routledge. 1981.
- Li, C. N. and Thompson, S. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press. 1981.
- Lin, J. Aspectual selection and temporal reference of -zhe in Mandarin Chinese. *Tsinghua Journal of Chinese Studies*. 32, 2, 257-297. 2002.
- Lin, J. Temporal reference in Mandarin Chinese. *Journal of East Asian Linguistics*. 12, 259-311. 2003.
- Lin, J. Time in a language without tense: the case of Chinese. *Journal of Semantics*. 23, 1-53. 2006.
- Liu, Y., Pan, W. and Gu, W. *Shiyong Xiandai Hanyu Yufa (Practical Modern Mandarin Grammar)*. Taipei: National Taiwan Normal University. 1996.
- Mann, W. C. and Thompson, S. A. *Rhetorical Structure Theory: A Framework for the Analysis of Texts*. *International Pragmatics Association Papers in Pragmatics*. 1, 79-105. 1987.
- Saeed, J. I. *Semantics*. 2<sup>nd</sup> Edition. Oxford: Blackwell. 2003.
- Portner, P. *Modality*. Oxford: Oxford University Press. 2009.
- Smith, C. *The parameter of aspect*. 2<sup>nd</sup> Edition. Dordrecht: Kluwer Academic. 1997.
- Vendler, Z. *Verbs and times*. *The Philosophical Review*; reprinted 1967, *Linguistics and Philosophy*. Ithaca: Cornell University Press. 1957.
- Wu, J.-S. *Modeling Temporal Progression in Mandarin: Aspect Markers and Temporal Relations*. Ph.D. Dissertation. University of Texas at Austin. 2003.
- Wu, J.-S. The Semantics of the Perfective LE and Its Context-Dependency: an SDRT Approach. *Journal of East Asian Linguistics*. 14, 4, 299-336. 2005.
- Wu, J.-S. Semantic Difference between the Two Imperfective Markers in Mandarin and Its Implications on Temporal Relations. *Journal of Chinese Linguistics*. 35, 2, 372-398. 2007a.
- Wu, J.-S. Temporal and Atemporal Relations in Mandarin. *Taiwan Journal of Linguistics Monograph Series No. 2*. Taipei: Crane. 2007b.
- Wu, J.-S. Antonyms? Presuppositions? On the Semantics of Two Evaluative Modals Jingran and Guoran in Mandarin. *Taiwan Journal of Linguistics*. 6, 97-118. 2008.
- Wu, J.-S. Tense and a discourse feature: rethinking temporal location in Mandarin Chinese. *Journal of East Asian Linguistics*. 18, 145-165. 2009a.
- Wu, J.-S. Aspectual Influence on Temporal Relations: A Case Study of the Experiential Guo in Mandarin. *Taiwan Journal of Linguistics*. 7, 2, 1-24. 2009b.
- Wu, J.-S. Interactions Between Aspect and Temporal Relations: A Case Study of the Perfective le. *Language and Linguistics*. 11, 1, 65-98. 2010.
- Wu, J.-S. and Kuo, J. Y.-C. “The Semantics of the Durative Marker Zhe and Its Dependency on Context: A Segmented Discourse Representation Theory Account.”

- Paper presented at Linguistic Society of Hong Kong Annual Research Forum. Hong Kong: Dec. 6 –7. 2003.
- Wu, J.-S. and Kuo, J. Y.-C. “More than a Simple Aspect Marker: Pragmatics in the Semantics of the Durative Marker zhe in Mandarin Chinese.” Paper presented at the Conference of Curriculum and Instruction on Language and Literature. Changhua: April 30<sup>th</sup>. 2010.
- Wu, J.-S. and Tseng, W.-T. Locating Antecedents to Zero Anaphora in Mandarin: An SDRT Approach. *Chinese Linguistics in Europe Volume 2: Chinese Linguistics in Leipzig*, Pp. 131-146. Paris: École des Hautes Études en Sciences Sociales: Centre de Recherches Linguistiques sur l’Asie Orientale. 2008.
- Yeh, M. The Stative Situation and the Imperfective Zhe in Mandarin. *Journal of Chinese Language Teachers Association*. 29, 69-98. 1993.
- Zhang, J. *Hanyu Yufa Yinan Tanjie (Explorations on the Difficulties of Mandarin Grammar)*. Taipei: Wenshizhe. 1994.