

Local and Global Coreferences: Third-Person Zero Pronoun in Chinese Written Narratives

Author(s): Minglang Zhou

Proceedings of the Twenty-First Annual Meeting of the Berkeley Linguistics Society: Special Session on Discourse in Southeast Asian Languages (1995), pp. 141-153

Please see “How to cite” in the online sidebar for full citation information.

Please contact BLS regarding any further use of this work. BLS retains copyright for both print and screen forms of the publication. BLS may be contacted via <http://linguistics.berkeley.edu/bls/>.

The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](#), the Linguistic Society of America's digital publishing platform.

LOCAL AND GLOBAL COREFERENCES: THIRD-PERSON ZERO PRONOUN IN CHINESE WRITTEN NARRATIVES *

Minglang Zhou
University of Oregon

0. Introduction

In this paper, I will show the distinction between two modes of third-person zero pronoun coreferences: locale coreference (LC) and global coreference (GC), in subject (*/topic*) positions in clauses in some classical and modern Chinese written narratives. I argue that third-person zero pronoun (\emptyset) and explicit pronouns in LC are purely anaphoric, as the artifacts of reference tracking computation by retaining antecedent NPs for \emptyset or tagging antecedent NPs and explicit pronouns in working memory, while \emptyset and explicit pronouns in GC are mental-deictic, as the artifacts of directly referring to conceptual tokens of individuals in mental models. Writers may have certain meta-knowledge of these modes of processing, and employ them as strategies in written discourse. Therefore, LC and GC serve as structures in written discourse comprehension, where they evoke respective processing modes in readers. I think that how these modes are employed as strategies underpins some cross-linguistic and cross-cultural differences in written discourse.

In a metaphoric classification of pro-drop (Huang 1984), Chinese is considered a cool language, while English is considered a warm language, with pro-drop languages, such as Italian, in the middle. Chinese is different from pro-drop languages in that it does not have a verbal morphology to mark verb-subject agreement. Thus, Chinese relies more on discourse structures and pragmatics for the interpretation of zero pronouns, and allows more 'free' use of zero pronouns in discourse. For example, an English deictic zero pronoun is limited to second person, as in (1), whereas a Chinese deictic zero pronoun is not, as in (2).

(1) (You/*They) Don't talk.

(2) Speaker A: Wōmen jìnqu ba. (Both speakers are at the entrance of a stadium.)
We enter P(article).

'Let's go in there.'

Speaker B: Bù huì rang wǒ jìn ba? Wǒ méi yǒu piào.

Not will allow I enter P. I not have ticket

'(He/they, i.e. the gatekeeper(s)) won't allow me to enter, will he/they? I do not have a ticket.'

The zero pronoun in (2) is used deictically in reference to third person. This phenomenon might have prompted Xu's (1986) characterization of zero pronouns in Chinese as having complete freedom of referentiality. Regardless of the apparent 'free' reference, I will demonstrate with data that \emptyset 's in the subject position are constrained in Chinese written narrative in LC and GC, the former of which is linear as conjoinability, and the latter of which is hierarchical as protagonist-driven.

This paper is divided into five sections. First, I will briefly review studies of coreference and Chinese \emptyset in discourse. Secondly, I will show how \emptyset is used in the LC mode in Chinese written narrative, as previous studies predict. Third, I will demonstrate how \emptyset is used in the GC mode in Chinese written narrative, contrary to the generalizations made in those previous studies. Fourth, I will discuss the relationship between these two modes of coreference and discourse production strategies from cognitive perspectives, and discuss how \emptyset and other pronouns are

used purely anaphorically in LC, and how they are used mental-deictically in GC. I will conclude this paper with implications from the distinction between the two modes of coreference in Chinese for studies of coreference in discourse in general.

1. Studies of coreference and Chinese \emptyset in discourse

In this section, I briefly review some previous studies of coreference in discourse and \emptyset in discourse in Chinese, as the background for further discussion of modes of \emptyset coreference in discourse in Chinese written narrative.

Coreferentiality is the focus in many studies in sentence-grammar (cf. Aoun 1985, Chomsky 1981, Huang 1984), while it is simply mentioned in passing in semantics and pragmatics (cf. Levinson 1983, Lyons 1977). Systematic analysis of coreferentiality in discourse is found in Givón's work (1983, 1989, 1990). Givón finds that coreferentiality is closely related to topicality along a syntactic coding scale, with the most continuous/accessible topic on the top in the following order, zero anaphora < unstressed/clitic pronoun < stressed/independent pronoun < R-dislocated definite noun, etc.. Thus, he proposes a number of measurements of (co)referentiality with respect to topicality in discourse. Two of them are referential distance (RD) and potential interference (PI) (Givón 1989:216-7, 1990:906-7), which are of particular concern in this study. RD measures the number of clauses (or elapsed time) from the last occurrence in the preceding discourse. The typical RD value is gradual with one clause for zero anaphora, 1-2 clauses for unstressed/clitic pronouns, 2-3 clauses for stressed/independent pronouns, and 10 clauses for full definite nouns. The cognitive underpinning of RD is memory decay in discourse processing. PI measures the number of semantically compatible referents within the preceding 1-2 clauses in a discrete binary scale of presence vs. absence or in a three point scale of two presences vs. one presence vs. absence. The cognitive underpinning of PI is that competing referent searches seem to be a burden on memory in discourse processing. RD and PI predict that zero pronouns mostly occur in conjoined clauses with no semantically compatible referents in the preceding clauses, and topic nouns/pronouns are generally realized as topic or subject. Previous studies of \emptyset in discourse in Chinese by Tai (1978), Li & Thompson (1979, 1981), Chen (1984, 1987) and Huang (1994) all support Givón's (co)-reference measurements in terms of RD and PI.

Tai (1978:311-39) observes that, within a given paragraph, the occurrence of \emptyset must meet three conditions: a) both the antecedent and its coreferential NP's are subjects; b) the clauses containing the coreferential NP's under consideration must be adjacent; and c) the clauses must be of the same type of description, that is, the same topic, while \emptyset is generally not allowed to cross paragraph boundaries.

In an analysis of \emptyset in classical written narrative, Li & Thompson (1979) find that the occurrence of \emptyset is generally determined by conjoinability of clauses in a topic chain, and that the interpretation of \emptyset can not be explained on the basis of grammatical structural factors, but on the basis of contextual information and shared knowledge. As for a wide range of variations where conjoinability does not apply, they believe that it is due to individual's perception of the relationship between the world of events, the real world and the created world in the narratives.

Chen (1984) proposes two conditions as the relevant parameters responsible for triggering \emptyset : the predictability condition (PC) and the negligibility condition (NC). The parameters bearing on the PC are availability vs. unavailability of competing nouns, low vs. high conjoinability with preceding clauses, and low vs. high in accessibility hierarchy (topic/subject < direct object < indirect object, etc.). The parameters bearing on the NC are specific vs. non-specific and generic reference,

positions in main vs. subordinate clauses, and animate vs. inanimate reference. Chen (1986) recognizes that narrative schemata play a role in interpreting PC and NC, but basically treats \emptyset clauses as subordinate clauses.

Huang (1994: 205-35) finds NP₁ ... P(ronoun)₁ ... \emptyset ₁ as the distributional pattern of anaphora for the maintenance of reference in conversation in Chinese, where \emptyset occurs in conjoined clauses. He proposes that Givón's topic continuity hypothesis and Chafe's given-only hypothesis should be subsumed under his more general neo-Gricean pragmatic principles, and claims that anaphora is largely determined by the systematic interaction of the M-principle (Do not use a prolix, obscure or marked expression without reason) and I-principle (Do not say more than is required), constrained by Disjoint Reference Presumption (The arguments of a predicate are intended to be disjoint, unless marked otherwise), information saliency and general consistency conditions on conversation implicatures.

In sum, all the previous studies of \emptyset in Chinese discourse reviewed above support Givón's topic continuity hypothesis, and show consistent conformity of \emptyset occurrences to RD and PI measurements of coreferentiality in discourse.

2. Local coreference in Chinese written narratives

I demonstrate in this section how \emptyset is used in the LC mode in classical and modern Chinese written narratives, as previous studies generally predict.

According to Tai (1978), Li & Thompson (1979), Chen (1984, 1987) and Huang (1994), LC can be characterized as conjoinability of the clause with the antecedent NP as the subject, a clause with a pronoun (in conversation), and 1-n clause(s) containing \emptyset subjects as a continuous topic chain of clauses, without any clause containing a semantically compatible NP as potential interference in the subject position, as schematically shown in (3), where '...' stands for a clause.

(3) LC: (in)definite NP_i ..., (P_i...), \emptyset _i ..., (\emptyset _i...)

In LC, the antecedent NP may be definite or indefinite, while the number of clauses with \emptyset subject can range from one to fifteen, as seen in classical Chinese data from Liáozhāi Zhìyì by Pu Songling (1640-1715), and modern Chinese data from Xiāo-xiao by Shen Congwen in 1929, and Fèidū by Jia Pingao in 1993.

In classical Chinese narrative, clauses with NPs and \emptyset s form continuous topic chains of conjoined clauses in LC, as in (4) from Huàbì in Liáozhāi Zhìyì.

- (4) a. *Jiāngxī Mèng Lóngtán yǔ Zhū Xiàolián kè dūzhōng.*
 Jiangxi Meng Longtan and Zhu candidate stay-temporarily capital-in
 b. \emptyset_1 *Ou shè yì lánruò, diānyú chǎnshè, jū bù kǎn hóngchǎng.*
 once go a temple palace rooms both not very large
 c. *Wéi yì lǎo sēng guàtā qízhōng. \emptyset_2 jiàn kè rù,*
 only a old monk live it-in see guest enter
 d. \emptyset_3 *xiǎo yī \emptyset_4 chū yà \emptyset_5 dào xǐng \emptyset_6 suí xǐ.*
 check cloth come-out meet show like follow like

'Meng Longtan from Jiangxi province and Imperial Candidate Zhu stayed in a hotel in the capital. (They)₁ one day visited a temple, (its) palace and rooms are not large. Only an old monk lived in it temporarily. (He)₂ saw the guests come in. (He)₃ straightened his cloths and (he)₄ came out to greet (them). (He)₅ showed (their) likes, and (he)₆ followed (their) likes.'

The clauses with the NP and the clauses containing \emptyset s are conjoined in two independent chains in (4). \emptyset_1 is coreferential with the NP *Meng Longtan* and *Zhu Xiaolian* in the first topic chain of two conjoined clauses, while \emptyset 's 2-6 are coreferential with *an old monk* in the subject position in the second topic chain of six clauses. Imperial Candidate Zhu is the protagonist in the short story. It seems that the protagonist and minor characters both are subject to LC, as further shown in (5) with the protagonist as the sole topic (from *Huàbì* in *Liáozhāi Zhìyì*).

- (5) a. *Zhū fù*, \emptyset_1 bù gǎn shāo xī, \emptyset_2 é wén xiēshēng zhì fángnèi, fùchū.
 Zhu hide not dare little sound soon hear steps into room-in and-out
 b. Wèijī, fánxūan jīn yuǎn, xīn shǎo ān,
 not-long noise gradually far heart little rest
 c. rán hùwài zhē yǒu láiwǎng yìlùn zhě. ...
 but room-outside always exist coming-going talking person

'Zhu hid (under the bed), (he)₁ did not dare to make any sound, (he)₂ soon heard steps into the room and out of it. Before long, the steps sounded farther and farther away, (his) heart felt a little relaxed, but there were always people talking while coming and going outside the room. ...'

In (5), the continuous topic chain consists of a clause containing the NP *Zhu* and two clauses containing \emptyset in the subject position. It is apparent that the topic chains of clauses in (4) and (5) do not have any clause containing an explicit pronominal subject bridging between one with a NP subject and one with a \emptyset subject, as Huang (1994) finds in conversation. This may be a difference between \emptyset distributional patterns in oral and written discourses.

Further, it is noticed that in classical Chinese written narrative LC may cross the boundaries of orthographic paragraphs, contrary to Tai's (1978) observation, as shown in (6) from *Huàbì* in *Liáozhāi Zhìyì*.

- (6) a. *Zhū zhù mù jiǔ*, \emptyset_1 bù jué shěnyáo yìduó, \emptyset_2 huǎngrán yí sī,
 Zhu focus eye long, not feel soul-shaken will-seized as if fix thought
 b. shēng hū piāopiao, \emptyset_3 rú jià yúnwù, \emptyset_4 yǐ dào bìshàng. #1
 body suddenly fly as-if fly cloud-fog already arrive wall-on
 c. \emptyset_5 jiàn diǎngé chǒngchong, fēi fù rénshì. Yì lǎo sēng ... Zhū ...
 See palace lay-lay not again lay-world A old monk ... Zhu ...

'... *Zhu* stared at (the lady in the wall painting) for a long time, (he)₁ could not but lose his mind, as if (he)₂ lost in thought, (his) body suddenly flew, as if (he)₃ flew the clouds, (he)₄ already arrived on the wall.

(He)₅ saw palaces after palaces. This was not the earthly world anymore. An old monk ... *Zhu* ...'

(6a) and (6b) are part of the preceding paragraph, while (6c) is the beginning of the following paragraph. The chain headed by the clause containing the NP *Zhu* has five \emptyset 's in five clauses, where a paragraph break separates the last clause with \emptyset_5 from the preceding five clauses containing the NP and the rest \emptyset 's in the chain.

The same phenomenon is also commonly found in modern Chinese written narrative. LC is also seen in (7) from *Xiǎoxiao*, where *Xiaoxiao* is the protagonist, while others are minor characters in the story.

- (7) a. *Xiāoxiao* hào gāo, Ø₁ yí gè rén chángchang pá dào cǎoliào duī shàng qù,
 Xiaoxiao like height, a C. person often climb to hay stack on go
 b. Ø₂ bào le yǐjīn shù shuì de zhàngfū zài huǒ lǐ,
 carry Asp. already deeply sleep M(arker) husband in arm in
 c. Ø₃ qīnqīn de suǐyì chāng zhe nà zì biānde shāngē, Ø₄ ..., Ø₅ ...
 softly M at-will sing Asp. those self compose compose folk-song

'*Xiaoxiao* likes places of height, (she)₁ often climbs up to the top of a hay stack without others, (she)₂ carries (her) already soundly sleeping husband in (her) arms, (she)₃ softly sings her own folk songs at will, (she)₄ ..., (she)₅ ...'

In (7), LC occurs in a chain of six conjoined clauses with five Ø's, making a whole paragraph in the story. Again, no clause containing an explicit pronoun is found between the clause containing the NP and those containing Ø's. LC is also found to cross paragraph boundaries in modern written narrative, as in (8) from *Xiāoxiao*

- (8) a. *Xiāoxiao* biān yě zhuāngchéng yào kū de yàngzi,
 Xiaoxiao then also pretend will cry M. look
 b. Ø₁ yòng shǒu zhǐ zhe dīdi de kū liǎn, Ø₂ shuō, '...!' #
 with hand point Asp. younger-brother's cry face, say
 c. Tiānqīn luòyǔ rìzi hùnxiaòqū, Ø₃ měiri bàobao zhāngfū,
 shining raining time spend everyday carry-carry husband
 d. Ø₄ yě bāng jiā zhōng zuò diǎn zháshì, ...
 also help family in do some household-work

'... Then, *Xiaoxiao* pretends to cry too, (she)₁ points (her) hand at (her) baby husband's crying face, (she)₂ says '... !'

Time goes by, whether it shines or rains. (She)₃ carries her baby husband now and then everyday, (she)₄ helps with some household work, ... (followed by 15 more Ø's clauses in the chain, with two other chains containing some semantically incompatible nouns, before the next occurrence of the NP *Xiaoxiao*)'

In (8), it is observed that the antecedent NP and Ø's₁₋₂ occur in those clauses in the preceding paragraph, while Ø's₃₋₄ appear in the clauses in the following paragraph with 15 more clauses containing Ø subject/topic in the chain.

In sum, as previous studies predict, LC as characterized in (3) is commonly seen in classical and modern Chinese written narratives in topic chains with 1-15 clauses in the data examined. However, it is observed, contrary to Tai's (1978) observation in Chinese and observations in other studies (Dijk and Kintsch 1983, Hinds 1979, Reichman 1981), that in both classical and modern Chinese written narratives a topic chain of clauses may cross the boundary of orthographic paragraphs, with the antecedent NP and some Ø subjects in clauses in the preceding paragraph, and some Ø subjects in clauses in the following paragraph. Ø's are also found to cross episode boundaries as defined in Dijk (1987), Dijk and Kintsch (1983), Tomlin (1987). LC in the Chinese written narrative data differs from Huang's (1994) basic distributional pattern of anaphora in conversation in Chinese. It is apparent that LC as characterized in (3) observes Givón's (1983, 1989, 1990) measurements of (co)referentiality in terms of RD and PI.

3. Global coreference in Chinese written narratives

In this section, I demonstrate how \emptyset is used in the GC mode in classical and modern Chinese written narratives, contrary to previous claims about \emptyset distributional pattern as conjoinability of clauses (cf. Tai 1978, Li & Thompson 1979, 1981, Chen 1984, 1987, Huang 1994).

GC can be characterized as nonconjoinability of the clause containing the 'antecedent' NP subject and 1-n clauses with a \emptyset subject, as a discontinuous topic chain that is broken by switch reference, as schematically illustrated in (9), where '...' stands for a clause.

(9) GC: definite NP_i ..., (\emptyset_i ...) definite NP_j ..., (\emptyset_j ...) \emptyset_i ..., (\emptyset_i ...)

In (9), the second definite NP in the following clause is semantically compatible with the first definite NP in the preceding clause. Thus, it is a potential interference for a \emptyset in clauses following the one containing the second NP to be coreferential with the first NP (cf. Givón 1983, 1989, 1990). The second NP are often found to block coreference between a following \emptyset and the first NP in many languages. However, the data from Liáozhāi Zhìyì, Xiāoxiào and Fèidū support GC, as in (9).

In classical Chinese written narrative, it is observed that in the GC mode the clause with the 'antecedent' NP subject and the clauses containing \emptyset subjects are separated by a gap of a clause containing a definite NP in the subject position, as in (10) from the story of Xiāocūi in Liáozhāi Zhìyì.

- (10) a. *Nū xiào lá Gōngzi. Gōngzi rù shì, \emptyset_1 dài pū yīshàng chén,*
 Lady smile take husband Husband enter room, for remove clothes-on dust
 b. *\emptyset_2 shī yǎn lèi. \emptyset_3 Mósuō zhānghén, \emptyset_4 ěr yī zǎi lì,*
 wipe eye tear Massage whipping-wound feed with dates nuts
 c. *Gōngzi nái shǒutī yī xīn.*
 Husband then collect-tear with happiness

'The woman, with a smile, took the husband away. The husband entered their room, (she)₁ dusted (his) clothes for (him), (she)₂ wiped (his) tear, (she)₃ massaged (his) wounds from the whipping, (she)₄ fed (him) with dates and nuts. Then, the husband stopped (his) tears with a smile. . .'

In (10), \emptyset 's in the four following clauses are not coreferential with the subject NP *Gongzi* (the husband) in the immediately preceding clause, but with the subject NP *Nū* (the woman) in the next preceding clause two clauses away. Thus, the clause with the first definite NP and the clauses containing \emptyset 's form a discontinuous topic chain, which is exactly like the pattern described in (9). This pattern apparently does not fit into the pictures of any previous studies of Chinese \emptyset in discourse (Tai 1978, Li & Thompson 1979, 1981, Chen 1984, 1987, Huang 1994) nor does it measure up to Givón's (1983, 1989, 1990) scales of coreferentiality in topicality. It should be noticed here that *Nū* (the woman) is the protagonist, while *Gongzi* (the husband) is a minor character, in the story. The difference between the protagonist and minor characters seems to be important in the GC mode of \emptyset use in Chinese written narrative, as also seen in other languages (cf. Chafe 1980, Clancy 1980).

In classical Chinese written narrative, it is also observed that in GC a discontinuous topic chain may cross the boundary of paragraphs and episodes, and tangle with other chains of clauses, as in (11) from Huàbì in Liáozhāi Zhìyì.

- (11) a. *Zhū cìqiě bù gǎn qián. Nǚ hūi shǒu, Ø₁ jǔ shǒuzhōng huā.*
 Zhu hesitant not dare forward Lady return head, hold hand-in flower
 b. *Ø₂ yáoyáo zuō zhāo zhuàng, Ø₃ nǎi qū zhī. #*
 remotely make call gesture then follow s/he
 c. *Shènnèi jì wú rén, Ø₄ jù yōng zhī, Ø₅ yì bù kǎnjū,*
 Room-inside quiet no one hurriedly hold s/he also not resist
 d. *Ø₆ suǐ xīng xiáohào, Ø₇ jǐēr bì mén qǔ, Ø₈ zhǔ wǔ kē, ...*
 follow like make-love then close door go tell not cough, ...

'... *Zhu* was hesitant to follow. *The lady* turned around, (she)₁ raised the flower in (her) hand, (she)₂ waved it remotely as a welcome gesture. (He)₃ followed her.

There was nobody in the quiet room. (He)₄ hurriedly embraced *her*, (she)₅ did not resist at all, (she)₆ was willing and happy to make love. Then, (she)₇ closed the door to leave, (she)₈ told (him) not to make any sound ...'

In (11), in the GC mode, the 'antecedent' NP *Zhu* and Ø₃ are separated by a gap of three clauses with a semantically compatible definite NP subject and Ø's₁₋₂, and, across the boundary of two paragraphs, Ø₄ is five clauses away from the first NP *Zhu*, with a gap of an unrelated clause between Ø₃ and Ø₄ in the discontinuous chain. In contrast, in the LC mode also in (11), the second NP *Nǚ* (the lady) and Ø₁₋₂ form one of the continuous chains, where the three clauses containing them are conjoined, and the second chain in the LC mode is also formed with *zhī* (she) in the object position in the preceding clause and Ø₅₋₈ in four following clauses in conjunction. (11) seems further to indicate that GC is hierarchically applied to the protagonist, such as *Zhu*, but not to minor ones, such as *Nǚ* (the lady).

The phenomena of GC is commonly found in modern Chinese written narrative too, as in (12) from *Xiāoxiao*.

- (12) a. *Yúshì Xiāoxiao qīngshǒuqīngjiǎo páqǐ chuáng lǎi,*
 Thus Xiaoxiao gentle-hand-gentle-foot climb-up bed come
 b. *Ø₁ shuǐyǎn ménglúng zǒu dào chuángbiān, Ø₂ bǎ rén bàoqǐ,*
 sleep-eye fuzzy walk to bed-side P. man carry-up,
 c. *Ø₃ gěi tā kàn yuèliang, Ø₄ kàn xīngguāng, huò Ø₅ hùxiāng qù zhe,*
 give him look moon look star or each-other stare Asp.
 d. *háizhìde 'hāihai, kàn mǎo hē', Ø₆ zhèyàng hǎn zhe Ø₇ nàyàng hǒng zhe,*
 childishly haihai look cat P. this-way cry Asp. that way coax Asp.
 e. *yúshì zhàngfū xiào le, Ø₈wán le yì huìr, Ø₉ mànman hēshàng yǎn.*
 thus husband smile Asp. play Asp. a while, slowly close-up eye
 f. *Rén shuì le, Ø₁₀ fāngshàng chuáng, Ø₁₁ zhàn zài chuángbiān kàn zhe, ...*
 Man sleep Asp. put-on bed stand in bed-side look Asp.

'... Therefore, *Xiaoxiao* gently got up, (she)₁ walked to the bed with fuzzy sleepy eyes, (she)₂ carried up the man (her baby husband), (she)₃ let him to look at the moon and (him)₄ to look at stars or (they)₅ stared at each other, 'haihai, look at the cat', (she)₆ cried childishly this way, (she)₇ pacified (him) that way, thus (her) *husband* began to smile, (he)₈ played for a while, (he)₉ slowly closed (his) eyes. *The man* fell asleep, (she)₁₀ put (him) on the bed, (she)₁₁ stood at the bedside looking at (him), ... (Followed by six more clauses with Ø subject being coreferential with the NP *Xiāoxiao*.)'

In (12), the clause with NP *Xiaoxiao* and those containing \emptyset 's_{1-3, 6, 7, 10, 11 ...} form a discontinuous topic chain of clauses, with a gap of two definite NP, *zhangfu* (her husband) and *ren* (the man), in the subject position in another chain of four clauses. These two definite NP's are not successful in interfering coreference between the 'antecedent NP *Xiaoxiao* and \emptyset 's_{10, 11 ...}. Once again, it is the NP whose referent is the protagonist that occurs with \emptyset 's_{1-3, 6, 7, 10, 11 ...} in GC, whereas the NP whose referent is a minor character only appear with \emptyset 's_{8,9} in LC.

In modern Chinese written narrative, GC is also found to cross boundaries of paragraphs, as in (13) from the novel of *Fèidū* (p.309)

- (13) a. *Niú Yuèqīng* lái dào yèshì, \emptyset_1 duì mài láozāo de tānzhǔ shuō:
 Niu Yueqing arrive night-market to sell fermented-sweet-rice M. vendor say
 b. 'Lái sān wǎn, měi wǎn wò sān gè jīdàn de'.
 Give three bowls, every bowl lie three C. egg P.
 c. *Mèng Yúnfāng* hé *Zhào Jīngwú* jiù míngbái tāde yìsi le,
 Meng Yunfang and Zhao Jingwu then know her meaning Asp.
 d. Yīrén guōlái \emptyset_2 chī le yī wǎn. #
 Each come-over eat Asp a bowl
 e. \emptyset_3 Huí dào jiālǐ, yǐjīng shì yèlǐ liǎng diǎn.
 Arrive home-in already be night two o'clock
 f. *Liu Yue* zài tīngshì de shāfa shàng kàn shū, ... *Niú Yuèqīng* duō le shū...
 Liu Yue in hall M sofa on read book ... Niu Yueqing seize Asp. book

'... *Niu Yueqing* arrived at the evening market, (she)₁ told the fermented-sweet-rice vendor, "Give (us) three bowls of fermented sweet rice. Put three eggs in each of them." *Meng Yunfang* and *Zhao Jingwu* knew what she meant, each (of them) came over, (they)₂ ate a bowl.

(She)₃ returned home, (it) is already two o'clock in the morning. *Liu Yue* was reading a book on the sofa in the living room, ... *Niu Yueqing* took away the book ...'

In (13), the clause containing the first NP *Niu Yueqing* and the clause with \emptyset 's_{1, 3} are coreferential, and form a discontinuous chain across another chain of three clauses with the definite NP, *Meng Yunfang* and *Zhao Jingwu*, and across the boundary of two paragraphs, while the following occurrence of the same NP under consideration is intervened by a third chain of two clauses with a definite NP *Liu Yue*. In this situation, both anaphoric and cataphoric relations should have been blocked (cf. Halliday & Hasan 1976), but it is clearly not the case in (13). *Niu Yueqing* is one of the protagonists in the novel of *Fèidū*, though she is not the chief protagonist. The paragraphs in (13) occur in a section about her.

In sum, GC characterized in (9) and witnessed by data from classical and modern Chinese narratives shows a coreferential pattern completely different from patterns observed and discussed in previous studies (Tai 1978, Li & Thompson 1979, Chen 1984, 1987 and Huang 1994). Unlike the LC mode, GC is characterized by its discontinuity between the clause with the 'antecedent' NP subject and the clause with a \emptyset subject, and is hierarchically driven by the protagonist in short stories or by protagonists in novels. Thus, GC appears to challenge Givón's RD and PI, as claimed in Fox (1987a, 1987b). GC also challenges claims in discourse studies that pronominalization does not occur across paragraph and episode boundaries (cf. Dijk and Kintsch 1983, Hinds 1979, Reichman 1981, Tomlin 1987).

4. Mental/situation models in discourse and the use of Ø

In this section, I review two cognitive theories of written discourse production and comprehension, and argue that Ø is used purely anaphorically in the LC mode, whereas Ø is used mental-deictically in the GC mode.

Written discourse is traditionally treated as 'autonomous' and 'explicit', as compared to oral discourse, but recently also treated as 'dependant' and 'implicit' as oral discourse in terms of cognitive strategies in the two modes of communication (cf. Denhiere & Rossi 1991, Horowitz & Samuels 1987, Meutsch & Viehoff 1989, Nystrand 1986, 1987). In oral discourse, people often talk about the real world before their eyes, while in written discourse, the author always talks about a world in his mind. The author often assumes that readers know something about the mental world so that he does not write everything explicitly about it. On the hand, readers assume that the author knows that they know something about the mental world so that not everything is written explicitly about it. Thus, written discourse manifests the strategies the author has adopted in discourse production, and serves as structures or cues for readers' comprehension, of the mental world in creation in discourse (cf. Gernsbacher 1991, Morrow *et al* 1990). Two theories of the mental world in written discourse processing, 'mental models' (Johnson-Laird 1980, 1983) and 'situation/episodic models' (Dijk & Kintsch 1983, Dijk 1987), are of particular interest in accounting for the distinction between LC and GC in this study.

Johnson-Laird (1983) proposes that mental models are analogues of the real world in that they represent objects, states of affairs, sequence of events, the way the world is, and the social and psychological actions of daily life. Mental models are different from other two mental representations: propositional and imagery, the former of which are strings of symbols corresponding to natural language, and the latter of which are perceptual correlates of models from a particular point of view (p.397). In discourse processing, propositional representations are interpreted with respect to mental models (p.156.). Pronouns take referents in mental models, introduced by referential expressions, while a pronoun of laziness picks out a new referent by using the propositional representation of its antecedent (p. 392).

Dijk and Kintsch (1983) propose that both the author and readers construct situation models in discourse production and comprehension by using knowledge of a fragment of the real world in the long-term memory. A situation model is 'an integrated structure of episodic information, collecting previous episodic information about some situation as well as instantiated general information from semantic memory' (p.344) and a schema with variable terminal categories. It is not made clear how situation models are difference from propositional representations, since their early position is that discourse is interpreted propositionally (cf. Kintsch and van Dijk 1978). In a later study, Dijk (1987) seems to suggest that situation models contain (concepts of) objects and people. Therefore, they are different from propositional representations. In the theory of situation models, like deictic pronouns, anaphoric pronouns refer to (concepts of) individuals in situation models, already referred to and identified by their antecedents (Dijk and Kintsch 1983:163).

Against Johnson-Laird's referent-taking analysis and Dijk and Kintsch's universal deictic analysis, I propose that there is a cognitive distinction between purely anaphoric use of Ø's/explicit pronouns and mental-deictic use of them in written discourse processing. In the pure anaphoric mode, Ø's/explicit pronouns may be anaphorically used in discourse, when reference is computed with linguistic forms in working memory (cf. Fisher & Glanzer 1986, Glanzer & Nolan 1986). Working memory comprises an attentional controller and the central executive, supplemented by two subsystems: the phonological loop and visuospatial sketch pad,

and is the system for the temporary maintenance and manipulation of information for higher cognition like reading comprehension (Baddeley 1986, 1992a, 1992b). Two specific features of working memory are relevant here. First, the phonological loop can hold speech based information only for 1 to 2 seconds, and has a limited capacity to store either fewer phonologically longer forms or more phonologically shorter forms at a time, when it rehearses to retain them longer (Baddeley 1986, 1992a, 1992b, Schneider & Detweiler 1988). Secondly, previous studies (Bock & Loebell 1990, Glanzer et al 1981, Jarvella 1979, Levelt & Kelter 1982) further suggest that phonological forms are not retained as random words but in connection to surface syntactic structures, and that about five clauses of surface syntactic structures may be retained in the storage of working memory. Given the capacity limitations of working memory and linguistic forms in its storage, it is more efficient to compute reference either by tagging pronouns and their antecedent NP's in their linguistic forms, in the case of explicit pronouns, or by retaining the antecedent NP's, in the case of \emptyset , in working memory in the pure anaphoric mode (cf. Daneman & Carpenter 1980, Garrod & Garrod 1981, Just & Carpenter 1992). In the former case, an antecedent NP may no longer be rehearsed when its pronoun is tagged, whereas, in the latter case, an antecedent NP may be further rehearsed to meet the referential needs of surface structures with a \emptyset subject. The artifact of working memory limitations and of the processing mode occurs in the form of LC in discourse, as measured by Givón's (1983, 1989, 1991) referential measurements. However, when the tagging of pronouns and rehearsal of NP's for \emptyset 's are interfered in reference computation, pronouns and \emptyset 's may be used mental-deictically in reference to conceptual tokens of individuals in mental models in discourse. It is called 'mental-deictic', since \emptyset 's and pronouns used in this mode only deictically refer to tokens of individuals in mental models, instead of deictically referring to individuals in the world. The mental-deictic use of a \emptyset /pronoun is similar to purely deictic use of a \emptyset /pronoun without pointing, as in (2). For example, a detective may simply utter 'He is leaving', without pointing, while he and his colleagues keep a surveillance on a suspect named 'John'. The deictic function of a \emptyset /pronoun is unambiguously carried out without pointing, since the situation creates no room for ambiguity. The mental-deictic use of a \emptyset /pronoun shows a stronger sense of recency, urgency, or continuity than an NP does in the same context. The same is found in written discourse, where mental models are created in such a manner that a \emptyset /pronoun is used mental-deictically, as in GC, without any ambiguity, as prompted by a stronger sense of recency, urgency, or continuity. Therefore, GC appears to be protagonist-driven so that a least ambiguous situation is created, where a \emptyset /pronoun is used mental-deictically to pick out the intended token of individuals in mental models.

Writers may not be aware of the exact cognitive processes in the two modes of reference computation in working memory. However, the way writers choose \emptyset 's or third-person pronouns in written discourse indicates that they have some meta-knowledge of the effects of recency, urgency, or continuity created by \emptyset 's or third-person pronouns, and may use them as discourse strategies to create such effects in readers. Readers also seem to have a feel for those effects, when LC and GC as artifacts or strategies of discourse production serve as structures in discourse comprehension, where LC also requires readers to tag pronouns and their antecedent NP's or rehearsing the antecedent NP's for \emptyset 's in working memory storage in order to track referents, and GC makes readers to pick out referents directly from tokens of individuals in mental models. These artifacts are among the linguistic devices that trigger bottom-up and top-down processes in written discourse comprehension (cf. Caron 1992, Dijk & Kintsch 1983).

5. Conclusion

Previous studies made generalizations about LC, which do not account for GC, in classical and modern Chinese narratives. To account for the difference, I have argued that LC is the artifact of reference computation by tagging pronouns and antecedent NP's in their linguistic forms or by rehearsing antecedent NP's for Ø's in working memory in a pure anaphoric mode, while GC is the artifact of mental-deictically referring to conceptual tokens of individuals in mental/situation models. The distinction between pure anaphoric mode and mental-deictic mode of pronoun uses have some implications. First, the distinction defines, in terms of cognitive processing modes, what Givón's (1983, 1989, 1991) referential measurements are intended to measure and what they are not, against Fox's (1987a, 1987b) claims that they do not account for GC. Secondly, the distinction as appeared in Chinese written narrative suggests that writers may have some meta-knowledge of their referential choices and use them as strategies in written discourse production. This means that sometimes it may not be a writer's attention or focus that trigger the use of a pronoun or a noun in written discourse production, but his strategies to evoke the attention or focus from readers in discourse comprehension. Third, GC as a discourse strategy or referential practice is culturally based so that it is more accepted in one culture, while less so in another (cf. Hanks 1990). For example, GC is considered sloppy, and prescriptively discouraged in English rhetorics (cf. Dale 1992, Ebbitt & Ebbitt 1990, Rothwell 1971), though there is evidence of such use (cf. Fox 1987a, 1987b). On the other hand, GC is commonly seen in some Asian languages, some African languages, and Mayan languages (cf. Ennulat 1978, Gleason 1968, Grimes 1978, Hanks 1990), even when speakers of one of those languages speak a second language (cf. Chafe 1980, Clancy 1980). Fourth, GC as a referential practice may depend on a larger social and cultural context in discourse, while LC as artifacts of working memory limitations is more likely to be subject to on-line factors in oral discourse production (cf. Tomlin 1987, Tomlin & Pu 1991).

Notes

*I am grateful to Talmy Givón, Russell Tomlin, and Doris Payne for their helpful comments, though they may not completely agree with me on my proposal.

¹ The symbol # indicates the boundary between paragraphs in the original text.

References

- Auon, Joseph. 1985. *A grammar of anaphora*. Cambridge, MA: MIT Press.
- Baddeley, Alan. 1986. *Working memory*. Oxford: Clarendon Press.
- 1992a. *Working memory*. *Science* 255.556-9
- 1992b. *Working memory: the interface between memory and cognition*. *Journal of Neuroscience* 4.281-7.
- Bock, Kathryn and Helga Loebell. 1990. *Framing sentence*. *Cognition* 35.1-39.
- Caron, Jean. 1992. *An introduction to psycholinguistics*. Translated by Tim Pownal. Toronto: Toronto University Press.
- Chafe, Wallace. (ed.) 1980. *The pear story: cognitive, cultural, and linguistic aspects of narrative production*. Norwood, NJ: Ablex Publishing.
- Chen, Ping. 1984. *A discourse analysis of third person zero anaphora in Chinese*. Bloomington, IN: Indiana University Linguistic Club.
- 1986. *Referent introducing and tracking in Chinese narratives*. Los Angeles, CA: University of California Dissertation.

- Chomsky, Noam. 1981. Lectures on government and binding. Dordrecht: Foris.
- Clancy, Patricia. 1980. Referential choice in English and Japanese narrative discourse. The pear story, ed. by Wallace L. Chafe, 89-126. Norwood, NJ: Ablex Publishing.
- Daneman, Meredyth and Patricia Carpenter. 1980. Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior* 19.450-66.
- Denhiere, Guy, and Jean-Pierre Rossi. (ed.) 1991. Text and text processing. Amsterdam/New York: North-Holland.
- van Dijk, Teun A. 1987. Episodic models in discourse processing. *Comprehending oral and written language*, ed. by Rosalind Horowitz & Jay Samuels, 161-96. San Diego/New York: Academic Press.
- and Walter Kintsch. 1983. *Strategies of discourse comprehension*. New York: Academic Press.
- Ennulat, Jurgen H. 1978. Participant categories in Fali stories. *Papers on discourse*, ed. by Joseph E. Grimes, 143-8. Dallas, TX: Summer Institute of Linguistics, Inc.
- Fischer, Beth and Murray Glanzer. 1986. Short-term storage and the processing of cohesion during reading. *Quarterly Journal of Experimental Psychology*. 38A.431-60.
- Fox, Barbara. 1987a. Anaphora in popular written English narratives. *Coherence and grounding in discourse*, ed. by Russell S. Tomlin, 157-74. Philadelphia: John Benjamins.
- , 1987b. *Discourse structure and anaphora*. Cambridge: Cambridge University Press.
- Garrod, Simon C. and Anthony J. Sanford. 1981. Bridging inferences and the extended domain of reference. *Attention and performance*, vol. ix, ed. by John Long and Alan Baddeley, 331-46. Hillsdale, NJ: Erlbaum.
- Gernsbacher, Morton A. 1991. Cognitive processes and mechanisms in language comprehension: the structure building framework. *The psychology of learning and motivation*, vol.27, ed. by Gordon H. Bower, 217-64. San Diego/New York: Academic Press.
- Givón, Talmy. (ed.) 1983. *Topic continuity in discourse: a quantitative cross-language study*. Philadelphia: John Benjamins.
- , 1989. *Mind, code and context: essays in pragmatics*. Hillsdale, NJ: Lawrence.
- , 1990. *Syntax: a functional-typological introduction*. vol. 2. Amsterdam/Philadelphia: John Benjamins.
- Glanzer, Murray, David Dorfman, and Barbara Kaplan. 1981. Short-term storage in processing text. *Journal of Verbal Learning and Verbal Behavior*. 20.656-70.
- and S. D. Nolan. 1986. Memory mechanisms in text processing. *The psychology of learning and motivation*, vol. 20, ed. by Gordon H. Bower, 275-317. Orlando, FL: Academic Press.
- Gleason, Henry A. 1968. Contrastive analysis in discourse structure. *Georgetown University Monograph Series on Languages and Linguistics* 21.
- Grimes, Joseph E. 1978. *Papers on discourse*. Dallas, TX: Summer Institute of Linguistics, Inc.
- Hanks, Williams. 1990. *Referential practice*. Chicago: University of Chicago Press.
- Hinds, John. 1979. Organizational patterns in discourse. *Syntax and semantics*, ed. by Talmy Givón, 135-58. New York: Academic Press.

- Horowitz, Rodalind, and Jay Samuels (ed.) 1987. *Comprehending oral and written language*. New York: Academic Press.
- Huang, James C-T. 1984. On the distribution and reference of empty pronouns. *Linguistic Inquiry* 15.531-74.
- Huang, Yan. 1994. *The syntax and pragmatics of anaphora: a study with special reference to Chinese*. Cambridge: Cambridge University Press.
- Jarvella, Robert J. 1976. Immediate memory and discourse processing. *The psychology of learning and motivation*, vol. 13, ed. by Gordon H. Bower, 379-422. New York: Academic Press.
- Johnson-Laird, Philip N. 1983. *Mental models: towards a cognitive science of language, inference, and consciousness*. Cambridge, MA: Harvard University Press.
- Just, Marcel and Patricia Carpenter. 1992. A capacity theory of comprehension: individual differences in working memory. *Psychological Review* 99.122-49.
- Kintsch, Walter, and Teun A. van Dijk. 1978. Toward a model of text comprehension and production. *Psychological Review* 85.363-94.
- Levelt, Willem J. M. and Stephanie Kelter. 1982. Surface form and memory in question answering. *Cognitive Psychology* 14.78-106.
- Levinson, Stephen C. 1983. *Pragmatics*. Cambridge: Cambridge University Press.
- Li, Charles, and Sandra Thompson. 1979. Third-person pronouns and zero-anaphora in Chinese discourse. *Syntax and semantics*, ed. by Talmy Givón, 311-35. New York: Academic Press.
- , 1981. *Mandarin Chinese: a functional reference grammar*. Berkeley: University of California Press.
- Lyons, John. 1977. *Semantics*. vol.2. Cambridge: Cambridge University Press.
- Meutsch, Dietrich, and Reinhold Viehoff (ed.) 1989. *Comprehension of literary discourse*. Berlin/New York: Walter de Gruyter.
- Morrow, Danial G., Gordon H. Bower, and Steven L. Greenspan. 1990. Situation-based inferences during narrative comprehension. *The psychology of learning and motivation*, vol. 25, ed. by Arthur C. Graesser and Gordon H. Bower, 123-36. San Diego/New York: Academic Press.
- Nystrand, Martin. 1986. *The structures of written communication: studies in reciprocity between writers and readers*. Orlando: Academic Press.
- , 1987. The role of context in written communication. *Comprehending oral and written language*, ed. by Rodalind Horowitz and Jay Samuels, 197-214. New York: Academic Press.
- Reichman, Rachel. 1981. *Plain speaking: a theory and grammar of spontaneous discourse*. Technical Report, Bolt, Beranek & Newman, Inc.
- Schneider, Walter, and Mark Detweiler. 1988. A connectionist/control architecture for working memory. *The psychology of learning and motivation*, vol.21, ed. by Gordon H. Bower, 54-121. San Diego/New York: Academic Press.
- Tai, James. 1978. Anaphoric constraints in Mandarin Chinese narrative discourse. *Anaphora in discourse*, ed. by John Hinds, 279-338.
- Tomlin, Russell S. 1987. Linguistic reflection of cognitive events. *Coherence and grounding in discourse*, ed. by Russell S. Tomlin, 455-80. Amsterdam/Philadelphia: John Benjamins.
- Tomlin, Russell S., and Ming Ming Pu. 1991. The management of reference in Mandarin discourse. *Cognitive Linguistics* 2-1. 65-93.