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## Written Discourse Segmentation: The Function of Unstressed Pronouns in Mandarin Chinese\*

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### 1. Introduction

This study focuses on the discourse function of unstressed pronouns in Mandarin Chinese. Given Accessibility theory (Ariel 1985, 1990, 1991), a zero pronoun in Mandarin Chinese is the highest Accessibility marker, and a full unstressed pronoun marks a somewhat lower degree of accessibility. Accessibility theory argues that discourse anaphora is determined by the degree of accessibility of a mental representation in memory storage. Under the assumption that mental representations are accessible to the addressee in varying degrees, speakers choose referring expressions to mark accessibility differences for the addressee's convenience. Given the scale of Accessibility (e.g., Ariel 1991: 449), an unstressed pronoun is a lower Accessibility marker than a zero. This means that for languages such as Chinese and Hebrew, the antecedent of a full unstressed pronoun is (slightly) more difficult to retrieve than that of a zero. Accessibility Theory then predicts that pronouns in Mandarin will be used to retrieve a highly accessible antecedent, though slightly less accessible than that retrievable by a zero.

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Similarly, the Conjoinability Hypothesis (Li and Thompson 1979: 330) predicts that speakers of Mandarin will prefer pronouns over zeros in a clause which is perceived as hardly conjoinable with the previous clause: "The degree of preference for the occurrence of a pronoun in a clause inversely corresponds to the degree of its conjoinability with the preceding clause."

We claim that unstressed pronouns in Mandarin are functional in text segmentation over and above their pure referential role. They occur in boundary positions to mark the beginning and end of a written discourse segment. While the occurrence of pronouns in segment initial position can be accounted for by both Accessibility and Conjoinability, their occurrence in ends of segments cannot. The beginning of a discourse unit can be taken to be less conjoinable with the previous clause. It is also the textual position which suggests that the reader can begin to process new information (see also Hofmann 1989, Vonk, Hustinx and Simons 1992, and references cited therein). Hence the rarity of zeros in segment initial position. However, neither theory can explain the tendency to realise a pronoun at the end of a discourse segment. At the end of a segment, the entity referred to by a pronoun rather than by a zero is both conjoinable with the preceding clause and highly accessible.

To be able to account for the function of pronouns as boundary markers, let us first consider the notion of a discourse segment. In what follows we report findings of previous research (especially Giora 1985a,b, 1988), which we will only illustrate here.

## 2. Discourse segment

The boundaries of a discourse segment such as a paragraph, a chapter, and a section are usually marked formally. Most written languages employ formal boundary markers such as spacing, indentation etc. Mandarin makes use of a period. This marks the end of a segment, ranging over one or more sentences.

In genres such as narratives, boundaries of a discourse segment are mostly determined by the boundaries of the Discourse Topic it discusses (Giora 1986, 1988). Previous research (e.g., Giora 1985a, 1986, 1988) has shown that a discourse segment (e.g., a paragraph) begins with the Discourse Topic proposition and ends with the most informative proposition relative to that Discourse Topic. The Discourse Topic is a proposition that has the form of a

generalisation. It governs the set of propositions that make up the paragraph in that it conceptually intersects with each of them. Each proposition, then, shares semantic properties with the generalisation, which accounts for the relevance relation it bears to that proposition.

Besides sharing semantic properties with the generalisation, each proposition also adds some new information to the set. The serial ordering of messages is informative — from the least to the most informative proposition relative to the generalisation (Giora 1988). In previous work (Giora 1985a, 1988) it has been shown that such ordering is the easiest to understand, and judged by speakers as preferable.

### 2.1 Discourse Topic mention as a boundary marker

The above order of presentation from the least to the most informative proposition is the unmarked or prototypical text ordering. It suggests that boundaries, initial and final, are respectively marked by the Discourse Topic proposition and the most informative proposition relative to that Discourse Topic. However, this is not the only possible ordering. The more marked ordering is that which delays Discourse Topic mention to the end (Giora 1985a, and Giora 1983a,b for an extensive discussion of Discourse Topic mention in final position). Examples (1) and (2) (taken from *Politics and Technology* by John Street, 1992): (1) illustrates this difference; while in (2) the Discourse Topic (underlined) appears in the beginning of the paragraph, the reverse ordering is practised in (1):

- (1) When protesting Chinese students were killed by the army in Tiananmen Square in 1989, their colleagues were able to challenge the official version of events. Despite the strict control over information exercised by the Chinese authorities, the students could reach the world's press and television stations through the use of FAX machines. When Saddam Hussein invaded Kuwait in 1990, Kuwaiti resistance fighters used FAX machines to give instant accounts of the experience of occupation. Without the technology, such tactics would have been unthinkable. *This book is about how such thoughts and actions become possible through the interaction of politics and technology.*
- (2) *There is no escape from either politics or technology.* Our daily lives are proof of this. Almost everything we do depends on the technology that

surrounds us; and almost everything we say or think incorporates political values and judgements. This book is another example of this state of affairs. Most obviously, it is an attempt to persuade you that we ought to see the world in a particular way, and as such it is an exercise in politics. But it is important to note that my ability to write these words, and yours to read them, depends partly on the vast array of sophisticated technologies used in word-processing, printing, distribution and retailing.

We have seen that a Discourse Topic mention marks the beginning (2) and end (1) of a new segment. These, however, are not the only possible paragraph structurings. A more marked paragraph ordering than the Discourse Topic final version is the one that exhibits no Discourse Topic mention at all. More common, however, are paragraphs with Discourse Topic mention in both initial and final positions as in (3) below:

(3) *Just how far have women risen in the film community?*

*According to Michelle Pfeiffer, who was at the Woman in Film luncheon recently in Los Angeles, the United States, it has actually been a very good year for women.*

Her tongue firmly in cheek, she said that Demi Moore was sold to Robert Redford for US\$ 1 million in the movie *Indecent Proposal*... Uma Thurman went for US\$ 40,000 to Robert De Niro in the recent movie, *Mad Dog and Glory*. "Just three years ago, in *Pretty Woman*, Richard Gere bought Julia Roberts for — what was it? US\$ 3,000?

*"I'd say women have had real progress," quips Pfeiffer.*

*(The Straits Times, a Singaporean daily, 1.8.93)*

Taken together, examples (1)-(3) attest that Discourse Topic mention can occur both in the beginning and end of text segments. Discourse Topic in mid position results in an ill-formed text (Giora 1988, Giora, Meiran and Oref 1992). While in initial position, Discourse Topics are functional in processing, in final position their mention has no informative function. Giora (1985a) has shown that where Discourse Topics are not mentioned in the beginning of a text segment, processing is slowed down. At the end of the text segment, however, mentioning and obviously rementioning of the Discourse Topic is redundant: Readers must have guessed it by then. We therefore conclude that

Discourse Topic mention at the end of a text segment has the function of a boundary marker besides summarising or recapitulating the text.

Having considered discourse structuring, let us clarify our notion of Discourse Topic.

## 2.2 *A propositional view of Discourse Topic*

Contrary to the prevailing view, and following e.g., van Dijk (1977), Giora (1985a,b), Enc (1986), Cheng (1988), we take a Discourse Topic to be a whole proposition rather than an NP, or at least an NP containing an argument and predicate. As has been suggested earlier by Giora's previous studies, the Discourse Topic is a generalisation — a proposition that reflects the redundancy structure of the text. It is the proposition that best represents the text, relative to which the rest of the propositions are processed. The Discourse Topic proposition can either be realised in the text, or be a construct. However, a text is ill-formed if it cannot be said to be about a Discourse Topic, whether this has been made explicit or not (for further discussion see Giora 1985a,b).

NPs are viewed here as forming part of the Discourse Topic (rather than constituting sentence topics). A Discourse Topic shift triggers the use of a lower accessibility marker (e.g., a full NP) where a higher accessibility marker could be expected (e.g., a pronoun). In Mandarin, where a zero is the highest (unmarked) accessibility marker, the same move triggers the use of a pronoun, which is slightly more informative than a zero. To clarify our claim, let us first consider an English example. The following discourse (4, taken from *Seeing Hands* by Eric de Maun, *The Listener* 13.8.64) will be used to show that in English a Discourse Topic shift triggers the use of a low Accessibility marker — a full NP — to refer to a highly accessible entity which could have been retrieved by a higher Accessibility marker — a pronoun:

- (4) *In the Soviet Union several cases have been reported of people who can read and detect colours with their fingers, and even see through solid doors and walls. One case concerns an eleven-year-old schoolgirl, Vera Petrova, who has normal vision but who can also perceive things with different parts of her skin, and through solid walls. This ability was first noticed by her father. One day she came into his office and happened to put her hands on the door of a locked safe. Suddenly she asked her father why he kept so many old newspapers locked away there, and even described the way they were done up in bundles.*

*Vera's curious talent was brought to the notice of a scientific research institute in the town of Ulyanovsk, near where she lives, and in April she was given a series of tests by a special commission of the Ministry of Health of the Russia Federal republic.* During these tests she was able to read a newspaper through an opaque screen and, stranger still, by moving her elbow over a child's game of Lotto she was able to describe the figures and colours printed on it; and, in another instance, wearing stockings and slippers, to make out with her foot the outlines and colours of a picture hidden under a carpet. Other experiments showed that her knees and shoulders had similar sensitivity. During all these tests *Vera* was blindfold; and, indeed, except when blindfold she lacked the ability to perceive things with her skin. It was also found that although she could perceive things with her fingers, this ability ceased the moment her hands were wet.

This is an excerpt of a longer text. The first paragraph exhibits both a Discourse Topic mention of the whole text and the Discourse Topic of the specific paragraph. We will concentrate on the latter. The Discourse Topic of the first paragraph, then, concerns Vera Petrova's curious talent — her ability to detect colours by her fingers and see through solid walls. In the beginning of the paragraph she constitutes new information, and is therefore referred to by a full name — a low Accessibility marker. Later on, throughout the paragraph, she is referred to by a pronoun — a high Accessibility marker. We contend that she is highly accessible because she makes up part of the Discourse Topic, and consequently can be constantly referred to by a pronoun.

The second paragraph discusses a new Discourse Topic — the set of tests which examined Vera's ability. Since this is a new Discourse Topic, she is referred to by her name — a low Accessibility marker, as predicted by Accessibility theory. However, three sentences before the end of this paragraph, her name — a low Accessibility marker — occurs again. And indeed a new Discourse Topic is discussed, albeit for a very short while — the circumstances under which her ability ceased. This Discourse Topic unit is not marked formally (by e.g., indentation or spacing), since it forms a part of the more general Discourse Topic of the whole paragraph, and is short enough to be contained within the given paragraph. The paragraph can, in fact, be viewed as divisible into two: the first part discusses her unique ability and the circumstances under which it is operative. The second part testifies to the opposite. Both sub Discourse Topics make up the paragraph Topic which concerns testing her ability. The discourse segmentation, then, is marked by a lower

Accessibility marker than could have been expected had no Discourse Topic change occurred: instead of a pronoun, there is a full NP (i.e., a name).

This example strongly suggests that a Discourse Topic cannot be an NP. It is not Vera — the NP — which is replaced, but rather the previous Discourse Topic proposition of which Vera is only a part. The reference to Vera by an Accessibility marker lower than a pronoun suggests that the reduction of the referent's accessibility status is due to the Discourse Topic shift. (See also Enc 1986 for a similar argument about Turkish).

This example further demonstrates that discourse boundaries are marked by a Discourse Topic mention. It shows that when a Discourse Topic shift occurs it is signalled by a low Accessibility marker (e.g., a full NP), though a higher Accessibility marker (e.g., a pronoun) could be expected.

However, example (3) above demonstrates that this also holds for cases where there is no Discourse Topic shift. Even when the same Discourse Topic is rementioned in the end of the segment, a lower than expected Accessibility marker surfaces (see also Longacre 1979, Clancy 1980, Fox 1984). While the change in the Accessibility of the entity triggered by a Discourse Topic shift can be accounted for by Accessibility theory, this cannot. The occurrence of a full-fledged Discourse Topic proposition has the function of marking the end of the segment.

We have thus far discussed English examples because we believe English is not essentially different from Chinese. The differences between languages which differ in the amount and markedness of Accessibility markers is just a matter of degree. For example, it has been observed that in many cases, where English employs a pronoun, Chinese uses a zero (e.g., Huang 1984, Ariel 1991). Below we will show that where English employs a full NP instead of a pronoun, Chinese uses a pronoun instead of a zero.

### 3. The function of pronouns in Mandarin

Li and Thompson (1979) postulated a few pragmatic constraints on the use of pronouns in Mandarin. The more general hypothesis concerns conjoinability of clauses: Pronouns are preferred over zeros where a clause is not perceived as conjoinable with the previous clause (cf Section 1). They further observed that conjoinability between clauses is impaired when the clause contains adverbial expressions such as time phrases or contrastive morphemes. "Such elements

signal the beginning of a new sentence rather than a connected clause" (p.332). The new sentence is viewed as marking the end of a previous topic chain and the beginning of a new "grammatical unit". They have also shown that a shift in turn-taking in conversation triggers the use of a pronoun.

Ariel's theory (1990, 1991) makes a more general claim and accounts for coinjoinability in terms of degrees of accessibility. She shows that in Hebrew, for example, pronouns are preferred over zeros just when the mental entity is not extremely high on the addressee's mind. This happens, among other things, when there is a low degree of cohesion (i.e., conjoinability) between sentences.

We take all these to agree with our intuition that pronouns occur in boundary positions. At least, the Conjoinability/Accessibility Hypothesis can be taken to be compatible with our view that pronouns (rather than zeros) are used in the beginning of Discourse Topic segments. In our view, adverbial expressions do not constitute another constraint. Rather, they are a specific instance of a new Discourse Topic introduction device (Giora 1985b). They are therefore expected to be followed by a pronoun only when they mark the boundary of a new discourse segment. We will later show that when an adverbial does not mark the introduction of a new Discourse Topic, no pronoun emerges. The Conjoinability/Accessibility Hypothesis, however, does not coincide with our more general claim that pronouns appear in boundary positions, endings included. At the end of a discourse segment a proposition is highly conjoinable with the preceding one, yet, as will be shown below, a pronoun, rather than a zero, occurs.

In fact, even Li and Thompson's own findings attest to our more general claim. Li and Thompson presented speakers of Mandarin with three passages taken from Mandarin narratives. They removed all third person pronouns and asked their subjects to insert pronouns where they felt they were needed. The first excerpt from *Ru Lin Wai Shi* (p.4), copied here for convenience (5 below), supports our hypothesis that pronouns are realised at the beginning and end of a Discourse Topic segment (the percentages suggest subjects' preferences, and the bold indicates the author's choice):

- (5) a. zhe Wang-Mian tianxing congming  
       this W.-M. nature smart  
       'This W.-M. was gifted.'
- b. (6%) nianji bu man ershi-sui  
       age not exceed twenty-year  
       '(He) was not more than twenty years of age.'

- c. (2%) jiu ba na tianwen, dili, jingshi  
       already obj. marker that astronomy, geography, classics  
       shang de da xuwen wu yi bu guantong  
       in great knowledge not a bit not master  
       '(He) had already mastered everything in astronomy, geography, and classics.'
- d. dan (76%) xingqing bu tong  
       however personality not similar  
       'However, (he) had a different personality.'
- e. (2%) ji-bu qiu guanjie  
       not only-not seek officialdom  
       'Not only did (he) not seek officialdom.'
- f. (0%) you bu jiaona pengyou  
       also not make friend  
       '(he) also did not make friends.'
- g. (2%) zhongri bi -hu dushu  
       all day close door study  
       '(He) studied at home all day.'
- h. (14%) you zai Chu-Ci-Tu shang kanjian hua de  
       also at Chu-Ci-Tu in see paint rel. cl. marker  
       Qu-yuan yi-guan  
       Qu-yuan attire  
       '(He) also saw the attire of Qu-yuan painted in Chu-Ci-Tu.'
- i. (8%) bian zi zao yiding ji gaode maozi, yijian ji kuo  
       then self make one very tall hat one very loose  
       de-yifu  
       garment  
       '(He) then made a very tall hat, and a very loose garment.'
- j. (0%) yu-zhe hua-ming-liu-mei-de shijie  
       chance-upon balmy days  
       '(When he) chanced upon balmy days'
- k. (12%) ba yi-cheng niu-che zai-le muqin  
       take a cattle-cart bring-aspect mother  
       '(He) took a cattle cart and brought his mother.'

- l. (10 %) bian dai-le gao mao  
then wear-aspect tall hat  
'(He) then wore a tall hat.'
- m. (0%) chuan-le kuo yi  
put on-aspect loose garment  
'(He) put on a loose garment.'
- n. (0%) zhi-zhe bianzi  
hold-aspect whip  
'(He) held a whip.'
- o. (0%) kou-li chang-zhe gequ  
mouth-in sing-aspect song  
'(He) sang songs.'
- p. (0%) zai xiang cun zheng-shang yiji hu-bian dao chu  
at village town in and lake-side everywhere  
wan-shua  
cruised about  
'(He) cruised about the villages, towns, lake-side, and everywhere.'
- q. (4%) re-de xiangxia haizi-men san wu cheng qun gen-zhe (4%)  
make country children three five from group follow  
xiao  
laugh  
'(He) made the children in the country follow him about  
and laugh in groups of three and five.'
- r. (56%) ye bu fang-zai-yi-xia  
even so not mind  
'(He) did not even mind.'
- s. ru-ci (14%) jiu shenghuo anding kuaile jian kang  
thus, then live stable happy healthy  
'Thus, (he) lived a stable, happy, and healthy life.'

Subjects preferred two positions for the introduction of a pronoun: In (5d) where a new Discourse Topic segment begins, and in (5r) where this segment ends. We should note here that the version of the text we have does not include (5s). The clause following (5s) begins an altogether new Discourse Topic

(discussing a neighbour called T.-L.). This strengthens our interpretation of (5r) or (5r-s) as concluding rather than beginning a new segment.

The boundaries of the segment (5d-s) are determined by the Discourse Topic it discusses, presented in (5d): The different personality of W.-M. The subsequent propositions (5e-p) are all relevant to this generalisation: They provide evidence for this claim. Propositions (5r-s) conclude this segment by stating that W.-M. did not mind being different, and lived happily.

While the Conjoinability/Accessibility Hypothesis can account for the use of a pronoun in (5d), where a new discourse segment begins, it cannot explain the use of a pronoun in (5r). The proposition in (5r) is conjoinable, or relevant to the generalisation in (5d). Nevertheless, it exhibits a pronoun rather than a zero. We explain this in terms of the discourse function of pronouns in Chinese. In Chinese, pronouns mark the boundaries of a discourse segment.

Li and Thompson's second example (6 below), also taken from the same novel (p. 14), exhibits the same phenomenon:

- (6) a. waibian zou-jin yige ren lai  
outside walk-in a person come  
'From outside entered a man.'
- b. (8.6 %) liang-zhi hong yan-bian  
two red eyes  
'(He) had two red eyes.'
- c. (0%) yifu guotie lian  
a stiff face  
'(He) had a stiff face.'
- d. (0%) ji-gen huang huzi  
a-few yellow beard  
'(He) had a few yellow whiskers.'
- e. (2.8%) wai-dai-zhe waleng mao  
wear tile-shaped hat  
'(He) wore a tile-shaped hat.'
- f. (0%) shen-shang qing bu yifu jiu-ru you- lou yiban  
body-on blue cloth garment like oiled basket  
'(He) had over his body a blue garment that looked like a oiled basket.'

- g. (5.6%) shou-li na-zhe yi-gen gan lu de bianzi  
hand-in hold a ride donkey rel. cl. marker whip  
'(He) was holding a whip for riding donkeys.'
- h. (2.8%) zou-jin men lai  
enter door come  
'(He) came in the door.'
- i. (0%) he zhongren gong-yi-gong shou  
toward everyone salute with hand  
'(He) saluted everyone with his hands.'
- j. (2.8%) yi-pigu jiu zuo zai shangxi  
one-buttock then sit at seat of honor  
'(He) then immediately took the seat of honor.'
- k. (75%) xing Xia  
surname Xia  
'(He) was surname Xia.'
- l. (0%) nai Xie-Jia-Ji shang jiu nian xing can de zongjia  
be Xie-Jia-Ji at last year newly appointed rel.cl. marker boss  
'(He) was the new boss of Xie-Jia-Ji, appointed last year.'
- m. (19.4%) zuo zai shang-xi  
sit at the seat of honor  
'(He) sat at the seat of honor.'
- n. (5.6%) xian fenfu heshang dao "..."  
first order monk say  
'(He) first ordered the monk by saying: "...'

Subjects chose to insert a pronoun in (6k). For Li and Thompson and Ariel this is explained by lack of conjoinability: The pronoun starts a new "grammatical unit", since it is a background clause, while the previous discourse is foreground information. This, however, does not hold. In fact this account is refuted by this very same example. This excerpt begins in a foreground clause (6a) and proceeds with a background clause (6b), using a zero rather than the anticipated pronoun. It later shifts back to foreground information in (6h), once again with no sign of a pronoun.

Our interpretation suggests the subjects chose to introduce a pronoun at

the end of a segment whose Discourse Topic revolves around introducing the protagonist *Xia*. *Xia* is introduced as a new entity ("a man") in the beginning of this segment (6a). He is then referred to by a zero pronoun throughout the text until (6k), where (6k-l) conclude this segment. The discourse segment introducing *Xia* (6a-l) ends in the most informative message about him, in terms of introduction, stating his name and function (6k-l).

That (6k-l) end rather than start a segment is further supported by (6m). In our version of the book, (6m) begins a new segment with *Xia*'s name and title — a low Accessibility marker — fully reintroduced. According to Li and Thompson's version, (6m) contains a pronoun, which they too take to indicate the beginning of a new unit. (6k-l), then can only be a concluding statement. It is highly relevant to the Discourse Topic of this segment which discusses this person's introduction. It is, therefore, also viewed by us as conjoinable with the preceding discourse.

To further validate our contention, we examined a longer stretch of Mandarin discourse (7 below) — *Shitouji* (The story of the stone) by Cao Xueqin (the author of the first eighty chapters), which made its appearance in the mid 1700s. We chose this text because its language is generally regarded as being free from the influence of Western languages, but still representing the model of current standard Chinese, and because it comprises both narrative and nonnarrative segments. We focused on the first chapter. We examined all pronoun types, to see whether they emerged in boundary positions. It should be noted, however, that we do not expect only unstressed pronouns to appear in boundary positions. Obviously, other lower Accessibility markers can serve to segment the text. However, we focus on unstressed pronouns, since their function in Mandarin seems unique. Given that when it comes to retrieve highly accessible antecedents, zero pronoun is the norm, we suggest that unstressed pronouns, a high Accessibility marker as well, has a distinct function. We maintain that when highly accessible entities appear in boundary positions, they tend to be referred to by a pronoun rather than by the otherwise expected zero in order to signal a boundary (see analysis after the text below).

(7)

- a1. ci kai juan diyi hui ye.  
this open scroll first chapter be  
'This is the first chapter of the book.'

- b1. *zuozhe* *zi* *yun*,  
author self say  
'The author says:'
2. *yin* *ceng* *li* *guo* *yifan* *menghuan* *zhihou*,  
because had experience asp one dream after  
'because (I) had a dream,'
3. *gu* *jiang* *zhen* *shi* *yin* *qu*,  
so take true fact conceal go  
'(I) concealed the true facts,'
4. *er* *jie* 'tong *ling*' *zhi* *shuo*  
instead use Spiritual Understanding rel. marker allegory  
'and instead (I) use the allegory of the jade of Spiritual Understanding'
5. *zhuan* *ci* *shitouji* *yi* *shu* *ye*.  
write this stone story one book  
'to write this story of the stone.'
- c1. *gu* *yue* 'Zhen Shiyin' *yunyun*.  
therefore say Zhen Shiyin say  
'Hence the use of names such as Zhen Shiyin.'
- d1. *dan* *shu* *zhong* *suo* *ji* *he* *shi* *he* *ren*,  
but book in all record what event what people  
'But what are the events recorded in this book and who are the characters?'
2. *zi* *you* *yun*,  
self again say  
'About this he said:'
- e1. *jin* *feng* *chen* *lulu* *yi* *shi* *wu* *cheng*,  
now win dust busy one thing no succeed  
'In this busy, dusty world, (I) having accomplished nothing,'
2. *hu* *nianji* *dang* *ri* *suoyou* *zhi* *nuzi*,  
suddenly recall those day all of girl  
'(I) suddenly recalled all the girls (I) had known those days.'
3. *yi* *yi* *xi* *kao* *jiao* *qu*,  
one one careful consider compare go  
'(I) consider each of (them) in turn,'

4. *jue* *qi* *xingzhi* *jianshi* *jie* *chuyu* *wo* *zhi* *shang*,  
feel their behavior understanding all over my above  
'(I) feel that they surpassed me in behavior and understanding.'
5. *he* *wo* *tangtang* *xumei* *cheng* *bu* *ruo* *bi* *qun*  
why I dignity mustache and eyebrow really not like they skirt  
*chai* *zai*,  
hairpin sigh  
'I, for all my masculine dignity fell short of the gentler sex.'
6. *shi* *kui* *ze* *you* *yu*,  
real shame then have more  
'There is much to be shameful for,'
7. *hui* *you* *wu* *yi* *zhi* *da* *wu* *ke* *ruhe* *zhi* *ri* *ye*.  
regret also no good such big no use of day be  
'but since this could never be remedied, it was no use regretting.'
- f1. *dang* *ci* *shi*,  
at this time  
'Meanwhile,'
2. *zi* *yu* *jiang* *yi* *wang* *suo* *lai* *tian* *en* *zu* *de*  
self want take past all depend Imperial grace ancestor virtue  
'I wish to thank all Imperial favor and ancestor virtue that had enabled (me)'
3. *jingyi* *wankua* *zhi* *shi*,  
silk expensive clothes of time  
'in those days to dress in silk,'
4. *yu* *gan* *yan* *fei* *zhi* *ri*,  
eat sweet eat nourish of day  
'and to eat good food.'
5. *bei* *fu* *xiong* *jiaoyu* *zhi* *en*,  
against father brother educate of grace  
'Yet (I) went against the kindly guidance of (my) elders'
6. *fu* *shi* *you* *guitan* *zhi* *de*,  
owe teacher friend advice of virtue  
'(and) good advice of teachers and friends.'



7. yizhi jinri yi ji wu cheng ban sheng liaodao zhi zui  
lead to today one skill not succeed half life poor of sin  
'As a result (I) had wasted half of my life and (I) had not acquired a single skill.'
8. bian shu yi ji yi gao tianxiaren,  
edit tell one volume to tell everyone  
'(I) shall make all these known to all through one volume (of the book).'
9. sui wo zhi zui gu buneng mian,  
though my sin indeed cannot forgive  
'Although my sins cannot be forgiven.'
10. ran guige zhong ben zi lili you ren,  
but chamber in actual natural clear have people  
'those lovely girls in the chamber'
11. wanbuke yin wo zhi buxiao,  
cannot because I pos misdeeds  
'cannot be due to my misdeeds'
12. zi hu ji duan,  
self protect own shortcomings  
'nor for wanting to hide my own shortcomings'
13. yi bing shi qi minmie ye.  
all make them vanish be  
'let all of them pass into oblivion.'
- g1. sui jinri zhi mao chuan feng chuang,  
Though today of thatched cottage matting window  
'Though (my) home is now a thatched cottage with matting windows,'
2. wa zao sheng chuang,  
earthen stove rope bed  
'earthen stove and rope-bed,'
3. qi feng che yue xi,  
its wind morning moon evening  
'the morning breeze and evening moonlight,'
4. jie liu ting hua,  
steps willow courtyard flower  
'the willows by (my) steps and the flowers in (my) courtyard'

5. yi wei you fang wo zhi jinhuai bimo zhe,  
also not have affect my heart writing such  
'have also not stopped me from laying bare (my) heart in writing.'
6. sui wo wei xue,  
though I not learn  
'Though I am not learned,'
7. xia bi wu wen,  
write no talent  
'and (I) have no literary talent,'
8. you hefang yong jia yu cun yan fuyan chu yiduan gushi lai,  
again no harm use false speech village speak act out one story come  
'what does it matter if (I) tell a tale using the language of a fictitious village'
9. yi yue ren zhi er mu zai.  
to please people pos ear eye so  
'in order to distract readers from their cares.'
- h1. gu yue 'Jia Yucun' yunyun.  
therefore read Jia Yucun say  
'Thus the use of Jia Yucun's name.'
- i1. nai shi di yi hui tigang zhen yi ye.  
Such be no. one chapter topic real meaning be  
'Such is (the) topic of the first chapter.'
- j1. kai juan ji yun 'feng chen huai guixiu',  
open scroll immediately say wind dust harbor beauties  
'The volume begins with 'beauties of this dusty world','
2. ze zhi zuozhe ben yiyuan wei jishu dangri guiyou guiqing  
then know author original idea be record those days friendship  
'then (you) know that the author's original idea was to record past friendships,'
3. bing fei yuan shi ma shi zhi shu yi;  
and not blame world scold time of book function word  
'and not one that concerns social affairs.'

4. sui yi shi you she yu shitai,  
though one time have concern on world affairs  
'Although at times (it) touches on affairs of the world,'
5. ran yi budebu xu zhe,  
but also have to relate such  
'(it) is out of necessity,'
6. dan fei **qi** ben zhi er.  
but not its main motive such  
'and not its main topic.'
- k1. yuezhe qie ji zhi.  
reader must remember this  
'Readers have to bear this in mind.'

## POEM

11. lie wei kan guan,  
all member official  
'Dear officials,'
2. **ni** dao ci shu he lai,  
you say this book where come  
'where do you think this book comes from?'
3. shuo qi genyou sui jing huangtang,  
speaking of origin though near absurd  
'The origin may sound absurd at first,'
4. xi an ze shen you quwei,  
careful consider then deep have interest  
'(but) carefully considered is of great interest.'
5. dai zaixia jiang ci laili zhuming,  
wait lowly make this origin clear  
'Let me tell you the origin,'

6. fang shi yuezhe liaoran bu huo.  
then make reader understand not confused  
'so that readers can understand and not be confused.'
- m1. yuanlai nuwashi lian shi bu tian zhi shi,  
actually Nuwa purify stone repair sky of time  
'Actually when the goddess Nuwa purified rocks to repair the sky,'
2. yu da huang shan wu ji ya lian cheng gao jing shier-zhang,  
at big waste mountain no base cliff purify succeed high reach hundred  
twenty feet
3. fang jing ershisi-zhang wan shi  
square reach two hundred and forty feet hard stone  
sanwan-liuqian-wubai-ling yi kuai.  
thirty-six thousand five hundred and one block  
  
'at Great Waste Mountain and Baseless Cliff, (she) succeeded to make  
thirty-six thousand five hundred and one blocks of stone each a hundred  
and twenty feet high and two hundred and forty feet square.'
- n1. wawangshi zhi yong le sanwan-liuqian-wubai kuai,  
Wawangshi only use asp thirty-six thousand five hundred block  
'The goddess Nuwa only used thirty-six thousand five hundred blocks.'
2. zhi dandan de sheng le yi kuai wei yong,  
only leave asp one block not use  
'(She) only left one block unused.'
3. bian qi zai ci shan qing geng feng xia.  
then threw at this mountain Blue Ridge Peak bottom  
'and threw (it) at the foot of Blue Ridge Peak.'
- o1. Shei zhi ci shi zijing duanlian zhihou,  
who know this stone since purify after  
'Who knows that after purification, this stone'
2. lingxing yi tong  
spiritual already clear  
'has gained spiritual understanding.'

3. yin jian zhong shi ju de bu tian  
because see all stone all get mend sky  
'Because all (its) fellow blocks had been chosen to mend the sky'
4. du ziji wu cai bu kan ruxuan,  
only self no talent not worthy chosen  
'only (it) alone was not worthy to be chosen.'
5. sui **zi** yuan **zi** tan,  
so self moan self groan  
'so it lamented'
6. ri ye bei hao cankui.  
day night sad howl shameful  
'day and night in distress and shame.'
- p1. yi ri zheng dang chaidao zhi ji,  
one day just when brooding moment  
'One day as (the Stone) was brooding'
2. er jian yi seng yi dao yuanyuaner lai  
suddenly see one Buddhist monk one Taoist priest far far approaching  
'(it) suddenly saw a Buddhist monk and a Taoist priest  
approaching from a distance.'
3. sheng de gu ge bu fan,  
born asp bone structure not ordinary  
'(They) had bone structures that looked extraordinary'
4. feng shen jiongbie,  
full spirit different  
'spirit that was different.'
5. shuoshuo xiaoxiao lai zhi feng xia,  
talk laugh come to mountain bottom  
'(They) talked and laughed as (they) approached the bottom of the mountain.'
6. zuo yu shi bian,  
sit at stone side  
'sitting by the stone'

7. gaotan kuailun.  
chat discuss  
'chatting away.'
- q1. xian shi shuo xie yun shan wu hai shenxian xuanhuan zhi shi;  
first be say some cloud mountain dew sea fairy mysterious of matter  
'(They) first talked of matters in the fairyland.'
2. hou bian shuo dao renjian hong chen zhong ronghua fugui.  
later then talk about people red dust in riches wealth  
'then about the riches and wealth of human beings on earth.'
- r1. ci shi ting le,  
this stone hear after  
'After hearing this, this stone's'
2. bujue da dong fan xin,  
suddenly beat move earthly heart  
'earthly heart was moved'
3. xiang yao dao renjian qu xiang yi xiang zhe ronghua fugui  
wish want go earth go enjoy one enjoy this riches wealth  
'so he wished to go to the earth to enjoy the riches and wealth.'
4. dan zi hen cu chun,  
but self hate rough stupid  
'But (he) hated himself for being coarse and stupid'
5. budeyi bian kou tu ren yan,  
couldn't help then mouth spit man words  
'then (he) couldn't help but spoke the words of man'
6. xiang na seng shuodao:  
to that monk say  
'to that monk:'
- s1. da shi,  
big teacher  
'Dear Sir,'
2. dizi chun wu buneng jianli le.  
student stupid thing cannot meet already  
'student is stupid and unworthy to meet (you).'

Let us first analyze the text's boundary positions. To do that, we start by considering the text's formal segmentation devices, such as paragraphing (where this occurs) and periods. We will show that pronouns tend to surface in the first two clauses before and after a period or a paragraph marking.

The text in (7) is originally divided into 19 formal units (a-s), allowing 35 boundary positions. Findings show that all in all, out of the 35 possible boundary positions, 19 introduce old referents that could, in principle, be referred to by a zero. Out of these 19 positions, 5 (26.32%) (e1, g1, o3, p1, q1) are left unmarked (i.e., a zero is used which is not obligatory) (see underlined positions at margin); 6 (31.58%) (d2, f2, f13, j6, l2, o5), are marked by an unstressed pronoun (these pronouns are in bold); another 7 (36.84%) (b1, g9, j2, k1, l6, n1, s2) — by a full NP (which we take to be a politeness strategy often referring to the author himself or the reader) (these are in italics), and 1 (5.26%) (o1) — by a full NP (which we explain in terms of ambiguity resolution, the previous clause having two zeros). This means that only 26.32% of the boundaries are left informationally unmarked. The rest, about (74%), are marked by a pronoun or an NP, where the pronoun is replaced by a lower Accessibility marker for politeness considerations. These findings suggest that there is a tendency to use a lower Accessibility marker than zero in boundary positions.

However, the text's formal segmentation is not the only one possible. Some of its segments are very small (one clause only), and can be joined with preceding or succeeding segments, and some are relatively long and contain more than one Discourse Topic unit. Together with 6 Chinese students of linguistics and discourse we have come up with a slightly different text segmentation. According to our proposal, the text is divisible into two large segments, 8 (a1-k1), which discusses the topic of the book, and 8.2 (l1-s2), which discusses its origin:

(8) is a large segment which discusses the topic of the first chapter. This, in itself, is divisible into two subsegments: (8.1.1) (b1-i1), which makes up the core of (8.1), and (8.1.2) (j1-j6, k1), which is a kind of a summary.

According to this segmentation, (k1) concludes the larger unit (a1-k1), marked also by a paragraph boundary, while (i1) and (j6) conclude the internal segments. However, the unit (b1-i1) is in itself rather large, and can be further broken up into subsegments. For convenience (a1) too will be included in the first segment:

(8.1.1.1) (a1, b1-c1) discusses the nature of the book. It ends in the most informative message relative to this Discourse Topic — the name of the person

(Zhen Shiyin) which alludes to the nature of the book: that the truth is concealed.

(8.1.1.2) (d1-e7) is the second unit. Here the Discourse Topic discussed concerns the events and characters of the book (d1). The initial boundary is signalled by full NPs referring to new entities (e.g., events, characters), and by a pronoun (*zi*) in the second clause, referring to a highly accessible referent (the author). We should note here that this segment abounds in pronouns. But these pronouns need not concern us: they are all stressed pronouns, used for contrastive purposes.

(8.1.1.3) (f1-f8) is the third segments in which the author apologises for his past behaviour. The beginning of this segment is signalled by a pronoun (*zi*) in (f2), referring to a highly accessible referent (the author). It ends with a zero, referring to the author, but introduces a full NP while referring to the volume under discussion.

(8.1.1.4) (f9-f13) discusses the author's unworthiness as opposed to the worthiness of those whom he is obliged to eternalize. The segment begins and ends with pronominal references to highly accessible entities: the author (*wo*) in the beginning (f9), and the characters (*qi*) in the end (f13), both making up part of the Discourse Topic. However, the segment abounds in pronouns, which are all stressed for contrastive purposes.

(8.1.1.5) (g1-g5) discusses the external barriers that will not stop the author from writing. It begins with a zero, referring to a highly accessible entity — the author, but ends with a pronoun (*wo*), referring to the same entity, while repeating the Discourse Topic.

(8.1.1.6) (g6-h1, i1) discusses the internal difficulties that will not bar the author's fictitious writing. It begins by referring to this highly accessible entity by a pronoun (*wo*), and ends by referring to another highly accessible entity, the readers, by a full NP (rather than by a pronoun), for reasons of politeness. This is followed by the most informative message relating to the fictitious nature of the book in (h1) by means of a character's name (*Jia Yucun*, meaning 'fictitious saying remains'). (i1) concludes the whole segment starting in (a1), using a full NP.

(8.1.2) (j1-k1) summarises the topic of the book. It begins with a full NP, then refers to the author using an NP (instead of a pronoun) out of politeness. It then ends by referring to the book by means of a pronoun (*qi*) in (j6), which makes up part of the Discourse Topic, and to the readers by means of an NP, again, out of politeness.

The second large discourse segment begins in (11) but goes beyond the scope of this excerpt:

(8.2) (11-s2) discusses the origin of the book. Again this extensive segment can be subdivided into smaller units:

(8.2.1) (11-l6) discusses the origin of the book in general. In the beginning it refers to the readers by a pronoun (*ni*), after addressing them by a polite NP. It then ends by addressing the readers again by an NP, out of politeness.

(8.2.2) (m1-n3) relates the events that eventually led to the making of the book, starting with a new entity (the goddess *Nuwa*). The end of this segment is unmarked (the stone is referred to by a zero).

(8.2.3) (o1-o6) discusses the feelings of the stone. The initial boundary is marked by a full NP (this stone), probably to resolve ambiguity, the previous clause containing two zeros. It ends with a pronoun (*zi*) in (o5), referring to the stone, a highly accessible entity which makes up a part of the Discourse Topic. (The pronoun in (o4) is stressed).

(8.2.4) (p1-q2) describes the monk and the priest the stone comes upon. Boundaries are marked by full NPs.

(8.2.5) (r1-r6) discusses the stone's feelings concerning earthly life. The segment begins and ends with full NPs referring to highly accessible entities to signal the boundaries of the segment.

(8.2.6) (s1-) is our last segment, though in context it is an initial part of a new segment. It begins with a humble reference to a highly accessible entity, the author, using an NP, for politeness considerations.

In sum, we have found 13 segments (8.2.6 included), allowing for 25 boundary positions, both initial and final, out of which 18 have references to highly accessible referents in boundary positions. In 9 cases (50%) (4 of which are segment final) (d2, f2, f9, f13, g5, g6, j6, l2, o5), boundaries are signalled by an unstressed pronoun. In 5 cases (27.77%) (g9, j2, k1, l6, s2), instead of a pronoun, a full NP is used for politeness considerations. In 1 case (5.55%) (o1), a full NP is used to resolve ambiguity, the previous clause having two zeros. In 3 cases (16.66%) (g1, n3 where two zeros are used) a zero is used where we expect a pronoun. This suggests that zeros are not preferred in boundary positions. Rather pronouns and NPs (about 83.33% of the occurrences of highly accessible entities in boundary positions) signal beginnings and ends of text segments. It should be noted further that no unstressed pronoun was found in nonboundary positions. These findings support our claim that pronouns in Mandarin function as boundary markers.

As for Li and Thompson's claim that pronouns emerge after adverbial phrases since they impair conjoinability, our findings suggests that this might

be true of the adverbial expressions which occur in boundary positions. Where they do not, a zero rather than a pronoun is preferred. In our corpus, we have found 16 adverbial expressions preceding highly accessible entities. 5 (f2, f9, g6, j6, o5) are followed by an unstressed pronoun, and occur in boundary positions (almost equally divided between initial and final position). 11 are followed by a zero, of which 8 occur in non-boundary positions (b2, b4, e1, j4, o3, q2, r4, r5.), and 3 in boundary positions (g1, p1, q1). These findings refute Li the Thompson's claim that adverbial expressions trigger the use of pronouns. They rather agree with our more general contention that unstressed pronouns tend to surface in boundary positions, whether signalled or unsignalled by an adverbial expression.

To test our hypothesis regarding the discourse function of pronouns, we examined the appropriateness of our text segmentation against Chinese speakers' intuitions. A confirmation of our proposed segmentation will provide support for our claim that unstressed pronouns in Mandarin play a role in marking boundary positions, both initial and final.

## Experiment

The purpose of this experiment is confirm our hypothesis that pronouns occur in boundary positions. We presented our subjects with the text in (7) above, without any punctuation marks or paragraph boundaries. The text did not end at the end of a segment. The subjects were Mandarin speakers. They were asked to fill in a period where they thought necessary.

### Method

Subjects: were 59 third year students of a Chinese discourse class in The National University of Singapore. This was their first class, and they had not yet learnt anything about the topic.

Materials: Subjects were presented with a one page text, containing the segment a1-s2, with no punctuation marks or boundary markers. All the polite NPs were replaced by pronouns so as to reduce the options that segmentation was motivated by the occurrence of an NP. This, of course, did not impair text coherence, since all these NPs referred to highly accessible antecedents.

Procedure: Subjects were told to insert a full-stop wherever they thought necessary. They were also told this is a rather old text. They did it as part of their course requirements during lecture time. They were given no time limit.

### Results

All in all, all subjects inserted a period in all the (12) expected positions but one. This exception is explained in terms of our instruction: Since we asked them to insert a full-stop, and since that particular segment ends in a colon rather than a period (r6), no one inserted a full-stop there.

The findings for the 11 period positions are all significant, ranging from 93.22% (chi-sq=650.25,  $p<.0001$ ) to 62.71% (chi-sq=10.227,  $p<.005$ ) of period insertion: c1 (71.19%), e7 (84.75%), f8 (72.88%), f13 (69.49%), g5 (62.71%), i1 (93.22%), k1 (77.96%), l6 (93.22%), n3 (67.80%), o6 (93.22%), q2 (79.66%).

On average, subjects inserted a period at 77.8% of the 11 period positions anticipated. This is significantly ( $p<.0001$ ) higher than 50% chance of inserting a period at random. Subjects' performance for the 66 non-period positions detected in the text was also significantly ( $p<.0001$ ) lower than 50% chance of inserting a period at random: They inserted a period at 2.9% of these 66 non-period positions. A Chi-sq test for independence between period vs. non-period positions suggests that the insertion of a period is not independent of the two types of location (Chi-sq=2655.12,  $p<.0001$ ).

### Discussion

Subjects' intuitions support our segmentation of the text, in which unstressed pronouns appear only in boundary positions. Recall that the text version the subjects read had mostly pronouns rather than NPs in boundary positions — the original and those that replaced polite NPs. The results confirm our hypothesis concerning pronouns' role in text segmentation. In Mandarin, unstressed pronouns surface in the beginning and end of text segments.

## 4. Conclusions

Accessibility Theory (Ariel 1985, 1990, 1991) predicts that a pronoun in Mandarin — a marked high accessibility marker — will occur in the beginning of a text segment (e.g., paragraph, section, chapter). Beginnings reduce accessibility of hitherto highly accessible entities, since they signal to the reader that she is allowed to process new information. Similarly, Li and Thompson (1979) acknowledge the function of pronouns as initial segment markers, indicating the introduction of a new "grammatical unit".

Following previous studies (e.g., Giora 1985, 1986, 1988), we claim that

unstressed pronouns are both initial and final boundary markers. We have shown that segment boundaries are determined by the boundaries of the (semantic) Discourse Topic discussed. We have further shown that such boundaries are usually marked by an accessibility marker lower than would be anticipated were the position non-boundary. We argue, then, that since in Chinese the highest unmarked accessibility marker is zero, it is a function of the unstressed pronoun — a lower accessibility marker — to mark boundaries.

To support this claim, we first reanalyzed the text samples examined by Li and Thompson, and showed that their analysis does not account for their data as well as ours does. The subjects in their experiment inserted pronouns in both initial and final Discourse Topic segments.

We then analyzed another longer text of an equivalent period, when Chinese was still uninfluenced by the Western tendency to proliferate the use of pronouns, and showed that unstressed pronouns appear only in text boundaries, both initial and final. To confirm our segmentation, we tested Mandarin speakers' intuitions. The results are highly significant and confirm our claim that there is a high correlation between pronoun realization and boundary positions in Mandarin.

Can Accessibility Theory account for our findings, i.e., for marking initial as well as final discourse segment boundaries? Though the theory makes claims only about initial boundary positions, it is nevertheless possible to see how it can account for the marking system of final boundaries as well. Marking a boundary by a richer than necessary marker signals to the addressee that this overt violation has a particular function. Rather than retrieving an antecedent of seemingly lower accessibility status, a relatively rich form signals the end of a Discourse Topic unit. Though the discourse boundaries are determined by the boundaries of the semantic Discourse Topic it discusses, their markings follow from Accessibility theory.

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## Relevance Theory Meets the Givenness Hierarchy An Account of Inferrables

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### 1. Introduction

Expressions like the underlined phrases in (1)-(3) provide us with valuable insights into what is involved in interpreting referring expressions in natural language discourse.

#### English

- (1) And we went into the Augusta bus station, and I came up to *the counter*, both of us, no I came up alone, first, and I said, 'could I have change please?', and *the girl* turned around and said, 'Are you for real?' [Frederickson tapes]<sup>2</sup>
- (2) When strangers come in the house Maynard will run away but not run out entirely out of *the room*. He will run off to *the side* and *the corner*, and then he will kind of sidle around and he'll look. [Frederickson tapes]

#### Russian

- (3) Kot vtsepilsja *zubami* v ryb'ju goluvu.  
cat seized (with)teeth in fish head  
'The cat seized the fish's head with (his) teeth.' [K.Paustovskij, *Kot Vorjuga*]