2021. *Proc Ling Soc Amer* 6(1). 775–787. https://doi.org/10.3765/plsa.v6i1.5014.

Assessing sensitivity to Condition A in the case of Chinese reflexives

Jun Lyu & Elsi Kaiser*

Abstract. There are two reflexives in Mandarin Chinese, *ziji* ('self') and *ta-ziji* ('s/he-self'). It is often assumed that *ziji* can be bound by a non-local antecedent while *ta-ziji* cannot. This is because *ziji* can be used as an exempt anaphor licensed by discourse-pragmatic conditions. However, prior research shows that, in contexts without perspectival cues, *ziji* tends to be interpreted as a 'regular' syntactically bound reflexive, exhibiting a similar locality bias as *ta-ziji*. However, prior studies comparing the locality biases of *ziji* and *ta-ziji* present divergent results. In this study, we report two forced choice judgment experiments to assess which reflexive, *ziji* or *ta-ziji*, exhibits a stronger locality bias. Overall, our results fit better with claims that in local contexts, *ta-ziji* is preferred over *ziji*; we find no clear evidence of *ziji* being preferred over *ta-ziji* in local contexts. Our results are compatible with the idea that *ta-ziji*, rather than *ziji*, is more constrained by Condition A.

Keywords. Mandarin Chinese, reflexive, recency, locality, classifiers

1. Introduction. There are two types of reflexives in Mandarin Chinese (henceforth "Chinese"), a bare reflexive *ziji* ('self') and a compound reflexive *ta-ziji* ('s/he-self') which is similar to English *himself/herself* in morphological composition. According to Condition A of the Binding Theory (Chomsky 1981), a reflexive must be bound within its local domain. However, it was soon realized that this description of the behavior of reflexives, even in English, falls short of accounting for some exceptional cases. In fact, different views on reflexive binding predate the Binding Theory (e.g., Postal 1971, Kuno 1972). Most relevant for this paper, Kuno (1987) proposes that the notion of *point of view* – also referred to as *perspective-taking* – is crucial to the interpretation of anaphora in English (also see e.g., Zribi-Hertz 1989). Indeed, a large body of literature shows that perspective-taking plays a pivotal role in licensing long-distance (LD) binding of so-called "exempt anaphors" (e.g., Pollard & Sag 1992, Reinhart & Reuland 1993 and many others), not only in English but also in other languages (e.g., Sells 1987).

In particular, it has been argued that Chinese *ziji* exhibits sensitivity to *perspective centers* (e.g., Huang & Liu 2001, Huang et al. 2009, Wang & Pan 2015, Charnavel et al. 2017) – people whose points of view or perspectives the speaker takes.[1] Under this view, LD binding of *ziji* is licensed if the non-local antecedent is a perspective center. Thus, in (1), *ziji* can be bound by the matrix subject Zhangsan if a speaker takes Zhangsan's perspective.

(1) Zhangsan$_i$ zhidao Lisi$_j$ xihuan ziji$_{i/j}$.
Zhangsan know Lisi like self
'Zhangsan$_i$ knows that Lisi$_j$ likes self$_{i/j}$.'

* The authors would like to thank the audience at the 95th Annual Meeting of the Linguistic Society of America for helpful comments and suggestions. Authors: Jun Lyu (junlyu@usc.edu) & Elsi Kaiser (emkaiser@usc.edu), University of Southern California.

[1] An often-cited phenomenon to support this view is the "blocking effect" where a local 1st/2nd-person pronoun blocks LD binding (e.g., Huang et al. 1985, Pan 1997, 2001). This is because a 1st/2nd-person pronoun encodes the perspective of the speaker/comprehender whose perspective is more privileged than that of a 3rd-person NP.

In contrast, it is claimed that *ta-ziji* is not sensitive to perspective centers and, unlike *ziji*, does not allow LD binding when the local antecedent is a human, shown in (2) taken from Pan (1998: 781):

(2) Zhangsan$_i$ zhidao Lisi$_j$ xihuan ta-ziji$_{*i/j}$.
Zhangsan know Lisi like s/he-self
'Zhangsan$_i$ knows that Lisi$_j$ likes s/he-self$_{*i/j}$.'

However, non-local binding of *ta-ziji* is still acceptable if the local antecedent is a non-human as in (3) (Pan 1998: 782). This is attributed to *ta-ziji* being sensitive to the antecedent's prominence in terms of the *animacy hierarchy* (Chou 1992: human > non-human > inanimate). Thus, if the non-local antecedent is more prominent (higher ranked on animacy) than the local one, LD binding is allowed. This leads Pan (1998) to conclude that *ta-ziji* is not only constrained by Condition A but also by an animacy prominence constraint.

(3) Zhangsan$_i$-de gou$_j$ zai ta-ziji$_{i/*j}$-de fangjian jiao.
Zhangsan-GEN dog at s/he-self-GEN room bark
'Zhangsan$_i$'s dog$_j$ is barking in s/he-self$_{*i/j}$'s room.'

To summarize, the claims in prior work are that *ziji* allows LD binding when the non-local antecedent is a perspective center (regardless of the animacy of the local antecedent), while *ta-ziji* allows LD binding only when the non-local antecedent outranks the local antecedent on the animacy hierarchy. Note that it is a common assumption in the literature on Chinese that local *ziji* and LD *ziji* show different linguistic properties (e.g., Pan 1997, Huang & Liu 2001). Local *ziji* is governed by Condition A – it's a *syntactic reflexive* – while LD *ziji* is governed by discourse-pragmatic conditions (see e.g., Huang & Liu 2001, Huang et al. 2009, Charnavel et al. 2017) – an *exempt anaphor* (However, see Charnavel (2020) for a recent analysis proposing a unification between syntactic and 'exempt' anaphora, based largely on data from French, but with crosslinguistic implications. In the present paper, we follow the assumption traditionally assumed in work on Chinese that distinguishes between two different linguistic entities for *ziji*. However, investigating an analysis along the lines of Charnavel (2020) is an important direction for future work). In contrast, *ta-ziji* can only be a syntactic reflexive as it does not show sensitivity to perspective centers.

2. Research questions. From the brief discussion above, one might be tempted to conclude that *ta-ziji* should show a stronger locality bias[2] than *ziji,* as the latter can be optionally interpreted as an exempt anaphor. However, prior theoretical and experimental work does not support this conclusion. Reuland (2001, 2011) argues that it is more economical for anaphoric relations to be encoded in narrow syntax than on the level of discourse. In other words, given a choice between *ziji* as a syntactic reflexive (constrained by Condition A) or an exempt anaphor (licensed by the presence of a perspective center), the former is preferred.

Indeed, psycholinguistic studies on Chinese reflexives support this view because, in absence of perspectival/point-of-view cues, native speakers have a strong tendency to bind *ziji* to a local antecedent (e.g., Gao et al. 2005, Li & Zhou 2010, Dillon et al. 2014, 2016, Jäger et al. 2015, Wang 2017 a,b), suggesting that *ziji* tends to be used as a syntactic reflexive rather than an

[2] In this paper, we reserve the term "locality bias" to refer descriptively to the empirical phenomenon where a reflexive tends to refer to the local antecedent. Thus, we make a terminological distinction between the empirical phenomenon and theoretical constructs such as "locality constraint" or "Condition A," which presumably contributes to the locality bias.

exempt anaphor. Thus, one non-trivial question is, since both *ziji* and *ta-ziji* tend to be interpreted as syntactic reflexives in stand-alone sentences, do these two reflexives exhibit the same degree of sensitivity to Condition A?

This question is a controversial one. In one study by Dillon et al. (2016) with sentences like (4a,b), it was found that while local binding of *ziji* in (4a) is more acceptable to native speakers than the non-local binding in (4b), there is no judgment difference between local and non-local binding for *ta-ziji*. The results of Dillon and colleagues are in line with a hypothetical view that *ziji* as a syntactic reflexive is more constrained by Condition A than *ta-ziji*. This being said, we would like to explicitly point out that Dillon et al. do *not* interpret their results in this way, as the research focus of their paper is different. In the present paper, we explore further this hypothetical view (not explicitly espoused by Dillon et al. 2016).

(4) a. Meiti$_i$ baodao de na-ge nvcaifeng$_j$ shang-ge xingqi ba (ta-)ziji$_{i/j}$ buxiaoxin
media report DE that-CL seamstress last-CL week BA (she-)self carelessly
nongshang-le.
harm-PERF
'The seamstress$_j$ that the media$_i$ reported on carelessly harmed (she-)self$_{i/j}$ last week.'

b. Zhang taitai$_i$ jingchang guanggu de na-jia shizhuangdian$_j$ shang-ge xingqi ba (ta-)ziji
Mrs. Zhang often visit DE that-CL boutique last-CL week BA (she-)self
buxiaoxin nongshang-le.
carelessly harm-PERF
'The boutique$_j$ that Mrs. Zhang$_i$ often visited carelessly harmed (she-)self$_{i/j}$ last week.'

Thus, although both *ziji* and *ta-ziji* tend to be interpreted as syntactic reflexives, the extent to which they are constrained by Condition A seems to be different. This is consistent with a form-specific view on anaphora resolution (e.g., Kaiser & Trueswell 2008) as Condition A has different impacts on the interpretation of *ziji* and *ta-ziji*. The findings of the study also fit well with a view proposed in a different subfield of linguistics, namely the "competitive mutual exclusion" account for synonyms (e.g., Lindsay & Aronoff 2014, Aronoff 2019). The idea behind this account is that just like biological systems organize themselves through adaptation, synonyms also adapt to a crowded space through competition and mutual exclusion until they find their own functional and grammatical niches. Borrowing this idea, we can hypothesize that since *ziji* can be used both as a syntactic reflexive and an exempt anaphor, hence overlapping with the function of *ta-ziji* as a syntactic reflexive, *ziji* might be replacing *ta-ziji* as a syntactic reflexive, such that *ta-ziji* is primarily reserved for its own niche (e.g., a contrastive reflexive). Thus, the findings of Dillon et al. (2016) could have important theoretical implications, which warrants a deeper look into the locality strength difference between *ziji* and *ta-ziji*.

But to our knowledge, there are few attempts to specifically assess the validity of the view that *ziji* shows stronger locality bias than *ta-ziji*. In addition to Dillon et al. (2016), only Lu (2011) and Wang (2017a, 2017b) directly and systematically compared the acceptability of local and non-local binding for *ziji* and *ta-ziji*. In two sentence acceptability judgment experiments, Wang (2017a,b) drew a similar conclusion as Dillon et al. (2016), although she pointed out that in her studies *ta-ziji* is situated in subject position and is likely a contrastive reflexive (Pan 1995, Xu 1999) which, she suggests, is exempt from Condition A (Pan 1998). In contrast, Lu (2011)'s investigation of the acceptability of *ziji* and *ta-ziji* in subject position found that *ta-ziji* shows a stronger locality bias than *ziji*. Note that in both Lu and Wang's studies, the critical reflexives are the subjects of an embedded clause and thus do not have a clausemate antecedent. This means

that the so-called "local" antecedent is not local in a technical sense but simply linearly closer compared to the more distant matrix subject.

In the study reported in this paper, we approach the locality bias question from two new angles. First, instead of asking participants to judge sentence acceptability, we ask participants to choose which reflexive (*ziji* vs. *ta-ziji*) they prefer to use in local and non-local syntactic contexts. The working hypothesis is that if *ziji* has a stronger locality bias, then in local contexts, native speakers will prefer *ziji* over *ta-ziji* when asked to choose one or the other.

Second, in prior work there have been few efforts to tease apart *syntactic locality* from *linear precedence* (or recency). In prior studies, these two factors are often confounded. For example, in Ex.(1), *Lisi* is both a recent and a local antecedent (i.e., in the same finite clause as the reflexive). Contrast this with (5) where *Lisi* is only a local but *not* a recent antecedent. This is because its trace (or copy) inside the relative clause (RC) is a clausemate antecedent of *(ta-)ziji*. *Lisi* thus becomes the local antecedent by virtue of being the binder of its trace. In this paper, we call *Lisi* in (1) a *non-strictly local* antecedent (as it also linearly precedes the reflexive) and *Lisi* in (5) a *strictly local* antecedent (as it does not linearly precede the reflexive).

(5) Zhangsan$_i$ yiwei [$_{RC}$ t$_j$ xihuan (ta-)ziji$_{i/j}$ de] Lisi$_j$ bujian-le.
Zhangsan think like (he-)self DE Lisi disappear-PERF
'Zhangsan thinks that Lisi who likes (he-)self has disappeared.

The general aim of this study is to probe native speakers' preference for *ziji* or *ta-ziji* with strictly and non-strictly local antecedents. Our research questions are as follows:

1) Does *ziji* show a stronger locality bias than *ta-ziji*?
2) Do the locality biases of *ziji* and *ta-ziji* vary in syntactic structures with (non-)strictly local antecedents?

Investigating the above questions serves to not only shed light on which reflexive is more sensitive to Condition A, but also to test the validity of a form-specific view on anaphora resolution (e.g., Kaiser & Trueswell 2008). Furthermore, the outcomes can inform us whether *ziji* and *ta-ziji* are organized into their own functional/grammatical niches as suggested above.

3. Experiment 1. In this experiment, we examine native speakers' preference for *ziji* or *ta-ziji* in sentences with strictly and non-strictly local antecedents. In the former, the local antecedent appears after the reflexive (see (5) above) and thus does not linearly precede the reflexive as is typical of the experimental designs in most prior studies.

3.1. PARTICIPANTS. Fifty-two participants self-identified as Mandarin native speakers (mean age = 21; SD = 3.89) participated over the internet via Qualtrics.

3.2. MATERIALS AND DESIGN. The factors *Structure type* (complement clause (CP) vs. relative clause (RC)) and *Antecedent position* (local vs. non-local) were crossed in a factorial design. In the CP structure, the local antecedent is non-strictly local; but in the RC structure, the local antecedent is strictly local. The second factor is *Antecedent position*. As *ziji* and *ta-ziji* are typically only compatible with animate antecedents, the antecedent position is determined by the animacy of the intended antecedent. In other words, each target sentence only contains one compatible antecedent (the animate entity); the intended referent of the reflexive is not ambiguous. Local antecedents are NPs that are animate in local positions while non-local antecedents are animate in non-local positions. In this paper, we refer to sentences with local animate antecedents as the

local context conditions, and sentences with animate non-local antecedents as the *non-local context* conditions.

We also included **demonstrative-classifiers** in CPs to make local NPs definite, on a par with local antecedents in (6c,d) which are definite as they are modified by a restrictive RC. (In-)animate local antecedents are paired with compatible classifiers (e.g., *ming* → a human; *jia* → a place/institution). For an example item, see (6). In all items, participants were given two options for what goes into the blank, as shown in Figure 1. On target trials, the two options were *ziji-de* ('self-GEN') and *ta-ziji-de* ('s/he-self-GEN') (similar to English '*his* interview's purpose' or 'the purpose of *his* interview').

(6) a. ***CP structure/Local antecedent***
Diantai biaoshi **na-ming** jizhe gongbu-le _____ caifang mudi.
radio station say that-CL journalist reveal-PERF interview purpose
'The radio station said that the journalist had revealed the purpose of _____ interview.'

b. ***CP structure/Non-local antecedent***
Jizhe biaoshi **na-jia** diantai gongbu-le _____ caifang mudi.
journalist say that- CL radio station reveal-PERF interview purpose
'The journalist said that the radio station had revealed the purpose of _____ interview.'

c. ***RC structure/Local antecedent***
Diantai biaoshi gongbu-le _____ caifang mudi de jizhe yinqi-le
Radio station say reveal-PERF interview purpose DE journalist provoke-PERF
dajia-de buman.
everyone-GEN anger
'The radio station said that the journalist who revealed the purpose of _____ interview provoked everyone's anger.'

d. ***RC structure/Non-local antecedent***
Jizhe biaoshi gongbu-le _____ caifang mudi de diantai yinqi-le
Journalist say reveal-PERF interview purpose DE radio station provoke-PERF
dajia-de buman.
everyone-GEN anger
'The journalist said that the radio station which revealed the purpose of _____ interview provoked everyone's anger.'

Participants read sentences like (6) and were asked to choose a reflexive (*ziji-de* 'self-GEN' or *ta-ziji-de* 's/he-self-GEN') in its genitive form in a forced-choice task. They were expected to choose a reflexive that makes the sentence sound most natural. The presentation order of the answer choices (i.e., *ziji-de* and *ta-ziji-de*) was counterbalanced. See Figure 1 for an example of the forced choice question. Twenty-four sets of target items were distributed into 4 lists using a Latin-Square design. Targets were pseudo-randomized with 24 filler sentences which were also presented with a word missing. Participants were required to fill in the blank with an appropriate verb or adverb.

Figure 1. Example screenshot.

3.3. RESULTS. Table 1 shows participants' choices of *ta-ziji* versus *ziji* in local and non-local contexts in CP and RC structures (see Figure 2). We can see that in CP structures (where local antecedents are non-strictly local), participants showed an asymmetric choice pattern such that they preferred *ta-ziji* in local contexts but *ziji* in non-local contexts. But in RC structures (where local antecedents are strictly local), there is a general tendency to choose *ziji*.

Structure type	Antecedent position	*ta-ziji*	*ziji*
CP	Local	170	130
	Non-local	132	168
RC	Local	117	183
	Non-local	112	188

Table 1. Number of *ta-ziji* vs. *ziji* across conditions in Experiment 1.

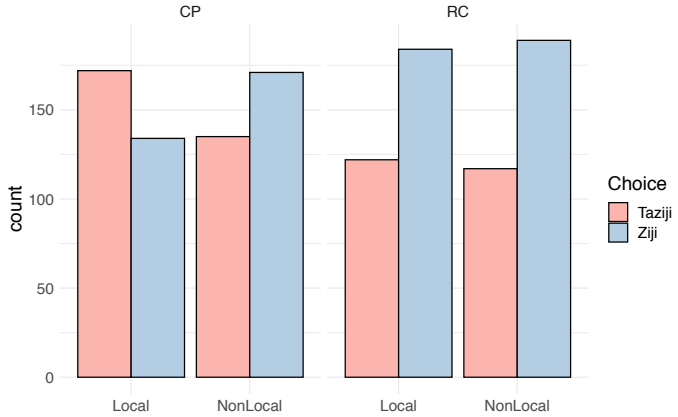

Figure 2. Choice of *ta-ziji* vs. *ziji* across conditions in Experiment 1.

To assess these patterns statistically, we fit intercept-only mixed-effect logistic regression models with the proportion of *ta-ziji* choices as the dependent variable. Four models were fit, one for each of the four conditions. Statistical analyses were conducted in R (R Core Team 2018). A significant main effect of intercept would mean that the average proportion of *ta-ziji* is above 50% chance level. We reason that if the preference for *ta-ziji* is above chance, this would mean that *ziji* is significantly below chance (since the proportions of *ziji* and ta-*ziji* add up to 100%) and thus participants preferred *ta-ziji* over *ziji*; the opposite would be true if the proportion of *ta-ziji* is below chance. Figure 3 displays the average proportion of *ta-ziji* across conditions with the same set of data used to plot Figure 2. The 50% chance level is indicated by a blue line.

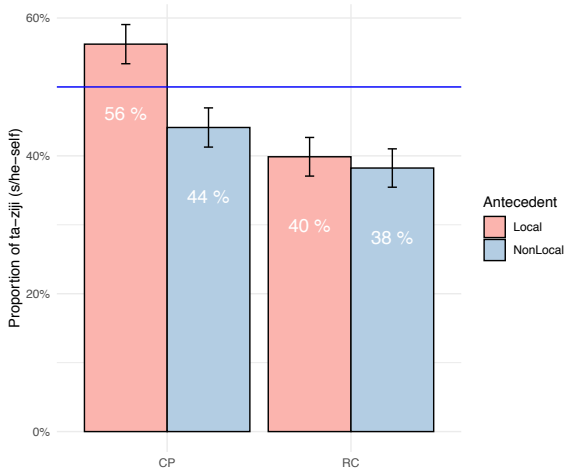

Figure 3. Proportions of *ta-ziji* across conditions in Experiment 1.

Statistical analyses show that in the CP/Local condition, the proportion of *ta-ziji* choices does not differ from chance, despite being numerically above 50% ($\beta = 0.29$, SE = 0.18, $t = 1.59$, $p = 0.11$). In the CP/Non-local condition, the proportion of *ta-ziji* choices also does not differ from chance ($\beta = -0.27$, SE = 0.17, $t = -1.63$, $p = 0.10$), despite being numerically below 50%. In the two RC conditions, the proportion of *ta-ziji* choices is significantly below chance (RC/Local: $\beta = -0.51$, SE = 0.19, $t = -2.57$, $p = 0.01$; RC/Non-local: $\beta = -0.68$, SE = 0.26, $t = -2.67$, $p < 0.01$).

3.4. DISCUSSION. In Experiment 1, we asked Chinese natives to choose *ziji* or *ta-ziji* in genitive forms in non-strictly local CP structures and strictly local RC structures. Overall, the results of Experiment 1 show that native speakers' choice patterns vary depending on the structure type and the compatible antecedent position. In the CP structures, their judgment patterns hint at an asymmetric pattern such that they show a numerical preference for *ta-ziji* in local contexts and *ziji* in non-local contexts. This is in line with a view that *ta-ziji* is more constrained by Condition A than *ziji*, although the numeric trends failed to reach significance. Intriguingly, for RC structures, participants choose *ziji* more often than *ta-ziji,* regardless of antecedent position. One possibility for the divergent choice patterns in CP and RC structures may be due to the complexity of RCs which arguably require more cognitive resources. Participants might choose the more frequent *ziji* to alleviate the processing burden. We address this issue in Experiment 2.

4. Experiment 2. In this experiment, we minimally changed the stimuli from Experiment 1 to include a pre-RC classifier phrase for RC structures in (5c,d). Pre-RC classifiers have been shown in previous studies to signal an upcoming head noun (HN) and can reduce processing burden (e.g., Wu 2009, Wu et al. 2009, 2014). As explained previously, the classifier *ming* and *jia* are only compatible with a human and non-human NP, respectively. Thus, in an RC structure, by the time a reader reaches the classifier $ming_{HUMAN}$ or $jia_{NON\text{-}HUMAN}$, even before the onset of the HN, she will be able to predict the animacy property (human/non-human, animate/inanimate) of the HN (strictly local antecedent). The benefit is that when the HN is encountered, it is partially anticipated as its animacy property has already been revealed by the classifier, thereby reducing the processing load for the reader.

4.1. PARTICIPANTS. Fifty-one participants self-identified as Mandarin native speakers (mean age = 22; SD = 2.80) participated via Qualtrics. None had participated in Experiment 1.

4.2. MATERIALS AND DESIGN. The materials are identical to Experiment 1 except that RC structures are preceded by **demonstrative classifiers**, shown in (7a,b):

(7) a. ***RC structure/Local antecedent***
Diantai biaoshi **na-ming** gongbu-le _____ caifang mudi de jizhe
Radio station say that-CL reveal-PERF interview purpose DE journalist
yinqi-le dajia-de buman.
provoke-PERF everyone-GEN anger
'The radio station said that the journalist who revealed the purpose of _____ interview provoked everyone's anger.'

b. ***RC structure/Non-local antecedent***
Jizhe biaoshi **na-jia** gongbu-le _____ caifang mudi de diantai
journalist say that-CL reveal-PERF interview purpose DE radio station
yinqi-le dajia-de buman.
provoke-PERF everyone-GEN anger
'The journalist said that the radio station which revealed the purpose of _____ interview provoked everyone's anger.'

4.3. RESULTS. Table 2 shows participants' choices of *ta-zji* and *ziji* across conditions (see Figure 4). In CP structures, *ta-ziji* was preferred over *ziji* in contexts with (non-strictly) local antecedents, while there was no clear preference in contexts with non-local antecedents. In RC structures, *ta-ziji* was again preferred in (strictly) local contexts, but *ziji* was preferred in non-local contexts.

Structure type	Antecedent position	*ta-ziji*	*ziji*
CP	Local	220	92
	Non-local	154	158
RC	Local	178	134
	Non-local	137	175

Table 2. Number of *ta-ziji* vs. *ziji* across conditions in Experiment 2.

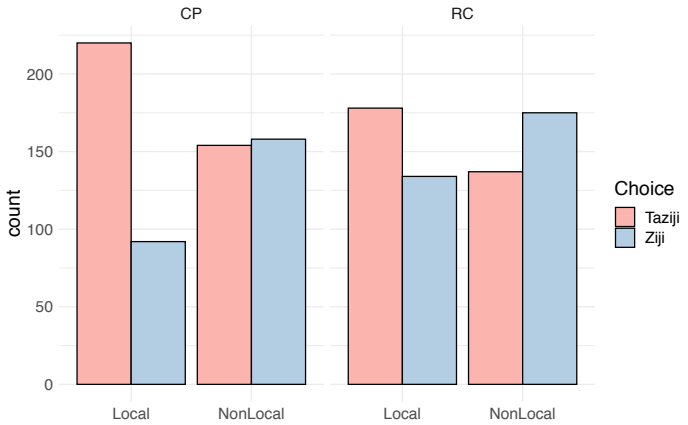

Figure 4. Choices of *ta-ziji* vs. *ziji* across conditions in Experiment 2.

To assess the (dis-)preferences for *ta-ziji* across conditions in Experiment 2, we similarly fit four mixed-effect intercept-only logistic models. As reasoned previously, if the proportion of *ta-ziji* is above chance level, we take this as evidence that *ta-ziji* is preferred more than *ziji*; if the

proportion of *ta-ziji* is below chance, we assume *ziji* is preferred. See Figure 5 for proportions of *ta-ziji* across conditions with the same data used for Figure 4.

Statistical analyses show that in the CP/Local structures, the proportion of *ta-ziji* choices is significantly above chance (β = 1.35, SE = 0.32, t = 4.26, p < 0.001). In the CP/Non-local condition, the proportion of *ta-ziji* choices does not differ significantly from chance (β = -0.03, SE = 0.19, t = -0.16, p = 0.88). In the RC/Local structures, the proportion of *ta-ziji* choices is marginally above chance (β = 0.34, SE = 0.18, t = 1.86, p = 0.06), but in the RC/Non-local structures, it is marginally below chance (β = -0.28, SE = 0.17, t = -1.69, p = 0.09).

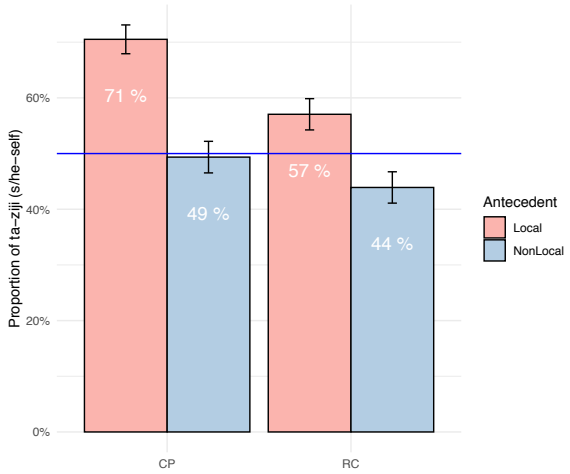

Figure 5. Proportions of *ta-ziji* across conditions in Experiment 2.

Interestingly, a visual comparison of Experiment 1 and 2 (Figure 3 and 5) seems to suggest that in Experiment 2, the proportions of *ta-ziji* across conditions increased overall. To verify this observation, we fit a mixed-effect logistic model with three factors, *Structure type* (coding: CP = 0.5, RC = -0.5), *Antecedent position* (coding: Local = 0.5, Non-local = -0.5), and *Experiment* (coding: Exp.1 = 0.5, Exp.2 = -0.5). Statistical analysis revealed a main effect of *Experiment* (β = -0.53, SE = 0.19, t = -2.65, p < 0.01), suggesting that the average proportion of *ta-ziji* is lower in Experiment 1 than in Experiment 2. Notably, there is an interaction of *Experiment* and *Antecedent position* (β = -0.51, SE = 0.18, t = -2.87, p < 0.005), suggesting the increase of *ta-ziji* in local contexts compared to non-local contexts in Experiment 1 was boosted in Experiment 2.

4.4. DISCUSSION. The results from Experiment 2 show that the stronger bias for *ta-ziji* in strictly local contexts is consistent across CP and RC structures. Although the bias for *ziji* in non-local contexts is only statistically meaningful in RC structures, the results are more in line with the view that *ta-ziji* is more local in nature and do not support an alternative view that *ziji* is more constrained by Condition A than *ta-ziji*.

In addition, we observed that the preference for *ta-ziji* increased overall in Experiment 2. As these two experiments only differ in the presence/absence of classifiers in RC structures, we link these divergent choice patterns to the increased presence of classifiers in Experiment 2. Specifically, we speculate that more frequent encounters of classifiers make local antecedents more salient because a classifier cue flags and reinforces the presence of the local antecedent. For example, the presence of a pre-RC classifier makes the processing of RC structures easier due to the predictability of the local HN (e.g., Wu 2009; Wu et al. 2014). The increased exposure to classifiers likely prompted participants to choose a reflexive that is more compatible with a local context. The fact that *ta-ziji* was selected more frequently as a result lends support to the view

that *ta-ziji* is preferred in local contexts than *ziji* (if native speakers are not cognitively burdened as when pre-RC classifier cues are available to reduce the processing load).

5. General discussion. This study aims to examine which reflexive, *ziji* or *ta-ziji*, is more constrained by Condition A, motivated by the previous findings that both reflexives tend to be interpreted as syntactic reflexives whenever possible. We approach this question by using a forced choice task where native speakers were required to choose either *ziji* or *ta-ziji* in their genitive forms, in contexts with local or non-local antecedents. In addition to the regular locality design where the local antecedent linearly precedes the reflexive in a CP structure, we included conditions where the local antecedent can follow the reflexive as in a RC structure, thus disentangling syntactic locality from linear precedence.

In Experiment 1, we observed an asymmetric choice pattern in CP structures as *ta-ziji* was preferred in local contexts and *ziji* was preferred in non-local contexts, although statistics did not reach significance. Therefore, we only have weak evidence that *ta-ziji* is more local than *ziji* based on observation of numeric trends. However, it should be emphasized that the opposite pattern was not observed at all, that is, we see no evidence that *ziji* is preferred in local contexts and *ta-ziji* in non-local contexts. Therefore, while there is no strong evidence supporting *ta-ziji* as more local, there is no evidence for the opposite view either. Interestingly, in RC structures, the asymmetric pattern was not observed, which we speculated could be due to the complexity of RCs, which prompted natives to favor *ziji* which is easier to retrieve from the mental lexicon.

In Experiment 2, we tried to alleviate the potential working memory burden associated with the processing of RCs by providing participants with a pre-RC classifier cue, as prior studies showed that pre-RC classifiers can reduce processing burden (e.g., Wu 2009, Wu et al. 2014). With this manipulation, an asymmetric choice pattern emerged in RC structures. Intriguingly, higher proportions of *ta-ziji* were found in Experiment 2 overall compared to Experiment 1. We speculate that as classifiers pre-activate the local antecedent, more frequent encounters of classifiers in Experiment 2 made participants pay more attention to local antecedents. Consequently, participants considered more frequently the reflexive that fits better with a local environment. Since *ta-ziji* was considered more often as a result, we have additional evidence that *ta-ziji* is more local than *ziji*.

The above results do not support the hypothetical view inspired by previous findings that *ziji* shows stronger sensitivity to Condition A than *ta-ziji*. Recall that Dillon et al. (2016) found that in sentences where the reflexive is in a direct object position, *ziji* shows stronger locality bias than *ta-ziji* (also see Wang (2017a, b) for similar findings with *ziji* and *ta-ziji* in subject position). If the locality bias difference between *ziji* and *ta-ziji* stems from their different sensitivities to Condition A, we should observe *ziji* to be preferred in local contexts in this study, contrary to our findings. The differences between this study and prior ones[2] may be related to the tasks that were used in the various experiments (e.g., acceptability judgments vs. selecting one form over the other). The differences may also have to do with how easily *ta-ziji* can be interpreted as being emphatic (cf. *he himself* in English). As mentioned above, emphatic *ta-ziji* is exempt from Condition A (Pan 1998). A higher proportion of emphatic readings of *ta-ziji* could account for the weaker locality bias of *ta-ziji* observed in prior work relative to our results. One way to examine this possibility would be to use spoken stimuli instead of written stimuli, so that the emphatic

[2] We acknowledge that individual variation might also account for the difference. Participants speaking different Chinese dialects could have different biases (see e.g., difference between Mandarin and Teochew (Cole et al. 2001)). As we have not looked into the influence of dialects in this work, we will not speculate any further.

reading of *ta-ziji* can be ruled out by the non-emphatic intonation. More work is needed to clarify the locality bias question.

Finally, we briefly comment on the theoretical contributions of the present work. Firstly, if we follow prior experimental work by assuming that *ziji* is by default a syntactic reflexive (but see our note above regarding Charnavel 2020), then the present work suggests that Condition A has different weights on the interpretation of *ziji* and *ta-ziji*, as the morphologically complex *ta-ziji* seems to be more constrained by Condition A. In other words, the influence of Condition A on anaphora resolution is form-specific. Therefore, even if one holds the view that both *ziji* and *ta-ziji* are syntactic reflexives by default, our results suggest that this does not mean that they are equally constrained by Condition A. However, it is important to acknowledge that if we view *ziji* as ambiguous between a syntactic reflexive and an exempt reflexive sensitive to perspective-taking, we also expect it to show lower sensitivity to Condition A since it would not be governed by Condition A when exempt. We leave these issues for future work.

Secondly, we see no evidence that *ziji* is replacing *ta-ziji* as a syntactic reflexive, as suggested earlier. Native speakers still prefer to associate *ta-ziji* with local contexts. This indicates that the two reflexives still overlap in their functions at the current stage of lexical evolution in Mandarin Chinese. However, according to the mutual competitive exclusion account (Lindsay & Aronoff 2013; Aronoff 2019), ultimately, each reflexive will have its own functional niche. The fact that *ziji* and *ta-ziji* do not have their own division of labor yet does not mean that they will not do so in the future. In fact, one way to verify the competitive mutual exclusion account in the context of bare and compound reflexives might be to look at the equivalents of *ziji* and *ta-ziji* in other Chinese dialects. We plan to look into this in our future work.

6. Conclusion. In two forced choice judgment experiments, we investigated Chinese native speakers' preference for *ziji* and *ta-ziji* in sentences with local and non-local antecedents. Combined experimental results from these two experiments fit better with claims that in local contexts, *ta-ziji* is preferred over *ziji*. We find no overarching evidence of *ziji* being preferred over *ta-ziji* in local contexts. As a whole, these results do not support a hypothetical view that *ziji* is more constrained by Condition A than *ta-ziji*. In fact, the results are more in line with the opposite view. Although not consistent with the results from some prior studies, the results from this study, together with results from earlier ones, support a form-specific view of anaphora resolution.

References

Aronoff, Mark. 2019. Competitors and alternants in linguistic morphology. In Franz Rainer, Francisco Gardani, Wolfgang U. Dressler & Hans C. Luschützky (eds.), *Competition in inflection and word-formation*. *Studies in Morphology 5*. Cham: Springer.

Charnavel, Isabelle, Peter Cole, Gabriella Hermon & C.-T. James Huang. 2017. Long-distance anaphora: Syntax and discourse. In Martin Everaert & Henk C. van Riemsdijk (eds.), *The Wiley Blackwell Companion to Syntax*, 2321–2402. Hoboken, NJ: John Wiley & Sons, Inc. https://doi.org/10.1002/9781118358733.wbsyncom074.

Charnavel, Isabelle. 2020. Logophoricity and locality: A view from French anaphors. *Linguistic Inquiry*, 51(4). 671–723. https://doi.org/10.1162/ling_a_00349. Chomsky,

Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.

Chou, Xiaoli. 1992. *An alternative to Chinese reflexives*. Austin, TX: University of Texas M.A. thesis.

Cole, Peter, Gabriella Hermon & C. Leng Lee. 2001. Grammatical and discourse conditions on long distance reflexives in two Chinese dialects. In Peter Cole, Gabriella Hermon & C.-T. James Huang (eds.), *Long distance reflexives*, 141–195. New York: Academic Press. https://doi.org/10.1163/9781849508742_002.
Dillon, Brian, Wing-Yee Chow & Ming Xiang. 2016. The relationship between anaphor features and antecedent retrieval: Comparing Mandarin *ziji* and *ta-ziji*. *Frontiers in Psychology* 6. 1966. https://doi.org/10.3389/fpsyg.2015.01966.
Dillon, Brian, Wing-Yee Chow, Matthew Wagers, Taomei Guo, Fengqin Liu & Colin Phillips. 2014. The structure-sensitivity of memory access: Evidence from Mandarin Chinese. *Frontiers in Psychology*, 5. 1025. https://doi.org/10.3389/fpsyg.2014.01025.
Gao, Liqun, Zhaojing Liu & Yueyuan Huang. 2005. Who is *ziji*? An experimental study about the binding principle. *Linguistic Sciences* 4. 39–50.
Huang, C.-T. James, Y.-H. Aaudrey Li & Yafei Li. 2009. *The syntax of Chinese*. Cambridge: Cambridge University Press.
Huang, C.-T. James, & C.-S. Luther Liu. 2001. Logophoricity, attitudes, and *ziji* at the interface. In Peter Cole, Gabriella Hermon & C.-T. James Huang, (eds.), *Long-distance reflexives*, 141–195. New York: Academic Press.
Jäger, Lena A., Felix Engelmann & Shravan Vasishth. 2015. Retrieval interference in reflexive processing: Experimental evidence from Mandarin, and computational modeling. *Frontiers in Psychology*, 6. 617. https://doi.org/10.3389/fpsyg.2015.00617.
Kaiser, Elsi & John C. Trueswell. 2008. Interpreting pronouns and demonstratives in Finnish: Evidence for a form-specific approach to reference resolution. *Language and Cognitive Processes* 23(5). 709–748. https://doi.org/10.1080/01690960701771220.
Kuno, Susumu. 1972. Pronominalization, reflexivization and direct discourse. *Linguistic inquiry*, 3(2). 161–195.
Kuno, Susumu. 1987. *Functional syntax: Anaphora, discourse, and empathy*. Chicago: The University of Chicago Press.
Li, Xiaoqian & Xiaolin Zhou. 2010. Who is *ziji*? ERP responses to the Chinese reflexive pronoun during sentence comprehension. *Brain & Research*, 1331. 96–104. https://doi.org/10.1016/j.brainres.2010.03.050.
Lindsay, Mark & Mark Aronoff. 2013. Natural selection in self-organizing morphological systems. *Morphology in Toulouse: Selected Proceedings of Décembrettes* 7. 133–153.
Lu, Hsin-Yi. 2011. *The effects of verb bias, context, and tasks on Mandarin Chinese Reflexives*. Champaign, IL: University of Illinois dissertation.
Pan, Haihua. 1995. *Locality, self-ascription, discourse prominence, and Mandarin reflexives.* Austin, TX: University of Texas dissertation.
Pan, Haihua. 1997. *Constraints on reflexivization in Mandarin Chinese*. New York: Garland.
Pan, Haihua. 1998. Closeness, prominence, and binding theory. *Natural Language & Linguistic Theory* 16(4). 771–815. https://doi.org/10.1023/A:1006056414208 .
Pollard, Carl & Ivan A. Sag. 1992. Anaphors in English and the scope of Binding Theory. *Linguistic Inquiry* 23(2). 261–303. https://www.jstor.org/stable/4178768.
Postal, Paul. 1971. *Crossover phenomena*. New York: Holt, Reinhart and Winston.
R Core Team. 2018. R: A language and environment for statistical computing. https://www.R-project.org/.
Reinhart, Tanya & Eric J. Reuland. 1993. Reflexivity. *Linguistic Inquiry* 24(4). 657–720. https://www.jstor.org/stable/4178836.

Sells, Peter. 1987. Aspects of logophoricity. *Linguistic Inquiry* 18(3). 445–479. https://www.jstor.org/stable/4178550.
Wang, Y. & Haihua Pan. 2015a. Empathy and Chinese long-distance reflexive *ziji* – Remarks on Giorgi (2006, 2007). *Natural Language & Linguistic Theory* 33. 307–322. https://doi.org/10.1007/s11049-014-9257-5.
Wang, Yuxia. 2017a. Semantic-constrained or syntactic-constrained? – Processing Chinese bare and compound reflexives. *Journal of Psychological Science* 40. 527–533.
Wang, Yuxia. 2017b. An eye-movement study on the online processing of Chinese bare and compound reflexives. *Journal of SJTU (Philosophy and Social Sciences)* 25(4). 97–106.
Wu, Fuyun, Elsi Kaiser & Elaine Anderson. 2009. The effects of classifiers in predicting Chinese relative clauses. In Michael Grosvald & Dionne Soares (eds.), *Proceedings of the Western Conference on Linguistics* (WECOL), 318–329. Davis, CA: University of California.
Wu, Fuyun, Yingyi Luo & Xiaolin Zhou. 2014. Building Chinese relative clause structures with lexical and syntactic cues: Evidence from visual world eye-tracking and reading times. *Language, Cognition and Neuroscience*, 29(10). 1205–1226. https://doi.org/10.1080/01690965.2013.841969.
Wu, Fuyun. 2009. *Factors affecting relative clause processing in Mandarin*. Los Angeles: University of Southern California dissertation.
Xu, Liejiong. 1993. The long-distance binding of *ziji*. *Journal of Chinese Linguistics* 21. 123–141.
Zribi-Hertz, Anne. 1989. Anaphor binding and narrative point of view: English reflexive pronouns in sentence and discourse. *Language* 65(4). 695–727. https://doi.org/10.2307/414931.