Influences on relative clause attachment in Mandarin

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Introduction

- This study examines relative clause (RC) attachment preferences in Mandarin. Consider (1a) and (1b): the possessive construction ***NP1 DE NP2*** following the RC yields two NPs that the RC could modify. Futhermore, Mandarin ***DE*** is ambiguous between the possessive marker and the relativizer, thus (1c) yields a third reading.

Three-way ambiguous in SRCs/ASRCs

V NP0 de NP1 de NP2

(1) [Zhiliao yinger **de** yisheng **de** zhensuo]...
cure baby$_{NP0}$ DE1 doctor$_{NP1}$ DE2 clinic$_{NP2}$

a. [[[***e*** cure baby] DE1*rel*] **doctor**$_{NP1}$] [DE2*poss* clinic]
"[The doctor that cured the baby]'s clinic"

b. [[***e*** cure baby] DE1*rel*][doctor [DE2*poss* **clinic**]]
"The doctor's clinic that cured the baby"

c. [***e*** cured [baby [DE1*poss* doctor]]] DE2*rel* **clinic**
"The clinic that cured the baby's doctor"

- However, corresponding Mandarin ORCs/PSRCs construction only has two readings since the first ***DE*** is unambiguously a relativizer because it is preceded by a verb.

Two-way ambiguous in ORCs/PSRCs

Passive NP0 V de NP1 de NP2

(2) [Bei Bingren tousu **de** yisheng **de** zhensuo]...
by patient$_{NP0}$ sue DE1 doctor$_{NP1}$ DE2 clinic$_{NP2}$

a. [[[by patient [sue ***e***]] DE1*rel*] **doctor**] [DE2*poss* clinic]
"[The doctor that is sued by the patient]'s clinic"

b. [[by patient [sue ***e***]] DE1*rel*] [doctor [DE2*poss* **clinic**]]
"The doctor's clinic that is sued by the patient"

- Attachment preferences on Mandarin RCs are mixed in the literature: Shen (2006) documents a local attachment preference; Kuang (2010) shows local preferences only for short RCs, but not for long RCs; Hsu (2011) finds non-local attachment preferences.

The present study

- **Method**: a centered self-paced reading task (Linger, version 2.94)
- **Participants**: 36 native Mandarin speakers (20 - 35 years old).
- **Stimuli**: 144 sentences/participant (96 critical stimuli + 48 fillers, in 16 conditions).
- **Design**: a 2 (**AMBIG/UNAMB**) * 2 (**ACTIVE/PASSIVE**) * 2 (**Animate NP1-Inanimate NP2 (AI)/Inanimate NP1-Animate NP2 (IA)**) * 2 (**+DEM/-DEM**) within subject design.
- **Data analysis**: semantic judgement targeting the RC attachment place (i.e. ***who cured/kissed the baby?*** (Correct answers: ***the doctor*** in AMBIG and ***the doctor or the clinic*** in UNAMB)) was collected by MySQL, and analyzed by the linear mixed-effects regression model with lme4 package in R (R Core Development Team, 2008).

Results

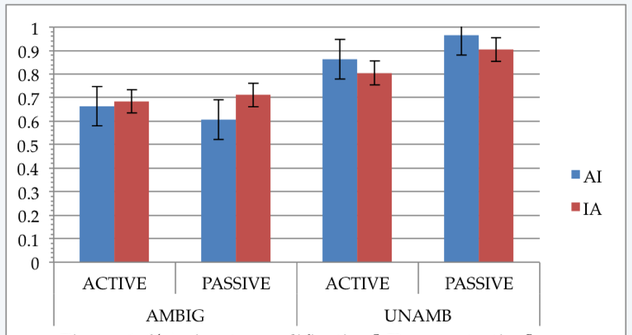

Figure 1. %Animate-modification[-Demonstrative]

AMBIGUOUS *(RC-attachment to either animate or inanimate NP)*
ACTIVE: [[_ cured baby] DE] doctor DE clinic / clinic DE doctor
PASSIVE: [[by patient sued _] DE] doctor DE clinic / clinic DE doctor
UNAMBIGUOUS *(RC-attachment to animate NP only)*
ACTIVE: [[_ kissed baby] DE] doctor DE clinic / clinic DE doctor
PASSIVE: [[by patient slapped _] DE] doctor DE clinic / clinic DE doctor

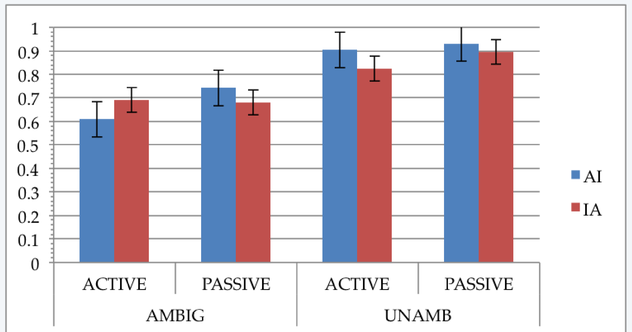

Figure 2. %Animate-modification[+Demonstrative]

AMBIGUOUS *(RC-attachment to either animate or inanimate NP)*
ACTIVE: [[_ cured baby] DE] **DEM** doctor DE clinic / clinic DE doctor
PASSIVE: [[by patient sued _] DE] **DEM** doctor DE clinic / clinic DE doctor
UNAMBIGUOUS *(RC-attachment to animate NP only)*
ACTIVE: [[_ kissed baby] DE] **DEM** doctor DE clinic / clinic DE doctor
PASSIVE: [[by patient slapped _] DE] **DEM** doctor DE clinic / clinic DE doctor

Discussions & Conclusions

1. A significant 4-way interaction was obtained. Presence/absence of ambiguity influenced judgments as we expected (i.e., left/right halves of Fig. 1 & 2, ($t = 7.133$, $p < .01$)).
2. The percentage of animate NP attachment in AI condition was significantly higher than that in IA condition in UNAMB cases (i.e., blue vs. red on right halves of Fig. 1 &2, $t = 4.757$, $p < .01$). Crucially all correct answers to the semantic judgment questions in UNAMB cases were the animiate NPs, despite of AI/IA conditions. The fact that more inanimate NP attachment (wrong answers) was found in IA than AI cases suggests **a local NP attachment preference**.
3. Moreover, judgments were less clear (less % of Animate-modification) for UNAMB-ACTIVE than for UNAMB-PASSIVE in [-DEM] cases (i.e. blue & red on UNAMB-ACTIVE vs. blue & red on UNAMB-PASSIVE in Fig. 1). Recall *DE* in Mandarin Chinese can be parsed either as a possession marker or a relativizer, our finding is consistent with **an additional processing load in the ACTIVE cases** ($t = 2.09$, $p < .05$) (see also Yun et.al (2014)).
4. In AMBIG cases, AI/IA interacted with [+/-DEM] and [ACTIVE/PASSIVE], with more animate NP2 attachments in PASSIVE when NP1 was [-DEM], and the opposite pattern was observed for [+DEM] (i.e. blue & red on AMBIG-PASSIVE in Fig. 1 & 2)($t = 2.181$, $p < .05$). This may be because **the dependency can be formed with NP1 when DEM is encountered** (blue is higher than red in Fig. 2), but when it was absent, the animacy properties of the NP can be considered, i.e. there was less local attachment when NP1 was inanimate (i.e., red is higher than blue on AMBIG-PASSIVE in Fig. 1)($t = 2.123$, $p < .05$). It suggests there was more animate NP attachment found in IA (non-local) than AI (local) conditions. Thus we found **an animate NP attachment preference**, and **the animate NP attachment preference is stronger than the local NP attachment preference in PASSIVE conditions**.

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