Testing extraction of and out of subjects and objects in Mandarin Chinese relative clauses

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This study probes into the subject relative clause preference and subject islands in Mandarin through two contextualized acceptability judgment experiments. Specifically, we manipulate grammatical function (subject vs. object) and resumptive pronouns (with vs. without RP) in simple subject/object relative clauses and sub-extraction from subject and object where the resumptive pronoun is possessive. The results showed a lack of the subject preference for simple relative clauses, but existence of preference for extraction out of subjects in RCs, which is consistent with discourse-based theory (Abeillé et al., 2020).

1 Introduction

Unlike simple extraction, which typically favors subjects, sub-extraction out of subjects is often penalized (so-called subject islands) even if there is cross-linguistic and cross-construction variation (Sprouse et al 2016). For sub-extraction, Abeillé et al (2020) found a subject advantage for French and English (with pied-piping) when extracting out of NPs in relative clauses but not in wh-questions (or it-clefts). In order to obtain the cross-linguistic pattern, we tested extraction preferences in Mandarin Chinese relative clauses.

Mandarin Chinese relative clauses (RC), which combine the basic SVO word order and head-final RC structures, appear to be inconsistent for a subject relative advantage. These different studies may be hard to compare because they look at different kinds of contexts and constructions (Yun et al., 2015), sometimes suffering from a variety of insufficiencies (Vasishth 2015). Hsiao and Gibson (2003), Gibson and Wu (2013), and Sung et al. (2016) found an Object preference, whereas Li et al. (2010), Wu et al. (2012), and Jäger et al. (2015) found a (slight) subject preference when the NP with RC starts with a classifier. In a meta-analysis, Vasishth et al. (2013) concluded that the general evidence points towards an advantage for subject relative clauses. The question of extraction out of subjects and objects in Mandarin Chinese RCs has been studied much less than simple relative clauses. We will provide new data on this question in our Experiment 2.

Also, resumptive pronouns (RP) are often thought of as a last resort strategy ameliorating long-distance dependencies (Zenker & Schwartz, 2021). In our first experiment, we will test extraction of the subject or the object in Mandarin relative clauses (with classifiers) with or without resumptive pronouns. If resumptive pronouns are a last resort strategy, they should be more acceptable in the more complex construction, i.e. the object relative clauses in our Experiment 1 and possibly extractions out of both subjects and objects in Experiment 2.

In sum, Mandarin RCs play a crucial role in addressing two research questions: (1) Is there a subject or object preference, for extraction and/or sub-extraction? (2) Does RP in Mandarin ameliorate extraction acceptability?

2 Experiment

2.1 Methods

Two contextualized acceptability judgment experiments were conducted on IBEX, where we crossed grammatical function (subject vs. object) and Resumptive pronouns (with vs. without RP) in a 2x2 Latin-square design. Materials for Experiment 1 comprised Mandarin simple subject/object RCs, with a classifier to avoid temporal ambiguity, and an RP in subject or object position (1), consisting of 20 items and 32 fillers. Materials for Experiment 2

are adapted from Exp1 for sub-extraction out of subject or object, and in which the RP is possessive (2), consisting of 20 test items and 25 fillers (from an unrelated experiment).

(1) Exp 1 example set

Context:
Wajue   gongzuo yijing   jinxingle   shunian le.
Extraction work   already going.on   several   years.
"Excavation work has been going on for years."

SRC_0RP
Kaoguxuejia faxian-le yige   zhenhanle   gudai   suoyou laifang guowang de jinzita
Archaeologist found one-CL astound-PFV in-ancient-times all visiting kings   REL pyramid
"The archaeologist found a pyramid which __ astounded all visiting kings in ancient times."

SRC_RP
Kaoguxuejia faxian-le yige ta zhenhanle   gudai   suoyou laifang guowang de   jinzita
Archeologist found one-CL it astound-PFVin-ancient-times all visiting   king   REL pyramid
"The archeologist found a pyramid, which it astounded all visiting kings in ancient times."

ORC_0RP
Kaoguxuejia faxian-le yige   gudai   suoyou laifang guowang dou   zantan de   jinzita
Archeologist found one-CL in-ancient-times all visiting kings   DOU admire REL pyramid
"The archeologist found a pyramid, which all visiting kings admire_ in ancient times."

ORC_RP
Kaoguxuejia faxian-le yige gudai   suoyou laifang guowang dou zantan ta de   jinzita
Archeologist found one-CL in-ancient-times all visiting kings   DOU admire it REL pyramid
"The archeologist found a pyramid, which all visiting kings admire it in ancient times."

(2) Exp 2 example set

Context:
Wajue   gongzuo yijing   jinxing-le shunian le.
Excavation work   already going on   several years.
Excavation work has been going on for years

RC_S_0RP
Kaoguxuejia faxian-le yige gaodu zhenhanle   gudai   suoyou laifang guowang de jinzita
Archaeologist found one-CL height astound-PFV in-ancient-times all visiting kings REL pyramid
"The archaeologist found a pyramid of which the height astounded all visiting kings in ancient times."

RC_S_RP
Kaoguxuejia faxian-le yige qi gaodu zhenhanle gudai   suoyou laifang guowang de jinzita
Archeologist found one-CL its height astound-PFV in-ancient-times all visiting king REL pyramid
"The archeologist found a pyramid of which its height astounded all visiting kings in ancient times."

RC_O_0RP
Kaoguxuejia faxian-le yige gudai   suoyou   laifang guowang dou zantan   gaodu de jinzita
Archeologist found   one-CL in-ancient-times all   visiting   king   DOU admire height REL pyramid
"The archeologist found a pyramid of which all visiting kings admire the height in ancient times."

RC_O_RP
Kaoguxuejia faxian-le yige gudai   suoyou laifang guowang dou zantan qi gaodu de jinzita
Archeologist found one-CL in-ancient-times all visiting king DOU admire its height REL pyramid

"The archeologist found a pyramid of which all visiting kings admire its height in ancient times."

2.2 Participants

Native Mandarin speakers residing in Mainland China completed the experiments online. Participants were presented with sentence pairs (context and experimental sentence) and asked to rate the second sentence on a 1-7 Likert scale, and answer simple yes/no comprehension questions. Only data from participants with an accuracy rate above 80% were analyzed, and the effective data is composed of judgment from 60 participants (Exp1) and 50 participants (Exp2) respectively.

3 Predictions

Most syntax-based theories predict a subject preference in Exp1 (simple RC) and a subject penalty in Exp2 (subject island). However, some syntactic approaches suggest that Mandarin Chinese in general has very few or no island constraints (see Cheng 2009 for wh-questions). No penalty for extraction out of the subject would be predicted in this case. If RP makes complex structures easier, this would predict an advantage for RP in case of island violations (if they exist), hence an interaction in Exp2. Resumptive pronouns may also make simple object relatives easier (Exp1). A discourse-based theory predicts no subject penalty in Exp2 because RCs are not focalizing constructions (Abeillé et al 2020). A distance-based processing theory predicts an object preference for both experiments because of the shorter linear distance between the object and the head noun. A frequency-based processing theory predicts a subject advantage in Exp1 because subject RCs are more frequent in corpora (Yun et al 2015).

4 Results and Discussion

4.1 Experiment 1: Subject and object relative clauses

Bayesian analyses (brms package by Bürkner, 2018, 8 chains, 9000 iterations, weakly informative priors, maximal model, cumulative) show a high probability for a main effect of RPs (higher ratings on RCs without RPs) and a high probability for an interaction (object relatives are judged more acceptable with RPs than subject relatives), but a low probability for a main effect of syntactic function, possibly because subject relatives are less acceptable with RP. It also supports Aoun & Li (2003), who argue that the syntax of RCs with RP is more complex (with an empty operator) than RCs with a gap. This might mean that RPs are only used to help with a very complex construction.
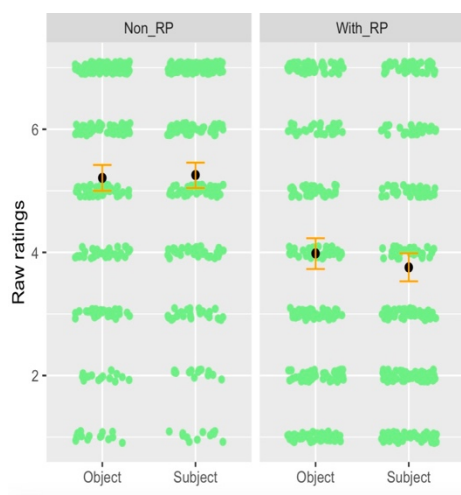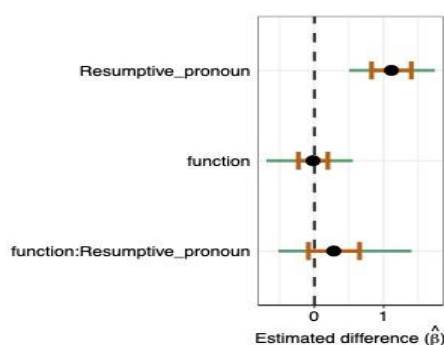
Figure 1a : Results Exp1

Figure 1b: Analysis Exp 1

Resumptive pronoun: p(beta>0) =1
Function: p(beta<0)=.58
Function:Resumptive_pronoun: p(beta<0) = .94

4.2 Experiment 2

With a maximal model in Bayesian analysis (all parameters as in Exp1), we found a tendency for a subject advantage with the probability of .86, but low probability for a main effect of RPs and interaction effect. This subject preference is similar to what was found for Italian, French and English RCs (with pied-piping). No penalty for RP was found for the extractions in contrast to the simple RCs. The lack of subject penalty is predicted by Abeillé et al 2020's discourse based theory but would also be compatible with a general lack of islands in Mandarin Chinese. However, it is not consistent with a universal subject island constraint and is not predicted by a linear distance-based processing theory either. Fukuda et al (2020) found that Japanese also lacked a subject-object asymmetry in subextraction in RC, although the distance for extraction out of objects is shorter. Our data may also be compatible with a frequency-based processing theory if subject sub-extraction is more frequent in corpora. This will be tested in future work.
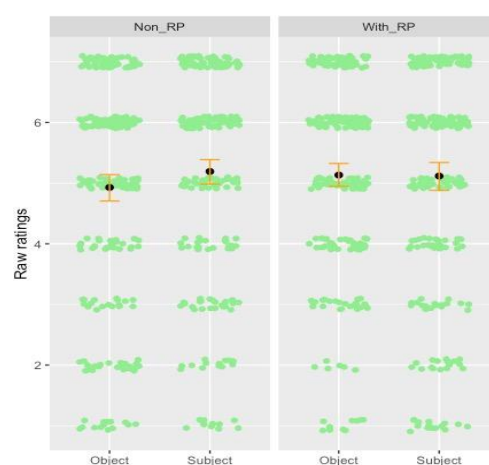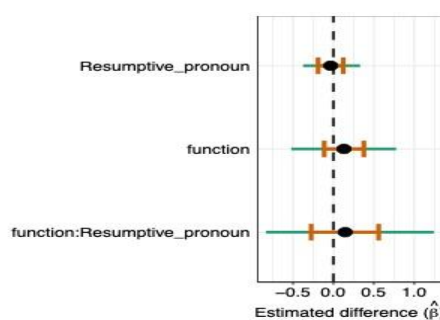
Figure 2a: Results Exp 2

Figure 2b: Analysis Exp 2

Resumptive pronoun: p(beta<0) =.70
Function: p(beta<0)=.86
Function: Resumptive_pronoun: p(beta<0) = .76

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