

Contextual vs. Verbal-semantic Cues in the Interpretation of Reflexive ‘ziji’

by (English-L1) L2 learners of Chinese:

What Predicts a Long-distance Interpretation?

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Introduction

1. A Cue-based Retrieval Approach on Antecedent Retrieval

Antecedent retrieval is constrained by multiple linguistic cues (i.e. syntactic-binding, semantic, discourse, etc.).

- multiple-constraint approaches to anaphor resolution (e.g. Badecker and Straub 2002)
- cue-based memory retrieval models (e.g. Lewis, Vasishth and Van Dyke 2006; Van Dyke and McElree 2011)

2. Different Retrieval Cues in English and Chinese Reflexive Binding

- English: local-binding only (syntactic constraint)

e.g. Tom_i asks John_j to take care of himself_{i/j}.

- Chinese allows long-distance binding of ‘ziji’ (-self), depending on
 - semantic properties of the embedded verb (3 verb types)
 - context

VT1: introverted/self-oriented verbs allowing **local** binding only;

(1) Zhangsan_i rang Lisi_j tanbai ziji_{i/j}.

NAME ask NAME confess -self

‘Zhangsan asks Lisi to confess himself.’

VT2: extroverted/other-oriented verbs allowing **long-distance** binding only;

(2) Zhangsan_i rang Lisi_j huida ziji_{i/j}.

NAME ask NAME answer -self

‘Zhangsan asks Lisi to answer him.’

VT3: verbs allowing **both** local and long-distance binding;

(3) Zhangsan_i rang Lisi_j zhaogu ziji_{i/j}.

NAME ask NAME take care of -self

‘Zhangsan asks Lisi to take care of him/himself.’

The **context** only has an effect on VT3.

3. Native and L2 Processing

- Native speakers (NS) don’t consider contextual information with VT1 and VT2 (e.g. Li and Zhou 2010);
- L2 speakers (NNS) have greater reliance on discourse-based cues during antecedent retrieval (e.g. Clahsen and Fesler 2006; Felser and Cummings 2012).

Research Questions

Q1: Do NNS allow a long-distance (LD) interpretation if it is ruled out by their L1? (parameter resetting)

Q2: Are NNS sensitive to verbal-semantic cues as well as contextual cues?

Q3: Are verbal-semantic and contextual cues weighted in the same way in NS and NNS?

Q4: Is any of the above modulated by proficiency?

Q5: Is any of the above modulated by working memory?

Participants

25 native Chinese speaker (NS);

29 (English-L1) learners of Chinese (NNS, low- to high- intermediate)

Participants	NS	NNS
Gender (F / M)	18 / 7	15 / 14
Age (in years)	25.0 (1.9)	22.0 (1.5)
Chinese Proficiency (Level IV&V HSK Grammar & Vocabulary Test)	100% (0)	82.5% (10.7)
Working Memory (Digit Span Test)	130 (10.3)	106(5.6)

Table 1: Participant-related variables: average and standard deviations. Working Memory measure is a standardized score, see Turner and Ridsdale 2004).

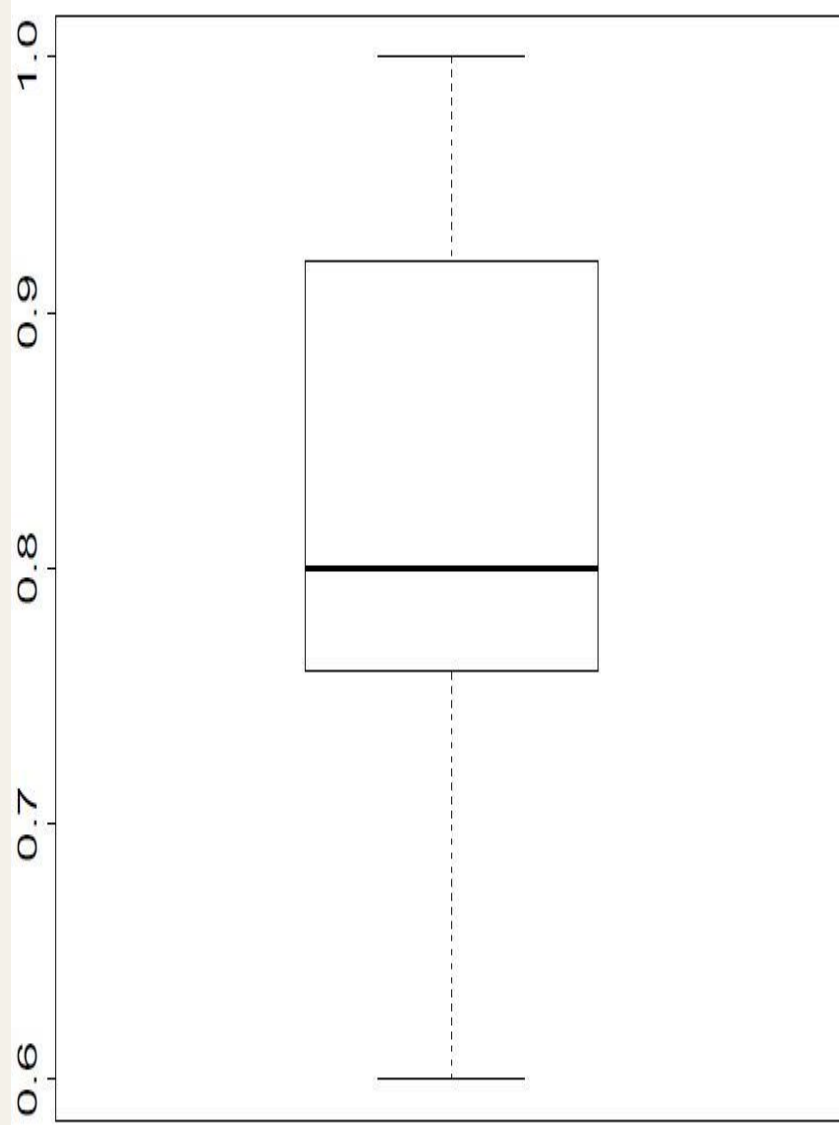


Figure 1: NNS Proficiency Scores

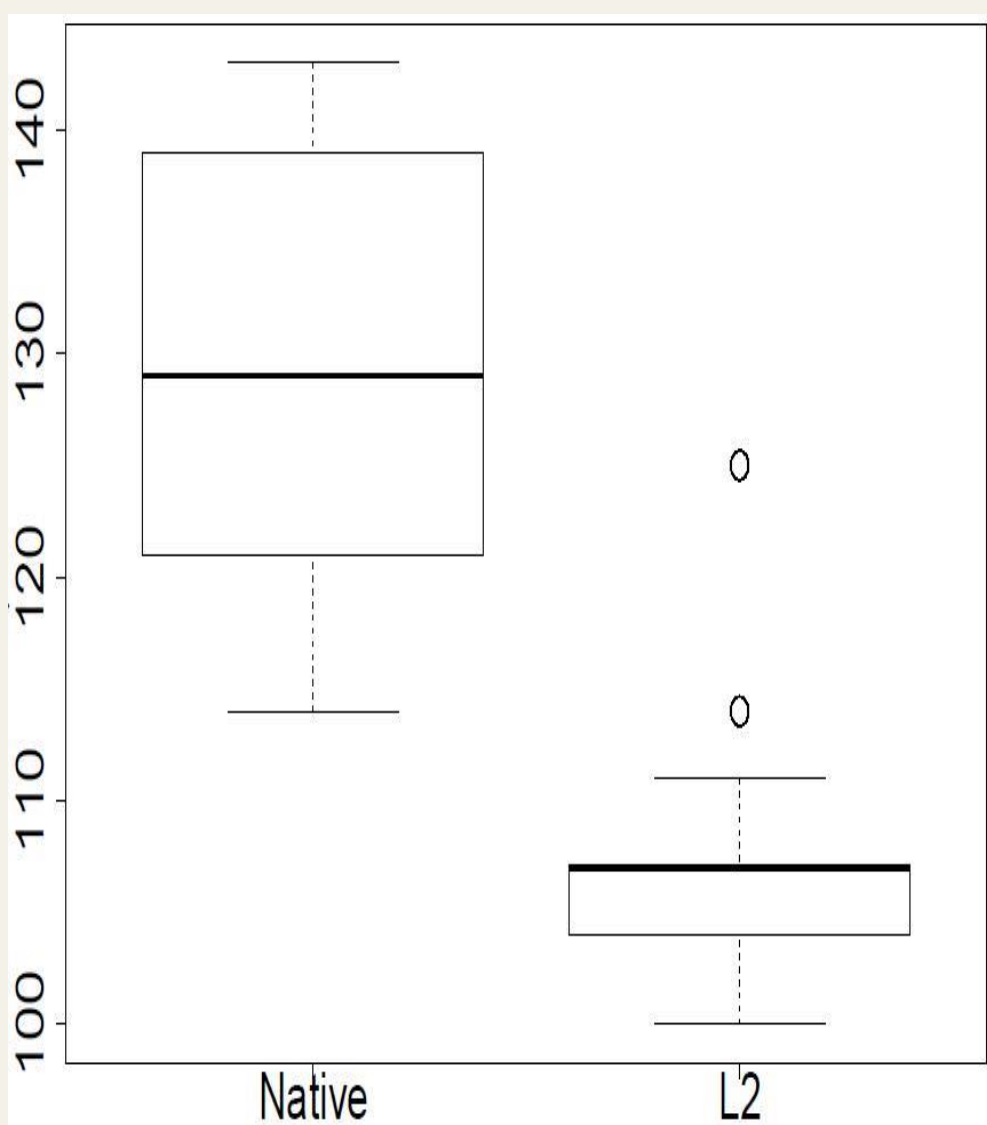


Figure 2: NS and NNS Memory Scores

(No significant correlation between Proficiency and Working Memory *within* NNS, $p = 0.3354$)

Experiment

Design: 3 (verb type: VT1, VT2, VT3) x 2 (context: Local, Long-distance) design, 90 experimental items and 90 distractors (with the non-reflexive pronoun ‘ta’).

Task: self-paced reading task with non-cumulative moving-window paradigm

- **Context Sentence** (first screen)

(4) Lisi dui Zhangsan shuohuang.

Lisi to Zhangsan tell a lie

‘Lisi told a lie to Zhangsan.’

- **Test Sentence** (second screen: self-paced presentation):

(5) Zhangsan rang Lisi tanbai ziji, dajia dou tongyi.

Zhangsan ask Lisi confess self, everyone all agree

‘Zhangsan asks Lisi to confess himself and everyone agrees.’

- **Forced Choice of antecedent for ‘ziji’** (final screen)

(6) shui yinggai tanbai shishi?

Who should confess the truth

‘Who should confess the truth?’

A. Zhangsan B. Lisi

Antecedent choice analysis

Logistic Mixed-effects Modelling Analysis;

1) Analysis on Native speakers’ Antecedent Choices

DV: Antecedent Choice (i.e. local or long-distance);

Random effects: Item (no significant individual variation);

Fixed effects: Verb Type, Context;

	Coefficient	Std. Error	Z	p
Intercept	-2.0008	0.3282	-6.097	1.08e-09***
VT1	-2.9648	0.4328	-6.849	7.42e-12***
VT2	3.1226	0.4439	7.034	2.01e-12***
Long-distance Context	4.9527	0.4080	12.138	< 2e-16***

Table 1: Summary of the fixed effects for a model predicting NS antecedent choice (Reference levels: VT3 and context favoring the local antecedent)

- VT1 strongly favors a local antecedent.
- VT2 strongly favors a long-distance antecedent.
- Context influences antecedent choice with *all* verb types.

2) Analysis on Non-native speakers’ Antecedent Choices

DV: Antecedent Choice (i.e. local or long-distance);

Random effects: Item, Working Memory;

Fixed effects: Verb Type*Context, Verb Type*Proficiency;

	Coefficient	Std. Error	Z	p
Intercept	-1.58381	0.22230	-7.125	1.04e-12***
VT1	-0.52665	0.28338	-1.858	0.06311.
VT2	1.38073	0.25919	5.327	9.98e-08***
Long-distance Context	2.53228	0.26293	9.631	< 2e-16***
Proficiency	2.45245	0.81265	3.018	0.00255**
VT1: Long-distance context	-0.05045	0.37646	-0.134	0.89340
VT2: Long-distance context	-1.08173	0.36312	-2.979	0.00289**
VT1: Proficiency	-4.71621	1.12901	-4.177	2.95e-05***
VT2: Proficiency	-0.45734	1.08213	-0.423	0.67257

Table 2: Summary of the fixed effects for a model predicting NNS’ antecedent choice (reference levels: VT3 and local antecedent favoring the local antecedent)

NNS are sensitive to verb type (Q2):

- More long-distance antecedents with VT2 than VT3.
- Distinction between VT1 and VT3 only becomes significant at higher proficiency.

NNS are sensitive to the context (Q2):

- More long-distance antecedents in contexts that favor them.
- Significant interaction between Context and VT: lesser effect of context on VT2

As proficiency increases (Q4):

- Long-distance antecedents are allowed more often (main effect) (Q1).
- Long-distance antecedents are allowed less with VT1 (compared with VT3) in long-distance contexts.
- Increased sensitivity to verb type.

Memory effect (Q5):

- Higher memory capacity increases the likelihood of a long-distance interpretation.

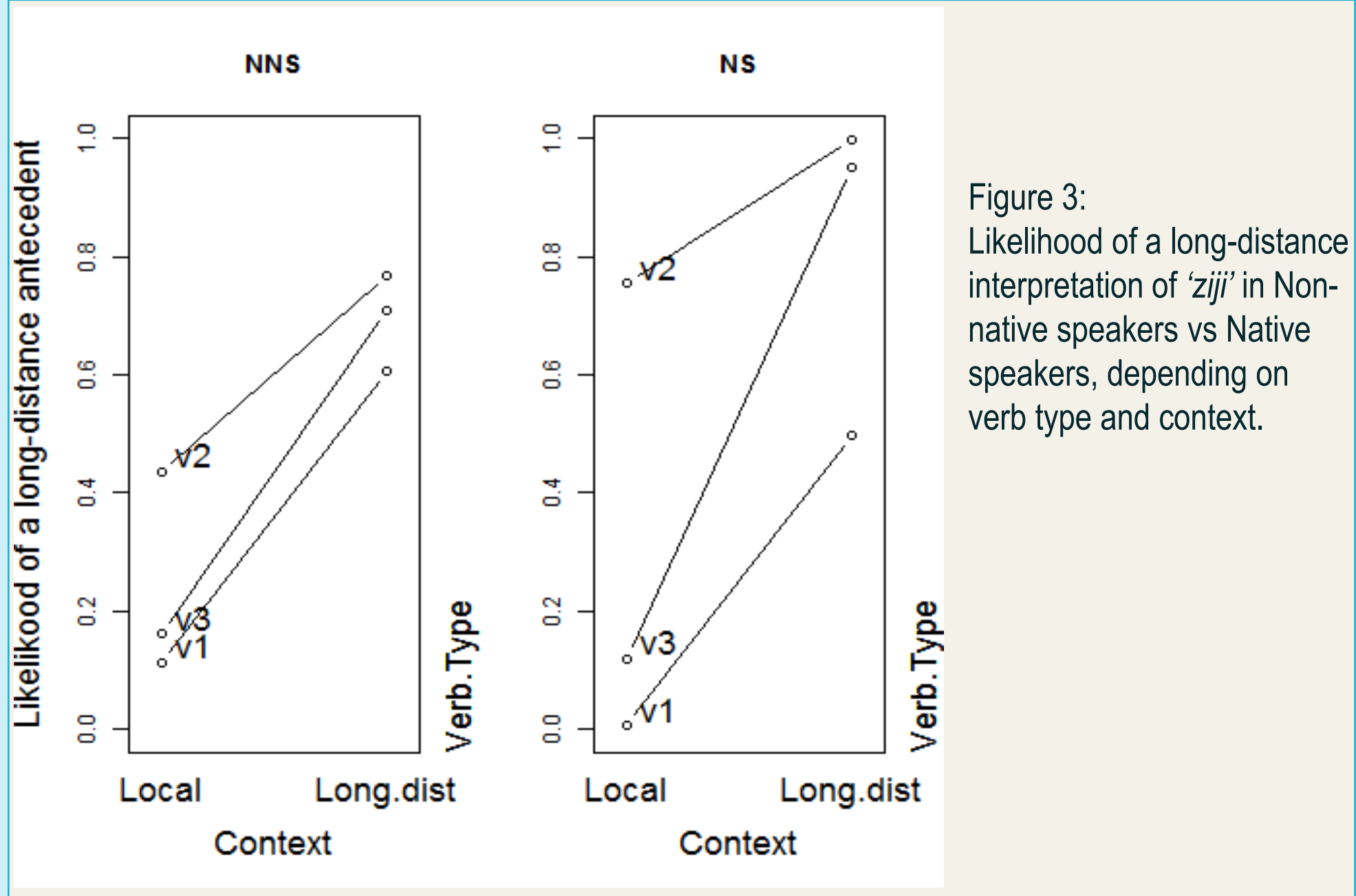


Figure 3: Likelihood of a long-distance interpretation of ‘ziji’ in Non-native speakers vs Native speakers, depending on verb type and context.

Cue choice analysis

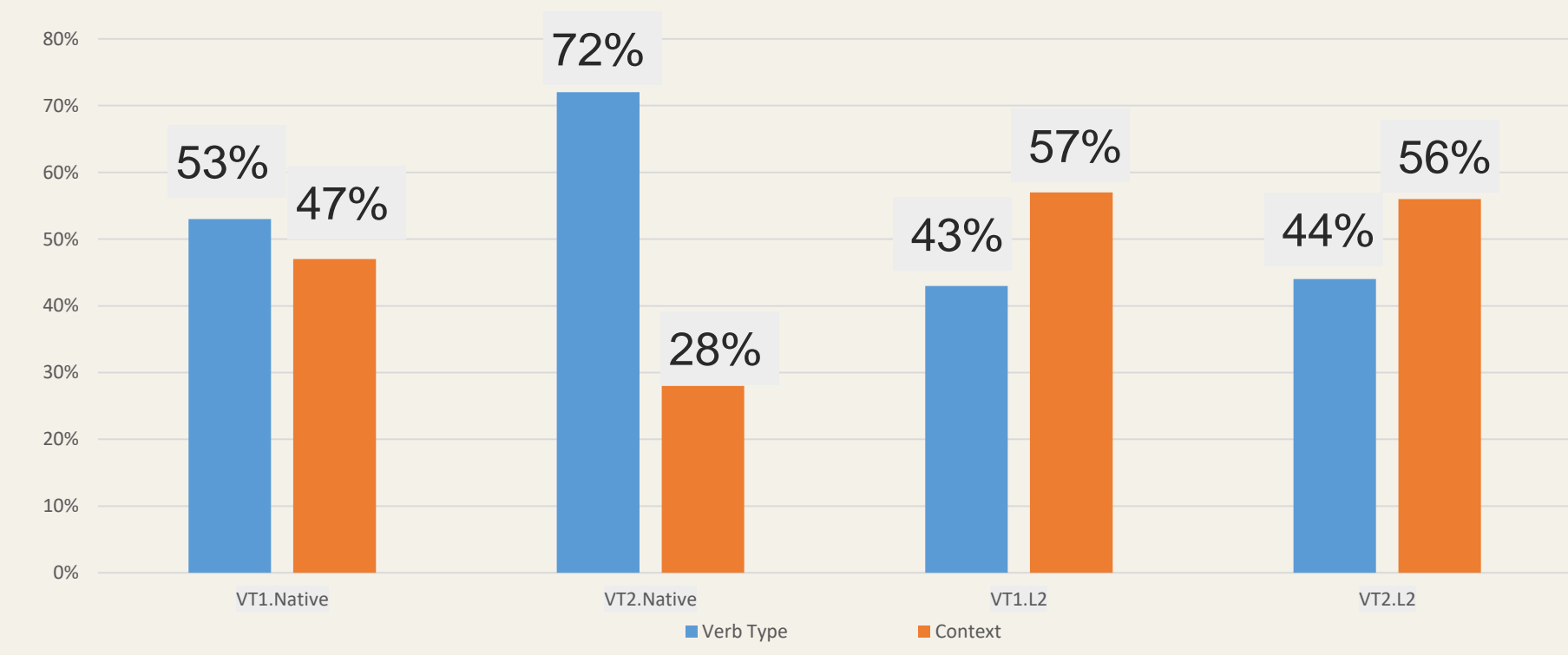


Table 4: Cue Choice in case of Conflict between the two Cues

DV: Cue Choice (i.e. context or verb type) to determine antecedent choice;

Random effects: Item, Participant;

Fixed effects: Verb Type*Group (NS vs NNS);

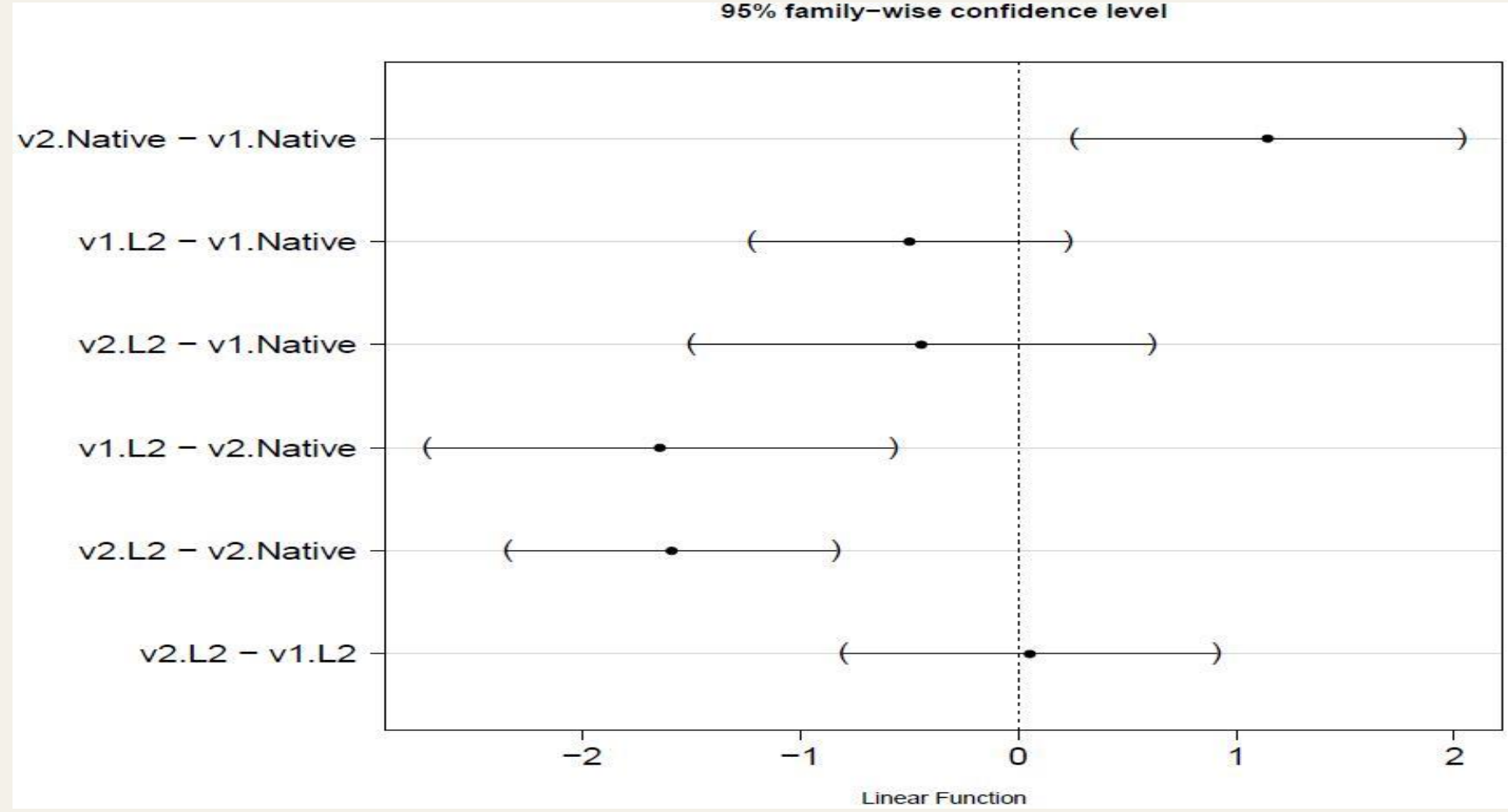


Figure 4: Tukey HSD contrasts (with Bonferroni correction) comparing NS and NNS reliance on Verb Type (against Context). (Intervals > 0 indicates a stronger reliance on Verb Type for the first term in the comparison (on the y axis), e.g. VT2.Native in the first comparison; Intervals < 0 indicates a stronger reliance on Context; Intervals crossing 0 indicates non-significant comparisons, i.e. no preference for either cue.)

Q3: cues weighted differently in NS and NNS. Specifically, when there is a conflict between the two cues,

- NS rely significantly more on verb type than context (most markedly with VT2);
- NNS rely more on context with both verb types.
- Proficiency levels investigated here did not have a significant effect on NNS’ reliance on context.

Conclusion

- NNS are able to allow a long-distance interpretation of ‘ziji’, overcoming L1 transfer. This increases with proficiency.
→ Probabilistic approach to parameter (re)setting? (Yang, 2002).
- NNS are sensitive to both cues, but they are less sensitive to verbal-semantic cues, especially at lower proficiency.
→ Reduced sensitivity to structural cues rather than higher sensitivity to discourse cues (Cummings, 2016).
- Substantial amount of individual variation in NNS but not in NS. Individual variation (in NNS) in terms of working memory and proficiency (distinct effects).

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