The Cantonese dative constructions: implications for processing

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Overview of presentation

- Cantonese word order

- Center-embedding in Cantonese

- Alternative constructions

- The experimental study

- Discussion and conclusion

Cantonese word order

- Cantonese is SVO, with the word order about as rigid as English.

我　　[$_{VP}$借　　　　[錢]]

ngo5　[$_{VP}$ **ze3**　　　[cin2]]

1Sg　**borrow**　　money

'I borrow money.'

Cantonese NP

- Cantonese NPs are head-final.
- All modifiers are prenominal.

[[$_{RC}$我   借   嘅   _] 錢$_{NP}$]
[[$_{RC}$ngo5   ze3   ge3 _] **cin2**$_{NP}$]
    1Sg   borrow   Prt   **money**
'The **money** (that) I borrowed'

Cantonese dative

- Order of Cantonese canonical DOC (double object construction): [V(erb) T(heme) R(ecipient)]

我　　　[_{VP}**畀**　　　　[錢]　　　　　　[你]]
ngo5　[_{VP} **bei2**　　　[cin2]　　　　　[nei5]]
1Sg　　　**give**　　　money　　　2Sg
S　　　　　V　　　　T　　　　　R
'I give you money.'

- Verbs that occur with DOC are very limited.

Cantonese BA construction

- BA word in Cantonese is *zoeng1* 將
- [BA T VP]

BA construction of a Cantonese dative

將	[錢]	[$_{VP}$畀	[我]]
zoeng1	[cin2]	[$_{VP}$ **bei2**	[ngo5]]
BA	money	**give**	1Sg
BA	T	V	R

'Give me those money.'

Typological distribution

- Relationship between order of [OV vs. VO] and [NRel vs. RelN] (Dryer, 2005)

[VO + RelN] 'distinctly rare'

- The 5 languages are:
  - Mandarin
  - other varieties of Chinese (Cantonese and Hakka)
  - Bai and Amis (both in close geographical proximity to Chinese).

Count	RelN	NRel
OV	109	96
VO	*5*	370

Center-embedding in Cantonese

- When object is modified by RC, center-embedding occurs.

  S [V [*[RC]* N]]

- This is predicted to cause processing difficulty according to psycholinguistic theories

VP

NP

XP

V   N
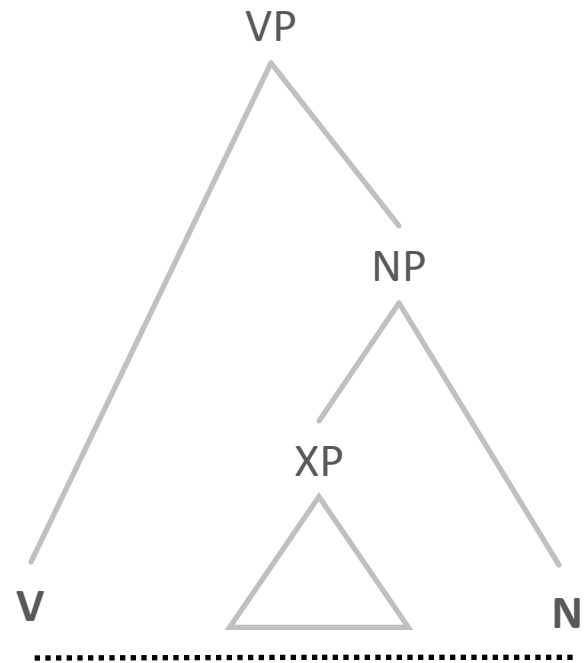
Minimize Domains

- Minimize Domains (MiD, Hawkins, 2004)
→ closer immediate constituents form smaller domains
→ lower overall complexity
→ easier processing

Canonical English DOC:
  I [$_{VP}$**give** [**the book** that I have borrowed**] [to** him]]

Example with heavy NP shift (HNPS):
  I [$_{VP}$**give** [**to him**] [**the book** that I have borrowed]]

Cross-linguistic psycholinguistic support: e.g. Japanese NP fronting (Yamashita & Chang, 2001), English HNPS, etc.

MiD and center-embedding

- Center-embedding is difficult to process according to psycholinguistic accounts (e.g. Minimize Domains, Hawkins, 2004)

我　　　　　[_{VP}**借緊**　　　　　[[佢　　寫　　嗰　　本　　　　得意　　　嘅] **書**_{NP}]]
ngo5　　　[_{VP}**ze3-gan2**　　　[[keoi5 se2　go2　bun2　　　dak1ji3　ge3] **syu1**_{NP}]]
1Sg　　　　　**borrow-PRG**　　　3Sg　write Det　CL　　　　funny　　PRT　**book**
'I'm borrowing the funny book that s/he wrote.'

(underlined: domain for main verb *ze*)

- Center-embedding – separation of verb and head nouns (T and R) in the Cantonese dative VP

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The 'Chinese Problem'

- Chinese languages
  - center-embedding which is difficult to process
  - very long VP domain when Theme is complex (Hawkins, 2004)
  - exception to 'VO languages avoid RelN' (Dryer, 2005)
  - **Why can Chinese tolerate this?**

Problem is expected to be more serious in datives (more objects, longer distance between V and NPs)

Alternative constructions

Dative construction	Example 'give you the book I wrote'
DOC	畀[我寫嗰本書]你 [$_{VP}$bei2 [ngo5 se2　go2 bun2 syu1] [nei5]] [$_{VP}$give [1Sg　write Det　CL　book] [2Sg]]
"Prepositional" Dative & double-*bei2*	畀/拎[我寫嗰本書]畀你 [$_{VP}$bei2/ling1 [ngo5 se2　go2 bun2 syu1] bei2 [nei5]] [$_{VP}$give/get　[1Sg　write Det CL　book] give [2Sg]]
BA-construction	將[我寫嗰本書]畀你 [zoeng1 [ngo5 se2　go2 bun2 syu1] bei2 [nei5]] [BA　　[1Sg　write Det CL　book] give [2Sg]]
Right dislocation	畀你(啦)[我寫嗰本書] [$_{VP}$bei2 [nei5]] (la1) [ngo5 se2　go2 bun2 syu1] [$_{VP}$give [you]] (SFP) [1Sg　write Det　CL　book]
Topicalization	[我寫嗰本書]畀你 [ngo5 se2　go2 bun2 syu1] [$_{VP}$bei2 [nei5]] [1Sg　write Det　CL　book] [$_{VP}$give　[2Sg]]
Extraposition from NP	畀本書你,我寫嗰本 [$_{VP}$bei2 [bun2 syu1] [nei5]] [ngo5 se2　go2 bun1] [$_{VP}$give [CL　book] [2Sg]] [1Sg　write Det　CL]

A previous study

- Cheung (2005) elicited a variety of alternative constructions

- Weight effect in Cantonese leading to the use of alternative constructions

Frequency (%) in condition	[T]	[Adj T]	[RC T]
DOC	238	206	169
[V T bei2 R]	13	34	51
BA construction [zoeng1 T bei2 R]	0	1	15
Others	1	11	17

The BA construction

- Traditionally called the 'disposal construction', limited to the expression of concrete or abstract motion
- Applicable to transitive and ditransitive verbs

- Low frequency in Cantonese

- Theme of the VP 'preposed'? Scrambling effect?
- Under debate: What is BA?

Traditional accounts: Prediction

- Traditional accounts
  - Semantic/pragmatic/discourse factors
    - Information status
    - Topic-prominence of Chinese
  - Lexical/constructional factors
- Lower frequency than that of the canonical order

- Hypothesis based on traditional accounts:
  Rare construction, scrambling effect expected for the BA construction: the canonical DOC will have better performance in comprehension and production

Maximize On-line Processing

- Maximize On-line Processing (MaOP, Hawkins, 2004)
  → the earlier the properties are correctly assigned, the better
    1. I believe [the boy knows the answer].
    2. I believe **that** [the boy knows the answer].

- In 2, the processor expects an embedded clause after 'that', and 'the boy' is correctly assigned as the agent of *knows*.

- As predicted by MaOP, 2 is easier to process even though there is an extra word.

MiD and MaOP: Predictions

- BA construction [zoeng1 T bei2 R] for Cantonese datives

[go3 sai3lou6zai2]	zoeng1	[keoi5 ze3.gan6	go2 bun2 dak1ji3 ge3 **syu1**]	**bei2.zo2**	[go3 **sin1saang1**]
[CL child]	BA	[3Sg borrow.PRG Det CL funny Prt **book**]	**give.PFV**	[CL **teacher**]
	BA		T V	R

'The child has given the teacher the funny book that he is borrowing.'

The head nouns of Theme and Recipient are closer to the verb.

- Shorter domain for the V – Good for MiD

The processor is expecting a definite Theme NP occurring immediately after *zoeng1*

- T is assigned early – Good for MaOP

Hawkins (2004): better performance predicted for the BA construction.

Summary of the predictions

- Hypothesis based on traditional accounts:
  The canonical DOC will have better performance than the BA construction in comprehension and production.

- **Hypothesis** based on Hawkins (2004):
  When center-embedding is expected in the DOC, the BA construction will have better performance in comprehension and production.

Experiment: Participants & Items

- 18 naïve participants, L1: Cantonese
- 12 sets of sentences with 6 conditions
  (2 constructions DOC vs. BA and 3 different levels of Theme complexity)
- 1 condition seen per construction per set in a random order
- Triple number of fillers in different constructions with comprehension questions to disguise task nature

	Unmodified theme [Cl N]	Adj-modified theme [Adj N]	RC-modified theme [RC N]
DOC A [bei2 [**T**] R]			
BA A [zoeng1 [**T**] bei2 R]	bun2 **syu1** Cl **book** 'that book'	bun2 dak1ji3 ge3 **syu1** Cl funny Prt **book** 'that funny book'	[nei5 ze3] go2 bun2 **syu1** you borrow Det CL **book** 'the book that you borrowed'

Item set 1: [T]

- Unmodified Theme, relatively easy to process

DOC
go3 sai3lou6zai2 [bei2.zo2 [go2 bun2 syu1] [go3 sin1saang1]]
CL   child   give-PFV Det CL   book CL   teacher

BA
go3 sai3lou6zai2 zoeng1 [go2 bun2 syu1]   [bei2.zo2 [go3 sin1saang1]]
CL   child   BA   Det CL   book   give-PFV CL   teacher

(both "The kid has given that book to the teacher.")

Item set 1: [Adj T]

- Theme modified by Adj, some processing difficulty

DOC
go3 sai3lou6zai2 bei2.zo2 [go2 bun2 dak1ji3 ge3 syu1] [go3 sin1saang1]
CL   child   give-PFV Det CL   funny Prt book CL   teacher

BA
go3 sai3lou6zai2 zoeng1 [go2 bun2 dak1ji3 ge3 syu1] bei2.zo2 [go3 sin1saang1]
 CL   child   BA   Det CL   funny   Prt book give-PFV CL   teacher

(both "The kid has given that funny book to the teacher.")

Item set 1: [RC T]

- Theme modified by RC, difficult to process

DOC
go3 sai3lou6zai2 bei2.zo2 [keoi5 ze3.gan6   go2 bun2 dak1ji3 ge3 syu1] [go3 sin1saang1]
CL   child   give-PFV 3Sg   borrow-PRG Det CL   funny Prt book CL   teacher

BA
go3 sai3lou6zai2 zoeng1 [keoi5 ze3.gan6   go2 bun2 dak1ji3 ge3 syu1] bei2.zo2 [go3 sin1saang1]
 CL   child   BA   3Sg   borrow-PRG Det CL   funny Prt book give-PFV CL   teacher

(both "The kid has given that funny book he is borrowing to the teacher.")

Experiment: dual-task procedures

- Masked moving window reading + elicited imitation

In each trial, subjects press a key to see the next word

_ _ _ _ _ _ _ _ _ _ _ _ →

個 _ _ _ _ _ _ _ _ _ _ _ →

_ 細 路 仔 _ _ _ _ _ _ _ → etc.

個|細路仔|畀咗|嗰|本|書|個|先生

  go sailouzai [$_{VP}$bei-zo   [go bun syu]   [go sinsaang]]

  CL child   [$_{VP}$give-PFV [Det CL   book] [CL teacher]]

  "The kid gave the teacher that book"

- RT for each window is recorded automatically.

- A probe appears after an item to ask the participant to repeat the sentence. (Fillers: question or probe)

個 ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿

＿＿ 細 路 仔 ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿

— — — — 畀 咗 — — — — — —

＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ 嗰 ＿＿ ＿＿ ＿＿ ＿＿ ＿＿

＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ 本 ＿＿ ＿＿ ＿＿ ＿＿

＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ ＿＿ 書 ＿＿ ＿＿ ＿＿

＿ ＿ ＿ ＿ ＿ ＿ ＿ ＿ ＿ 個 ＿ ＿

＿＿＿＿＿＿＿＿＿＿＿ 先 生

REPEAT

Average reading time

	[T]	[Adj T]	[RC T]
■ DOC	407.55	398.44	438.25
■ BA	387.34	389.97	422.59
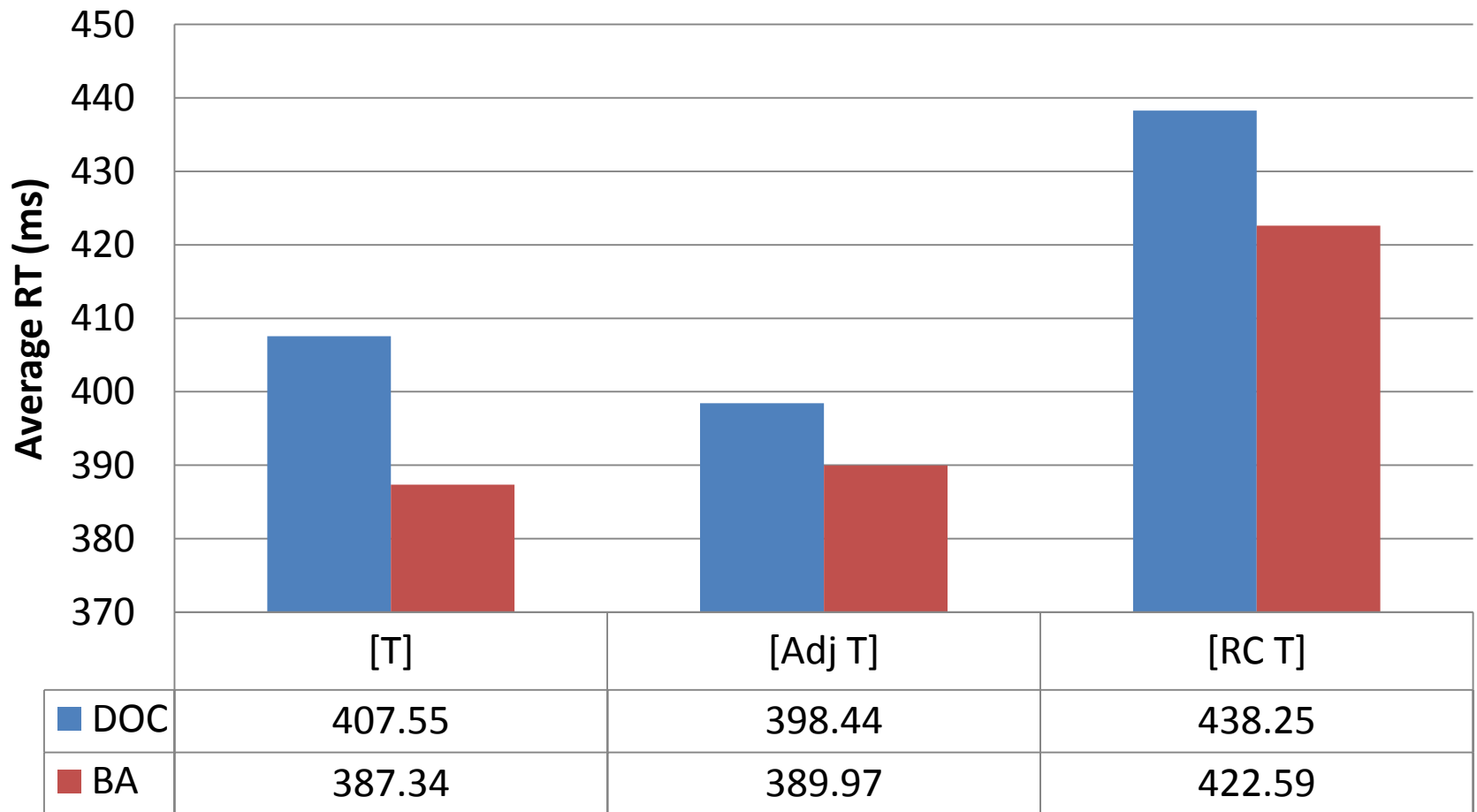
Both factors significant

Elicited imitation

Qualitative data: errors
- DOC when the target is BA
- BA construction when target is DOC
- Double-*bei2* construction [*bei2* T *bei2* R] example:

個細路仔　　　　畀咗　[佢　借緊　　　　嗰　本　得意 嘅 書]　畀咗　　[個 先生]
go sailouzai　　bei-zo　[keoi ze-gan　　go　bun dakji ge **syu**]　bei-zo　[go sinsaang]
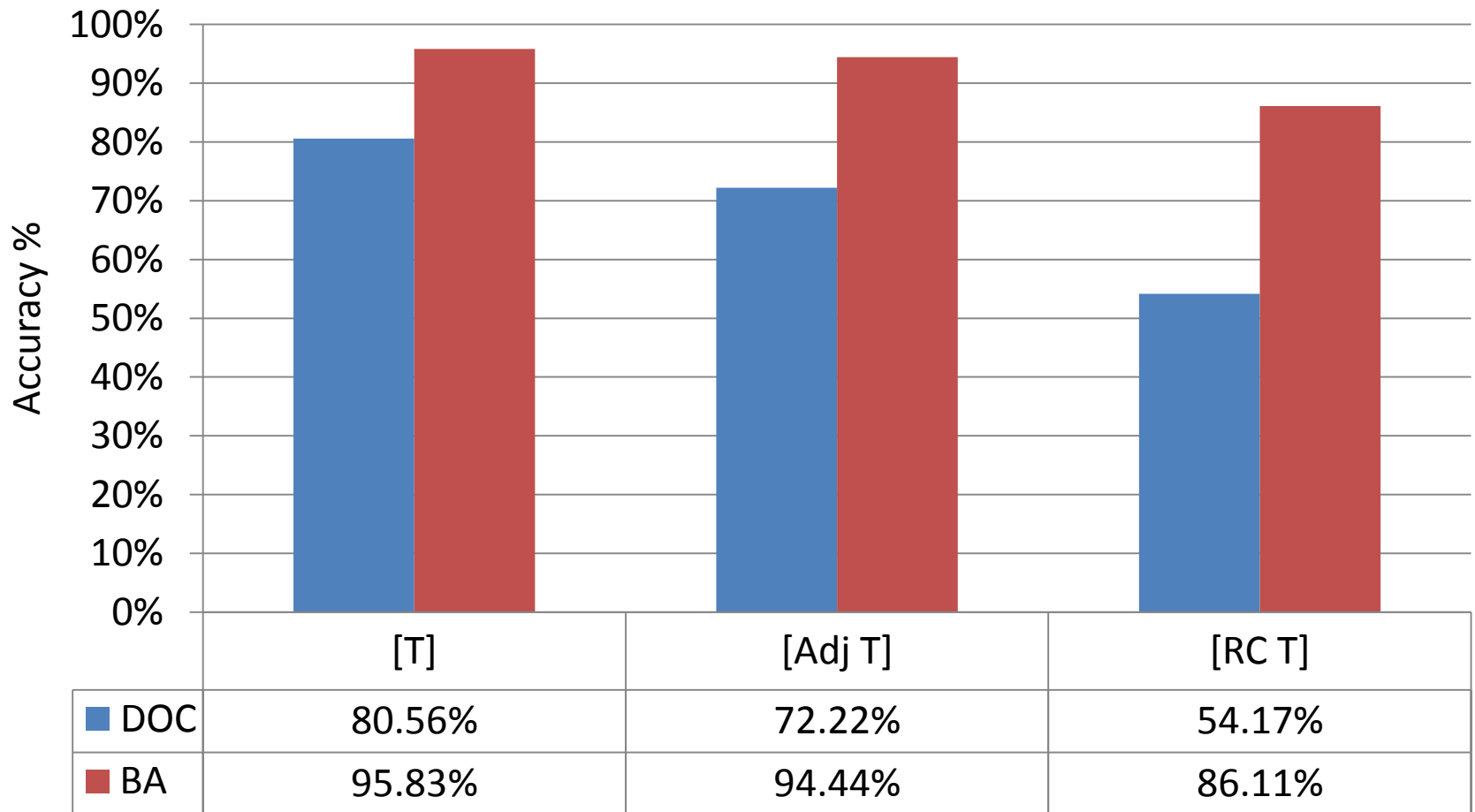CL child　　　　give-PFV 3Sg　borrow-PRG Det CL　funny Prt **book give-PFV** CL teacher

　　　　　　　　　V　　　　　　　　　　　　　　　　　　T V　　　R

- Others
  - Other alternative constructions, such as topicalization
  - Multiple repairs/restarts
  - Missing arguments, giving up, etc.

Response accuracy

	[T]	[Adj T]	[RC T]
DOC	80.56%	72.22%	54.17%
BA	95.83%	94.44%	86.11%

Both factors significant

Discussion

- The BA construction is easier to process than the canonical DOC in terms of reading time and accuracy.

- Theme complexity effect: performance suffers when complexity increases…

- Both factors *Construction* and *Theme complexity* are significant, lending **support to the processing principles MiD and MaOP in Hawkins (2004).**

- Partial correlations (factoring out *Theme complexity*) reveal that both the performance in comprehension and production are significantly correlated
    - → **What is difficult to parse is also difficult to produce** (at least for Cantonese)
    - → Supports the claim that language comprehension and production are related.
    - → More investigation of the role of priming is needed.

More questions

- Is there a cost associated with choosing a rarely used alternative construction? Scrambling?
Little support from this study as the BA construction is not read slower than the DOC, even for the bare Theme NP. The BA construction is read significantly faster (anti-scrambling?).

- What is BA? Verb? Coverb? Preposition? Case Marker?
Does it matter for the processor? It knows that BA only occurs with the BA construction. It assigns the Theme to the following NP, which is good for MaOP.

- Language comprehension and production seem to be related:
Are they affected differently? How to test it better?

Conclusion

- The processing factors proposed in Hawkins (2004) make the correct predictions for the experimental results.
    - → *Performance* may affect the choice of construction used in a sentence (cf. Hawkins, 2004).

    - → *Processing demands* may be one of the reasons for alternatives in Chinese like topicalization to be used.
        - → Center-embedding avoided in performance

Alternative constructions such as the BA construction can **facilitate** processing and avoid center-embedding. Also, RCs are not frequent in colloquial speech. These may help Cantonese retain a typologically rare configuration.

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