Clausal complements and tone sandhi in Chaozhou

Nick Huang and Jiajia Cai
{znhuang, jiajia.cai}@nus.edu.sg

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URL to slides: https://tinyurl.com/ynda43ud

This talk: subcategorization and finiteness

Two types of attitude verbs: “belief verbs” (beliefs and speech) vs. “control verbs” (expressing desires).

In many languages, different subcategorization requirements.

(1) English

a. Jo **thinks** [$_{\text{Finite}}$ she is in LA]. — Belief verb

b. Jo **plans** [$_{\text{Nonfinite}}$ to be in LA]. — Control verb

Is the same clausal distinction present in Chinese?

A lot of evidence suggests: yes, there is a two-way distinction.

	Belief complements	"Control" complements
Overt subjects	OK	Typically no
Future markers and modals	OK	No
Low SFPs	OK	No
Certain cross-clausal dependencies	No	OK

But this evidence almost always comes from Mandarin.

(C.-T. J. Huang 1989, Li 1990, a.m.o.; see C.-T. J. Huang 2022 and He 2024 for recent reviews.)

What about other varieties of Chinese?

This talk: a case study from Chaozhou (Southern Min)

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Theoretical contribution 1: Chaozhou provides a new kind of evidence (tone sandhi) from a non-Mandarin variety for recent claims about the Implicational Complementation Hypothesis (ICH; Wurmbrand & Lohninger 2023) and finiteness in Chinese (see also Liu & Yip 2025 on Cantonese).

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Theoretical contribution 2: an argument for a uniform analysis of clause structure across Chinese varieties.

Contents

Background: Implicational Complementation Hypothesis (ICH)

Empirically based on restructuring and tense-related phenomena.

Intuition: Attitude verbs select for complement clauses with certain semantics, which then impose lower bounds on structure.

Complement clauses of "plan" and similar control verbs:

- Semantically: must be a Situation.
- Structurally: must have the Inflectional domain (IP level).
  - But **may** contain higher functional projections (e.g. complementizers), provided they don't change the semantics $\rightarrow$ **Structural flexibility**.

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Complement clauses of "think," "say" and other belief verbs:

- Semantically: must be a Proposition.
- Structurally: must have the Operator domain (CP level).
  - In principle, could allow higher functional projections, but not in practice, because there are no higher projections beyond the Operator domain $\rightarrow$ **No structural flexibility**.

Overview of Chaozhou tone sandhi

Eight tones + extensive tone sandhi very similar to Xiamen and Taiwanese Southern Min.

All data reported here are for Fengxi Chaozhou (Jiajia's native variety, $\sim$ prestige variety in mainland China), using Peng'im romanization and Chao tone numerals (1 = low pitch, 5 = high pitch).

- Same tone sandhi generalizations hold for NH's variety of Singapore Chaozhou.

Citation and sandhi tones

Two types of environments affecting how tone is realized: Final syllable of VP, NP, clauses, in isolation: **citation**; all other positions: **sandhi**

(2) sang$^{\underline{\text{citation 213}}}$
give

Tone 3a “yinqu”

(3) a. oi$^{\underline{\text{citation 55}}}$
shoe

b. sang$^{\text{sandhi 53 = high falling}}$ [$_{NP}$ oi$^{\underline{55}}$] keh i
give shoe to 3s
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For tone 3a, the overall pitch (“register”) of its sandhi tone is actually determined by the register of following citation tone.

(4) a. san[citation 33]
“shirt” (low register)
b. sang[sandhi 42 = low falling/*53] [$_{NP}$ san[33]] keh i
give shirt to 3s

“Register harmony” (Bao 1999)

(5) Tone 3a’s sandhi tone:

a. 53 (high falling) if following citation tone is high-register
b. 42 (low falling) elsewhere

Formally: A citation tone’s high register spreads leftwards to the immediately-preceding sandhi tone (adapting Bao 1999). (Low register is default.)

Caveats:

- Register harmony applies to only 3 tones (out of 8): 2a, 3a, 4a (yinshang, yinqu, yinru) (Lin 1995; Bao 1999).
- But register harmony is robust: found in VPs, compound words, resultative verbs, Aux-Verb, …

Tone sandhi for tone 2a “yinshang”

(6) Tone 2a’s sandhi tone:

a. 35 (high rising) if following citation tone is high-register

b. 24 (low rising) elsewhere

(7) (oi)hiou$^{\underline{\text{citation 53}}}$

can

(8) a. tag$^{\underline{\text{citation 5}}}$

read

b. hiou^{35} tag$^{\underline{5}}$

can read

(9) a. zo$^{\underline{\text{citation 213}}}$

“do”

b. hiou^{24} zo$^{\underline{213}}$

can do

Tone sandhi for tone 4a “yinru”

(10) Tone 4a’s sandhi tone:

a. 5 (high) if following citation tone is high-register

b. 3 (mid = low register) elsewhere

(11) tih$^{\underline{\text{citation 2}}}$
iron

(12) a. giu$^{\underline{\text{citation 55}}}$
ball

b. tih^{5} giu$^{\underline{55}}$
iron ball

(13) a. dêng$^{\underline{\text{citation 33}}}$
“nail”

b. tih^{3} dêng$^{\underline{33}}$
iron nail

Register harmony in attitude verb constructions?

Fact 1: Attitude verbs can also precede citation tone.

(14) Verb [$_{\text{clause}}$ CitationTone …]
Citation tone on topic, subject, …

Prediction: If Verb ends with either Tone 2a, 3a, or 4a, register harmony should apply.

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Fact 2: Overt complementizer *dan* (< *dan* "say", Tone 3a) can also precede citation tone.

(15) Verb [$_{\text{clause}}$ *dan* CitationTone …] "Overt COMP clause"

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Following examples will always feature Tones 2a, 3a, 4a + H citation tones. Do we find "**H sandhi, H citation**"?

Verbs checked

Rightmost tone	Belief verbs	Control verbs
2a	• *toin* “think” (lit. “see”) • *huênglo* “worry” [cf. MC *fánnǎo*]	n/a
3a	• *dan* “say” • *siangsing* “believe” [MC *xiāngxìn*] • *manggin* “dream” [MC *mèngjiàn*]	• *ain* “want, must” • *main* “do not want” • *pahseng* “plan” [MC *dǎsuàn*] • *dah’êng* “promise” [MC *dāyìng*] • *haon* “be willing to”
4a	• *gagdig* “feel, think” [MC *juéde*] • *gidig* “remember” [MC *jìdé*]	• *gidig* “remember” [MC *jìdé*] • (Singapore/Malaysia Chaozhou only) *su’gah* “like” [< Malay *suka* “like”]

Belief verbs: unmarked clauses

No register harmony: odd to have register harmony.

- NB: *dan* “say” has tone 3a (sandhi tone: high/low falling).

(16) L sandhi, H citation

a. i dan$^{42/*53}$ [[$_{NP}$ iên$^{\underline{55}}$] oi si-ke].
3s say goat will die-PRT
‘S/he said that the goat(s) will die.’ *V-Subject*

b. i {dan$^{42/*53}$ / gagdig$^{3/*5}$} [[$_{NP}$ iên$^{\underline{55}}$] i bho bhoi].
3s say feel goat 3s NEG sell
‘S/he said/felt that the goat(s) s/he didn’t sell.’ *V-Topic*

c. i {dan$^{42/*53}$ / gagdig$^{3/*5}$} [*pro* [$_{VP}$ lai$^{\underline{55}}$] liou.]
3s say feel come PRT
‘S/he said/felt that [s/he] has arrived.’ *V-VP*

Control verbs: unmarked clauses

Register harmony applies.

(17) H sandhi, H citation

a. i {ain$^{53/*42}$ / pahseng$^{53/*42}$ / haon$^{53/*42}$ [PRO lai$^{\underline{55}}$].
3s want plan be.willing come
'S/he wants/plans/is willing to come.' *V-VP*

b. i pahseng$^{53/*42}$ [lai$^{\underline{55}}$ muanrig zian bhoi].
3s plan pear tomorrow PRT buy
'S/he plans to buy pears tomorrow.' *V-Topic*

Overt COMP clauses

No register harmony: *dan* always has L sandhi, regardless of verb type.

(18) L sandhi, H citation

a. i gagdig [dan$^{42/*53}$ iên^{55} oi si-ke].
3s feel COMP goat will die-PRT
'S/he said/felt that the goat(s) will die.' *Belief*

b. i gagdig [dan$^{42/*53}$ iên^{55} i bho bhoi].
3s feel COMP goat 3s NEG sell
'S/he said/felt that the goat(s) s/he didn't sell.' *Belief*

c. i pahseng [dan$^{42/*53}$ lai^{55} muanrig zian bhoi].
3s plan COMP pear tomorrow PRT buy
'S/he plans to buy pears tomorrow.' *Control*

Summary: the distribution of register harmony

	Unmarked	Overt COMP
Belief verbs	No register harmony	No register harmony
Control verbs	Register harmony	No register harmony

Recall that register harmony is otherwise robust.

Analysis

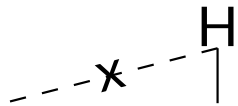
Two components:

1. Register harmony applies **only within a prosodic domain** Φ: H register of citation tone can spread leftward but must stop at Φ's boundary (cf. Lee & Selkirk 2022 on Xitsonga high tone spreading).
2. Φ is the prosodic correlate of a functional projection FP in the complement clause (following a standard intuition about the syntax–prosody interface).

Absence of register harmony = presence of FP and Φ.

How this works: unmarked complements

Belief verb / No register harmony => FP present



(19) i dan [$_{FP/\Phi}$ lai$^{\underline{55}}$ i bho bhoi].
3s say pear 3s NEG buy
'S/he said the pear(s) s/he didn't buy.'

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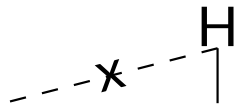

(19) i dan [$_{FP/\Phi}$ lai$^{\underline{55}}$ i bho bhoi].
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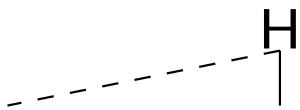
Control verb / Register harmony => FP absent



(20) i pahseng [$_{not\ FP}$ lai$^{\underline{55}}$ muanrig zian bhoi].
3s plan pear tomorrow PRT buy
'S/he plans to buy pears tomorrow.' *Control verb: no FP*

Note that FP is very high – Operator domain: it contains topics.

How this works: overt COMP clauses

No register harmony => FP always present

H

(21) i gagdig [$_{CP}$ dan [$_{FP/\Phi}$ lai$^{\underline{55}}$ i bho bhoi]].
3s feel say pear 3s NEG buy
'S/he felt the pear(s) s/he didn't buy.' *Belief verb*

Both components of our analysis have independent support

Spreading of tone is sensitive to prosodic domains in certain languages, e.g. Xitsonga (Bantu) (Lee & Selkirk 2022).

- Well-established analyses of such phenomena: e.g. CrispEdge family of constraints within OT (Itô & Mester 1999).

Well-established that syntactic structure correspond to prosodic domains. Within Southern Min:

- Citation tones in Southern Min found on right edge of prosodic domains, which in turn correspond to syntactic constituents like NPs, VPs, clauses (see Chen 1987; Lin 1994 for Xiamen Min).
- The same tone group analysis is a good fit for Chaozhou citation tones.
- Unsurprising that Chaozhou register harmony is similarly sensitive to prosodic and syntactic boundaries.

Belief and control verbs have different complements

	Unmarked	Overt COMP
Control verbs	Register harmony $\rightarrow$ No FP and Φ	No register harmony $\rightarrow$ FP and Φ
Belief verbs	No register harmony $\rightarrow$ FP and Φ	No register harmony $\rightarrow$ FP and Φ

Belief complements always have FP; not so for control complements.

Basic subcategorization difference between belief and control verbs (Huang 2022, etc., contra Huang 1994; Hu et al. 2001).

- But evidence from a very different phenomenon – tone sandhi, and not e.g. future markers, cross-clausal dependencies, etc.

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Belief complements always have FP; not so for control complements.

Structural flexibility for control complements, as generally predicted by the ICH (C.-T. J. Huang 2022, He 2024, also N. Huang 2018).

- Control complements can be quite small (like IP), but higher projections (like FP) are possible.
- Reminiscent of monoclausal/biclausal structures and restructuring phenomena.

But ICH does not predict the exact distribution of FP

The ICH merely predicts that, all else being equal, FP can freely occur in all control complements.

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There is actually less flexibility: FP is ...

- Always absent in unmarked control complements (i.e. register harmony always applies), and
- Always present in overt COMP control complements (no register harmony).

Restrictions => FP needs to be formally licensed.

What licenses FP?

Unmarked clauses: FP cannot appear with control verbs => FP's licenser is incompatible with control verbs.

Our proposal, based on cross-linguistic considerations: this licenser is a Finite head.

- Licensing might be via subcategorization: Fin takes FP as a complement.
- Likely that Fin has certain semantics that gives the clause a Proposition interpretation (C.-T. J. Huang 2022).

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Explains why register harmony applies outside of attitude verb constructions (e.g. compound nouns): these constructions do not involve clauses, Fin or FP.

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Explains why register harmony applies outside of attitude verb constructions (e.g. compound nouns): these constructions do not involve clauses, Fin or FP.

Overt COMP clauses: Simplest story is that the complementizer *dan* requires FP in the Operator domain, with or without Fin (e.g. in control constructions) (several ways to cash this out).

Additional evidence for a finiteness distinction

If Chaozhou makes such a finiteness distinction, then control complements should show characteristics more typical of nonfinite clauses.

This is indeed the case, e.g. control complements disallow overt subjects and future markers.

(22) i pahseng (dan) (*i) (*oi) ke.
3s plan COMP 3s will go.
Intended: 'S/he plans to go.'

Uniform analysis of Chinese clause structure

Our proposal about Chaozhou aligns with proposals that locate finite-marking heads high in the left periphery.

- Italian: Finiteness is located on Force head (= C) (Rizzi 1997; Rizzi & Bocci 2017).
- Mandarin: SFPs like *le* and *laizhe* head a CP-like projection and can be thought to mark finiteness (Paul & Pan 2017; Zhang 2019, etc.)

The parallels between Chaozhou and Mandarin suggests that the representation of (non)finiteness might be more or less uniform across Chinese varieties.

(23) CP(/FinP) > FP > TopicP > ExternalFocus > …

Conclusion

Chaozhou belief and control verb constructions show tone sandhi exceptions.

These tone sandhi phenomena can be explained in structural terms, following the literature on the syntax–prosody interface.

These structural differences in turn are consistent with the ICH and a finiteness distinction.

Thank you

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Background: Implicational Complementation Hypothesis (ICH)

Verb class	Example	S-selection	Canonical structure
Control	“try”	Event	vP = Theta domain
Control	“plan”	Situation	IP = vP + Inflectional domain
Belief	“think”	Proposition	CP = IP + Operator domain

Chaozhou tone inventory

Tone	Name	Citation	Citation register	Sandhi
1a	yinping	33	Low	33
2a	yinshang	53	High	35/_ 53, 55, 5 = H citatic 24 elsewhere
3a	yinqu	213	Low	53 /_ 53, 55, 5 = H 42 elsewhere
4a	yinru	2	Low	5 /_ 53, 55, 5 = H 3 elsewhere
1b	yangping	55	High	11
2b	yangshang	35	Low	21
3b	yangqu	11	Low	11
4b	yangru	5	High	2

The overall picture

Still consistent with the ICH.

Belief complements always contain the Operator domain, which contains FinP and FP.

Control verbs still have greater flexibility in their complements. Three scenarios:

Operator domain projections	*dan*	FinP	FP	Register harmony
None (Unmarked)	No	No	No	Yes
Some (e.g. TopicP)	No	No	No	Yes
Some (overt COMP)	Yes	No	Yes	No

What is FP?

One possibility: FP = TopicP

- But we can find FP in belief complement clauses without topics.

Another possibility: No FP. Rather, there is a prosodic mapping rule that maps the **complement** of Fin and complementizer *dan* (whatever that is) into the prosodic domain Φ (Selkirk 2009; Kratzer & Selkirk 2007).

Fin = C?

Maybe Fin = C: no need to posit two distinct functional heads.

FP is uniformly licensed by complementizers:

- a silent finite complementizer compatible with only belief verbs
- an overt complementizer *dan* with finite and nonfinite variants, compatible with both belief and control verbs (cf. N. Huang 2018 on finite and nonfinite *shuo* in Mandarin).

Overt complementizer and topics in control complements

One might argue that these already demonstrate that control complements can be larger than IPs.

But this isn't evidence that validates the ICH.

- To support the ICH, we need to show subcategorization differences between control and belief complements.
- However, overt complementizers and topics are also optional in belief complements.
- So they merely show that control and belief complements both can be larger than IPs, but they don't demonstrate a difference.

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