

From Demonstrative to Discourse: The cartographic footprint of Cantonese *gam2*

Tommy Tsz-Ming Lee

City University of Hong Kong

The 6th International Workshop on Syntactic Cartography (IWSC-6)

October 31– November 1, 2025

The Chinese University of Hong Kong

Table of Contents

① Introduction

② SFP *gam2*

③ Tag *gam2(joeng2)*

④ The cartographic footprint

⑤ Concluding remarks

Introduction

- Demonstratives allow us to “point at” different ontological types anaphorically or deictically (Diessel 1999; Anderson and Morzycki 2015; König and Umbach 2018).

	<i>Nominal demonstratives</i>		
Antecedent	Entity	Time	Place
Form	<i>ni1/go2 -go3</i>	<i>ni1/go2 -zan6</i>	<i>ni1/go2 -dou6</i>
Gloss	this/that-CL	now/then	here/there

Table 1: Nominal demonstratives in Cantonese

Introduction

- **Adverbial demonstratives** are less studied (but see König and Umbach 2018; Lai and Wu 2020; Wu, Lai, and Liu 2024).

	<i>Adverbial demonstratives</i>		
Antecedent	Degree	Manner	Quality
Form	<i>gam3</i> -Adj	<i>gam2</i> -V	<i>gam2</i> -N
Gloss	this/that	like this/that	such

Table 2: Adverbial demonstratives in Cantonese

(1) a. 條繩咁長。

Tiu sing **gam3** coeng.

CL rope that long

‘The rope is that long.’

b. 佢噉食野。

keoi **gam2** sik-je.

s/he like.that eat

‘S/he eats like that.’

Introduction

- Only *gam2* can be used as a **predicative demonstrative** (Fung 2000).

	<i>Predicative demonstratives</i>		
Antecedent	Property	Situation	Proposition
Form	<i>gam2</i>	<i>gam2</i>	<i>gam2</i>
Gloss	like this/that	that/such	so

Table 3: Predicative demonstratives in Cantonese

(2) a. 佢係噉架。

Keoi hai **gam2** gaa3.

s/he be like.that SFP

‘S/he is like that.’

b. 如果噉，點好？

Jyugwo **gam2**, dim hou?

if so how good

‘If so, what should we do?’

Introduction

- What is known about *gam2* (Peng 2003; H.-n. S. Cheung 2007; Sio and Tang 2007; 2008; Matthews and Yip 2011; H.-n. S. Cheung 2013; Lai and Wu 2020, i.a.):
 - It has a clear division labor with *gam3*
 - It serves dual functions: **adverbial** and **predicative**
 - It develops from the general classifier *go3*
 - It also develops into a structural particle that introduces adverbials.
- In this talk, I reveal two additional functions of *gam2*:
 - ① *gam2* as a **sentence-final particle**
 - ② *gam2* as a **tag statment**

(M. C. Y. Lee 2018)

Introduction

- By outlining the cartographic footprint of *gam2* in Cantonese, we
 - obtain a case of **upward successive analysis** (Roberts and Roussou 2003)

“Thus grammaticalization pathways can be deduced from the functional hierarchy (and possibly vice versa), once upward reanalysis is taken as a basic mechanism of syntactic change” (p.209)

- uncover a parallel development of demonstratives in nominal and non-nominal domain (first discussed in Sio 2011)

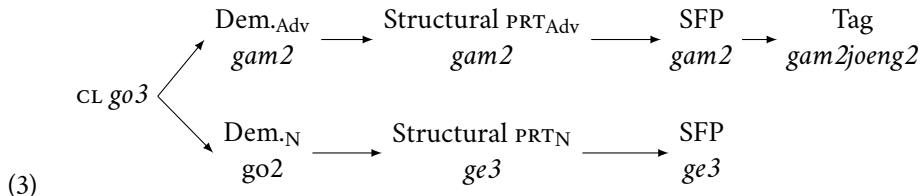


Table of Contents

- 1 Introduction
- 2 SFP *gam2*
- 3 Tag *gam2(joeng2)*
- 4 The cartographic footprint
- 5 Concluding remarks

SFP *gam2*

- *Gam2* can be used sentence-finally (Peng 2003; M. C. Y. Lee 2018).

(4) Examples of sentence-final *gam2*

- a. 我想黎幫吓手 噉 咋。 (Peng 2003, (10), modified)

Ngo soeng lai bong-haa sau **gam2** zaa3

I want come help hand SFP SFP

'I just want to help.'

- b. 張三有冇去台北玩 噉 呀？ (M. C. Y. Lee 2018, (29b))

Zoengsaam jau-mou heoi Toibak waan **gam2** aa3?

Zoengsaam have-not go Taipei travel SFP SFP

'Did Zoengsaam travel to Taipei?'

- Peng notes that *gam2* is anaphoric to the previous proposition, giving rise to some emphasis effect.

The syntax of SFP *gam2*

- Following the classification of SFP in Tang (2020), I argue that *gam2* is an Event-type SFP.

(5) The ordering of SFPs in Cantonese

Event < Temporal < Focus < Degree < CoA (Call on Addressee)

- The evidence is two-fold:
 - gam2* occurs before the other four types of SFPs.
 - gam2* occurs before some Event-type SFPs, but after some others.

The syntax of SFP *gam2*

- **Before SFP_{Temporal}** → e.g., *laa3* (change of state)

(6) 感覺上個大學生涯都完左 噉 喇。

blog

Gamgoksoeng go daaihok sangngaai dou jyun-zo **gam2** laa3.

Feeling CL college life DOU finished SFP SFP

‘I feel like the college life is over.’

- **Before SFP_{Focus}** → e.g., *zaa3* (‘only’); see (4a)
- **Before SFP_{Degree}** → e.g., *aa3* (evaluative); see (4b)
- **Before SFP_{CoA}** → e.g., ↗ (rising intonation)

(7) 你想黎幫吓手 噉 ↗ ?

Nei soeng lai bong-haa sau **gam2** ↗ ?

You want come help hand SFP SFP

‘You want to help?’

The syntax of SFP *gam2*

- Among the Event-type SFPs, *gam2* precedes *tim1* (additive)

(8) 副校仲要叫我唔好講出去 咁 添。

forum

Fuhaau zungjiu giu ngo m-hou gongcoetheoi **gam2** tim1.

Vice.Principal also ask me not tell.others SFP SFP

‘Vice Principal also asked me not to tell others.’

- But it follows *mat1zai6* ‘not at all’.

(9) 缺維他命D會提唔起勁乜滯 噉 囉

social media (modified)

Koet waitaaming D wui tai-m-hei-ging mat1zai6 **gam2** lo1

lack Vitamin D will feel.unenthusiastic SFP SFP SFP

‘Lacking Vitamin D will (make one) feel unenthusiastic.’

(10) Event SFPs: mat1zai6 < **gam2** < tim1

The semantics of SFP *gam2*

- While the semantic contribution of *gam2* is subtle, I suggest that there is a **fuzziness effect** in sentences with *gam2*.

(11) The fuzziness effects of SFP *gam2*

The referent of the preceding proposition of *gam2* must allow a certain degree of fuzziness.

- Pragmatically, *gam2* also has a **softening effect** on the proposition by making the utterance less forceful.

The semantics of SFP *gam2*

① *Gam2* is sensitive to clause types.

- As in (4a) and (4b), *gam2* can appear in **declaratives** and **interrogatives**.
- ... but not **imperatives** and **exclamatives** → no fuzziness allowed

(12) # 即刻走 噉 !

#Zikhak zau **gam2**!

now go SFP

'Leave now!'

(14) # 套戲真係好正 噉 !

#Tou hei zanhai houzeng **gam2**!

CL film really nice SFP

'The film is really nice.'

(13) cf. 我想你即刻走 噉 。

Ngo soeng nei zikhak zau **gam2**.

I want you now go SFP

'I want you to go now.'

(15) cf. 套戲幾正 噉 。

Tou hei gei zeng **gam2**!

CL film quite nice SFP

'The film is quite nice.'

The semantics of SFP *gam2*

- ② While *gam2* can be embedded in the antecedent of a conditional,

(16) *Gam2* in conditionals

如果識少少日文 噉 ，可以插班。

Jyugwo sik siusiu jatman gam2, hoji zaapbaan.

if know a.bit Japanese SFP can join.a.class.midway

'If (you) know a bit Japanese, (you) can join a class midway.'

The semantics of SFP *gam2*

- ... it is sensitive to the types of conditionals.

(17) *Gam2* in *only-if* conditionals

→ no fuzziness allowed

#只有識少少日文 噉，先可以插班。

#*Zijau* sik siusiu jatman **gam2**, sin hoji zaapbaan.

only.if know a.bit Japanese SFP then can join.a.class.midway

‘Only if (you) know a bit Japanese, (you) can join a class midway.’

(18) *Gam2* in *only-if* conditionals

→ vacuous fuzziness

#無論識幾多日文 噉，都可以插班。

#*Mouleon* sik geidou jatman **gam2**, dou hoji zaapbaan.

No.matter know how.much Japanese SFP all can join.a.class.midway

‘No matter how much (you) know Japanese, (you) can join a class midway.’

The semantics of SFP *gam2*

- I suggest that this fuzziness effect comes from the core meaning of demonstratives.
- **the primary function of demonstratives is to establish kinds** (Anderson and Morzycki 2015; Arsenijevic, Kratochvil, and Sio 2015).

“the connections between kinds, manners, and degrees are too systematic and too widespread to be accidental, and suggest a profound similarity among these domains.”

(Anderson and Morzycki 2015, p.800)

The semantics of SFP *gam2*

- **Unifying different types demonstratives with the notion of kinds** (Umbach and Gust 2014; Arsenijevi, Kratochvil, and Sio 2015)
 - Demonstratives establish *ad-hoc* kinds within the context (rather than well-established kinds)
 - “only when extent is concerned, equality is expressed. In other cases, it is similarity” (Arsenijevi, Kratochvil, and Sio 2015)
 - **Adverbial demonstratives** refer to event-kinds, rather than object-kinds
- My suggestion: **Clausal-final demonstratives** refer to **kinds of worlds** (i.e., situation).
 - **the fuzziness effect and the softening effect**

Table of Contents

- ① Introduction
- ② SFP *gam2*
- ③ Tag *gam2(joeng2)*
- ④ The cartographic footprint
- ⑤ Concluding remarks

Tag *gam2(joeng2)*

- *Gam2* can be used utterance-finally, often in the form of *gam2joeng2*.
 - This usage is understudied, mentioned only in passing in Luke (2000).
 - But it is common in colloquial speeches.

(19) Examples of utterance-final *gam2joeng2*

- a. 佢要求索償四十五萬嘅， 噉樣 。 (p.309, modified)

Keoi jiukau saaksoeng 45maan ge3, **gam2joeng2**

s/he ask.for compenentation 450k SFP TAG

(Lit.) 'S/he askeed for a 450k compensation, like this.'

- b. 唔通你話你唔得啊？ 噉樣 。 (p.309)

M-tung nei waa nei m-dak aa4? **gam2joeng2** .

could.it.be.that you say you can't.do SFP TAG

'Could it be that you say you can't do it?'

The syntax of tag *gam2(joeng2)*

- Some basic properties of tag *gam2joeng2* :
 - It follows all other SFPs.
 - There is usually a pause before it.
 - It is optional.
 - It cannot be used on its own.
 - It can take its own SFP.**

(20) 可能價值教育會比較貼近啲咁，咁樣囉。 Interview transcript

Honang gaazik-gaaujuk wui beigaau tipgan di gwaa3,
maybe Values-Education will more close bit SFP

gam2joeng2 lo1.

TAG

SFP

‘Maybe Values Education will be closer to (the goal), I believe.’

The syntax of tag *gam2(joeng2)*

- I suggest that it is similar to constant polarity tags (Huddleston 1970).

- (21) a. John has gone, has he (?)
- b. John hasn't gone, hasn't he (?)

- The difference is that **the tag is a statement**, rather than a question.

The semantics of tag *gam2(joeng2)*

- The discourse functions of the Mandarin counterpart of *gam2* are well recognized.

(22) *Zheyangzi* ‘like this’: Mandarin counterpart of *gam2joeng2*

聽起來很青春 這樣子

(Huang 1999, p.87)

tingqilai hen qingchun **zheyangzi**.

hear very pure this

‘(It) sounds like very pure.’

(23) 我大概六分鐘就睡著了 這樣子

(Tang 2015a, p.14)

wo dagai liu fenzhong jiu shuizhao le **zheyangzi**

I probably six minute then sleep LE this.appearance

‘Probably I will fall asleep in six minutes (or something like that).’

The semantics of tag *gam2(joeng2)*

- Huang (1999, p.87)
 - “to mark a **boundary in the discourse**”; “to mark the end of a turn contribution”
- Tang (2015a), p.14:
 - “kind of repetition of the main clause that precedes them and they are used to **reinforce the meaning** denoted by the main clause.
- Y.-H. Lee (2020)
 - “a type of **discourse completion marker**, which marks the speakers emphasis on the finality or completion of the given discourse” (p.92)
 - “to show the speakers subject **distant from the story**.” (p.117)

The semantics of tag *gam2(joeng2)*

- I suggest to assimilate the functions of *gam2joeng2* to **confirmational** in language (Lam 2014; Wiltschko and Heim 2016; Yang and Wiltschko 2016; Tang 2020; Cory and Koev 2025)
 - Their function is to “requests that the addressee confirm that the proposition expressed in the host sentence is true” (Wiltschko and Heim 2016, p.306)

(24) Confirmational tags in English

- You have a new dog, **eh**?
- You have a new dog, **dont you**?

The semantics of tag *gam2(joeng2)*

- I suggest *gam2joeng2* to be a **self-confirmational tag**.
 - By uttering tag *gam2joeng2*, **the speaker expresses his/her confirmation to the preceding utterance**.
 - The speaker is thus reassuring himself/herself that what is uttered is true/correct, as if the confirmation is provided by a third party.
- It follows that it gives the effects describe in the literature:
 - a boundary in discourse/ discourse completion
 - a reinforcement of meaning
 - distance from the story

Interim summary

- **SFP *gam2***

- Syntax: it is a low SFP, i.e., an Event-type SFP.
- Semantics: it is anaphoric to a previous proposition.
- Functions: it gives rise to a fuzziness effect.

- **Tag *gam2joeng2***

- Syntax: it involves a conjoined structure at the root clause.
- Semantics: it is anaphoric to a previous utterance.
- Functions: it expresses self-confirmation.

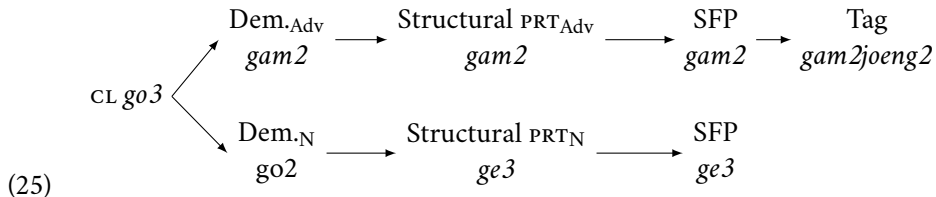
- Next: The cartographic footprint of *gam2*, compared to its nominal counterpart

Table of Contents

- 1 Introduction
- 2 SFP *gam2*
- 3 Tag *gam2(joeng2)*
- 4 The cartographic footprint
- 5 Concluding remarks

The cartographic footprint

- Recall that:



- The structural particle usage of *gam2* is discussed in details in Peng (2003) and Sio and Tang (2007, 2008), briefly overvied below.

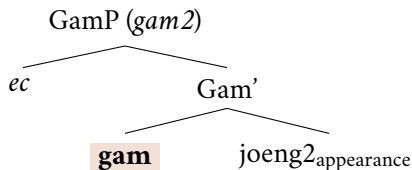
An overview on *gam* as a structural particle

- H.-n. S. Cheung (2007, p.99) critically observes that adverbial *gam2* allows **apposition**.
- Peng (2003) and Sio and Tang (2007, 2008) argue convincingly that *gam2* develops into a structural particle that introduces adverbials, signalling the lose of anaphoricity.
- Sio and Tang (2007) proposes that *gam* is a head that takes two arguments, whose internal argument affects its phonological realizations.
 - *gam2* vs. *gam3*

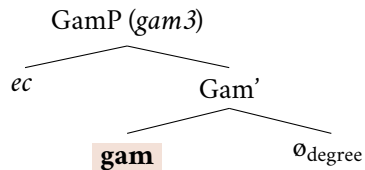
An overview on *gam* as a structural particle

- They propose the following internal structure of *gam*:

(26) Adverbial *gam*



(27) Ad-adjectival *gam*



- ec* can be filled by an overt adverb.

The origin of demonstratives

A remark (not discussed here):

- It has been argued that the the origin of demonstratives in Cantonese is **the general classifier *go*3**.
 - For the adverbial/predicative *gam*2 and *gam*3, see H.-n. S. Cheung (2013) and Lai and Wu (2020).
 - For the nominal (distal) demonstrative, *go*2 and *ge*3, see S. H.-n. Cheung (2006) and Sio (2011).
- Now it's time to put everything together.

The cartographic footprint

(28) 佢靜雞雞噉食咗 [嗰個好食嘅蛋糕] 噉／嘅 咋，噉樣。

Keoi zinggaigai-**gam2** sik-zo [**go2** **go3** housik-**ge3** daangou]

S/he secretly-GAM2 eat-PFV that CL delicious-GE3 cake

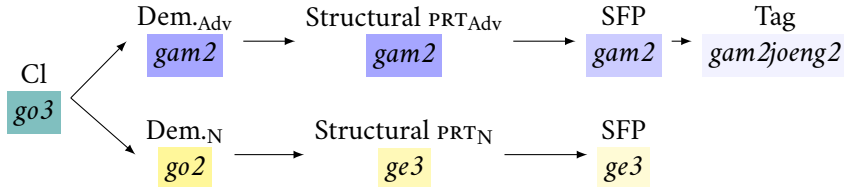
gam2 / **ge3** zaa3, **gam2joeng2** .

SFP

SFP

TAG

‘Aaming only secretly ate that delicious cake, (I believe).’



(29)

(30) The cartographic footprint of *go3* in Cantonese

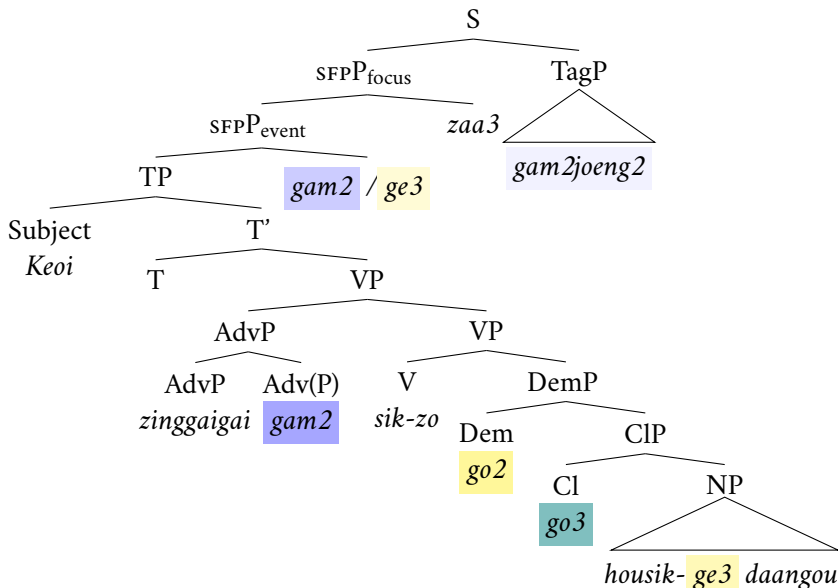


Table of Contents

- 1 Introduction
- 2 SFP *gam2*
- 3 Tag *gam2(joeng2)*
- 4 The cartographic footprint
- 5 Concluding remarks

Concluding remarks

The directionality of grammaticalization

- From demonstrative (inner) to discourse (outer)
 - **G-family** (Dem): *gam2, gam3, ge3* this talk (cf. Fung 2000)
 - **Wh-family**: *how, what, where* (Tsai 2011; L. Y.-L. Cheung 2009)
- From tag (outer) to SFP (inner) (Tang 2025, talk at TEAL-14, USC)
 - **H-family** (be): *oho2, ehe2, ahaa2*
(Sybesma 2007; Chor, Yap, and Wong 2016; Tang 2020)
 - **W-family** (say): *wo5, waa2, wo4, haa6waa5* (Tang 2015b)
- Chinese right periphery is rich –
 - it is the destination of both inner and outer elements, and
 - grammaticalization comes in a wide variety.

Concluding remarks

Demonstratives and kind establishment

- There appears to be an underlying function connecting all the demonstratives.
- An initial attempt:

Form	<i>go2</i>	<i>gam3</i>	<i>gam2</i>	<i>gam2</i>	<i>gam2</i>	<i>gam2joeng2</i>
Position	Adnominal + CL	Ad-adjectival	Adnominal + MOD	Adverbial	Clausal-final	Utterance-final
Antecedent	Entity	Degree	Quality	Manner	States of affairs	Proposition
Dimension	<i>Equative (single-dimensional)</i>		<i>Similitive (multi-faceted; property)</i>			<i>Equative (single-dimensional)</i>
Type	objects	kinds of states	kinds of objects	kinds of events	kinds of worlds	truth values
Examples	阿明個個人	兩米咁高	好似綿羊噉嘅人	好積極噉幫手	想食啲咩噉	我好快就訓咗囉，噉樣。

Table 3: Different kinds established by different demonstratives

Acknowledgements

- Earlier versions of this work have been presented at FoCaL-7 (HKSYU, 2024), The 5th Workshop on Sentence-final Particles in Modern Chinese (GDUFS, 2024), Yue 28 (MU, 2024). I thank the audience at the above occasions.
- I also thank Dr. Yik-Po Lai for discussions and comments.

References I

- Anderson, Curt, and Marcin Morzycki. 2015. "Degrees as kinds." *Natural Language and Linguistic Theory* 33 (3): 791–828.
- Arsenijeви, Boban, Frantisek Kratochvil, and Joanna Ut-seong Sio. 2015. "Equative and Similative Demonstratives in Sinitic and Beyond." *Proceedings of 15th International Symposium on Chinese Languages and Linguistics*.
- Cheung, Hung-nin Samuel. 2007. *Xianggang Yueyu yufa de yanjiu [Cantonese as spoken in Hong Kong] (revised edition)*. Hong Kong: The Chinese University Press.
- Cheung, Hung-nin Samuel. 2013. "What about gam? - Revisiting to the Demonstrative in Early Cantonese." *Bulletin of Chinese Linguistics* 7 (2): 165–201.

References II

- Cheung, Lawrence Yam-Leung. 2009. "Negative *wh*-construction and its semantic properties." *Journal of East Asian Linguistics* 18 (4): 297–321.
- Cheung, Samuel Hung-nin. 2006. "The study of *go3* in Early Cantonese." In *Linguistic Studies in Chinese and Neighboring Languages: Festschrift in Honor of Professor Pang-Hsin Ting on His 70th Birthday*, edited by Dah-An Ho, Samuel Hung-nin Cheung, Wuyun Pan, and Fuxiang Wu, 813–835. Taipei: Academia Sinica.
- Chor, Winnie Oi-Wan, Foong Ha Yap, and Tak-Sum Wong. 2016. "Chinese interrogative particles as talk coordinators at the right periphery." *Journal of Historical Pragmatics* 17 (2): 178–207.

References III

- Cory, Bill, and Todor Koev. 2025. "Bias in tag questions." In *Biased questions: Experimental results and theoretical modelling*, edited by Tue Trinh, Anton Benz, Daniel Goodhue, Kazuko Yatsushiro, and Manfred Krifka, 141–174. Berlin: Language Science Press.
- Diessel, Holger. 1999. *Demonstratives - form, function, and gramamticalization*. Amsterdam and Philadelphia: John Benjamins Publishing.
- Fung, Roxana Suk-Yee. 2000. "Final particles in Standard Cantonese: semantic extension and pragmatic inference." PhD diss., The Ohio State University.
- Huang, Shuanfan. 1999. "The emergence of a grammatical category definite article in spoken Chinese." *Journal of Pragmatics* 31 (1): 77–94.
- Huddleston, Rodney. 1970. "Two approaches to the analysis of tags." *Journal of Linguistics* 6 (2): 215–222.

References IV

- König, Ekkehard, and Carla Umbach. 2018. “Demonstratives of manner, of quality and of degree: A neglected subclass.” In *Atypical Demonstratives: Syntax, Semantics and Pragmatics*, 285–327. Berlin: Walter de Gruyter.
- Lai, Yik-Po, and Dazhen Wu. 2020. *Adverbial Demonstratives in Chinese Dialects*. Handout of talk at 2020 Annual Research Forum of the Linguistic Society of Hong Kong, CUHK.
- Lam, Zoe Wai Man. 2014. “A complex forceP for speaker- and addressee-oriented discourse particles in Cantonese.” *Studies in Chinese Linguistics* 35 (2): 61–80.
- Lee, Yu-Hui. 2020. “Indexicality and Discourse Functions of Manner Demonstratives Zheyang and Nayang in Spoken Mandarin.” PhD diss., University of California, Los Angeles.

References V

- Lee, Margaret Chui Yi. 2018. "Assertion , Addressee's Commitment and the Cantonese particle *gam2*." *University System of Taiwan Working Papers in Linguistics* 10:85–112.
- Luke, Kang-kwong. 2000. "Juzi chengfen de houzhi yu hualun jiaoti jizhizhong de hualun houxu shouduan [Postposed sentential constituents as post-completion devices in conversational turn-taking]." *Zhongguo Yuwen*, no. 4: 303–310.
- Matthews, Stephen, and Virginia Yip. 2011. *Cantonese: A Comprehensive Grammar*. 2nd. London: Routledge.
- Peng, Xiaochuan. 2003. "Gam: a Cantonese structure particle." In *Proceedings of The 8th International Conference on Yue Dialects*, 546–557. Chinese Social Science Publication.

References VI

- Roberts, Ian, and Anna Roussou. 2003. *Syntactic change: A Minimalist approach to Grammaticalization*. Cambridge: Cambridge University Press.
- Sio, Joanna Ut-Seong. 2011. "The Cantonese *ge3*." In *Nominalization in Asian Languages: Diachronic and Typological Perspectives*, edited by Foong Ha Yap, Karen Grunow-Hårsta, and Janick Wrona, 125–146. Amsterdam: John Benjamins.
- Sio, Joanna Ut-Seong, and Sze-Wing Tang. 2007. "The indexical expressions *gam2* and *gam3* in Cantonese." *Studies in Cantonese linguistics* 2:55–73.
- Sio, Joanna Ut-Seong, and Sze-Wing Tang. 2008. "Some Notes on *gam2* and *gam3* in Cantonese." In *Selected Papers from the 2006 Annual Research Forum of the Linguistic Society of Hong Kong*, edited by Colleen Wong, 98–108. Hong Kong: The Linguistic Society of Hong Kong.

References VII

- Sybesma, Rint. 2007. "Whether we tense-agree overtly or not." *Linguistic Inquiry* 38 (3): 580–587.
- Tang, Sze-Wing. 2015a. "A generalized syntactic schema for utterance particles in Chinese." *Lingua Sinica* 1:1–23.
- Tang, Sze-Wing. 2015b. *Yueyu yufa jiangyi [Lectures on Cantonese Grammar]*. Hong Kong: The Commercial Press.
- Tang, Sze-Wing. 2020. "Cartographic syntax of performative projections: evidence from Cantonese." *Journal of East Asian Linguistics* 29:1–30.
- Tsai, Wei-Tien Dylan. 2011. "Rethinking Formal Licensing." Handout distributed at GLOW in Asia Workshop for Young Scholars, Mie University, Japan, on Sept 7-8, 2011.

References VIII

- Umbach, Carla, and Helmar Gust. 2014. "Similarity demonstratives." *Lingua* 149:74–93.
- Wiltschko, Martina, and Johannes Heim. 2016. "The syntax of confirmationals." *Outside the clause: Form and function of extra-clausal constituents* 178:305.
- Wu, Dazhen, Yik-Po Lai, and Yanting Liu. 2024. *A Typological Study of Degree, Manner and Quality Demonstratives in Chinese Dialects*. Handout of talk at IACL-30.
- Yang, Xiaodong, and Martina Wiltschko. 2016. "The confirmational marker *ha* in Northern Mandarin." *Journal of Pragmatics* 104:67–82.