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Differentiating between evidential bias and epistemic bias in questions: Evidence from Cantonese

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This study argues that there are two sources of question bias: one from the speaker's epistemic states, another one from contextual evidence available in the discourse. Crucial support is drawn from four Cantonese yes-no question particles, which encode question bias of a particular type: epistemic bias for *maa3* (anti-biased/neutral), *ho2* (positive-biased), and *me1* (negative-biased); and positive evidential bias for *aa4*, which is underspecified for epistemic bias. Epistemic bias is modeled as arising from public beliefs of the possible answers, whereas evidential bias is analyzed as a requirement of a set of propositions in the Common Ground that entails the weak necessity of the positive answer to the question. A parallel between rising declaratives in English and Cantonese *aa4* is discussed, which also shows that evidential bias may be encoded either in the form of intonation or sentence-final particles.

I also propose that *aa4*'s apparent rhetorical use is a "higher-level" confirmational question on the addressee's belief rather than on the proposition itself. Given contextual evidence of the addressee's belief and obvious falsity of the proposition, using *aa4* triggers a conversational implicature of challenging the belief, leading to the rhetorical flavor. This account resolves some issues about yes-no rhetorical questions with negative answers, further strengthening the pragmatic approach to rhetorical questions.

Keywords: yes-no questions, evidential bias, epistemic bias, rhetorical questions, higher-level confirmation, Cantonese

1. Introduction

It has been long observed that question forms may differ in their expected answers, in other words, "biased" (Ladd 1981, Büring & Gunlogson 2000; Gunlogson 2002; Romero & Han 2004; Sudo 2013; Gyuris 2017; Xu 2017; Romero 2024, *i.a.*). For example, a polar question with subject-verb inversion in (1) does not have a speaker expectation of the positive or the negative answer, whereas a rising declarative question in (2) is biased towards the positive answer.

(1) **Polar questions with subject-verb inversion in English**

[Context: You're in a windowless room and curious about the weather outside. You ask a person who just came in from the outside.]

Is it raining? (neutral)

(2) **Rising declarative questions in English**

[Context: You're in a room and see water drops on the window. You ask a person who just came in from the outside.]

It's raining? (positive-biased)

Similar contrasts have been investigated extensively in two types of A-not-A questions in Mandarin Chinese, one formed by verbs, another one formed by the (cleft/verum) focus particle *shi* (the so-called B-not-B questions; Hagstrom 2017). It has been observed that A-not-A is always neutral (“anti-biased”) whereas B-not-B is positively biased (Schaffar & Chen 2001; Yuan & Hara 2013; Ye 2020; Wang 2024), as illustrated in (3).

(3) **A-not-A and B-not-B questions in Mandarin Chinese**

a. [Zhangsan is interviewing Lisi, a student he knows nothing about. He is interested in Lisi's research interests.]

Ni xihuan-bu-xihuan yuyongxue? (neutral)

2SG like-not-like pragmatics

‘Do you like pragmatics?’ (Ye 2020: 356)

b. [Zhangsan is curious about Lisi's research interests. In the library, he finds that Lisi is borrowing some books on pragmatics.]

Ni shi-bu-shi xihuan yuyongxue? (positive-biased)

2SG FOC-not-FOC like pragmatics

‘Is it pragmatics that you like?’ (Ye 2020: 356)

The main goal of this paper is to investigate the nature of question bias through the lens of yes-no question sentence-final particles (SFPs) in Cantonese (Hong Kong). What is remarkable about Cantonese is that it has a rich repertoire of yes-no question particles, *all* encoded with question (anti-)bias, as illustrated by the four particles in (4):¹

¹ All the Cantonese examples are transcribed in *Jyutping*, also known as the Linguistic Society of Hong Kong Cantonese Romanization Scheme. Tones are represented as follows: 1 = high level [55]/[1], 2 = high rising [35]/[4], 3 = mid-level [33]/[4], 4 = low falling [21]/[4], 5 = low rising [13]/[4], 6 = low level [22]/[4]. Tone marks are omitted except for SFPs.

(4) **Yes-no question particles in Cantonese**

- a. *Aaming wui lai maa3?* (neutral/anti-biased)²
Ming will come SFP
'Will Ming come?'
- b. *Aaming wui lai o3ho2?* (positive-biased)³
Ming will come SFP
'Ming will come, won't he?'
- c. *Aaming wui lai me1?* (negative-biased)
Ming will come SFP
'Ming won't come, will he?'
- d. *Aaming wui lai aa4?*
Ming will come SFP
'Ming will come? (is that true?)'

Notably, they have a nice division of labor in encoding bias: *maa3* for neutrality (anti-bias) in (4)a, *ho2* for positive bias in (4)b, and *me1* for negative bias in (4)c (Hara 2014; Lam 2014; Wakefield 2014; Law, Li & Bhadra 2018; 2024; Tang 2020; Ng to appear; see Hara 2023 for experimental support; also Koung 2008 for Macau Cantonese). However, the question bias of *aa4* in (4)d has been debatable. While previous studies agree that *aa4*'s major function is to seek confirmation from the addressee (Cheung 2007[1972]: 188; Law 1990: 101; Leung 2005[1992]: 64; Li et al. 1995: 520; Sybesma & Li 2007; Tang 2015: 234-235), they diverge regarding *aa4*'s bias: positive bias (Matthews & Yip 1994, Wakefield 2014), negative bias or "rhetorical" (Matthews & Yip 1994; Li et al. 1995; Kuong 2008), or even flexible between neutral and negative biases (Hara 2014; 2023). Interestingly, *aa4* is consistently translated as English rising declaratives by native Cantonese-English bilinguals (Wakefield 2014), which are clearly biased as in we have seen in (2).

The goal of this paper is three-fold. First, drawing on a growing body of literature on differentiating between sources of question bias (Sudo 2013; Gyuris 2017; also Buring & Gunlogson 2000; Romero & Han 2004; Bhadra 2017; 2020), I argue that Cantonese yes-no question particles can be divided into two sets according to the bias sources: *contextual evidence* vs. *epistemic states*. Specifically, *aa4* is sensitive to the evidence available in the context but not the speaker's belief/commitment of the proposition being questioned,

² *Maa3* is a native Cantonese SFP developed from *m4* 'not' and SFP *aa3* (Leung 2005: 78), instead of being borrowed from Mandarin. While Mandarin yes-no question particle *ma* is underspecified and may be used in neutral or biased contexts (Schaffar & Chen 2001: 839-840), Cantonese *maa3* must be neutral and is incompatible with biased contexts (see §3).

³ *O3* in *o3ho2* is argued to be a dummy particle (see Tang 2020). When *o3* is absent, *ho2* can precede by the assertive *aa3* with similar meaning (but see the discussion in footnote 10).

i.e., *aa4* encodes **positive evidential bias** and is **underspecified for epistemic bias**. In contrast, *maa3*, *ho2*, and *me1* encode only epistemic bias (neutral, positive, and negative respectively), and do not require the presence of contextual evidence. This serves as a novel piece of evidence for the distinction between the two types of bias. The parallel between English rising declaratives and Cantonese *aa4* further suggest that evidential bias can either be encoded by intonation or by segmental particles.

Second, I discuss how contextual evidence and epistemic states may interact and result in rhetorical questions (RQs). *Aa4* has a secondary use which conveys a negative rhetorical reading. I argue that it is a “higher-level” use which operates on the addressee’s belief of a proposition *p*, rather than on *p* itself (cf. Wiltschko & Heim 2016; Law et al. 2018; 2024). This use is licensed by positive contextual evidence for the addressee’s belief of *p*, and the speaker’s negative epistemic state of *p*. The negative rhetorical reading arises as a conversational implicature from questioning the addressee’s belief of a proposition that the speaker considered to be obviously false. This provides an alternative pragmatic account for yes-no RQs that have only negative answers without positing them as having negative operators (Sadock 1971; Han 2002; cf. Caponigro & Sprouse 2007; Farkas 2024b for the pragmatic view).

Last but not least, I address the discrepancy on *aa4* in the literature of Cantonese linguistics, which is largely due to a dual conflation of evidential vs. epistemic bias and of confirming the proposition vs. the addressee’s belief. I demonstrate that resorting to the notion of evidential bias and the pragmatic approach to RQs resolves the discrepancy.

The rest of this paper is organized as follows. §2 provides a general description of Cantonese yes-no question particles, on both their syntactic and semantic properties. §3 examines the question bias of *aa4* by contrasting it with *maa3*, *ho2* and *me1* in terms of evidential bias and epistemic bias, with relevant discussion on English rising declaratives. §4 proposes a formulation of the two types of bias, with a focus on the positive evidential bias of *aa4*. §5 is devoted to the “higher-level” use of *aa4* that results in a negative rhetorical reading, with implications on the competing approaches to RQs. §6 concludes the paper.

2. An overview of Cantonese yes-no question particles

This section provides an overview of the four yes-no question particles in Cantonese. §2.1 describes their syntactic properties and the necessary background of the decompositional approach to Cantonese SFPs. §2.2

describes types of questions that they may occur in with regard to the required epistemic states of the speaker and addressee.

2.1 Syntactic properties

I discuss the clause type requirement of *aa4*, *maa3*, *ho2* and *me1* first. All the four particles may turn a declarative clause into a yes-no question (repeated from (4) in (5)). As shown in (6), *Aa4*, *maa3*, *o3ho2*, and *me1* are incompatible with the interrogative A-not-A forms as well.⁴ Note that they can only form yes-no questions and cannot form *wh*-questions and alternative questions.

- (5) *Aaming wui lai {aa4/ maa3/o3ho2/ me1}?*
 Ming will come SFP SFP SFP SFP
 ‘Will Ming come?’ (bias omitted)
- (6) *Aaming wui-m-wui lai (*aa4/ *maa3/ *o3ho2 / *me1)?*
 Ming will-not-will come SFP SFP SFP SFP
 ‘Will Ming come?’ (bias omitted)

Second, the four particles are not equally embeddable. Except for *maa3*, the other three particles cannot be embedded under both responsive predicates like ‘know’ in (7)a and rogative predicates like ‘wonder’ in (7)b. They can only be embedded in quotations under ‘ask’ like (7)c, where the indexical shift of *ngo* ‘I’ indicates that the lower clause is a direct quotation. *Maa3* may be embedded under rogatives but not responsives, similar to English subject-verb inversion, Hindi polar question particle *kya*, and Mandarin yes-no question particle *ma* (Bhatt & Dayal 2020; Dayal 2023; see Liu 2024; Luo 2024; Liu & Luo 2025 for Mandarin). In contrast, the A-not-A form interrogative A-not-A can be embedded under responsives in (8), just like English interrogative complementizer *whether* or Japanese question morpheme *ka*.

⁴ For *ho2* to be compatible with A-not-A, a preceding question particle *ne1*, which can occur with A-not-A, VP-neg *mei6* ‘not yet’, and *wh*-questions, must be added, as in (i). This use is slightly different from the canonical use of confirming the proposition. It confirms whether the addressee shares the same question/wonder as the speaker does (see more discussion in §5.3; Law et al. 2024; Ng to appear).

- (i) *Aaming wui-m-wui lai ne1 ho2?*
 Ming will-not-will come SFP SFP
 ‘Will Ming come? Do you share my wonder?’

(7) **Embeddability of Cantonese yes-no question particles**

- a. *Keoi zidou* (responsive predicate)
 3SG know
 [Aafan wui hoeng {*aa4/ *maa3/ *o3ho2/ *me1}].
 Fan will go SFP SFP SFP SFP
 Int.: ‘S/he knows whether Fan will go.’ (bias omitted)
- b. *Keoi soeng zidou* (rogative predicate)
 3SG want know
 [Aafan wui hoeng {*aa4/ ^{OK}maa3/ *o3ho2/ *me1}].
 Fan will go SFP SFP SFP SFP
 ‘Ming wonders whether Fan will go.’ (bias omitted)
- c. *Keoi_i man:* (quotation)
 3SG ask
 [Aafan wui wan ngo_i {aa4/ maa3/ o3ho2/ me1}?]
 Fan will find 1SG SFP SFP SFP SFP
 ‘S/he_i asks: “will Fan find me_i?”’ (bias omitted)

(8) *Aaming zidou [Aafan wui-m-wui hoeng].*

Ming know Fan will-not-will go
 ‘Ming knows whether Fan will go.’

Dayal’s (2023) proposes a three-tier periphery for questions to capture the embedding patterns in English similar to (7)-(8), as in (9). CP supports regular embedding and contributes to the interrogative clause type, whereas Speech Act Phrase (SAP) cannot be embedded (except quotation), amounting to question speech acts. There is a middle projection, Persp(ective)P, which signals speaker’s attitude (e.g., belief or knowledge states) towards the (set of) proposition(s) denoted by CP.⁵ In the case of questions, it signals the speaker’s ignorance of the answer (see footnote 21). Elements that can be embedded under rogatives but not responsives fall under PerspP.

(9) **The three-tier periphery for questions in Dayal (2023)**

[SAP ... [PerspP ... [CP ...

Adopting Dayal’s (2023) three-tier periphery, I suggest that *aa4* is located at the highest illocutionary SAP along with the biased *me1* and *ho2*, whereas *maa3* is at the lower PerspectiveP, schematized in (10). The interrogative A-not-A can be analyzed as on the CP level after covert

⁵ This is similar to the “grounding” function of GroundP in Wiltschko & Heim (2016), which is also a middle projection between the highest Resp(onding)P and lower CP.

movement (Huang 1991; see Law 2001; 2004 for Cantonese).⁶

(10) Fitting the Cantonese yes-no question devices into the three-tier periphery in Dayal (2023)

[_{SAP} *aa4/ho2/me1* [_{PerspP} *maa3* [_{CP} A-not-A_[+Q] [_{TP} ...

Note that (10) is only meant to formally represent the embedding patterns of these yes-no question particles. There have been various proposals of Cantonese SFPs' cartographic syntax (e.g., Sybesma & Li 2007; Tang 2015; 2020; Lau 2019; Wakefield 2020), and it is not the main goal of this paper to adjudicate between them. As we will see in §5, the non-embeddability of *aa4* will play an important role in explaining a puzzling rhetorical use of *aa4*.

Third, there are some variants of *aa4* that may be further decomposed into multiple SFPs. *Aa4* has four variants: *aa4*, *laa4*, *gaa4* and *zaa4*. It is a consensus that the latter three are a result of combining the temporal *l-*, assertive *g-* and restrictive *z-* with *aa4* respectively (Law 1990; Sybesma & Li 2007; Ding 2013; Lau 2019, *i.a.*). These "SFP onsets" have non-question counterparts, such as *laa1* (imperative or declarative), *laa3* (declarative); *ge3*, *gaa3* (both declarative); and *zaa3*, *ze1* (both declarative).

Following the decompositional approach, I suggest that *l-*, *g-*, and *z-* also project in the syntax, and they combine with *aa4* through head movement for phonological support. I assume the temporal *l-* to be at TP, the assertive *g-* to be at CP (see Tang 2000 for regular embedding of *ge3*), and *z-* to be at in the CP layer (Ann Law 2002; Tang 2015; Paul Law 2023; Yip 2023; against the TP-internal approach in Tang 1998; Cheng 2015), but slightly higher, at PerspectiveP, since it can follow *g-* as in the SFP cluster *ge3 zaa3*. The decomposition is illustrated in (11).⁷

⁶ In Tang's (2020) cartographic syntax, there are five projections as in (i). CoAP (Call on Addressee Phrase) roughly corresponds to Dayal's SAP, DegreeP roughly corresponds to SAP and/or PerspP, and FocusP roughly corresponds to PerspP. CP projects in between TempP and FocusP. Tang (2020) treats *ho2* as base-generated at DegreeP and moved to CoAP, which is consistent with (10).

(i) [_{CoAP} CoA [_{DegreeP} Degree [_{FocusP} Focus [_{TempP} Temp [_{EventP} Event ...

⁷ A question that arises is whether *aa4* may be further decomposed. *Aa4* is minimally different from a neutral *aa3* which may appear in various clause types (Lau 2019). It is attractive to analyze the low falling tone 4 [2¹] as a low intonation/boundary tone rather than a lexical tone, i.e., *aa4* = *aa3* + L% (see experimental support from Lee 2021; see also Sybesma & Li 2007; Ding 2013; Zhang & Tang 2016; Lau 2019 for decomposing *aa1* and *aa5*). Nevertheless, this decompositional analysis faces difficulties of defining the exact contribution of the L%. Although *aa4* forms a yes-no question, other tone 4 SFPs, such as *wo4* (mirative), *lo4* (obviousness) and *le4* (suggestion), do not form a yes-no question. It is thus implausible to analyze L% as having a question semantics, otherwise the source of *aa4*'s question reading would be unclear.

(11) **The decomposition of *aa4*'s variants**

- a. *laa4* → [SAP *aa4* [PerspP ... [CP ... [TP *l-*
- b. *gaa4* → [SAP *aa4* [PerspP ... [CP *g-* [TP ...
- c. *zaa4* → [SAP *aa4* [PerspP *z-* [CP ... [TP ...

2.2 Types of questions and the seat of knowledge

I discuss three types of questions: information-seeking questions, quiz questions, and rhetorical questions (Dayal 2016: §9; Zu 2018: §3; see Farkas 2024a for a detailed classification). They differ in the required epistemic states of the speaker and addressee. I adopt the term “Seat of Knowledge (SoK)” from Zu (2018) to illustrate, but with a difference in defining SoK in terms of knowledge instead of belief, unlike what Zu does. That is, if a proposition *p* is in the speaker’s knowledge set, the speaker is the SoK of *p*. In information-seeking questions, only the addressee, but not the speaker, is presumed to have knowledge on the proposition being asked and is the SoK. In quiz questions, the SoK is flipped: only the speaker is the SoK. In RQs, both the speaker and the addressee are the SoK. In other words, the answer is contained in the Common Ground (CG) in Stalnaker (1984; 2002)’s sense for RQs.

First, all the four particles may be used in an information-seeking question, as in (12). While the licensing contexts are slightly different, in all the scenarios the police officer does not know the nationality of the addressee who clearly has the relevant knowledge of himself. The police officer only has speculations (but not knowledge) on the nationality, and asks the addressee for information (i.e., nationality).

Nevertheless, as we will see, *aa4* encodes positive evidential bias. Curiously, *aa4*, *wo4* and *lo4* are also related to evidentiality (Law 1990). The relation between the low boundary tone L% and evidentiality is worth studying. Moreover, as noted in Law (1990) and Leung (2005), there are other uses of *aa4* in declaratives and imperatives. These uses are not popular in modern-day Cantonese, but they suggest that *aa4* might not be a genuine question particle historically. Synchronically, *aa4* also has a topic-marking function (as in (i)) and a backchanneling function like “um hum”, such as *gam aa4* ‘(lit.) that + SFP’ or *hai aa4* ‘(lit.) be + SFP’, which is different from a question speech act. I leave the decomposition of *aa4* to future research.

- (i) [Context: A asks: “Will Ming come?” B responds:]
Aaming aa4? *Naan gong.*
Ming SFP hard say
‘As for Ming, it’s hard to say.’

(12) Information-seeking questions

- a. [Scenario: Jimmy is asked to take a seat in an interrogation room of a police station in Hong Kong. A police officer asks for Jimmy's name and says:] (Scenario adapted from Hara 2014: 607)

Nei hai Hoenggong jan {aa4/ maa3}?

2SG be Hong Kong person SFP SFP

'Are you a Hong Konger?'

- b. [Scenario: same as (a), except that a colleague says that Jimmy holds a Hong Kong ID. The police officer says:]

Nei hai Hoenggong jan o3ho2?

2SG be Hong Kong person SFP

'You are a Hong Konger, right?'

- c. [Scenario: same as (a), except Jimmy only speaks English and the police officer thinks that he is American. Yet, a colleague says that he holds a Hong Kong ID. The police officer is confused, and says:]

Ji2? Nei hai Hoenggong jan me1?

INTERJ 2SG be Hong Kong person SFP

'What? You're a Hong Konger? (No way!)' (with surprise)

Second, only *maa3* may be used in quiz questions, but not *aa4*, *me1* and *ho2*.⁸ In (13), only the teacher, but not the students,⁸ is presumed to know the answer.

(13) Quiz questions

[Scenario: In a class, a biology teacher asks the students:]

- a. *Haau-haa neidei*,

examine 2PL

ngau sik kwancung {#aa4/ ^{OK}maa3/ #o3ho2/ #me1}?

cow eat insect SFP SFP SFP SFP

Int.: 'Let me ask you: do cows eat insects?'

- b. *Haau-haa neidei, ngau sik-m-sik kwancung (gaa3)?*

examine 2PL cow eat-not-eat insect SFP

'Let me ask you: do cows eat insects?'

Last but not least, only *me1* and *ho2* can serve as RQs, but not *aa4* and *maa3*.⁹ Three diagnostic tests are provided. First, adverbials like *after all*,

⁸ For some speakers, *maa3* may not be completely natural in an informal setting. *Maa3* is in general restricted in formal registers in Modern Cantonese (Tang 2015: 233). Since A-not-A also encodes neutrality (Hara 2014), I provide the A-not-A counterparts whenever appropriate.

⁹ I will return to the so-called rhetorical use of *aa4* in §5.

which require an assertion-like force, distinguish RQs from the above types of questions (Sadock 1971, 1974, Han 2002). While the question in (14)a can be used for information seeking, it only has an RQ reading with *after all* in (14)b and implies a negative answer.

- (14)a. Do phonemes have anything to do with language?
 b. After all, do phonemes have anything to do with language?
 (Han 2002: 203)

This test has been adopted in Cantonese using *lousat gong* ‘frankly speaking’ and *gongdoumei* ‘after all’ (Cheung 2009, Tang 2022). As shown in (15)-(16), only *me1* and *ho2* may form an RQ, but not *aa4* and *maa3*.¹⁰ In the given contexts, it is presumed that both speaker and addressee know the answer, namely “Ming won’t come” in (15) and “the pandemic won’t end” in (16).

(15) Rhetorical questions

[Scenario: You and Fan have a meeting with Ming at 3 pm. It is 4 pm now and you think Ming won’t come. Fan said nothing. You say:]

- a. *Lousat gong, Aaming wui lai {#aa4/ #maa3/ OKme1}?*
 frankly speak Ming will come SFP SFP SFP
 ‘Frankly speaking, Ming won’t come, will he?’
 b. *Lousat gong, Aaming m-wui lai {#aa4/ #maa3/ OKlaa3 ho2}?*
 frankly speak Ming not-will come SFP SFP SFP SFP
 ‘Frankly speaking, Ming won’t come, will he?’

(16) Rhetorical questions

[Scenario: In December 2021, you and Ming were discussing the pandemic. Since COVID variants emerged one after another, you both lost hope for the society to go back to normal. You said:]

- a. *Gongdoumei, go jikcing wui jyun {#aa4/ #maa3/ OKme1}?*
 after.all CL pandemic will end SFP SFP SFP
 ‘After all, the pandemic won’t end, will it?’
 b. *Gongdoumei, go jikcing m-wui jyun {#aa4/ #maa3/ OKlaa3 ho2}?*
 after.all CL pandemic not-will end SFP SFP SFP SFP
 ‘After all, the pandemic won’t end, will it?’

¹⁰ Without *laa3* (i.e., temporal *l-* + *aa3*), *o3ho2* is not natural in (15)-(16). There might be a slight pragmatic difference between *o3ho2* and *aa3 ho2* (Anonymized p.c.), where *o3ho2* sounds a bit more committed. Tang (2020) claims that *o3* is a dummy particle and cannot be used as an SFP alone. It is not clear whether the difference is raised by the so-called “softening” function of *aa3* (Leung 2005; but see Lau 2019), or that *o3* does have its own contribution. I set aside this issue for now. What is crucial is that both *(l)aa3 ho2* and *o3ho2* convey positive bias.

The second test comes from *wh*-RQs that only have a negative answer in Cantonese (dubbed as negative *wh*-constructions in Cheung 2009; see Tang 2022; Choi 2024a; 2024b for an RQ analysis). Only questions formed by *me1* and *ho2* may follow the *wh*-RQs formed by the negative *bin* ‘where’ in (17), but not questions formed by *aa4* and *maa3*.

(17)[In the COVID scenario in (16):]

- Go jikcing bin wui jyun aa1?*... (wh-RQ)
 CL pandemic where will end SFP
 ‘The pandemic won’t end, will it? ...’
- a. ... *go jikcing wui jyun {#aa4/ #maa3/ ^{OK}me1}*?
 CL pandemic will end SFP SFP SFP
 ‘... The pandemic won’t end, will it?’
- b. ... *go jikcing m-wui jyun {#aa4/ #maa3/ ^{OK}laa3 ho2}*?
 CL pandemic not-will end SFP SFP SFP SFP
 ‘... The pandemic won’t end, will it?’

Third, Wei (2020) observes that the discourse particle *you* (lit. ‘again’) in Mandarin requires a negative assertion. She notes that yes-no questions following the negative assertion must be interpreted as rhetorical. The Cantonese *jau* counterpart behaves the same. In (18), John rejects Mary’s suggestion to take a cab with *jau* (see Wei 2020: 161 for the Mandarin example). The following yes-no question can only be formed by *me1/ho2* but not *aa4/maa3*. This shows that *aa4/maa3* questions cannot serve as RQs.

(18)[Scenario: John and Mary are leaving the house to a football game.]

- Mary: *Ngodei ko dik le4.*
 1PL call taxi SFP
 ‘Let’s call for a cab.’
- John: *Kaucoeng jau m-jyun, ...*
 stadium JAU not-far,
 ‘The stadium is not far.’
- a. ... *ngodei seoiuiu ko dik {#aa4/ #maa3/ ^{OK}me1}*?
 1PL need call taxi SFP SFP SFP
 ‘We don’t need to take a cab, do we?’
- b. ... *ngodei m-seoiuiu ko dik {#aa4/ #maa3/ ^{OK}laa1 ho2}*?
 1PL not-need call taxi SFP SFP SFP SFP
 ‘We don’t need to take a cab, do we?’

A summary of the distribution of yes-no question particles is given in Table 1.

Table 1. The distribution of Cantonese yes-no question particles according to question types

Types of questions	Seat of Knowledge		<i>Aa4</i>	<i>Maa3</i>	<i>Ho2</i>	<i>Me1</i>	Ex.
	Speaker?	Addressee?					
Information-seeking	NO	YES	OK	OK	OK	OK	(12)
Quiz	YES	NO	#	OK	#	#	(13)
Rhetorical	YES	YES	#	#	OK	OK	(15)- (18)

Aa4 can only be used in information-seeking questions but not in quiz questions and RQs. That is, *aa4* requires the SoK *not* to be the speaker, i.e. the speaker does not know the answer. Such requirement is not found with *maa3*, *ho2* and *me1*, which show complementary distribution when the SoK is the speaker (i.e., quiz questions & RQs). The complementary distribution may be attributed to their biases: *maa3* requires the lack of bias which is incompatible with RQs (which are always biased); and the bias encoded in *ho2* and *me1* provides hints for the answer and thus leads to the infelicity in quiz questions.

3. Two types of question bias: evidential vs. epistemic

Let us now consider the bias in yes-no questions formed by the four particles. In §3.1, I demonstrate that *aa4* is interchangeable with *maa3*, *me1* and *ho2* respectively, showing an apparent flexibility in bias. In §3.2, I show that *aa4* encodes positive evidential bias and the flexibility only applies to epistemic bias. *Maa3*, *me1* and *ho2*, on the other hand, only encode epistemic bias, but not evidential bias.

3.1 *Aa4*'s flexibility of bias

First, *aa4* is compatible with a “neutral” context where *maa3* can be used (*cf.* Hara 2014), such as the information-seeking question in (12) (repeated below as (19)). The context is “neutral” in the sense that the speaker does not have any prior belief on the nationality of Jimmy.¹¹ *Ho2* and *me1* are not felicitous in such a neutral context (see (12)b-c for the licensing contexts).

¹¹ Nevertheless, this context potentially supports positive evidential bias, given that the police station is in Hong Kong and “Jimmy” is also a common Western name that Hong Kongers use.

(19) **A neutral context where the speaker lacks prior belief**

[Scenario: Jimmy is asked to take a seat in an interrogation room of a police station in Hong Kong. A police officer asks for Jimmy's name and then says:] (Scenario adapted from Hara 2014: 607)

- a. *Nei hai Hoenggong jan* {^{OK}*aa4/* ^{OK}*maa3/* #*o3ho2/* #*me1*}?
2SG be Hong Kong person SFP SFP SFP SFP
'Are you a Hong Konger?'
- b. *Nei hai-m-hai Hoenggong jan* (*aa3*)?¹²
2SG be-not-be Hong Kong person SFP
'Are you a Hong Konger?'

Second, *aa4* may be used in a context that favors the expectation of a positive answer (cf. Matthews & Yip 1994: 310; Wakefield 2014). In (20), both *laa4* (*aa4*'s variant, see §2.1) and *ho2* can be used by the teacher for asking the students to confirm the proposition that s/he presumes to be true. As expected, the neutral *maa3*/A-not-A and negative-biased *me1* are not felicitous.¹³

(20) **A positive-biased context**

[Scenario: You are a teacher monitoring a final exam. The exam has ended, and the teaching fellow has collected the exam papers, stacked in front of you. You think that all the students probably have submitted their exam papers, but nevertheless ask the teaching fellow for final confirmation:]

- a. *Taaigaa gaau-cai gyun* {*laa4/ laa3 ho2/* #*maa3/* #*laa3 me1*}?
everyone submit-all paper SFP SFP SFP SFP SFP SFP
Gam syunbou zau-dak.
then announce go-can
'Everyone has submitted their exam papers, right? Then tell the students they can go.'
- b. #*Taaigaa jau-mou* *gaau-cai gyun?*
everyone have-not.have submit-all paper
Int.: 'Has everyone submitted their exam papers?'

Third, *aa4* can also be used in a negative-biased context such as (21) (cf. Matthews & Yip 1994: 311, 346; Li et al. 1995: 520, Hara 2014). The speaker has reasons to believe the negative answer, and both *aa4* and *me1* can be used

¹² Note that this A-not-A is formed by the copula *hai* 'be', but not the focus particle *hai*. The latter forms the so-called B-not-B questions which are positive-biased (see §1).

¹³ If the A-not-A is formed by the focus particle *hai* instead of the aspectual marker *jau* 'have', a positive-biased question with verum focus can be obtained and (20)b will be felicitous.

to express doubt about the opposite claim in the context. Again, the positive-biased *ho2* and neutral A-not-A/*maa3* are disallowed.

(21) **A negative-biased context**

[Scenario: In the beginning of 2022, Ming is checking the new calendar. He said there is a 29th this February. You think that 2022 is not divisible by 4 (and hence not a leap year), but you didn't really do the calculation. You then say:] (adapted from Hara 2014: 607, scenario enriched)

- a. *Zanhai?* *Gam go jiyut jau*
 really this CL February have
jaagau hou {aa4/ me1/ #maa3/ #o3ho3}?
 29 date SFP SFP SFP SFP
 'Really? Is there a 29th this February?' (I doubt it. You sure?)
- b. *Zanhai?#Gam go jiyut jau-mou jaagau hou?*
 really this CL February have-not.have 29 date
 Int.: 'Really? Does this February have a 29th?'

We have seen that *aa4* appears to have flexibility of bias and can be interchanged with *maa3* (or A-not-A) in neutral contexts, with *ho2* in positive-biased contexts and with *me1* in negative-biased contexts. This is further supported by Hara's (2023) experimental study, which shows that *aa4* can be used in all these three contexts. In the next section, I show that the flexibility only applies to epistemic bias but not evidential bias.

3.2 Epistemic bias vs. evidential bias

As suggested as early as by Ladd (1981), there are two sources of bias in English yes-no questions, either from the speaker or from the context. This idea is further elaborated in subsequent work across languages like Japanese and Hungarian (Büiring & Gunlogson 2000; Gunlogson 2002; Romero & Han 2004; Sudo 2013; Gyuris 2017; Romero 2024; see also Bhadra 2017; 2020 for the link between questions bias and evidentiality in Bangla). Epistemic bias is treated as from the speaker's epistemic state, specifically belief (but not knowledge).¹⁴ Evidential bias comes from contextual evidence "mutually available to the participants in the current discourse situation" (Sudo 2013: 4). Sudo (2013) demonstrates that a question may have different requirements on epistemic bias and evidential bias. For example, an English polar question is

¹⁴ If epistemic bias came from knowledge, one would *wrongly* predict that positive-biased *ho2* and negative-biased *me1* cannot be used in information-seeking questions (where the speaker is *not* the SoK), which is not the case.

neutral regarding epistemic bias, but rejects a context with negative evidence. The wet raincoat in (22) is negative evidence for the proposition “it is sunny”.

(22)[Context: My officemate enters the windowless computer room wearing a dripping wet raincoat.] What’s the weather like out there?

- a. *#Is it sunny?*
- b. *Is it raining?* (Sudo 2013:3)

In what follows, I will show that *aa4*’s flexibility of bias is only applicable to epistemic bias, but not evidential bias. *Aa4* requires a context where supporting evidence for the proposition must be available for the discourse participants. That is, *aa4* has obligatory positive evidential bias and underspecified epistemic bias. On the other hand, *maa3*, *ho2* and *me1* require relevant epistemic states of the speaker instead of contextual evidence. They only encode epistemic bias and are underspecified for evidential bias.¹⁵

In a neutral context with neither speaker’s belief nor contextual evidence of the possible answers, *aa4* is not felicitous, such as in (23):

(23) No epistemic bias and no evidential bias

[Scenario: Ming has just opened a Kinder Surprise Egg. You are guessing what kind of toys is in it. You ask Ming:]

- a. *Leoimin jau ce {#aa4/ maa3}?*
inside have car SFP SFP
‘Is there a car inside?’
- b. *Leoimin jau-mou ce?*
inside have-not.have car
‘Is there a car inside?’

There is no clue for the toy inside the Kinder Egg in (23). This contrasts with the “Jimmy’s name” scenario in (19) where *aa4* is interchangeable with A-not-A: that the scenario happens in Hong Kong, and that “Jimmy” is a common Western name Hong Kongers use, may be taken as weak evidence for a Hong Kong identity. Although the speaker’s epistemic states in (23) and in (19) are both neutral, the lack of positive evidence in (23) disfavors the use of *aa4*. In contrast, *maa3* and A-not-A can be used in (23) even with the absence of contextual evidence.

For positive bias, *aa4* is only felicitous if it is evidence-based. In (24),

¹⁵ The picture becomes complicated with *strong* evidence in the context, which may lead to a positive or negative epistemic state of the speaker. In those cases, evidential bias cannot be separated from epistemic bias. See the discussion under (25).

that Ming knows “I” like lobsters facilitates a positive epistemic bias towards “Ming bought lobsters”. There is however no positive contextual evidence available to the speaker due to the phone call scenario, and *aa4* is not licensed.

(24) Positive epistemic bias and no evidential bias

[Scenario: Ming knows that lobsters are your favorite food. Today, Ming has gone to a seafood store with Fan. You think that he will probably buy lobsters for you and are excited. You call Fan, and ask:]

Aaming maai-zo lunghaa {#aa4/ o3ho2}?

Ming buy-PFV lobster SFP SFP

‘Ming bought lobsters, didn’t he?’

In contrast, while the speaker in (25) has a neutral epistemic state, as indicated by the information-seeking constituent question, the red claw is (weak) positive evidence. *Aa4* is allowed in (25). *Ho2*, which requires positive epistemic bias, has a flipped pattern and can only be used in (24).

(25) No epistemic bias and positive evidential bias

[Scenario: Today, Ming went to a seafood store with Fan. Ming came back, holding a bag in which there seems to be a red claw, but you cannot see it very clearly. You’re not sure what that is and ask Fan:]

Aaming maai-zo mat? Aaming maai-zo lunghaa {aa4/ #o3ho2}?

Ming buy-PFV what Ming buy-PFV lobster SFP SFP

‘What did Ming buy? Did Ming buy lobsters?’

It should be noted that it is difficult to be completely epistemically neutral with positive evidence. In (25), for example, if the speaker sees the red claw clearly and does not entertain the possibility of a red crab, *ho2* can be used, as in (26). That is, the red claw becomes a piece of strong positive evidence, which leads the speaker to believe that “Ming bought lobsters”. Hence, increasing the strength of evidence may lead to a change in epistemic state.

(26) Strong positive evidence feeds positive epistemic state

[Scenario: Same as (25), except that you can see the red claw clearly. You think it’s a lobster claw, and ask Fan:]

Aaming maai-zo lunghaa {aa4/ o3ho2}?

Ming buy-PFV lobster SFP SFP

‘Did Ming buy lobsters?’

Indeed, contextual evidence appears to always trigger some strength of epistemic bias. Even in the original scenario in (25), the speaker has a very

weak positive epistemic bias towards lobsters. However, the bias is too weak to be considered as a belief or a commitment. This can be seen in (27) with modalized assertions. While epistemic modals presuppose indirect evidence (von Fintel & Gillies 2010), only the strong evidence in (26) licenses the necessity modal. The weak evidence in (25) only licenses the possibility modal.

- (27)a. [Scenario in (25)]
Aaming { #*jatding/ honang* } *maai-zo lunghaa.*
 Ming definitely possible buy-PFV lobster
 ‘Ming {#must/might} have bought lobsters.’
- b. [Scenario in (26)]
Aaming { *jatding/ honang* } *maai-zo lunghaa.*
 Ming definitely possible buy-PFV lobster
 ‘Ming {must/might} have bought lobsters.’

Now, let us consider negative bias. *Aa4* cannot be used regardless of the source of the bias. In (28), the context provides no evidence for whether Ming will go, but the speaker has prior belief of the negative answer. The negative epistemic bias is not sufficient to license *aa4*.

(28) Negative epistemic bias and no evidential bias

[Scenario: You and Fan are discussing who you should invite to tomorrow’s party. Fan is listing your common friends: Lok, Ming, ... When you hear Ming, you remember that he is an introvert that never goes to any social event. You stop Fan, and say:]

Haa2? *Aaming wui heoi* {#*aa4/ me1*}?

INTERJ Ming will go SFP SFP

‘What? Ming won’t go, will he?’ (We don’t need to invite him.)

In (29), Ming’s reluctant face is negative evidence for “Ming will go”, and the speaker has no prior (dis)belief of the proposition as indicated by the preceding assertion in (29)b. The negative evidential bias cannot license *aa4* either. Note that *me1* is also not completely natural due to the neutral epistemic bias. An appropriate continuation can be a modalized proposition like (29)c.¹⁶

¹⁶ If the evidence is strong enough to suggest the negative answer, it could facilitate a negative epistemic bias and licenses *me1*. For example, if Ming shakes his head in (29), *me1* in (29)b can then be used. In this case, (29)a appears to soften the tone of the rejection to Fan’s suggestion in (29)b, rather than to indicate the neutral epistemic state of the speaker.

(29) **No epistemic bias and negative evidential bias**

[Scenario: You meet Fan's friend Ming today. Fan suggests to you that you and Ming should go to her party tomorrow. You see Ming's reluctant face, and respond:]

- a. *Ngo m-zi Aaming soeng-m-soeng heoi,*
1SG not-know Ming want-not-want go
daan nei tai keoi go joeng, ...
but 2SG look 3SG CL face
'I don't know whether Ming wants to go or not, but look at his face, ...'
- b. ... *keoi wui heoi {#aa4/ ?me1}?*
3SG will go SFP SFP
Int.: '... will he go?'/ 'he won't go, will he?'
- c. ... *keoi honang m-wui heoi.*
3SG possible not-will go
'... he perhaps won't go.'

It is now clear that *aa4* only imposes requirements on contextual evidence and is underspecified for the speaker's epistemic state. What happens if the available contextual evidence points to different polarities (i.e., both positive and negative evidence are available)? (30) represents such a case.

(30) **Inconsistent contextual evidence**

[Scenario: You are a police officer in Hong Kong. Ming is asked to take a seat in an interrogation room of a police station. Your colleague said to you that he is an American. However, you see that Ming holds a Hong Kong passport. You say to your colleague:]

Haa2? Keoi hai Meiguo jan aa4?
INTERJ 3SG be US person SFP
'What? He is American? (you sure?)'

Regarding "Ming is American", the hearsay evidence from the colleague is positive whereas the inferential evidence from the Hong Kong passport is negative. Neither piece of evidence is decisive: the colleague could be mistaken, and double nationality (passports) is also possible in Hong Kong. *Aa4* can be used in this context, suggesting that *aa4* merely requires the existence of positive evidence and does not reject negative evidence.

Aa4 is often said to express "surprise" or even mirativity (Matthews & Yip 1994, Chor, Yap & Wong 2016). I suggest that it may come from inconsistency between epistemic bias and evidential bias. In (21) (repeated below as (31)), for example, the speaker tends to believe the negative answer,

whereas Ming provides a piece of positive (hearsay) evidence.

(31) Contextual evidence inconsistent with epistemic state

[Scenario: In the beginning of 2022, Ming is checking the new calendar. He said there is a 29th this February. You think that 2022 is not divisible by 4 (and hence not a leap year), but you didn't really do the calculation. You then say:]

Zanhai? Gam go jiyut jau jaagau hou *aa4*?

really this CL February have 29 date SFP

'Really? Is there a 29th this February?' (I doubt it. You sure?)

The evidence is out of speaker's expectation, which I take to be the source of the "surprise" use of *aa4*. This sense of counter-expectation can be strengthened if (i) the speaker saw that there is February 29th on the calendar (a stronger piece of positive evidence) and (ii) the year is 2021 which is clearly not divisible by 4 (a stronger negative epistemic bias).

All the above patterns are summarized in Table 2.

Table 2. Felicity conditions of Cantonese yes-no question particles¹⁷

Epistemic bias	Evidential bias	<i>aa4</i>	<i>maa3/A-not-A</i>	<i>ho2</i>	<i>me1</i>	Scenarios	Ex.
neutral	neutral	#	OK	#	#	Kinder Surprise Egg	(23)
neutral	+VEinferential	OK	OK	#	#	Nationality of Jimmy	(19)
neutral	+VEinferential	OK	OK	#	#	Lobsters in bag	(25)
neutral	+VEhearsay -VEinferential	OK	OK	#	#	Nationality of Ming	(29)
+ve	+VEinferential	OK	#	OK	#	Stacked exam papers	(20)
+ve	neutral	#	OK/# ¹⁸	OK	#	Lobsters expected	(24)
-ve	neutral	#	#	#	OK	Ming the introvert	(28)
-ve	+VEhearsay	OK	#	#	OK	Feb 29 th	(21)
neutral	-ve (inf.)	#	OK	#	#	Ming's face	(30)

All in all, *aa4* questions require positive evidential bias and are underspecified for epistemic bias. It requires a context where there is supporting evidence for a proposition *p*. The discrepancies on the bias of *aa4* in the literature can thus be resolved. *Maa3* (A-not-A), *ho2*, and *me1*, in

¹⁷ The supporting examples for judgments in gray boxes are not given due to space reasons.

¹⁸ Using A-not-A/*maa3* in (24) would appear to suggest that the speaker does not have strong faith in Ming. The positive epistemic bias is then gone, supporting the neutral use of A-not-A/*maa3*. If the speaker first asserts his/her faith in Ming, A-not-A/*maa3* becomes infelicitous.

contrast, require neutral epistemic states, positive epistemic bias, and negative epistemic bias respectively, and are underspecified for evidential bias. Table 3 gives a summary of the biases.

Table 3. The biases of Cantonese yes-no question particles

	Epistemic bias	Evidential bias
<i>aa4</i>	Underspecified	+ve
<i>maa3/A-not-A</i>	Neutral/Anti-biased	Underspecified
<i>ho2</i>	+ve	Underspecified
<i>me1</i>	-ve	Underspecified

4. Formulating question bias

This section gives a formulation of the two kinds of question bias. I adopt Stalnaker’s (1984, 2002) discourse model with the notion Common Ground, “the mutually recognized shared information in a situation in which an act of trying to communicate takes place” (2002: 704). It is defined recursively as a set of propositions P such that all discourse participants believe P , and they all believe that all participants believe P , and so on. I take positive evidence for a proposition p to be a set of propositions in CG (after Gyuris 2017)¹⁹ that entails the weak necessity (in Kratzer 1991’s sense)²⁰ of p . Positive evidential bias is a requirement of such a set, encoded in *aa4* as in (32):

(32) **The semantic contribution of *aa4***

Aa4 returns $Q_{\langle st, \triangleright \rangle}$ such that

- (i) $Q = \{p, \neg p\}$
- (ii) $\neg \text{Know}(s, \text{Ans}(Q))$
- (iii) $\text{Ev}(\text{CG}) \models \text{Probably}(p)$
- (iv) s puts a under obligation to **ASSERT**($\text{Ans}(Q)$)

where s = speaker; a = addressee; $\text{Ev}(\text{CG})$ = evidence available in the Common Ground; **Probably** = weak necessity modal

¹⁹ Gyuris’s (2017) original formulation is $\text{Ev}(C)$, where C refers to the context set yet without an explicit definition. Since contextual evidence is available to both speakers and addressees (Sudo 2013), I adopt Stalnaker’s notion of CG. Note that Gyuris (2017: 20, fn. 22) cites Buring & Gunlogson’s (2000: 8) observation that recent contextual evidence for p overrides previous beliefs of $\neg p$ in the CG to “re-open” the case. The *evidence* per se (as opposed to p), however, still need to be in the CG.

²⁰ Kratzer defines weak necessity as: “A proposition p is a weak necessity in a world w with respect to a modal base f and an ordering source g iff p is a better possibility than $\neg p$ in w with respect to f and g .” (1991: 644).

(32) captures four properties of *aa4* questions. First, *aa4* returns a set of propositions of “*p*” and “not *p*”, which is a yes-no question. Second, the speaker does not *know* the answer. The speaker is not the SoK for *p* (cf. §2.2) and the question remains “active” for the speaker.²¹ Third, the evidence available in CG entails a weak necessity of *p*. Thus, “*p*” is more probable than “not *p*” (cf. Kratzer 1991). That is, the context contains a set of propositions which constitute weak, positive evidence for *p*. Finally, *aa4* questions perform a speech act of asking the addressee to confirm the truth/falsity of *p*.

I suggest that *maa3*, *ho2* and *me1* crucially differ from *aa4* in lacking the evidential component (iii). Instead, they encode the epistemic states of the speaker. Concretely, they express a public commitment by the speaker concerning his/her belief of a proposition in (33):

(33) **The semantic contribution of *maa3*, *ho2*, and *me1***

Maa3/ho2/me1 returns $Q_{\langle st, t \rangle}$ such that

- (i) $Q = \{p, \neg p\}$
- (ii) $\neg \text{Know}(s, \text{Ans}(Q))$
- (iii) *Maa3*: $\text{ASSERT}(s, \neg \text{Believe}(s, p) \wedge \neg \text{Believe}(s, \neg p))$
Ho2: $\text{ASSERT}(s, \text{Believe}(s, p))$
Me1: $\text{ASSERT}(s, \text{Believe}(s, \neg p))$
- (iv) *s* puts *a* under obligation to $\text{ASSERT}(\text{Ans}(Q))$
 where *s* = speaker; *a* = addressee

For *maa3*, it is $\text{ASSERT}(s, \neg \text{Believe}(s, p) \wedge \neg \text{Believe}(s, \neg p))$: the speaker conveys a public commitment of holding no belief of “*p*” or “not *p*” (i.e., the possible answers of *Q*). In other words, *maa3* is anti-biased. However, the speaker can still hold *private* belief of one of the possible answers, such as in quiz questions (see (13)) where the speaker knows and believes the correct answer without committing to it publicly. For *ho2* and *me1*, it is $\text{ASSERT}(s, \text{Believe}(s, p))$ and $\text{ASSERT}(s, \text{Believe}(s, \neg p))$ respectively. The speaker conveys a public commitment of holding (dis)belief of *p*, leading to the epistemic bias. These three particles do not encode the evidential component like *aa4* does in (32)(iii), and do not require contextual evidence. On the other hand, *aa4* also does not encode such kind of public commitment (33)(iii), and hence is flexible in epistemic bias.

²¹ This is an adaption of the notion “P(otentially)-ACTIVE” in Dayal (2023). A question *Q* (set of propositions) is “P-ACTIVE” if and only if some perspective center *x* (e.g. the speaker) *might* not know the answer to *Q*, as in (i). I suggest a stronger version for *aa4*: *Q* is “ACTIVE” if and only if *x* *does not* know the answer to *Q*, as in (ii).

- (i) $\forall x \forall Q [\text{P-ACTIVE-for}(Q, x) \leftrightarrow \diamond \neg \text{Know}(x, \text{Ans}(Q))]$ (Dayal 2023: 11, ex.25)
- (ii) $\forall x \forall Q [\text{ACTIVE-for}(Q, x) \leftrightarrow \neg \text{Know}(x, \text{Ans}(Q))]$ (for *aa4*)

I would like to end this section by discussing a parallel between *aa4* and English rising declaratives. Wakefield (2014) reports an acoustic experiment where native Cantonese-English bilinguals were asked to translate *aa4* and *me1* questions into English. They produced rising declaratives for both questions, with a systematic difference in intonation: mid-rising for *aa4* and high rising for *me1*. This is illustrated in Figure 1.

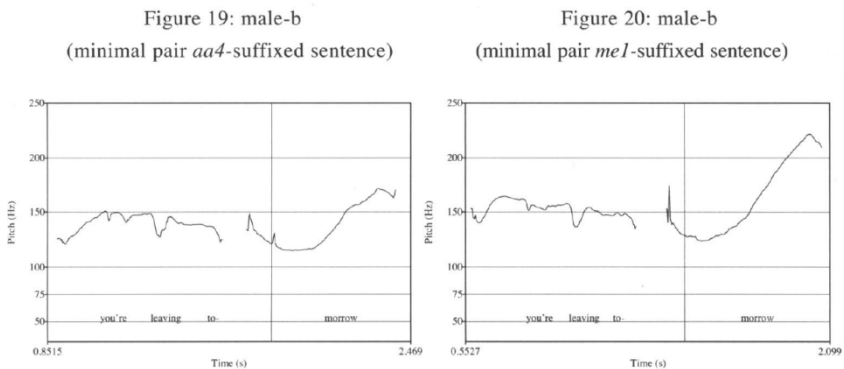


Figure 1. Mid-rising and high-rising declaratives translated from *aa4* and *me1* questions by native Cantonese-English bilinguals (Wakefield 2014: 120)

The two types of rising declaratives are confirmed again in Jeong (2018), who differentiates between inquisitive rising declaratives (with low rising) and assertive rising declaratives (with high rising). A natural question is whether the inquisitive rising declaratives (low/mid-rising) encode evidential bias like *aa4*. Gunlogson (2002:141) has reported that contextual evidence licenses the use of rising declaratives, as shown in (32)-(33).²²

(34)[Robin is sitting in a windowless computer room with no information about current weather conditions when another person enters. Robin says to the newcomer:]
#It's raining?

(35)[Robin is sitting in a windowless computer room when another person enters. The newcomer is wearing a wet raincoat and boots. Robin says:]
It's raining?

²² Note that Gunlogson does not treat rising declaratives as encoding evidential bias, but rather as encoding the *addressee's* (not the *speaker's*) public commitment to *p* (which is called “Contextual Bias Condition”). She suggests that the contextual evidence facilitates accommodation of the addressee’s public commitment.

Applying the tests to distinguish evidential bias from epistemic bias, rising declaratives share similar patterns with *aa4*, as shown in (36)-(37). Positive epistemic bias is not sufficient to license an inquisitive rising declarative, and contextual evidence must be available for it to be felicitous. Hence, the account for *aa4* may extend to rising declaratives. Evidential bias, therefore, can be either encoded in the form of intonation (mid-rising in English) or particles hosting a functional projection (SFPs in Cantonese).

(36) Positive epistemic bias and no evidential bias

[Scenario: Yesterday, Ming told you that he will buy lobsters. That is your favorite food and you were excited. Today, Ming went to a seafood store with Fan. You call Fan, and ask:]

- a. #*Ming bought lobsters?*
- b. *Did Ming buy lobsters?*
- c. *Ming bought lobsters, didn't he?*

(37) No epistemic bias and positive evidential bias

[Scenario: Today, Ming went to a seafood store with Fan. Ming came back, holding a bag in which there seems to be a red claw, but you cannot see it very clearly. You ask Fan:]

- a. *Ming bought lobsters?*
- b. *Did Ming buy lobsters?*
- c. #*Ming bought lobsters, didn't he?*

5. Confirmation of addressee's belief and rhetorical questions

We have seen in the previous section that *aa4*, together with *maa3*, *ho2* and *me1*, supports the distinction between contextual evidence and epistemic states in question bias. This section discusses how contextual evidence and epistemic states may interact and yield RQs in a secondary use of *aa4*. I also address a few relevant theoretical and cross-linguistic implications.

5.1 The rhetorical question use of *aa4*

To begin with, *aa4* is often claimed to have a rhetorical, “disproval” reading (Matthews & Yip 1994: 311,346, Li et al. 1995: 520, Kuong 2008), where the speaker *knows* the negative answer (i.e., “not *p*”). This is at odds with the observation in §2.2 that *aa4* questions requires the speaker not to be the SoK. Moreover, the answer is always negative but not positive, which is

inconsistent with the flexibility of *aa4* in epistemic bias.

Below, I suggest that the rhetorical reading of *aa4* is a conversational implicature which arises from asking for confirmation about the addressee's belief of a proposition rather than the proposition itself. The proposed semantics of *aa4* in (32) still holds with minimal revision.

Two examples of the rhetorical reading of *aa4* are cited in (38)b and (39)b. In (38)b, the speaker intends to express the negative proposition "Playing dumb cannot help you to get through this". (39)b is an example of "skepticism/disproval" use from Matthews & Yip (1994), which can also be interpreted as rhetorical "it is not that easy". These are genuine RQ uses and can be preceded by *wh*-RQs in (38)a and (39)b.

- (38)a. *Zaadinbaanso bin gwo-dou gwat aa1?* ...
 play.dumb where pass-ACHV bone SFP
 'Playing dumb cannot help you to get through this.'
- b. ... *Nei gu zaadinbaanso zau gwo-dou gwat aa4?*
 2SG guess play.dumb then pass-ACHV bone SFP
 'Do you think that playing dumb can help you to get through this?'
 (i.e., it cannot.) (b) from Li et al. 1995: 520
- (39)a. *Bin jau gam jungji aa1?* ...
 where have so easy SFP
 'It is not that easy.'
- b. ... *Nei gu gam jungji aa4?*
 2SG guess so easy SFP
 'You think it's that easy, do you?' (i.e., it's not.)
 (b) from Matthews & Yip 1994: 346

However, observe that the negated propositions in (38)-(39) are not the ones expressed by the matrix clause. The propositions are embedded under an attitude verb with the addressee as the attitude holder (i.e., "you think"). Furthermore, even for examples where the negated proposition seems to be the matrix, they can often be further embedded under "you think" without affecting the meaning. In (40)a, the speaker expresses that the addressee cannot have it all, which is interchangeable with (40)b with further embedding.

- (40)a. *Nei oi-saai aa4?*
 2SG want.to.have-all SFP
 'Do you think that you can have it all?' (i.e., you cannot)
 (Li et al. 1995: 520)

- b. *Nei gu/jiwai nei oi-saai aa4?*
 2SG guess/wrongly.think 2SG want.to.have-all SFP
 ‘Do you (really) think that you can have it all?’ (i.e., you cannot)

The possibility of further embedding suggests that the negated proposition may not be the proposition being questioned by *aa4*. Recall in §2.1 that *aa4* cannot be embedded (except in quotations). Structurally, *aa4* must be placed in the matrix due to the non-embeddability of SAP, as in (41) (underline indicates what *aa4* is questioning).²³ I suggest that even in (40)a, *aa4* targets the addressee’s belief of the embedded proposition rather than the proposition itself, and the matrix subject and verbs are phonologically omitted.

- (41)a. [_{SAP} [_{CP1} (‘You think’) [_{PerspP} [_{CP2} ‘you can have it all’]]] *aa4*]?
 b. * [_{SAP} [_{CP1} (‘You think’) [_{PerspP} [_{CP2} ‘you can have it all’] *aa4*]]].

There is a good reason to believe that this “higher-level” *aa4* is still the same *aa4* we witnessed in the previous sections. Recall in §2.2 that *aa4* cannot form RQs. Upon a closer look, those examples do not indicate the addressee’s belief in the context, such as (42) (reproduced from (15)a). When such an indication is available in the context, *aa4* then becomes felicitous with ‘you think’ as in (43).²⁴

- (42)[Scenario: You and Fan have a meeting with Ming at 3 pm. It is 4 pm now and you think Ming won’t come. **Fan said nothing.** You say:]
#Lousat gong, Aaming wui lai aa4?
 frankly speak Ming will come SFP
 Int.: ‘Frankly speaking, Ming won’t come, will he?’

- (43)**Contextual evidence for the addressee’s belief**
 [Scenario: same as (42), except that **Fan said “I don’t know whether he will come, but I have faith in him.”** You say:]
Lousat gong, [nei gokdak [Aaming wui lai] aa4]?
 frankly speak 2SG think Ming will come SFP
 Int.: ‘Frankly speaking, do you really think that Ming will come?’
 (i.e., he won’t come)

²³ Except for quotation, which is not the case in (40) due to the lack of indexical shifts.

²⁴ The addressee (“Fan”) said that she does not *know* whether Ming will come in the scenario, which does not count as hearsay evidence for the embedded proposition.

5.2 A pragmatic approach to rhetorical questions

In the following, I first propose the semantics of this “higher-level” use of *aa4* and show that how the RQ reading can be derived by conversational implicature. Then, I discuss the implications of this proposal to the current debate on approaches to RQs.

The semantic contributions of the “higher-level” *aa4* are proposed in (44), with the relevant licensing conditions.

(44) The “higher-level” use of *aa4*

The semantic contributions

Aa4 returns $Q_{\langle st, t \rangle}$ such that

- (i) $Q = \{\mathbf{Believe}(a, p), \mathbf{-Believe}(a, p)\}$
- (ii) $\mathbf{-Know}(s, \mathbf{Ans}(Q))$
- (iii) $\mathbf{Ev}(C) \models \mathbf{Probably}(\mathbf{Believe}(a, p))$
- (iv) *s* puts *a* under obligation to $\mathbf{ASSERT}(\mathbf{Ans}(Q))$

The licensing conditions

- (i) $\mathbf{Know}(s, \mathbf{-}p)$
- (ii) $\mathbf{Believe}(s, \mathbf{-}p \in \mathbf{CG})$

In (44), *aa4* does not operate on the core proposition, but rather on the addressee’s belief of the proposition. Similar to the primary use in §3, this use of *aa4* requires to speaker not to be the SoK of the answer (instead, the addressee is always the SoK), and the context contains positive evidence for the addressee’s belief of *p*. The evidence can either come from direct claims by the addressee as in (43), or inferential evidence from the context, such as the drawing in (45). It supports the addressee’s belief and licenses *aa4*.

(45)[Scenario: You are an art teacher, and you see your student drew a six-legged spider. You say:]

[(Nei gokdak) [zizyu dak lok zek goek] gaa4]?

2SG think spider only.have six CL leg SFP

‘Do you think that spiders only have six legs?’ (i.e., spiders do not only have six legs)

Crucially, this “higher level” use is licensed when the speaker *knows* that the proposition *p* being discussed is obviously false. In other words, the speaker knows “not *p*”, and moreover believes that “not *p*” is in the CG. I propose that the rhetorical reading arises as a conversational implicature from the interaction between the semantic contributions of *aa4* and the licensing conditions, as outlined below:

(46)The derivation of the rhetorical reading

- a. First, the speaker knows that the proposition p being discussed is obviously false, which should be known to everyone in the context (i.e. the speaker knows p , $\text{know}(s, \neg p)$, and the speaker believes that the negated proposition is in the Common Ground, $\text{believe}(s, \neg p \in \text{CG})$).
- b. Second, however, there is contextual evidence showing that some discourse participant (i.e., the addressee) does not share the same belief, such as directly claiming p (i.e., $\text{believe}(a, p)$).
- c. Third, since the speaker has knowledge of $\neg p$, the speaker refuses to update his/her epistemic state. There is no way to incorporate p into the CG. Also, the falsity of p is too obvious for the speaker to update his/her belief on the CG immediately (i.e., the speaker thinks that the addressee should not believe p , and $\neg p$ should be contained in the CG). Thus, there is a conflict between the speaker's belief about the CG (i.e., $\neg p \in \text{CG}$) and the addressee's belief (i.e., $\text{believe}(a, p) \rightsquigarrow \neg p \notin \text{CG}$).
- d. Fourth, the speaker asks the addressee to confirm his/her belief of p . Since the addressee just asserted p , the question can be understood as a challenge to the addressee's belief as a conversational implicature: "the proposition you believed is not true, are you sure you (still) believe it?" This results in the "rhetorical/ dispraval" reading.

There has been a continuing debate on whether RQs are derived from a negative operator in syntax/Logical Form (Sadock 1971, Han 2002), or derived on a purely pragmatic ground, namely both the speaker and addressee know the answer (Caponigro & Sprouse 2007, Farkas 2024b). One of the major arguments from the pragmatic view is that RQs allow answers other than the negative answer, such as "all of them" in (47).

(47)[Situation: All faculty members voted for the current chair months ago and now everyone is complaining about him to the students. Both the Speaker and Addressee are students.]

SPEAKER: *They should stop complaining about the chair to us. After all, who voted for him?*

ADDRESSEE or SPEAKER: *(All of) them / #Nobody*

(Caponigro & Sprouse 2007: 4)

However, this argument does not hold for yes-no RQs, as already pointed by Caponigro & Sprouse (2007) themselves. (48) only allows the negative answer. This constitutes an unresolved problem for the pragmatic view.

- (48)a. *After all, does everybody like ice-cream?*
 b. *No / #Yes* (Caponigro & Sprouse 2007: 12)

The yes-no RQs with *aa4* also only allow negative answers. It is licensed by a pragmatic condition that the speaker must know the negative answer and believe the negative answer to be in the Common Ground. The rhetorical reading only arises in this pragmatic condition. Otherwise, *aa4* is understood as an ordinary question of confirming the proposition itself, as shown in (49). As a first-grade student, the speaker does not know the answer and *aa4* lacks a rhetorical reading.

- (49)[Scenario: You are a first-grade student, and you see your teacher drew a six-legged spider. You say:]
 (#*Nei gokdak*) *zizyu dak lok zek goek gaa4?*
 2SG think spider only.have six CL leg SFP
 ‘Do (#you think that) spiders only have six legs?’

In short, even yes-no RQs can be derived pragmatically such as *aa4* RQs. While there are further issues on why *wh*-RQs in English have different licensing conditions from yes-no RQs, the proposed analysis here provides additional support for the pragmatic view.²⁵

5.3 More on the “higher-level” confirmation

This section discusses several remaining issues of the “higher-level” use of *aa4* as well as its cross-linguistic relevance.

First, *aa4* not only can target the addressee’s belief, but also any discourse participants’ belief. For examples without overt embedding like (40)a, since the attitude holder in a question is by default the addressee, the question can still be understood as targeting the addressee’s belief. It is then expected that overt embedding is required if the relevant attitude holder is not the addressee. The prediction is borne out in (50). The context guarantees that the speaker *knows* that the proposition being discussed is obviously false (i.e., the speaker is the SoK of “Cantonese is a dialect of Mandarin”, and the falsity of this proposition should be known to every Cantonese speaker), leading to a

²⁵ Tang (2022: 331-332) and Choi (2022: 135) observe that *aa4* questions license strong NPI *sai* ‘need’ in Cantonese. Strong NPI licensing has been taken as an argument in favor of the negative operator in rhetorical questions (e.g., Han 2002; Tang 2022). However, how exactly NPIs are licensed are still subject to debate, given that not-at-issue negative *implicature* can indeed license both weak and strong NPIs (Linebarger 1987; Eckardt & Csipak 2013; see the overview in Horn 2016). The argument from NPIs is thus indecisive and should be submitted to further scrutiny.

rhetorical reading. In (a), the addressee is Ming, who claimed the false proposition. The question can be understood as confirming Ming’s belief regardless of the presence of “you think”. In (b), however, the addressee is Fan, who did not express her attitude towards the (false) proposition. The question is infelicitous without embedding. “Ming/he thinks” must be added to confirm Ming’s belief.

(50) Confirming (non-)addressees’s belief

[Scenario: You are a Cantonese linguist. Ming and Fan, two Cantonese speakers, are discussing what language family Cantonese belongs to, and Ming says that Cantonese is a dialect of Mandarin. You walk by, and say:]

a. [Say to Ming loudly:]

Haa2?! (Nei gokdak)

INTERJ 2SG think

Jyutjyu zanhai Poutungwaa ge jat zung aa4?

Cantonese really Mandarin GE one CL SFP

‘What? (You think) that Cantonese is really a dialect of Mandarin?’

b. [Say to Fan in a low voice:]

Haa2?! #(Keoi gokdak)

interj 3SG think

Jyutjyu zanhai Poutungwaa ge jat zung aa4?

Cantonese really Mandarin GE one CL SFP

‘What? #(He thinks) that Cantonese is really a dialect of Mandarin?’

Moreover, we may expect that this secondary use of *aa4* is not available when the speaker does not have an attitude towards *p* (i.e., no epistemic bias). It is because the rhetorical-like reading is derived from a need to confirm some individual’s belief due to the obviousness of *p*. The need goes away when *p* is no longer obvious for the speaker. This is the case in the “Ming’s little sister” scenario in (51). The speaker’s epistemic state is neutral towards “Ming has a little sister”. The ban on overt embedding indicates that *aa4* can only be used to confirm the proposition but not Ming’s or Fan’s belief.

(51) Confirming the proposition

[Scenario: You, Fan, Ming have been friends for a week. Today, you three meet in a café. Fan says that Ming has a little sister. You don’t know whether he does at all, and ask Ming:]

(#Nei/keoi gokdak) nei jau saimui gaa4?

2SG/3SG think 2SG have little.sister SFP

Felicitous: ‘Do you have a little sister?’

Infelicitous: ‘Do(es) you/she think that you have a little sister?’

Note that *aa4* can also be used to confirm the source of evidence of a given proposition. In the “February 29th” scenario in (21)/(31) (repeated in (52) with modification), the positive contextual evidence (i.e., the claim by Ming) is inconsistent with the speaker’s epistemic state (i.e., negative epistemic bias). The counter-expectation gives rise to a sense of “surprise”. While *aa4* can confirm the proposition without embedding in (21)/(31), *aa4* may also be used to confirm the source of evidence by adding “you saw” (as opposed to the addressee’s belief with “you think”).

(52) Confirming the source of evidence

[Scenario: In the beginning of 2022, Ming is checking the new calendar. He said there is a 29th this February. You think that 2022 is not divisible by 4, but you didn’t really do the calculation. You then say:]

Zanhai? {*Nei gokdak/ nei gin-dou*}
 really 2SG think 2SG see-ACHV
gam go jiyut jau jaagau hou aa4?
 this CL February have 29 date SFP
 ‘Really? Did you {think/see} that there is a 29th this February?’

That *aa4* may target both propositions and individuals’ belief of propositions is reminiscent of the tag particle *eh* in Canadian English. Wiltschko & Heim (2016) observe that *eh*, unlike *huh* and *right*, can be used to confirm both a proposition *p* (= (53)) or the addressee’s attitude towards *p* (= (54)). In (54), the speaker asks the addressee to confirm that s/he knows the speaker has a new dog, instead of confirming the truth of *p* (which would have been pragmatically odd). This is similar to *aa4*, except that the secondary use of *aa4* is triggered by the obvious falsity of *p*, whereas the trigger for *eh* is the uncertainty about the addressee’s belief in (54).

(53) Confirming the proposition

[Scenario: John knows that Mary would like to have a new dog. He hasn’t seen her in a long time. And he keeps wondering whether she got a new dog. One day he runs into her while she’s walking a new puppy. John utters:]

You have a new dog, {eh/huh/right}? (= Confirm that p is true)
 (Wiltschko & Heim 2016:309)

(54) Confirming the addressee’s attitude towards *p*

[Scenario: Mary is walking her new dog when she runs into John. She is expecting that he would congratulate her on the new dog, but he’s not mentioning it. She isn’t sure anymore whether he actually realizes that she has a new dog. So she utters:]

*I have a new dog, {eh/*huh/*right}?*

(= Confirm that you know that *p* is true) (Wiltschko & Heim 2016:309)

The “confirming belief” uses of Cantonese *aa4* and Canadian English *eh* might be comparable to another Cantonese particle *ho2*, which is analyzed as a higher-level question operator on speech acts (Law et al. 2018, 2024; see also Ng to appear). Strikingly, *ho2* may cluster with *me1* and operates on the negative bias encoded. In (55), *me1* conveys the speaker’s epistemic bias that Ziming does not eat shrimp, and *ho2* asks whether the addressee shares the same negative bias “do you also agree that Ziming doesn’t eat shrimp?”.²⁶ Notice that in the given scenario, the speaker also *believes* that the addressee shares his belief of “not *p*”, which licenses *ho2*’s positive epistemic bias but on a higher level of addressee’s attitude, rather than the core proposition *p*.

(55) Confirming the addressee’s negative bias against *p*

[Scenario: Ada told Bob and Cindy that Ziming eats shrimp, but Bob remembered otherwise. Bob believed that Cindy may share his belief, so he asked Cindy:]

Ziming sik haa me1 ho2?

Ziming eat shrimp SFP SFP

‘Does Ziming really eat shrimp? Do you also wonder?’

(Law et al. 2024: 329)

6. Conclusion

To conclude, this paper has argued for a distinction between evidential bias and epistemic bias based on the neat division of labor among Cantonese yes-no question particles. While *maa3*, *ho2*, *me1* encode neutral, positive and negative epistemic biases respectively, *aa4* encodes only positive evidential bias and is underspecified for epistemic bias. Positive evidential bias is

²⁶ The *me1-ho2* clustering is first observed by Lam (2014: 64). Tang (2020: 4) suggests that a pause before *ho2* is needed. Ng (to appear) argues that this *ho2* should be analyzed as a pre-sentence conjoining with the preceding *me1* question, allowing for shifting of the addressee. The so-called “higher-level” use, hence, involves a more articulated syntactic structure, which is compatible with the proposed view for *aa4*.

formulated as a requirement of having a set of propositions present in the current context. This set of proposition entails weak necessity of the proposition that *aa4* seeks confirmation about and constitutes positive evidence. The analysis may be extended to English inquisitive rising declaratives (low/mid-rising), which share similar evidential bias to *aa4*.

Moreover, this paper has discussed a “higher-level” use of *aa4*, which seeks confirmation about addressee’s belief of a proposition, instead of the proposition itself. This use is licensed when the speaker knows the proposition to be obviously false but there is contextual evidence that the addressee believes it. A rhetorical reading arises as a conversational implicature of questioning the addressee’s false belief of the proposition. This provides an alternative pragmatic account of yes-no RQs to the negative operator view.

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List of abbreviations

1,2,3	first, second, third person respectively
ALL	affixal universal quantifier
CG	Common Ground
CL	classifier
CoAP	Call on Addressee Phrase
INTERJ	interjection
PFV	perfective aspect
PL	plural
RQ	rhetorical question
SAP	Speech Act Phrase
SFP	sentence-final particle
SG	singular
SoK	Seat of Knowledge

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