Semantics and Pragmatics of Cantonese Polar Questions: an inquisitive approach

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Abstract

This paper analyzes four kinds of Cantonese polar questions, HO2, ME1, AA4 and A-NOT-A questions in the framework of radical inquisitive semantics (Groenendijk & Roelofsen, 2010; Aher, 2012; Sano, 2014). HO2, ME1 and A-NOT-A questions have multi-dimensional semantics. In addition to their primary speech act of questioning, HO2 and ME1 interrogatives encode secondary assertive acts of positive and negative expectations, respectively, while A-NOT-A interrogatives conventionally encode lack of expectation, hence the neutral requirement. In contrast, AA4 interrogatives are semantically simplex question acts, thus they can be used in both biased and neutral contexts.

1 Introduction

Cantonese has a number of constructions that express a polar question as in (1) and (2). Examples in (1) are taken from Lam (2014b,a). All of them encode a polar question meaning but they also differ in terms of the context's bias/neutrality. (1-a), a so-called A-NOT-A question, can only be asked in a neutral context. (1-b) with a sentence-final particle HO2 is used when the speaker is biased toward the positive answer, while (1-c) with ME1 is asked when the speaker has a bias toward the negative answer.[1]

(1) a. zi3ming4 jau5 mou5 fu6ceot1
Jimmy have not.have devote
gwo3 si4gaan3 aa3?
ASP time PRT
'Has Jimmy spent time (on the project), or not?' (A-NOT-A Q)

b. zi3ming4 jau5 fu6ceot1 gwo3
Jimmy have devote ASP
si4gaan3 gaa3 ho2?
time PRT HO2
'Jimmy has spent time (on the project), hasn't he?' (HO2 Q)

c. zi3ming4 jau5 fu6ceot1 gwo3
Jimmy have devote ASP
si4gaan3 me1?
time ME
'Jimmy hasn't spent time (on the project), has he?' (ME1 Q)

In contrast, an AA4 question like (2), which is simply marked with a final question particle AA4 is not as restricted. It can be used in both neutral and biased contexts.[2]

(2) zi3ming4 jau5 fu6ceot1 gwo3 si4gaan3
Jimmy have devote ASP time
aa4?
AA4
'Has Jimmy spent time (on the project)?' (aa4 Q)

The goal of this paper is to provide a semantic analysis that derives each interpretation. Lam

[1] The numbers in Cantonese example sentences indicate lexical tones: 1 = high-level; 2 = medium rising; 3 = medium level; 4 = low falling; 5 = low rising; 6 = low level.

[2] There is also MAA3 particle, which is borrowed from Mandarin and somehow more formal (Matthews & Yip, 1994).

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(2014a) argues that HO2 and ME1 questions are complex speech acts of questioning and asserting, while A-NOT-A questions are simple acts of questioning. Lam's (2014a) account of A-NOT-A questions fails to explain why they are more restricted than AA4 questions, which can be used in both biased and neutral contexts. Incidentally, Yuan & Hara (2013) claim that Mandarin A-NOT-A questions are also complex speech acts of questioning and asserting, where the content of the assertion is a tautology, 'p or not p'. Yuan & Hara (2013) argue that the assertion of 'p or not p' in effect indicates the ignorance of the speaker, hence the neutrality requirement. However, Yuan and Hara's analysis also poses a conceptual problem because in truth-conditional semantics, an assertion of 'p or not p' is equivalent to that of 'q or not q'. This paper thus offers a solution to this problem in the framework of inquisitive semantics (Groenendijk & Roelofsen, 2009). Contra Lam (2014a), the semantics of an A-NOT-A question is also multi-dimensional in that it has a question meaning as well as a secondary assertion meaning which indicates lack of 'anticipation of prior expectation-rejection shift'.

2 Lam (2014) on (non-)biased questions

Lam (2014a) analyzes the three interrogative constructions in (1) and proposes that an A-NOT-A question denote a simple speech act of questioning while ME1 and HO2 questions are complex speech acts of questioning and asserting.

Lam (2014a) provides convincing pieces of evidence supporting that A-NOT-A questions are neutral, HO2 questions have positive bias, and ME1 questions have negative bias.

First, only A-NOT-A questions can be used in neutral contexts as in (3). Examples (3)-(6) are adapted from Lam (2014a).

(3) Scenario: Jimmy is asked to take a seat in an interrogation room of a police station. A police officer asked for Jimmy's name and then says this.

a. nei5 hai6 m4 hai6 mei5gwok3 jan4?
2SG COP NEG COP USA person
'Are you American?' (A-NOT-A)

b. #nei5 hai6 mei5gwok3 jan4 ho2?
2SG COP USA person HO2
'You are American, right?' (HO2)

c. #nei5 hai6 mei5gwok3 jan4 me1?
2SG COP USA person ME1
'You aren't American, are you?' (ME1)

Second, A-NOT-A questions cannot be responded by 'You are right' (Asher & Reese, 2005).

(4) A: gam1 go3 ji6jyut6 jau5 mou5
this CL February have not.have
jaa6gau2 hou6?
twenty-nine number
'Is there a 29th this February?'
B: #nei5 aam1, nei5 aam1. jau5/mou5
2SG right, 2SG right not.have/have
'You are right, you are right. There is(n't).'

In contrast, to a HO2 question, the responder B can say 'You are right' to agree with the positive answer.

(5) A: gam1 go3 ji6jyut jau5 jaa6gau2
this CL February have twenty-nine
hou6 ho2?
number HO2
'There is a 29th this February, isn't there?'
B: nei5 aam1, nei5 aam1. ✓jau5/*mou5
'You are right, you are right. There ✓is/*isn't.'

Similarly, to a ME1 question, the responder B can say 'You are right' to agree with the negative answer.

(6) A: gam1 go3 ji6jyut jau5 jaa6gau2
this CL February have twenty-nine
hou6 me1?
number ME1
'There isn't a 29th this February, is there?'
B: nei5 aam1, nei5 aam1. *jau5/✓mou5
'You are right, you are right. There *is/✓isn't.'

Based on these data,[3] Lam (2014a) concludes that A-NOT-A questions are pure questions in that they are simple speech acts of questioning, thus can be used only when the context is neutral. On the other

[3] See Lam (2014a) for other arguments.

hand, HO2 questions are complex speech acts of questioning and assertion of p while ME1 questions are also complex speech acts of questioning and assertion of $\neg p$. Lam's analysis is summarized in Table 1.

Syntax	Observation	Analysis
A-NOT-A	neutral	QUEST(p)
HO2	p bias	QUEST(p)&ASSERT(p)
ME1	$\neg p$ bias	QUEST(p)&ASSERT($\neg p$)

Table 1: Lam's analysis of Cantonese polar questions

I agree with Lam (2014a) in that A-NOT-A questions are only used in neutral contexts, but contra Lam (2014a), I claim that A-NOT-A questions also have multi-dimensional semantics. To see this, let us compare A-NOT-A questions with another polar question, namely AA4 questions. First, AA4 questions are similar to A-NOT-A questions in that they are used in neutral contexts as in (7).

(7) Scenario: Jimmy is asked to take a seat in an interrogation room of a police station. A police officer asked for Jimmy's name and then says this.

nei5 hai6 mei5gwok3 jan4 aa4?
2SG COP USA person AA4

'Are you American?'

Also, just like A-NOT-A questions, AA4 questions cannot be responded by 'You're right', suggesting that AA4 questions are true questions without assertive contents.

(8) A: gam1 go3 ji6jyut6 jau5 jaa6gau2 hou6 aa4?
this CL February have twenty-nine number AA4
'Is there a 29th this February?'
B: #nei5 aam1, nei5 aam1. jau5/mou5
'You are right, you are right. There is(n't).'

However, the parallel breaks down with respect to the following situation. In (9), A first asserted 'There is a 29th this February!' (p). Thus, when B responds, the context is biased toward p (see Gunlogson, 2003). In this biased context, an A-NOT-A question is odd while an AA4 question is good:

(9) A: gam1 go3 ji6jyut6 jau5 jaa6gau2 hou6 aa3!
'There is a 29th this February!'
B1:#zan1 hai2? gam1 go3 ji6jyut6 jau5 mou5 jaa6gau2 hou2?
'Really? Is there a 29th this February or not?'
B2: zan1 hai2? gam1 go3 ji6jyut jau5 jaa6gau2 hou6 aa4?
'Really? Is there a 29th this February?'

As summarized in Table 2, A-NOT-A questions can be used only in neutral contexts, while AA4 questions can be used in both neutral and biased contexts. In other words, an A-NOT-A question explicitly encodes its neutrality requirement in the semantics while an AA4 question simply performs a question act. Lam's (2014a) analysis fails to account for this contrast. Thus, this paper claims that A-NOT-A questions perform complex speech acts and AA4 questions perform simple question acts. The next section briefly reviews Yuan & Hara (2013) who make a similar claim for Mandarin polar questions.

Syntax	Neutral	Biased
A-NOT-A	OK	#
AA4	OK	OK ($\neg p$ bias)

Table 2: Difference among "neutral" questions

3 Yuan and Hara (2013) on Mandarin A-not-A questions

Yuan & Hara (2013) analyze Mandarin polar questions and argue that MA questions like (10) are simple questions while A-NOT-A questions like (11) perform questioning and asserting of ignorance at the same time. Mandarin data in this section are taken from Yuan & Hara (2013).

(10) Lin xihuan Wu ma?
Lin like Wu Q
'Does Lin like Wu?' (Mandarin MA Q)

(11) Lin xihuan bu xihuan Wu (ne)?
Lin like not like Wu NE
'Does Lin like or not like Wu?'
(Mandarin A-NOT-A Q)

Yuan and Hara's analysis is motivated by the following contrast. Just like Cantonese AA4 and A-NOT-A questions, MA questions can be used in both neutral and biased contexts, while A-NOT-A questions cannot be used in biased contexts:

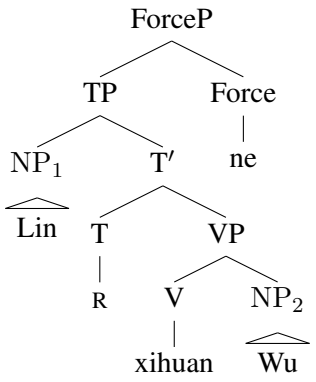
(12) A: Lin xihuan Wu.
Lin like Wu
'Lin likes Wu.'
B: ✓Lin xihuan Wu ma? (MA Q)
#Lin xihuan bu xihuan Wu (ne)? (A-NOT-A Q)

According to Yuan & Hara (To appear), the Mandarin morpheme MA is a question operator. It takes a proposition p denoted by its sister TP and yield a context change potential (CCP; Heim (1982)), which adds a Hamblin (1958) set $\{p, \neg p\}$ created out of the proposition p onto the question under discussion (QUD) stack (Roberts, 1996).[4]

(13) $[\![\text{MA}]\!] = \lambda p.\lambda \text{C}.[\text{QUD}(\text{C}) + \{p, \neg p\}]$

Turning to Mandarin A-NOT-A questions Yuan & Hara (2013) follow Huang (1991) and propose that the surface structure of (11) is derived from a deep structure depicted in (14).

(14)



The reduplication feature R defined in (15) creates a Hamblin set; thus, the TP denotes a set of propositions as in (16).

(15) $[\![\text{R}]\!] = \lambda P.\lambda x.\{P(x), \neg P(x)\}$

(16) $[\![\text{TP}]\!] = [\![\text{R(like.Wu)(Lin)}]\!] = \{\text{p}, \neg\text{p}\}$
p ='Lin likes Wu'

[4] '+' is an update function. $\text{QUD}(\text{C}) + S$ is a stack that is exactly like $\text{QUD}(\text{C})$ except that $\text{QUD}(\text{C}) + S$ has S as the topmost member of the stack.

The particle NE is another question operator which yield a multi-dimensional meaning as indicated by '$\times$' in (17). On the one hand, it produces a question CCP, which adds the set of propositions S to the QUD stack. On the other hand, it outputs a single proposition by connecting each proposition in S with the disjunction '$\vee$':

(17) $[\![\text{NE}]\!] = \lambda S.\lambda \text{C}.[\text{QUD}(\text{C}) + S]$
$\times\ \lambda S.(r_1 \vee r_2 \vee ... \vee r_{|S|})$,
$r_i \in S$ for all $1 < i \leqslant |S|$

Furthermore, Yuan & Hara (2013) show that A-NOT-A questions obligatorily end with the low boundary tone 'L%'. Adopting Bartels' (1997) analysis of English intonation, Yuan & Hara (2013) propose that the L% tone in a Mandarin A-NOT-A question is an intonational morpheme which is paratactically associated with the syntactic structure like (14). Semantically, it denotes an assertion, i.e., a CCP which adds a proposition to the Stalnakerian (1978) common ground (CG):[5]

(18) $[\![\text{L\%}]\!] = \lambda p.\text{ASSERT}(p) = \lambda p.\lambda \text{C}.[\text{CG}(\text{C}) + p]$

This morpheme is looking for a proposition as its argument. Now, among the two meanings generated by the structure in (14), the primary meaning is already a CCP of questioning; thus the morpheme *L%* can only attach to the secondary meaning, i.e., the disjunction $p \vee \neg p$. As a result, the whole A-NOT-A construction with the L% tone expresses a complex speech act, questioning and asserting. Yuan & Hara (2013) claim that this assertion of $p \vee \neg p$ is the source of the neutrality requirement of A-NOT-A questions. $p \vee \neg p$ is a tautology, thus asserting $p \vee \neg p$ is an uninformative act. Following Gricean principles, the questioner is indicating his or her ignorance towards the issue $p \vee \neg p$. When the context is biased, the speaker cannot be ignorant about the issue $p \vee \neg p$; thus an A-NOT-A question cannot be use in a biased context.

In short, a MA question is a simple act of questioning while an A-NOT-A question is a complex act of questioning and asserting, as summarized in Table 3. The neutrality meaning is reinforced by the asser-

[5] $\text{CG}(\text{C}) + p$ is a context that is exactly like $\text{CG}(\text{C})$ except that $\text{CG}(\text{C}) + p$ has p.

tion component of the A-NOT-A question. The same explanation could be given to the contrast of Cantonese AA4 and A-NOT-A questions in (9). However, Yuan and Hara's implementation of the neutrality requirement faces a conceptual problem for both Mandarin and Cantonese. That is, in truth-conditional semantics, $p \vee \neg p$ is equivalent to $q \vee \neg q$ since they are both tautologies thus always true. Similarly, ASSERT($p \vee \neg p$) is equivalent to ASSERT($q \vee \neg q$), hence it cannot indicate the ignorance toward a particular issue $p \vee \neg p$. In order to solve this problem, this paper adopts another semantic framework, that is, inquisitive semantics.

Syntax	Observation	Analysis
A-NOT-A	anti-bias	QUEST(p)&ASSERT($p \vee \neg p$)
MA	neutral	QUEST(p)

Table 3: Yuan and Hara's analysis of Mandarin polar questions

4 Proposal: Inquisitive Semantics

In classical truth-conditional semantics, the meaning of a sentence is determined by its truth-condition:

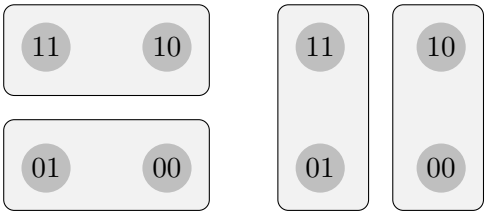
(19) Truth-condition:
One knows the meaning of a sentence
iff
one knows under which circumstances the sentence is *true* and under which it is *false*.
(Groenendijk & Roelofsen, 2013, 2)

In recent work by Groenendijk and his colleagues (Groenendijk & Roelofsen, 2009, among others),[6] it is argued that the truth-conditional semantics is not capable of analyzing interrogative sentences. In order to analyze both declarative and interrogative sentences, the new framework, inquisitive semantics, centers around support-conditions:

(20) Support-condition:
One knows the meaning of a sentence
iff
one knows which information states *support* the given sentence, and which don't.
(Groenendijk & Roelofsen, 2013, 2)

[6]See `https://sites.google.com/site/inquisitivesemantics/` for details.

Let us see the difference between the two frameworks with figures. Each figure represents an information state σ which contains only four possible worlds. In world 11, for instance, both p and q are true, in world 01, p is false but q is true, and so on. In truth-conditional semantics, both $p \vee \neg p$ and $q \vee \neg q$ are true in all four worlds. Thus, $p \vee \neg p$ and $q \vee \neg q$ cannot be distinguished from one another as noted above. In inquisitive, i.e., support-conditional, semantics, on the other hand, the two sentences are distinguished as follows: The information state depicted in Figure 1a supports $p \vee \neg p$, while the information state depicted in Figure 1b supports $q \vee \neg q$.



(a) $p \vee \neg p$ (b) $q \vee \neg q$

Figure 1: Support for disjunctive sentences

Another important feature of inquisitive semantics is that a polar question $?\varphi$ is defined in terms of disjunction:

(21) Questions and support:
A question $?\varphi = \varphi \vee \neg\varphi$ is supported in σ iff σ either supports φ or supports $\neg\varphi$.

4.1 Groendijk (2013) on Dutch biased questions

Groenendijk (2013) analyzes biased questions marked by a stressed particle *toch* in Dutch, which seem to have the same effect as Cantonese HO2 questions. Dutch examples in this section are taken from Groenendijk (2013).

Let us start with a declarative sentence with stressed TOCH as in (22). The sentence p-TOCH conveys a secondary meaning which indicates the speaker's *prior expectation* of $\neg p$:[7]

[7]Groenendijk (2013) calls this secondary meaning "conventional implicature". The current paper does not employ this term since at least for Cantonese data, the secondary meanings which arise from biased questions do not conform the properties of conventional implicatures in the sense of Potts (2005).

(22) Ad is TOCH in Amsterdam.
'Ad is in Amsterdam after all'
Secondary meaning: The speaker expected that Ad would not be in Amsterdam.

When TOCH is used in a question, p-TOCH?, as in (23), it gives rise to a *current* expectation of p 'Ad is in Amsterdam'.

(23) Ad is in Amsterdam, TOCH?
'Ad is in Amsterdam, right?'

The interpretation might be clearer with possible answers to (23). If the answer is 'yes', the prior expectation of p is confirmed. 'No' answers can be given either with or without TOCH. In (24-c), TOCH indicates that the *prior* expectation p is rejected.

(24) a. Ja, Ad is in Amsterdam.
b. Nee, Ad is niet in Amsterdam.
c. Nee, Ad is TOCH niet in Amsterdam.

As mentioned above, the interpretation of p-TOCH? is similar to that of a Cantonese HO2 question. The questioner is biased toward the positive answer p.

4.2 Radical Inquisitive Semantics

In analyzing TOCH sentences, Groenendijk (2013) employs a radical version of inquisitive semantics (Groenendijk & Roelofsen, 2010; Aher, 2012; Sano, 2014). In radical inquisitive semantics, the semantics of sentences are characterized by positive and negative semantic relations between sentences and information states, *support* and *reject*:[8]

(25) The atomic clause: ($|p|$ is the set of worlds where p is true)
support $\sigma \models^{+} p$ iff $\sigma \neq \emptyset$ and $\sigma \subseteq |p|$
reject $\sigma \models^{-} p$ iff $\sigma \neq \emptyset$ and $\sigma \cap |p| = \emptyset$

An information state σ is a set of possible worlds. A state σ supports an atomic sentence p just in case σ is consistent and p is true in all worlds in σ. In contrast, σ rejects p just in case σ is consistent and p is false in all worlds in σ.

As for negation, a state σ supports $\neg\varphi$ just in case it rejects φ, and it rejects $\neg\varphi$ just in case it supports φ.

(26) The clauses for negation:
a. $\sigma \models^{+} \neg\varphi$ iff $\sigma \models^{-} \varphi$
b. $\sigma \models^{-} \neg\varphi$ iff $\sigma \models^{+} \varphi$

Turning to conjunction, a state σ supports $\varphi \wedge \psi$ just in case it supports both φ and ψ , and it rejects $\varphi \wedge \psi$ just in case it rejects either φ or ψ .

(27) The clauses for conjunction:
a. $\sigma \models^{+} \varphi \wedge \psi$ iff $\sigma \models^{+} \varphi$ and $\sigma \models^{+} \psi$
b. $\sigma \models^{-} \varphi \wedge \psi$ iff $\sigma \models^{-} \varphi$ or $\sigma \models^{-} \psi$

Similarly, a state σ supports $\varphi \vee \psi$ just in case it supports either φ or ψ , and it rejects $\varphi \vee \psi$ just in case it rejects both φ and ψ.

(28) The clauses for disjunction:
a. $\sigma \models^{+} \varphi \vee \psi$ iff $\sigma \models^{+} \varphi$ or $\sigma \models^{+} \psi$
b. $\sigma \models^{-} \varphi \vee \psi$ iff $\sigma \models^{-} \varphi$ and $\sigma \models^{-} \psi$

In order to analyze TOCH, Groenendijk (2013) introduces a basic sentential operator, $(\neg)$. Thus, (29) translates as $(\neg)p$:

(29) Ad is TOCH in Amsterdam.
'Ad is in Amsterdam after all'

Recall that an interrogative sentence is defined as $?\varphi =_{\text{def}} \varphi \vee \neg\varphi$. Now, an interrogative operator for TOCH? is defined as:

(30) $?_{(\neg)}\varphi =_{\text{def}} \varphi \vee (\neg)\neg\varphi$

Consequently, (31) translates as $?_{(\neg)}p = p \vee (\neg)\neg p$.

(31) Ad is in Amsterdam, TOCH?
'Ad is in Amsterdam, right?'

As discussed in Section 4.1, sentences with TOCH give rise to prior/current expectations. Thus, in defining semantics for TOCH sentences, Groenendijk (2013) introduce two notions, 1) the expectations in an information state σ; and 2) the history of σ.

[8] Actually, Groenendijk (2013) uses a more recent version called suppositional inquisitive semantics (InqS) that includes the third semantic relation, *dismissing a supposition*, $\sigma \models^{\circ} p$ iff $\sigma = \emptyset$, which characterizes a denial of the antecedent of conditional sentences. For the purpose of the current paper, a (non-suppositional) radical inquisitive semantics suffices since we do not consider conditional sentences.

First, a model includes a function ϵ which takes any information state σ and yield an expectation state $\epsilon(\sigma) \subseteq \sigma$.

Second, in order to talk about different stages in the history of an information state, σ is now changed into a sequence of states. If σ is such a sequence, $\mathsf{length}(\sigma)$ returns the number of stages in σ. For $n < \mathsf{length}(\sigma)$, σ_n refers to the n-th stage in σ from the current stage σ_0. Thus, when σ_n is more recent than σ_m, $m > n$.

To define the semantics of $(\neg)\varphi$, Groenendijk (2013) introduces another semantic relation, *prior expectation-rejection shift*. It characterizes the changes of expectations through the stages. Initially, some proposition was expected but it became no longer expected at some later stage. At the most recent stage, the proposition is rejected.

(32) Prior expectation-rejection shift
Let $t < \mathsf{length}(\sigma)$.
$\sigma_t \models^{\bullet}_{\mathcal{M}} \varphi$ iff $\exists t' : \mathsf{length}(\sigma) > t' > t$ such that:
1. $\epsilon_{\mathcal{M}}(\sigma_{t'}) \models^{+}_{\mathcal{M}} \varphi$ and
2. $\forall t''$: if $t' > t'' > t$, then $\epsilon_{\mathcal{M}}(\sigma_{t''}) \not\models^{+}_{\mathcal{M}} \varphi$ and
3. $\sigma_{t+1} \models^{-}_{\mathcal{M}} \varphi$

Based on (32), semantics for TOCH sentences, i.e., $(\neg)\varphi$ is defined as follows:

(33) Semantics for TOCH
a. $\sigma_t \models^{+}_{\mathcal{M}} (\neg)\varphi$ iff
$\sigma_t \models^{+}_{\mathcal{M}} \varphi$ and $\sigma_t \models^{\bullet}_{\mathcal{M}} \neg\varphi$
b. $\sigma_t \models^{-}_{\mathcal{M}} (\neg)\varphi$ iff
$\sigma_t \models^{-}_{\mathcal{M}} \varphi$ and $\sigma_t \models^{\bullet}_{\mathcal{M}} \neg\varphi$

Let us see how the interpretations of (34) are derived. As its primary speech act, it asserts p ($\sigma_0 \models^{+}_{\mathcal{M}} p$). At the same time, as its secondary act, it indicates that $\neg p$ is a prior expectation, which is now rejected ($\sigma_0 \models^{\bullet}_{\mathcal{M}} \neg p$).

(34) Ad is TOCH in Amsterdam. $((\neg)p)$

That is, 'Ad would not be in Amsterdam' used to be expected, $\epsilon_{\mathcal{M}}(\sigma_2) \models^{+}_{\mathcal{M}} \neg p$, but at some point it stopped being expected, $\forall t''$: if $2 > t'' > 0$, $\epsilon_{\mathcal{M}}(\sigma_{t''}) \not\models^{+}_{\mathcal{M}} \neg p$. Finally, it is rejected, $\sigma_1 \models^{-}_{\mathcal{M}} \neg p$.

Let us turn to an interrogative TOCH?, namely $?_{(\neg)}\varphi$. Given that $?_{(\neg)}\varphi =_{\text{def}} \varphi \vee (\neg)\neg\varphi$, the semantics is derived as follows:

(35) Derived semantics for TOCH?
a. $\sigma_t \models^{+}_{\mathcal{M}} ?_{(\neg)}\varphi$
iff $\sigma_t \models^{+}_{\mathcal{M}} \varphi$, or
($\sigma_t \models^{+}_{\mathcal{M}} \neg\varphi$ and $\sigma_t \models^{\bullet}_{\mathcal{M}} \varphi$)
b. $\sigma_t \models^{-}_{\mathcal{M}} ?_{(\neg)}\varphi$ never

Thus, (36) asks $p \vee \neg p$, i.e., $\sigma_0 \models^{+}_{\mathcal{M}} p$ or $\sigma_0 \models^{+}_{\mathcal{M}} \neg p$, and at the same time, in case that the answer was negative, it anticipates a current expectation-rejection, $\sigma_0 \models^{\bullet}_{\mathcal{M}} p$.

(36) Ad is in Amsterdam, TOCH?
$(?_{(\neg)}p = p \vee (\neg)\neg p)$

Thus, 'Ad is in Amsterdam' is currently expected, $\epsilon_{\mathcal{M}}(\sigma_2) \models^{+}_{\mathcal{M}} p$. But, there was some move in the conversation that made 'Ad is in Amsterdam' no longer expected, $\forall t''$: if $2 > t'' > 0$, then $\epsilon_{\mathcal{M}}(\sigma_{t''}) \not\models^{+}_{\mathcal{M}} p$.

If the answer to (36) is 'yes', there is no prior expectation-rejection shift. If the answer is 'no', 'Ad is in Amsterdam' is rejected, $\sigma_1 \models^{-}_{\mathcal{M}} p$:

(37) a. Ja, Ad is in Amsterdam.
b. Nee, Ad is niet in Amsterdam.
c. Nee, Ad is TOCH niet in Amsterdam.

In summary, a TOCH declarative, $(\neg)p$, conventionally encodes a rejection of prior expectation $\neg p$ as a secondary assertion. A TOCH? interrogative, $?_{(\neg)}p$, secondarily asserts the anticipation of a rejection of current expectation p.

Recall that a Cantonese HO2 question indicates a bias toward the positive answer. Thus, it can be analyzed analogously to the Dutch TOCH?.

4.3 Back to the Cantonese questions

Based on the data reported by Lam (2014a) and the novel data in (7)-(9) in Section 2, I propose that among the four kinds of the Cantonese questions, only an AA4 question denotes a simplex speech act of questioning, while A-NOT-A, HO2 and ME1 questions are multi-dimensional in that they perform question acts as well as secondary assertion acts.

I define the semantics of each questions which de-

rives the correct interpretations in the framework of radical inquisitive semantics. First, let us take a HO2 question as it is identical to the Dutch TOCH? question, as in (38).

(38) Semantics of a HO2 question
$\sigma_t \vDash^+_{\mathcal{M}}$ HO2(φ) iff
$\sigma_t \vDash^+_{\mathcal{M}} \varphi$, or ($\sigma_t \vDash^+_{\mathcal{M}} \neg\varphi$ and $\sigma_t \vDash^\bullet_{\mathcal{M}} \varphi$)

Recall that HO2 questions cannot be used in neutral contexts (3-b) and the addressee can respond to a HO2 question by saying "You're right" to agree with the positive answer (5). Both facts are correctly predicted since HO2(p) semantically indicates that the questioner has an expectation toward p.

Similarly, a ME1 question indicates that the questioner has an expectation toward $\neg p$. Thus, it cannot be used in neutral contexts (3-c) ant can be responded with "You're right" to agree with the negative answer (6).

(39) Semantics of a ME1 question
$\sigma_t \vDash^+_{\mathcal{M}}$ ME1(φ) iff
$\sigma_t \vDash^+_{\mathcal{M}} \neg\varphi$, or ($\sigma_t \vDash^+_{\mathcal{M}} \varphi$ and $\sigma_t \vDash^\bullet_{\mathcal{M}} \neg\varphi$)

Now, let us turn to the two questions which appear to be "neutral". First, an AA4 question is defined as a simplex question as in (40).

(40) Semantics of an AA4 question
$\sigma_t \vDash^+_{\mathcal{M}}$ AA4(φ) iff $\sigma_t \vDash^+_{\mathcal{M}} \varphi$ or $\sigma_t \vDash^+_{\mathcal{M}} \neg\varphi$

Put another way, it does not encode any expectation within its semantics. Thus, it can be used in neutral contexts (7). At the same time, it can also be used in biased contexts (9), repeated here as (41).

(41) A: gam1 go3 ji6jyut6 jau5 jaa6gau2 hou6 aa3!
'There is a 29th this February!'
B: zan1 hai2? gam1 go3 ji6jyut jau5 jaa6gau2 hou6 aa4?
'Really? Is there a 29th this February?'

In this case, the bias or expectation meaning arises as a *pragmatic* effect. A asserted 'There is a 29th this February' $(= p)$. If B did not have any prior expectation, B should just accept p. Still, B asks a question $p \vee \neg p$. Hence, B is anticipating a rejection of his/her prior expectation $\neg p$. Furthermore, since it is a simple question, it cannot be responded by 'You are right', as we have seen in (8).

Finally, I agree with Lam (2014a) in that A-NOT-A questions are neutral questions, though contra Lam (2014a), I propose that A-NOT-A questions are complex speech acts. In other words, A-NOT-A questions are anti-bias questions. They semantically negate any anticipation of prior expectation-rejection shift toward p or $\neg p$.

(42) Semantics of an A-NOT-A question
$\sigma_t \vDash^+_{\mathcal{M}}$ A-NOT-A(φ) iff
($\sigma_t \vDash^+_{\mathcal{M}} \varphi$ or $\sigma_t \vDash^+_{\mathcal{M}} \neg\varphi$) and $\sigma_t \nvDash^\bullet_{\mathcal{M}} \varphi \vee \neg\varphi$

Therefore, A-NOT-A questions can be of course used in neutral contexts (3-a). However, they cannot be used in biased contexts. Consider (43), which is a repetition of (9) followed by A's answer. As before, A asserted 'There is a 29th this February' p, but B still attempts to ask a question $p \vee \neg p$. This means that: 1) B had a prior expectation, $\epsilon_{\mathcal{M}}(\sigma_3) \vDash^+_{\mathcal{M}} p$; 2) A's first assertion indicates that p is no longer supported by the expectation state, $\epsilon_{\mathcal{M}}(\sigma_2) \nvDash^+_{\mathcal{M}} p$; 3) A's answer indicates that p is rejected, $\sigma_1 \nvDash^-_{\mathcal{M}} p$. Thus, $\sigma_1 \vDash^\bullet_{\mathcal{M}} p$. This contradicts the secondary component of the semantics of A-NOT-A question, $\sigma_1 \nvDash^\bullet_{\mathcal{M}} p \vee \neg p$.

(43) A: gam1 go3 ji6jyut6 jau5 jaa6gau2 hou6 aa3!
'There is a 29th this February!'
B: #zan1 hai2? gam1 go3 ji6jyut6 jau5 mou5 jaa6gau2 hou2?
'Really? Is there a 29th this February or not?'
A: jau5.
'Yes.'

Note also that the conceptual problem that Yuan & Hara (2013) face does not arise here, since in inquisitive semantics, $p \vee \neg p$ is not a tautology. $\sigma_t \nvDash^\bullet_{\mathcal{M}} p \vee \neg p$ is not equivalent to $\sigma_t \nvDash^\bullet_{\mathcal{M}} q \vee \neg q$.

As summarized in Table 4, among the four Cantonese polar questions considered in this paper, only AA4 questions are simplex questions while HO2, ME1 and A-NOT-A questions have multi-dimensional semantics. The bias meaning that arises

from an AA4 question is due to the pragmatic pressure. HO2 and ME1 questions semantically encode prior-expectations toward p and $\neg p$, respectively, as their secondary speech acts. Lastly, A-NOT-A questions encode the neutrality requirement in their semantics as lack of anticipation of prior expectation-rejection shift.

Syntax	Semantics
HO2	$\sigma_t \vDash^{+}_{\mathcal{M}} \varphi$, or ($\sigma_t \vDash^{+}_{\mathcal{M}} \neg\varphi$ and $\sigma_t \vDash^{\bullet}_{\mathcal{M}} \varphi$)
ME1	$\sigma_t \vDash^{+}_{\mathcal{M}} \neg\varphi$, or ($\sigma_t \vDash^{+}_{\mathcal{M}} \varphi$ and $\sigma_t \vDash^{\bullet}_{\mathcal{M}} \neg\varphi$)
AA4	$\sigma_t \vDash^{+}_{\mathcal{M}} \varphi$ or $\sigma_t \vDash^{+}_{\mathcal{M}} \neg\varphi$
A-NOT-A	($\sigma_t \vDash^{+}_{\mathcal{M}} \varphi$ or $\sigma_t \vDash^{+}_{\mathcal{M}} \neg\varphi$) and $\sigma_t \nvDash^{\bullet}_{\mathcal{M}} \varphi \vee \neg\varphi$

Table 4: Inquisitive-semantics-based analysis of Cantonese polar questions

5 Conclusion

5.1 Summary

Cantonese has a variety of (non-)biased polar questions. HO2 and ME1 questions express a bias toward the positive and negative answers, respectively. In contrast, A-NOT-A and AA4 questions seem to be neutral questions. Thus, Lam (2014a) analyzes HO2 and ME1 questions as complex speech acts of questioning and asserting while A-NOT-A questions are simple acts of questioning. Lam's (2014a) account cannot explain the contrast between A-NOT-A and AA4 questions, A-NOT-A questions can only be used in neutral contexts while AA4 questions can be used in both neutral and biased contexts. Incidentally, Yuan & Hara (2013) claim that Mandarin A-NOT-A questions are also complex speech acts of questioning and asserting, where the content of the assertion is a tautology, 'p or not p'. Yuan & Hara (2013) argue that the assertion of 'p or not p' in effect indicates the ignorance of the speaker, hence the neutrality requirement. However, Yuan and Hara's analysis is also conceptually problematic. In truth-conditional semantics, an assertion of 'p or not p' is equivalent to that of 'q or not q'. This paper thus offers a solution to this problem in the framework of inquisitive semantics (Groenendijk & Roelofsen, 2009), where meaning of sentences are given based on support-conditions. Contra Lam (2014a), the semantics of an A-NOT-A question is also multi-dimensional in that it has a primary question meaning as well as a secondary assertion meaning which indicates lack of 'anticipation of prior expectation-rejection shift'. Therefore, A-NOT-A questions are anti-bias questions, thus cannot be used in biased contexts, while AA4 questions are simple questions which can be pragmatically rendered into biased questions in biased contexts.

5.2 Future direction

One important outstanding issue is the compositionality of the interpretations of these questions. In the current paper, semantics of each interrogative is stipulated at the level of the entire construction. Although Yuan and Hara's analysis of A-NOT-A questions has the conceptual problem in deriving the neutrality requirement, it has the nice compositional picture which derives the meaning from the syntactic structure and paratactic association of the L% tone with the construction. It appears to be fruitful to test whether a similar morphological analysis can be given to the Cantonese A-NOT-A construction.

Also, as mentioned in Footnote 8, radical inquisitive semantics is now evolved into suppositional inquisitive semantics which can handle conditional sentences. It would be interesting to see whether the new framework has any implication for the Cantonese conditional questions.

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