Questioning speech acts

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1 Introduction Speech acts such as assertions and questions had been initially argued to be unamenable to being embedded under other elements (Ross 1970; Hooper & Thompson 1973). However, recent studies in German, Japanese, English and other languages have indicated that speech acts can and do serve as arguments for higher sentential operators (Zimmermann 2008, Davis 2011, Krifka 2014). In this paper, we draw attention to an interrogative sentence-final particle (SFP) *ho* in Cantonese, and argue that it is a **question operator on speech acts**, rather than on propositions.

2 Cantonese SFP *ho* Cantonese *ho* is a polar question SFP (Lam 2014). *Ho* embeds a speech act, i.e., the assertion in (1) and the question in (2), crucially appearing after the speech act operator in the structure. In (1), the speaker A is committed to the truth of the proposition in the scope of the assertion operator. *Ho* functions to confirm whether the addressee B is also committed to the same proposition. In (2), *ho* embeds a *wh*-question and returns a polar question with a special function. This polar question conveys not only that the speaker thinks *Where is Aaman?* is a valid question but also asks whether the addressee shares the same question. The addressee can answer the polar question, as shown in (2B).

(1) A: [Aaman wui lai gaa] **ho**?
Aaman will come ASSERT HO
'Aaman will come. Right?'

B: Hai aa.
yes SFP
'Yes, he will.'

(2) A: [Aaman heoi-zo bin le] **ho**?
Aaman go-ASP where Q HO
'Where is Aaman? Do you wonder the same thing?'

B: Hai lo.
yes SFP
'Yes. (I also wonder about it.)'

3 Proposal Using the framework in Farkas & Bruce (2010), Rawlins (2010) and Malamud & Stephenson (2015), we analyze *ho* as an operator on speech acts, rather than on propositions. Concretely, we assume that a context is a n-tuple $\langle \mathrm{H}, \mathrm{T}, \mathrm{DC}_x, \mathrm{DC}_y, ... \mathrm{QUD}_x, \mathrm{QUD}_y, ... \rangle$, where 'H' is a non-empty set of conversation participants, 'DC_x' is a participant-oriented discourse commitment, 'T' is a table, defined in (3) (Farkas & Bruce 2010; Malamud & Stephenson 2015), and 'QUD_x' is a participant-oriented question-under-discussion (QUD) stack, defined in (4) (Davis 2011).

(3) **Table**: A table is a stack of issues to be resolved (the top issue first), where issues are represented as sets of propositions.

(4) **Participant-oriented QUD stack**: QUD_x is a set of questions that x commits her/himself to seeking a resolution to, and QUD_x is totally ordered by the precedence relation.

In this framework, an assertion is formalized as an assertive update of contexts, as in (5). Asserting a proposition ϕ is to update an input context by putting ϕ on T and adding it to the speaker's DC. Correspondingly, a question is formalized as an interrogative update of contexts, as in (6). Hence, an interrogative sentence Q (a set of propositions) can update an input context by putting Q on T, where Q is the top item in the speaker's QUD.

(5) **Assertive update:** $c+[\textsc{assert}_S(\llbracket\phi\rrbracket)] = \left\langle \mathrm{H}_c,\ \textbf{push}(\{\llbracket\phi\rrbracket\}, \mathrm{T}_c),\ \mathrm{DC}_S^c \bigcup \{\llbracket\phi\rrbracket\},\ \mathrm{QUD}_S^c,\ ... \right\rangle$, where $\textbf{push}(e, \mathcal{S})$ represents the new stack with item e added to the top of the stack $\mathcal{S}$.

(6) **Interrogative update:** c+[QUESTION$_S$($[\![Q]\!]$)] = $\langle \mathrm{H}_c,\ \mathbf{push}([\![Q]\!], \mathrm{T}_c),\ \mathrm{DC}^c_S,\ [\![Q]\!] = \mathbf{top}(\mathrm{QUD}^c_S),\ ... \rangle$
where $\mathbf{top}(\mathcal{S})$ represents the top item in the stack $\mathcal{S}$.

We propose that ***ho* denotes a set of updates**, as in (7). ACCEPT means that the addressee accepts the input context. As in (8), If the input context results from the assertive update, the addressee is also committed to the asserted proposition ($\mathrm{DC}^c_A \bigcup \mathbf{top}(\mathrm{T}_c)$); whereas, if the input context results from the interrogative update, the addressee also wonders the answer to the question ($\mathbf{top}(\mathrm{T}_c) = \mathbf{top}(\mathrm{QUD}^c_A)$). By contrast, REJECT means that the addressee rejects the input context. As in (9), if the input context results from the assertive update, the addressee is not committed to the asserted proposition ($\mathbf{top}(\mathrm{T}_c) \notin \mathrm{DC}^c_A$); whereas, if the input context results from the interrogative update, the addressee does not want to resolve the question ($\mathbf{top}(\mathrm{T}_c) \neq \mathbf{top}(\mathrm{QUD}^c_A)$).

(7) $[\![ho]\!] = \{c + [\mathrm{ACCEPT}_A],\ c + [\mathrm{REJECT}_A]\}$

(8) $c + [\mathrm{ACCEPT}_A]$ = (see also Farkas & Bruce 2010)
(a) $\langle \mathrm{H}_c,\ \mathbf{pop}(\mathrm{T}_c),\ \mathrm{DC}^c_A \bigcup \mathbf{top}(\mathrm{T}_c),\ \mathrm{QUD}^c_A, ... \rangle$ if $\mathbf{top}(\mathrm{T}_c)$ is a singleton set;
(b) $\langle \mathrm{H}_c,\ \mathbf{pop}(\mathrm{T}_c),\ \mathrm{DC}^c_A,\ \mathbf{top}(\mathrm{T}_c) = \mathbf{top}(\mathrm{QUD}^c_A), ... \rangle$ if $\mathbf{top}(\mathrm{T}_c)$ is a non-singleton set
where $\mathbf{pop}(\mathcal{S})$ represents the stack by popping off the top item of the stack $\mathcal{S}$.

(9) $c + [\mathrm{REJECT}_A]$ = (see also Krifka 2015)
(a) $\langle \mathrm{H}_c,\ \mathbf{pop}(\mathrm{T}_c),\ \mathbf{top}(\mathrm{T}_c) \notin \mathrm{DC}^c_A,\ \mathrm{QUD}^c_A, ... \rangle$ if $\mathbf{top}(\mathrm{T}_c)$ is a singleton set;
(b) $\langle \mathrm{H}_c,\ \mathbf{pop}(\mathrm{T}_c),\ \mathrm{DC}^c_A,\ \mathbf{top}(\mathrm{T}_c) \neq \mathbf{top}(\mathrm{QUD}^c_A), ... \rangle$ if $\mathbf{top}(\mathrm{T}_c)$ is a non-singleton set

Then, (1) and (2) can be translated as (10) and (11). Applying an interrogative update to each set yields a new question–'does the addressee accept or reject the speaker's update?', capturing the intuition that a *ho* question asks whether the addressee 'shares' the speaker's assertion or question.

(10) $[\![(1)]\!] = \left\{ \begin{array}{l} (c + [\mathrm{ASSERT}_S([\![\text{Aaman will come}]\!])]) + [\mathrm{ACCEPT}_A], \\ (c + [\mathrm{ASSERT}_S([\![\text{Aaman will come}]\!])]) + [\mathrm{REJECT}_A] \end{array} \right\}$

(11) $[\![(2)]\!] = \left\{ \begin{array}{l} (c + [\mathrm{QUESTION}_S([\![\text{where is Aaman}]\!])]) + [\mathrm{ACCEPT}_A], \\ (c + [\mathrm{QUESTION}_S([\![\text{where is Aaman}]\!])]) + [\mathrm{REJECT}_A] \end{array} \right\}$

4 Unembeddable questions A prediction from the proposed analysis is that *ho* cannot embed a question the speaker knows that the addressee already has an answer for. This is because if the addressee already has an answer for a question, she wouldn't be committed to resolving the question and hence wouldn't have it in her QUD stack. (12) illustrates this point:

(12) *Ni giu me meng le ho?
you call what name Q HO
'What is your name? Do you wonder the same thing?'

5. Answering the embedded question Another prediction is that when the addressee picks the ACCEPT update (by using a response particle like 'yes' or 'right') and adds the question embedded by *ho* into her QUD stack, she cannot provide an answer for the embedded question, as illustrated in (13B). Answering the embedded question in (13A) is only possible when the addressee does not pick the ACCEPT update, as illustrated in (13B'), which indicates that the addressee rejects the question.

(13) A: Aaman heoi-zo bin le ho?
Aaman go-ASP where Q HO
'Where is Aaman? Do you wonder about the same thing?'

B': #Hai lo. Keoi heoi-zo hokhaau.
Yes SFP he go-ASP school
'Yes. He went to school.'

B: Keoi heoi-zo hokhaau.
he go-ASP school
'He went to school.'

References: **Davis**, C. 2011. Constraining Interpretation: Sentence Final Particles in Japanese, UMass diss. **Farkas and Bruce**. 2010. On Reacting to Assertions and Polar Questions. *JoS*. **Krifka**. 2014. Embedding illocutionary acts. **Krifka**. 2015. Bias in Commitment Space Semantics. *SALT-25*. **Rawlins**. 2010. Conversational backoff. *SALT-20*. **Lam**. 2014. A complex ForceP for speaker &-addressee-oriented discourse particles in Cantonese. *SCL*.