Discourse adverbs and polar questions in Cantonese: a preliminary rating study

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1 Introduction

Sinitic languages such as Cantonese and Mandarin have at least two kinds of polar questions, *yes/no* particle question (henceforth YN) and so-called A-not-A question (henceforth ANOTA). According to the seminal work by Hamblin (1958, 1973), the semantics of a polar question p? is a set consisting of two possible answers $\{p, \neg p\}$, but there exist a vast range of empirical evidence that the distributions of YN and ANOTA questions are different though there are also some overlaps. The similarities and differences between these two constructions have important implications for the syntax and semantics of polar questions. There is a wide range of literature on this topic in Mandarin Chinese (Li & Thompson, 1981; Huang, 1991; Dong, 2009; Yuan & Hara, 2013; Krifka, 2015; Yuan, 2015; Xu, 2017; Ma, 2018), while fewer works are available for Cantonese (Lam, 2014; Hara, 2015, 2019). The aim of the current project is to fill this gap by offering more empirical data that show the properties of Cantonese YN and ANOTA questions. More specifically, this paper serves as a preliminary report of a rating study which examines the (in)compatibility between discourse adverbs, *dou3dai2* 'after all' and *m4tung1* 'as if/could it be that', on one hand and polar questions, YN and ANOTA, on the other.[1]

2 Basic Data

In Cantonese, a YN question is formed by adding a question particle *aa4* or with rising intonation as in (1).

(1)   a.   *Mary sik6 sau6si1 aa4?*
             Mary eat   sushi   Q
             'Does Mary eat sushi?'   (YN Q)
       b.   *Mary sik6 sau6si1↑*
             Mary eat   sushi
             'Mary eats sushi?'   (YN Q)

An ANOTA question is formed by sandwiching negation with two identical predicates:

(2)   *Mary sik6 m4 sik6 sau6si1 aa3?*
       Mary eat   not eat   sushi   Q
       'Does Mary eat sushi or not?'   (ANOTA Q)

Mandarin has structures parallel to (1) and (2). One of the intuitive differences between the two observed by Li & Thompson (1981) for Mandarin is that a YN question can be used when the speaker has a bias toward one of the answers while an ANOTA seems to be always neutral.[2]

Furthermore, Huang et al. (2009) observe that there is a distributional difference in terms of the co-

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[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]   See Yuan & Hara (2013) and Yuan (2015) for more detailed discussions.

occurrence of these constructions and discourse adverbs, *daodi* 'truly' and *nandao* 'actually'. As in (3), *daodi* can occur in an ANOTA question while it cannot occur in a YN question. On the other hand, *nandao* cannot occur in ANOTA, while it can in YN:

(3)   Mandarin   (Huang et al., 2009:237)

    a.   *ni   daodi/*nandao renshi ta   bu   renshi ta?*
       you truly/actually   know him/her not know him/her
       'Let me get to the answer now: do you know him/her or not?'   (A-NOT-A)

    b.   *ni   nandao/*daodi (bu) renshi ta   ma?*
       you actually/truly   not known him/her Q
       'Is it actually the case that you (don't) know him/her?'   (YN)

Cantonese equivalents to *daodi* and *nandao* are *dou3dai2* 'after all' and *m4tung1*, respectively. Literally, *dou3dai2* means 'reach-bottom' and when it is used with a declarative, it functions as a discourse marker such as 'after all' or 'in the end' as in (4).

(4)   *hou2do1 jan4   waan5lau4 keoi5, daan6 keoi5 dou3dai2 dou1hai6 zau2 zo2.*
      many   people keep   him but   he   after.all still   leave PFV
      'Many people asked him to stay, but in the end he still left.'

Dou3dai2 cannot be used in a YN question while it can in ANOTA. When it is used in an ANOTA as in (5-b), it expresses a sense of impatience:

(5)   a.   **dou3dai2 Mary sik6 sau6si1 aa4?*
       after.all Mary eat sushi   Q
       'After all, does Mary eat sushi?'   (YN)

    b.   *dou3dai2 Mary sik6 m4 sik6 sau6si1 aa3?*
       after.all Mary eat not eat sushi   Q
       'After all, does Mary eat sushi or not?'   (ANOTA)

As for *m4tung1*, it literally translates to 'not-understand' and introduces rhetorical questions of two different usages according to Matthews & Yip (2013). One usage is to express "scepticism or sarcasm" (5224) as in (6).

(6)   *m4tung1 ngo5 wui5 seon3   nei5 aa4?*
      as.if   I   will believe you Q
      'As if I'd believe you!'   (Matthews & Yip, 2013:5224)

The other is "to speculate on possible causes" (5224) resulting in the meaning similar to "I wonder if" as in (7).

(7)   *dim2gaai2 zung6 m4 gin3 keoi5 ge2? m4tung1 keoi5 beng6 zo2?*
      why   still not see her   SFP as.if   she   ill   PFV
      'Why hasn't she shown up yet? I wonder if she's fallen ill?'   (Matthews & Yip, 2013:5224)

Note that both (6) and (7) are YN questions. *M4tung1* cannot be used in ANOTA questions as in (8).

(8)   **m4tung1 Mary sik6 m4 sik6 sau6si1 aa3?*
      mtung   Mary eat not eat sushi   Q
      'I wonder if Mary eats sushi or not?'   (*mtung*-ANOTA)

To recapitulate, *dou3dai2* cannot occur in a YN question while it can in ANOTA. *M4tung1* can occur in a YN question but it cannot in ANOTA. The observation is summarized in the following Table.

(9)

	dou3dai2	*m4tung1*
YN	*	✓
ANOTA	✓	*

3   Rating study

To reinforce the empirical basis of the observation reported in the previous section, I conducted a naturalness rating survey and elicited linguistic judgements from native speakers who are naive to the linguistic phenomenon and theory at issue.

3.1   *Method*

Stimuli   The stimuli had two fully-crossed factors—Adverb (*doudai/mtung*) and Question type (YN/ANOTA), which resulted in four conditions— *doudai*-YN, *doudai*-ANOTA, *mtung*-YN, *mtung*-ANOTA. Each condition had 80 items. 80 fillers were included.

(10)   a.   **dou3dai2 Mary sik6 sau6si1 aa4?*
           after.all   Mary eat   sushi   Q
           'After all, does Mary eat sushi?'   (*doudai-YN)
       b.   *dou3dai2 Mary sik6 m4 sik6 sau6si1 aa3?*
           after.all   Mary eat   not eat   sushi   Q
           'After all, does Mary eat sushi or not?'   (*doudai*-ANOTA)
       c.   *m4tung1 Mary sik6 sau6si1 aa4?*
           as.if   Mary eat   sushi   Q
           'Could it be that Mary eats sushi?'   (*mtung*-YN)
       d.   **m4tung1 Mary sik6 m4 sik6 sau6si1 aa3?*
           as.if   Mary eat   not eat   sushi   Q
           'Could it be that Mary eats sushi or not?'   (*mtung-ANOTA)

The current observation gives rise to the predictions in (11).

(11)   a.   *doudai*-ANOTA is preferred over *mtung*-ANOTA.
   b.   *mtung*-YN is preferred over *doudai*-YN.

Procedure   The stimuli were presented via a web-based online survey system, Qualtrics.[3] The experiment was counterbalanced so that a subject does not see the same adverb or interrogative from the same item twice. The participants rated the naturalness of the target sentences as in (10) on a 1-to-7 scale.

Participants   30 native speakers of Cantonese participated in the rating experiment. They received 80 Hong Kong dollars as compensation.

Statistics   To analyze the results, a general linear mixed model (Baayen, 2008; Baayen et al., 2008; Bates, 2005) was run using the lme4 package (Bates et al., 2011) implemented in R (R Core Team, 2019). Adverbs and constructions were the fixed factors. Speakers and items were the random factors. The p-values were calculated by the Markov chain Monte Carlo method using the LanguageR package (Baayen, 2009).

3.2   *Result and Discussion*   Figure 1 shows the average and median naturalness ratings. With YN questions, *mtung* is preferred over *doudai* ($|t| = 72.80; p < 0.001$). With ANOTA questions, *doudai* is preferred over *mtung* ($|t| = 101.32; p < 0.001$).

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[3]   The output for this paper was generated using Qualtrics software, Version 022018 of the Qualtrics Research Suite. ©2017 Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. `http://www.qualtrics.com`
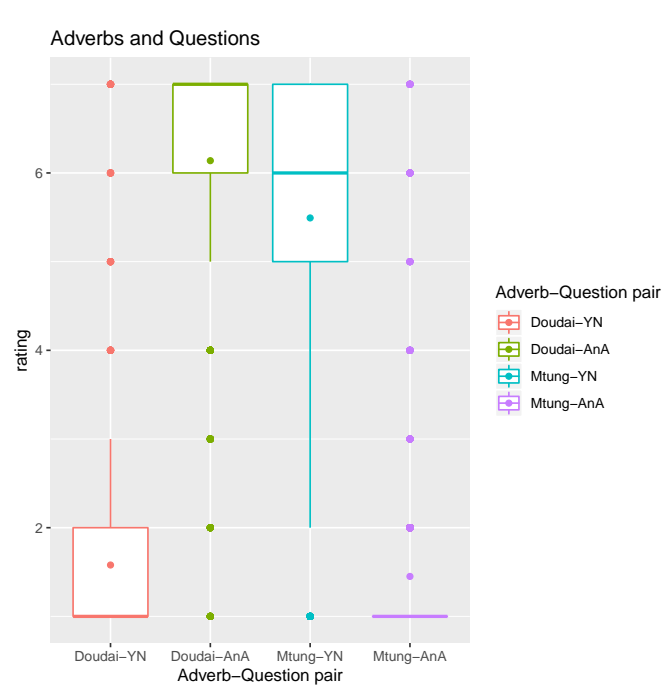
Figure 1: Naturalness Ratings of Adverb-Question combinations

The current result confirms the introspection-based pattern observed in Section 2:

(12)

	dou3dai2	*m4tung1*
YN	*	✓
ANOTA	✓	*

4 Summary and outlook

This paper reported a naturalness rating study the result of which confirms the introspection-based judgement that *dou3dai2* is compatible with ANOTA but not with YN, while *m4tung1* is compatible with YN but not with ANOTA. What would be the theoretical implications of this result? Yuan & Hara (2019) suggest that in Mandarin both YN and ANOTA questions denote Hamblin sets of propositions, but they are composed differently. In a YN question, the question particle *ma* is an expressive force marker which is responsible for creating the Hamblin set. As for ANOTA questions, the Hamblin-set is produced at at-issue level. If Yuan & Hara's (2019) suggestion can be carried over to Cantonese YN and ANOTA questions, it is plausible to hypothesize that *dou3dai2* selects an at-issue Hamblin-set while *m4tung1* selects an expressive one.

Another interesting observation is that *dou3dai2* can precede not only ANOTA interrogatives but also declarative sentences as we have seen in (4). Inquisitive semantics (Ciardelli et al., 2019) provides a platform which can deal with declaratives and interrogatives uniformly as a set of propositions. It would be fruitful to investigate whether we can assign a single denotation to *dou3dai2* that can apply to both the declarative and interrogative usages.

Finally, the pattern discussed in this report has a potential contribution in the neurolinguistic processing of polar questions. An occurrence of *dou3dai2/m4tung1* prompts the processor to expect either an ANOTA question or a YN question. By investigating what kind of ERP components (N400, P600, etc) is elicited by the violation of the expectation, it is possible to reveal whether the differences between YN and ANOTA questions arise from their syntactic, semantic or pragmatic properties.

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