



# The prosody of enhanced bias in Mandarin and Japanese negative questions

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## Abstract

This paper examines the semantics of prosodic cues that enhance the bias meaning of negative polar questions in Mandarin Chinese and Japanese. We propose a semantic denotation for each phonetic phenomenon: Mandarin sentence-final stress marks the salience of the proposition with the opposite polarity to that of the surface proposition, while Japanese deaccentuation marks the givenness of the positive answer. The proposed semantics compositionally derives the observed discourse effects. The second part of the paper reports two naturalness rating experiments, which further support the empirical bases of our semantic analyses. Taken together, our study demonstrates the significant interaction between prosodic cues and contexts.

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## 1. Introduction

In Hamblin-style (1973) analysis of questions, a positive polar question and the corresponding negative polar question like (1) are predicted to have the same semantics, i.e.,  $\{p, \neg p\}$ .

- (1) a. Is there a vegetarian restaurant around here?  
b. Is there no vegetarian restaurant around here?

(Büring and Gunlogson, 2000)

However, the two questions in (1) have different meanings (Büring and Gunlogson, 2000). While (1-a) can be asked when the speaker has no bias, (1-b) should be used when the speaker has evidence against the proposition 'there is a vegetarian restaurant around here'. Thus, Büring and Gunlogson (2000) claim that these questions have different felicity conditions; a negative polar question like (1-b) requires evidence against  $p$ .

Similarly, Romero and Han (2004) observe that a preposed negative polar question like (2-a) has a bias toward the positive answer compared to the non-preposed one (2-b).

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- (2) a. Doesn't John drink?  
Positive epistemic implicature: The speaker believes or at least expects that John drinks.  
b. Does John not drink?  
No epistemic implicature necessary.

(Romero and Han, 2004, pp. 609–610)

Although how the biased meaning arises from a negative polar question is still controversial (Ladd, 1981; Büring and Gunlogson, 2000; Creswell, 2000; Romero and Han, 2004; Reese, 2006), there is a general consensus that the negative polar question induces a bias meaning. For instance, Romero and Han (2004) hypothesize that preposed negation in English introduces a VERUM operator that generates the bias meaning as an implicature. Deriving bias in negative questions is beyond the scope of the current study, which focuses on the semantics of the prosody that enhances this bias. However, we speculate that the Gricean Quantity Principle or the Principle of Economy may be at work. That is, if positive and negative questions have identical semantics, then uttering the (usually shorter) positive version is more economical. Thus, if the speaker decides to use the negative question, there must be an extra message that the speaker wants to convey above and beyond the plain question meaning.

This paper points out and analyzes previously unnoticed means of constraining the felicity of negative polar questions in Mandarin Chinese and Japanese. In these two languages, the presence of an additional prosodic cue on a negative polar question requires a context where the speaker has stronger evidence that reinforces the bias, in contrast to questions without this additional cue. The paper first describes the relationship between the prosodic cues and the bias effects, and proposes our semantic analyses. We treat these prosodic cues as intonational features or morphemes that are paratactically associated to the sentence. That is, these prosodic features are not syntactically integrated in the structure; rather, they are floating morphemes that attach to sentences (Bartels, 1999). We then provide the lexical meanings that compositionally derive the desired interpretations of the negative polar questions, whereby information-seeking questions are turned into meta-discourse questions. Finally, we report two experiments which empirically support our observations and analyses.

This paper is structured as follows: In Section 2, we start with the basic observation and semantic analysis of Mandarin sentence-final stress. Section 3 deals with Japanese deaccentuation. Section 4 summarizes the introspection-based analyses of the two languages. In Sections 5 and 6, we report two experiments in which native speakers of Mandarin and Japanese judge the naturalness of the prosodic cues against contexts where the strength of the bias is manipulated. The results support the proposal that the addition of the prosodic cues requires a context where there is stronger evidence supporting the bias. Section 7 concludes the paper.

## 2. Mandarin sentence-final stress

This section presents introspection-based observations about the prosodic cues of enhanced bias in Mandarin Chinese. Prosodic stress that is normally placed on constituents to induce a focus interpretation can also appear in a sentence-final position. When sentence-final stress is used in a negative polar question, the question expresses that the speaker had a previous belief that the positive answer was true.

### 2.1. Introspection-based data

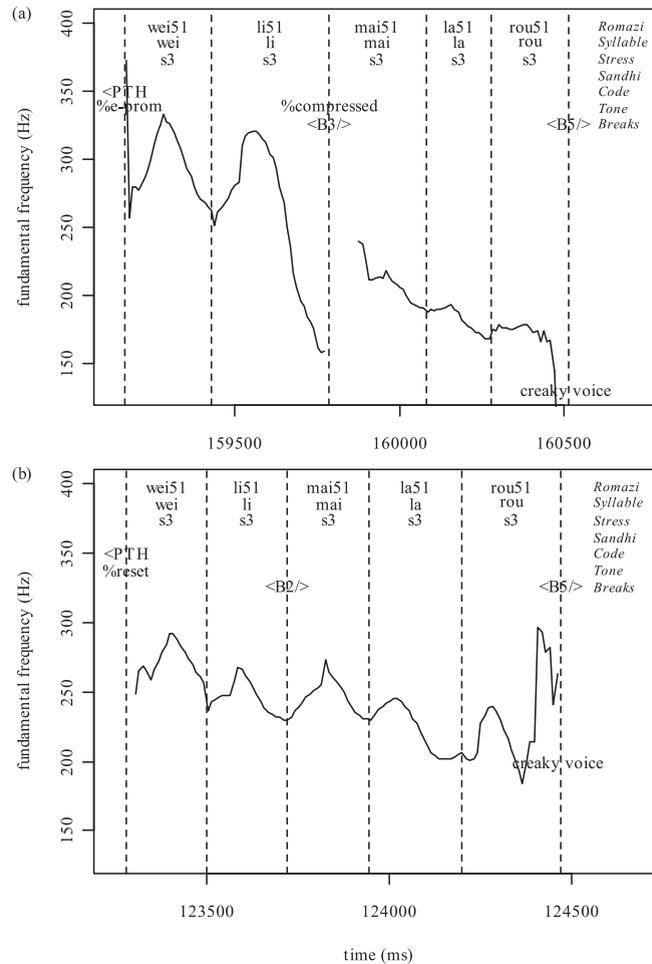
In Mandarin Chinese, prosodic stress on a constituent can indicate focus (c.f., Liu and Xu (2005) and Peng et al. (2006)). In (3), the subject NP *Weili* receives emphatic stress (marked as ES), which gives rise to a narrow focus on *Weili*; that is, (3) indicates that among the contextually salient alternative individuals, it is *Weili* that sells bacon, not the others.<sup>1</sup>

- (3) [<sub>ES</sub>Weil<sub>51</sub>li<sub>51</sub>] mai<sub>51</sub> la<sub>51</sub>rou<sub>51</sub>.  
Weili sell bacon  
'WEILI sells bacon.' (It is Weili, not others, that sells bacon.)

(adapted from Peng et al. (2006))

Phonetically, the emphatic stress is realized via expansion of the pitch range of focused syllables as well as post-focus compression, as depicted in Fig. 1 (taken from Peng et al. (2006)). Semantically, emphatic stress gives rise to alternative

<sup>1</sup> The subscript numbers in Mandarin example sentences indicate lexical tones: <sub>55</sub> = high-level tone; <sub>35</sub> = high-rising tone; <sub>21</sub> = low-dipping tone; <sub>51</sub> = high-falling tone. Those that do not have subscript numbers have no lexically specified tones.



(a) Narrow focus on *WeiLi*  
 (b) “Out of the blue” statement

Fig. 1. Pitch range expansion due to constituent stress in Mandarin Chinese (Peng et al. 2006, p. 52). *Weili* (the first two intervals) receives a constituent focus in (a).

propositions. In the case of constituent stress like (3), the alternative propositions are obtained by replacing the focused constituent with alternative constituents of the same semantic type (e.g., type *e* in (3), see Rooth (1985)). For instance, we obtain the following alternative set for (3): Alt([<sub>F</sub> *Weili*] sells bacon) = { [<sub>F</sub> *Weili* sells bacon ], [<sub>F</sub> *Zhansang* sells bacon ], [<sub>F</sub> *Xiaomei* sells bacon ], ... }. An exhaustive interpretation is derived from these alternatives through pragmatic strengthening (see Schulz and van Rooij (2006) for details). See also Hirotani (2005) who relates focus to the alternative semantics.

The same kind of pitch range expansion can occur sentence-finally. In (4), stress (marked as *sfs* for sentence-final stress) falls on the last syllable of a rising negative question. Figs. 2 and 3 show the pitch expansion and elevation as well as final lengthening in the sentence with stress.<sup>2</sup> In terms of the semantic interpretation, native-speaker intuitions suggest that sentence-final stress on *yu*<sub>21</sub> (as in Fig. 3) indicates that the speaker had a previous belief in a proposition with the opposite polarity. More specifically, final stress in a rising question like (4) intensifies the speaker’s incredulity about the embedded proposition. The situation where the sentence-final syllable does not receive stress (as in Fig. 2), by contrast, does not give rise to this inference.

<sup>2</sup> In Fig. 3, pitch expansion seems to target non-final syllables as well as final syllables, whereas lengthening is most clearly observed in the final word (276ms vs./ 495ms). We are currently conducting a production study to pin down the phonetic realizations of “final stress” in Mandarin (which may not be strictly localized to final position, but will be referred to as “final stress” here for clarity).

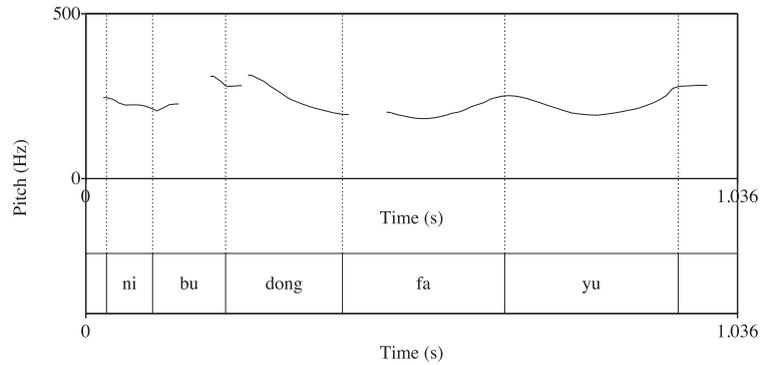


Fig. 2. Unstressed  $yu_{21}$  in (4); pronounced by a female native speaker of Mandarin.

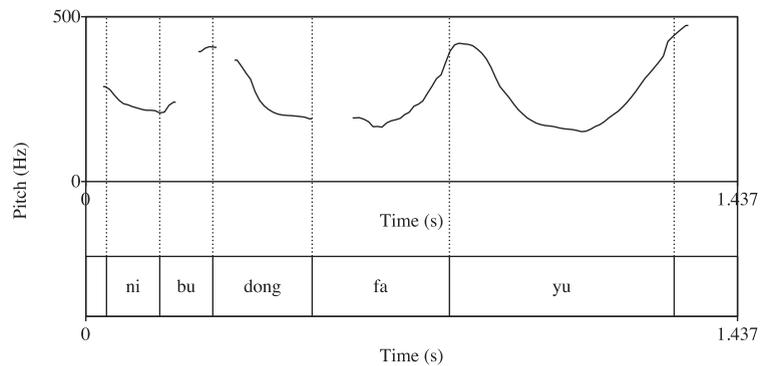


Fig. 3. Stressed  $yu_{21}$  in (4); pronounced by a female native speaker of Mandarin.

- (4)  $Ni_{21}$   $bu_{51}$   $dong_{21}$   $fa_{35[SFS]}$   $yu_{21}$ ?  
 You NEG know French  
 'You don't know French?'

(I believed that you knew French.)

Building on the discussion of the focus effect of constituent stress observed by Peng et al. (2006), we propose that emphatic stress is licensed only if there is a set of salient alternatives in the context, and thus we unify the semantic effect of constituent stress and sentence-final stress as triggering salient alternatives.

## 2.2. Modelling the discourse effects

This section presents a formal analysis of the role of stress in a biased question, where the use of sentence-final stress requires there to be more evidence in the context (see Section 5 for experimental confirmation). If the context has strong evidence toward  $p$ , it is natural to assume that the speaker believes  $p$ , which conflicts with the at-issue proposition  $\neg p$  denoted by the surface sentence NEG-S. In short, sentence-final stress indicates an epistemic conflict because  $\neg p$ , the proposition at issue, is at odds with the speaker's previous belief  $p$ . The next questions are: (i) what semantic/pragmatic function is encoded by stress and (ii) how does the interpretation of sentence-final stress interact with the context? We have consulted several native informants, who report that sentence-final stress indicates the speaker's incredulity. How does this surprise connotation come about? To address these questions, we first assume with the previous literature that stress in general induces salient alternatives, unifying both constituent and sentence-final stress; then we derive the interpretation of the utterances with sentence-final stress in terms of dynamic update over beliefs of conversation participants.

### 2.2.1. The role of stress

Constituent stress has attracted a considerable amount of attention in both prosodic and semantic studies (Jackendoff, 1972; Rooth, 1985, 1992; von Stechow, 1991; Bartels and Kingston, 1994; Schwarzschild, 1999; Krifka, 2001; Selkirk, 1984, 2002, to name a few). Stress has been formalized as inducing different alternatives, as illustrated by the English example in (5).

- (5)  $[[_{ES} \text{ Weili}] \text{ sells bacon.}]$   
 (It is Weili that sells bacon)

When uttered with emphatic stress on the subject Weili, (5) yields an exhaustive interpretation, i.e., ‘Only Weili sells bacon’, with respect to a question under discussion (‘Who sells bacon?’) or a set of alternative propositions ( $[[\text{Weili sells bacon}], [\text{Xiaomei sells bacon}], [\text{Xiaohua sells bacon}]]$ ). We adapt the framework of Rooth (1992) in deriving the alternatives, where stress indicates focus-marking on the stressed constituent. The existence of focus in a sentence triggers the focus semantic value  $[[\cdot]^f]$  in addition to the ordinary semantic value  $[[\cdot]]$ . The focus value can be obtained by abstracting the proposition over the focused element (6-a). However, the focus value cannot itself be the alternative set since the focus value includes all the propositions of the form  $\text{sell}(x, \text{bacon})$ , as long as  $x$  is an individual. Rather, the alternative set is recovered from the context, and the focus value constrains the form of the members of the alternative set by requiring it to be a subset of the focus value (6-b). In other words, focus-marking presupposes that there is a salient set of alternatives in the context, and constrains the form of these alternatives by requiring that they be a subset of the alternatives denoted by the focus value of the sentence.

- (6) a.  $[[[_F \text{ Weili}] \text{ sells bacon.}]^f = \{\text{sell}(x, \text{bacon}) \mid x \in D_e\}$   
 b.  $\text{Alt}([[[_F \text{ Weili}] \text{ sells bacon.}])$   
 $= \{\text{sell}(\text{weili}, \text{bacon}), \text{sell}(\text{xiaomei}, \text{bacon}), \text{sell}(\text{xiaohua}, \text{bacon})\}$   
 $\subset [[[_F \text{ Weili}] \text{ sells bacon.}]^f$

The exhaustive meaning is obtainable by pragmatic strengthening (Schulz and van Rooij, 2006). To simplify the picture, let us introduce an exhaustive operator  $\text{Exh}$  which operates over the alternative set and the focused element (Chierchia, 2004; Fox, 2007).

- (7)  $\text{Exh}(\text{Alt}(p), p) = \forall q[q \in \text{Alt}(p) \wedge w_{@} \in q \rightarrow q = p]$

For each proposition in the alternative set salient in the discourse, if it is true, it is identical to the surface proposition  $p$ . Hence, only the surface proposition is true among the alternatives. Crucially, the focus-marking presupposes the existence of a contextually salient set of alternatives, which is restricted to be a subset of the focus semantic value of the sentence.

Let us return to sentence-final stress, which is the main concern of this section. Although sentence-final stress and constituent stress may seem to have different functions, we propose that it is possible to unify the two. That is, stress is an intonational feature which induces salient alternatives in both cases. In the case of sentence-final stress, it is not syntactically but paratactically associated with the sentence (Bartels, 1999) and focus-marks the covert affirmative operator,  $\text{Ident}$ , which is an identity function of the semantic type  $\langle st, st \rangle$ . Now, what would be the alternative to  $\text{Ident}$ ? Our answer is the negative operator  $\neg$ , which reverses the truth value of the proposition. Hence, the alternative set of the sentence  $\text{NEG-S}$  with sentence-final stress is  $\{\neg p, \neg\neg p\} (= \{\neg p, p\})$ , where  $[[\text{NEG-S}]] = \neg p$ .

- (8) a.  $[[\text{You don't speak French-}[_F \text{ Ident}]]^f$   
 $= \{O(\neg \text{you-speak-French}) \mid O \in D_{\langle st, st \rangle}\}$   
 b.  $\text{Alt}([[ \text{You don't speak French-}[_F \text{ Ident} ]])$   
 $= \{\neg \text{you-speak-French}, \neg\neg \text{you-speak-French}\}$   
 $= \{\neg \text{you-speak-French}, \text{you-speak-French}\}$   
 $\subset [[\text{You don't speak French-}[_F \text{ Ident}]]^f$

Now, as in the case of constituent stress, the presence of sentence-final stress presupposes the existence of the alternative set. The surface proposition  $\neg p$  is salient as the at-issue proposition, while the salience of the alternative proposition  $p$  depends on the speaker's previous belief. In summary, regardless of its position in a sentence, the role of stress is to generate an alternative set.

### 2.2.2. Semantic analysis of Mandarin sentence-final stress

To formally model the interpretation of the utterance with sentence-final stress, we follow Gunlogson (2003), who defines a Stalnakerian (1998) common ground as an intersection of the public beliefs of the conversation participants (i.e., the speaker and the addressee). The common ground is a set of propositions, each of which is a mutual belief of the participants in the discourse. An assertive act is characterized as a proposal to add a new proposition into the common ground (Stalnaker, 1998). Gunlogson (2003), in analyzing English rising declarative sentences, provides a more fine-grained notion, the public belief, which is relativized to each conversation participant:

- (9) With respect to a context  $C$ ,
- $p \in \text{PB}_A(C)$  iff 'A believes  $p$ ' is a mutual belief of A and B in  $C$ .
  - $p \in \text{PB}_B(C)$  iff 'B believes  $p$ ' is a mutual belief of A and B in  $C$ .

(Modified from Gunlogson, 2003, p. 42)

A linguistic utterance performs an update to this public belief (Heim, 1982). Following Gunlogson's analysis of English rising declaratives, we argue that a Mandarin rising '↑' declarative like (4) denotes *the addressee's* commitment to the embedded proposition. We treat such questions as rising declaratives (following Gunlogson, 2003) since the surface order of a question like (4) is the same as that of a declarative, and its status as a question comes about solely because of the final rise (rather than the addition of a question particle). A declarative sentence denotes a discourse participant's commitment. That is, the proposition denoted by the sentence is added to the public belief PB relativized to the individual. If a declarative sentence is uttered with a falling intonation, it updates the speaker's public belief,  $\text{PB}_{\text{spkr}}$ , and hence the construction denotes the speaker's commitment. In contrast, if a declarative is uttered with a rising intonation, it updates the addressee's public belief,  $\text{PB}_{\text{addr}}$ , and thus the construction denotes the addressee's commitment. In other words, final rise is an intonational morpheme which shifts the seat-of-knowledge of PB from the speaker to the addressee.

In the case of a rising negative declarative, the proposition  $\neg p$  is added to the addressee's public beliefs,  $\text{PB}_{\text{addr}}(C)$ , as defined in (10).

- (10)  $\llbracket \uparrow \rrbracket (\neg p)(C) = \text{PB}_{\text{addr}}(C) \cup \neg p$ ,  
where  $C$  is the current context of the utterance.

As discussed in Section 2.2.1, sentence-final stress focus-marks the affirmative operator of the surface proposition, introducing a set of alternatives:  $\text{Alt}(\neg p) = \{ \neg p, \neg\neg p \} (= \{ p, \neg p \})$ . The salience of the surface proposition  $\neg p$  is evident as it is uttered by the speaker and committed to by the addressee. The definition of sentence-final stress 'sfs' needs to further pin down the salience of the alternative proposition with the opposite polarity,  $\text{Alt}(\neg p) - \{ \neg p \} (= \{ p \})$ . The alternative is salient because it is part of the speaker's previous beliefs. When does the speaker have a belief toward a particular proposition? The most plausible situation is when the speaker has some evidence which supports the proposition. The strength of evidence determines the speaker's epistemic states and therefore influences the change of belief. For concreteness, we spell out the presupposition of sentence-final stress as in (11). The belief here could be public or private; hence we use  $\text{Bel}_{\text{spkr}}$ .

- (11)  $\llbracket \text{sfs} \rrbracket (\neg p)(C)$  is defined iff  $\text{Alt}(\neg p) - \{ \neg p \} \subset \text{Bel}_{\text{spkr}}(C_{\text{pre}})$ ,  
where  $\text{Alt}(\neg p) = \{ \neg p, p \}$  and  $C_{\text{pre}} <_{\tau} C <_{\tau} C_{\text{post}}$ .

According to the presupposition introduced by sfs in (11), sentence-final stress is more compatible with the contexts where the speaker has sufficient evidence for  $p$ . In summary, a declarative sentence uttered with a final rise and sentence-final stress is interpreted as follows: Final rise indicates that the addressee is committed to the proposition  $\neg p$ , which conflicts with the alternative proposition  $p$  which is part of the speaker's previous beliefs.

- (12) The interpretation of NEG-S-SFS-↑:
- $\neg p \in \text{PB}_{\text{addr}}(C)$
  - $\{ p \} \subset \text{Bel}_{\text{spkr}}(C_{\text{pre}})$ , where  $\llbracket S \rrbracket = p$ .

The speaker attempts to resolve this conflict by uttering a rising declarative. The communicative intent of the speaker goes as follows: I have enough evidence for  $p$ ; and you are publicly committed to  $\neg p$ . Therefore, I inquire whether you have sufficient evidence to commit yourself to  $\neg p$ , i.e., whether you are sure about adding  $\neg p$  into the common ground. In contrast, when the speaker does not have sufficient evidence, then  $p$  does not belong to the speaker's set of beliefs, and  $p$  is therefore not salient. The speaker can at best make a mere guess about the trueness of the alternative proposition; therefore, there is naturally no epistemic conflict and final stress is less preferred.

In summary, we decompose the meaning of Mandarin negative questions with sentence-final stress into three components: their propositional content; the final tone, which is the intonational cue of propositional commitment relativized to interlocutors; and the stress, a cue of the speaker's previous beliefs. In particular, having sentence-final stress indicates an epistemic conflict between the speaker's previous belief and the incoming proposition. The speaker is not asking a neutral information-seeking question, but indicating surprise or requesting more evidence for the conflicting proposition. The experimental results discussed in Section 5 further support our analysis.

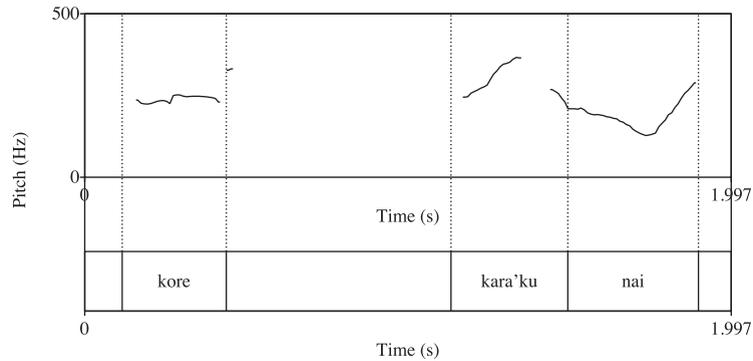


Fig. 4. Accented rendition of the adjective predicate.

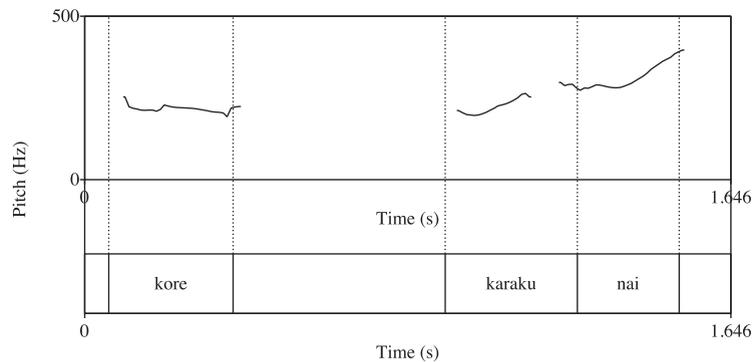


Fig. 5. Deaccented rendition of the adjective predicate.

### 3. Japanese deaccentuation

#### 3.1. Introspection-based data

Next, we turn to the deaccentuation of adjectives in Japanese.<sup>3</sup> In Japanese, rising negative questions like (13) express bias meanings which parallel English preposed negative questions (Romero and Han, 2004), or tag questions (Reese, 2007). That is, the question is accompanied by an implicature that the speaker has a bias toward the positive answer ('This is spicy.'). As far as the lexical accent of the adjective is concerned, the rising intonation for this construction has two variants.<sup>4</sup> In (13-a) and Fig. 4, the lexical accent of *kara'ku* (H\*+L) (Venditti, 2005) is retained. In (13-b) and Fig. 5, the lexical accent is deleted.

- (13) kore, karaku-nai?  
 this spicy-NEG  
 'Isn't this spicy?'  
 a. kara'ku nai ↑  
 L%HH\*+L L%H%  
 b. karaku nai ↑  
 %LH- H%

Deaccenting has been widely discussed in the domain of Information Structure (Halliday, 1967). For instance, in many intonation languages (English, German, etc.), post-focus (or post-nuclear) deaccenting takes place after the focused

<sup>3</sup> We only consider adjectives since adjectives are the only predicates which can undergo deaccentuation. This restriction may arise from adjectives' semantic properties, such as vagueness and gradability. See Section 7 for further discussion.

<sup>4</sup> As an anonymous reviewer pointed out, the negative suffix *nai* is lexically accented and shows its accent when the suffix is attached to unaccented roots (Kawahara, in press). In this paper, we only consider the lexically accented adjectives which delete the lexical accent of *nai*. The reviewer also reported that the deaccenting of the suffix with an unaccented root yields a similar connotation as the deaccented adjective. We agree with the judgment, but testing whether our analysis can extend to the deaccenting of the suffix is a matter for future research.

word. In Japanese, focus interpretation is realized through post-focus/focal reduction or compression of pitch register (see Deguchi and Kitagawa, 2002; Sugahara, 2003; Ishihara, 2003, 2007; Tomioka, 2009; Hirotsu, 2012, for Tokyo Japanese and see Smith, 2013, for Fukuoka Japanese).<sup>5</sup> We argue that deaccenting of adjectives in Japanese has a discourse function different from post-focus-reduction.<sup>6</sup> That is, deaccentuation indicates that the speaker has enough evidence for the proposition expressed by the sentence. Indeed, the introspection-based data suggest that the use of deaccentuation correlates with the evidentiality associated with the proposition embedded in the utterance (Hara and Kawahara, 2008).

Evidentiality is “[t]he grammatical encoding of the speaker’s [...] grounds for making a speech act” (Faller, 2002, p. 2).<sup>7</sup> Deaccentuation is used when the speaker’s bias is enhanced by newly acquired evidence.<sup>8</sup> To illustrate, consider the following contexts for the question in (13). As noted above, the lexical accent of the adjective is either deleted or retained. The deaccentuation is felicitous only when the bias for the positive answer is enhanced by newly acquired evidence, as in (14).

(14) Enhanced Evidence Context

A went to a Korean restaurant for the first time with B. A tasted the soup B ordered, which was burning hot. A saw B sweating a lot and asked B:

- a. #kara'ku nai ↑ (Accented)
- b. ↘karaku nai ↑ (Deaccented)

In contrast, when there is no enhancement of bias by new evidence as in (15), the accented rendition is preferred.

(15) Baseline Context

A went to a Korean restaurant for the first time with B. A saw that the soup B ordered was red with chilli peppers in it. A said to B before eating:

- a. ↘kara'ku nai ↑ (Accented)
- b. #karaku nai ↑ (Deaccented)

Although this deaccentuation pattern has been documented in a sociolinguistic study (Tanaka, 2010)<sup>9</sup> and a pedagogical study (Wakuda, 2003), its semantic properties have not been systematically investigated in theoretical linguistics. This section fills this gap.

### 3.2. Modelling the discourse effect

The contrast in interpretations between the two prosodic patterns is very similar to the one that exists with Mandarin sentence-final stress. That is, the extra prosodic cue of a deaccented adjective is more felicitous when the context suggests that the speaker has a stronger bias toward the positive answer. However, there are also differences from Mandarin sentence-final stress. First, the prosodic cue is not given by stress but by deaccenting. Second, unlike Mandarin stress, Japanese deaccenting does not give rise to an epistemic conflict. Rather, the speaker is seeking agreement or confirmation from the addressee. This observation is independently supported by an experiment conducted in Wakuda (2003), which

<sup>5</sup> In (i), the *wh*-word *nani-o* is in focus and receives a prominent  $F_0$  peak, whereas *nomiya-de* and *nonda* are post-focus-reduced.

(i) Naoya-ga nani-o nomiya-de nonda no?  
Naoya-NOM what-ACC bar-LOC drank Q  
'What did Naoya drink at the bar?'

(Ishihara, 2003, p. 52)

The difference between the deaccenting under current investigation and this post-focus-reduction is that in deaccentuation, the lexical accent is completely deleted, while in post-focus reduction, the  $F_0$  peak is lowered but the lexical contrast of pitch accents is still retained. Ishihara (2003) also discusses the difference between deaccentuation and post-focus-reduction: No post-lexical operation deletes pitch contrasts; hence some phonetic traces of the lexical accent are still observable after the post-focus-reduction. One exception to his generalization is that the *wh*-phrases lexically lose their accents in NPI *mo* constructions (Kuroda, 2006).

<sup>6</sup> There is a possible connection between the deaccented adjectives and the post-focus-reduction in terms of givenness. See also Section 7.

<sup>7</sup> See Aoki (1986) for a summary of Japanese evidential morphemes.

<sup>8</sup> Hara and Kawahara (2008) suggested that deaccentuation requires direct evidence. As pointed out by Yasutada Sudo (personal communication), however, deaccentuation is available for predicates of personal taste (Lasnik, 2005) such as *mazui* 'distasteful', and hence direct evidentiality is not appropriate to describe the distributional pattern as one cannot have direct evidence for someone else's personal taste.

<sup>9</sup> For example, we have consulted several native speakers and they share an intuition that the use of deaccentuation is more common in women and younger generations.

elicits prosodic patterns of clauses containing a negation (i.e., ‘*p-na?*’) when uttered as *hitei-hyoomei* ‘asserting negation’ and when uttered as *dooi-motome* ‘seeking for agreement’. [Wakuda \(2003\)](#) concludes that deaccentuation takes place more often when the expression functions to ‘seek for agreement’ than when it functions to ‘assert negation’ (see also [Tanaka, 2010](#)).

We account for these observations by proposing that deaccenting indicates givenness of the positive answer. More specifically, by deaccenting the predicate, the proposition denoted by the positive answer is marked as GIVEN. As a result, the speaker is asking a question, but also indicating that the positive answer to the question is GIVEN. This apparent superfluity engenders a special discourse effect, just like Mandarin final stress does. To formalize our proposal, we draw on [Barker \(2009\)](#) (reviewed in [Section 3.2.1](#)), and propose that deaccenting marks the positive proposition as GIVEN.

### 3.2.1. *Barker (2009) on English clarity assertions*

[Barker \(2009\)](#) proposes that an English clarity assertion like (16), which appears to be uninformative, is actually a meta-assertion about the discourse state.

(16) It is clear that Abby is a doctor.

([Barker, 2009, p. 253](#))

According to [Barker \(2009\)](#), the assertion in (16) is paradoxical. In order for (16) to be uttered felicitously, there must be “public” evidence that Abby is a doctor, e.g., wearing a lab coat and a stethoscope. In contrast, such a requirement is not necessary for the plain assertion like (17). The speaker can truthfully utter (17) with his or her private evidence.

(17) Abby is a doctor.

([Barker, 2009, p. 253](#))

The clarity statement requires public evidence which makes the truth condition of the sentence obvious to the conversation participants; hence asserting the clarity statement should be uninformative.

In analyzing clarity assertions, [Barker \(2009\)](#) uses two levels of context update ([Stalnaker, 1998](#)): main effects and side effects ([Barker, 2002; Potts, 2005; Shan, 2005](#)). The main effect is the truth-conditional content of the assertion, while the side effect includes conventional implications, presuppositions, the introduction of discourse referents, etc. The main effect of the clarity assertion is trivial, but the side effect is not. The side effect of the clarity assertion is to announce that enough evidence is available to justify concluding the content of the main effect. We can never be 100% sure of any proposition, even when we have good evidence; but at some point in the conversation, we have to decide to add the proposition into the common ground. [Barker \(2009\)](#) argues that clarity is a vague and gradable notion that measures degree of justification. The clarity assertion tells the interlocutor that according to the state of the discourse (which includes the information about the standard for clarity), the public evidence meets the standard; hence we should conclude *p*. Therefore, (16) translates as ‘The observably available evidence justifies concluding that Abby is a doctor’.

[Barker \(2009\)](#) models the semantics of the clarity assertion using [Kratzer’s \(1991\)](#) semantics of modality. Let *f* be an epistemic modal base (18-a) and *g* a stereotypical ordering source, as in (18-b).  $\bigcap f(w)$  is the set of worlds that are consistent with the common ground in *w* and further restricted by the ordering source *g(w)* as in (18-c). [Barker \(2009\)](#) introduces a function  $\mu$  that maps worlds to degrees, which are ordered according to *g* as in (18-d). Thus, ‘it is clear that *p*’ ( $\approx$  ‘the public evidence justifies *p*’) is true if and only if *p* is true for each world *w* such that *w* is consistent with the common ground and the degree of the clarity in *w* exceeds the standard, as in (18-e).

- (18) a. Let *W* be a set of possible worlds.  
 Let  $f: W \rightarrow \wp(\wp(W))$  and  $f(w)$  represent the common ground in *w*.  
 b. Let  $g: W \rightarrow \wp(\wp(W))$  and  $g(w)$  represent a set of assumptions about the normal course of events in *w*.  
 c.  $u \leq_{g(w)} v$  iff  $v \in q$  implies  $u \in q$  for any  $q \in g(w)$ .  
 d. Let  $\mu$  be a degree-valued function on *W* such that  $w \leq_{g(w)} w'$  implies  $\mu(w) \leq \mu(w')$  for any  $w, w' \in W$ .  
 e. Let  $(w, d)$  be an evaluation point such that *w* is a possible world and *d* is a possible discourse.  
 Then,  $(w, d) \models \llbracket \text{The public evidence justifies } p \rrbracket$   
 iff  $\forall x \in \bigcap f(w). \mu(x) \leq d(\text{clear})$  implies  $x \in p$ ,  
 where  $d(\text{clear})$  is the operative standard for skepticism at the evaluation point.

(adapted from [Barker, 2009, p. 268](#))

This way, the side effect of the clarity assertion sets up a cutoff point for justifying the strength of the evidence; hence, a sentence like (16) is informative about the state of the discourse.

### 3.2.2. A semantic analysis of Japanese deaccentuation

The introspection-based data show that deaccentuation is judged as felicitous when the speaker is biased toward the positive answer. In particular, the speaker assumes that the positive answer is already GIVEN. We thus propose that the deaccentuation is an intonational morpheme which is paratactically associated to the sentence (Bartels, 1999) and marks the GIVEN feature:

- (19) The deaccentuation of the adjective in rising NEG-S marks the positive answer S as GIVEN, i.e., there is enhanced evidence that supports the proposition represented by S.

Note that the notion of GIVEN is different from the one in the classic sense (i.e., having a linguistic antecedent). That is, deaccentuation can happen when there is no linguistic antecedent as can be seen in (14), repeated here as (20).

- (20) Enhanced Evidence Context  
 A went to a Korean restaurant for the first time with B. A tasted the soup B ordered, which was burning hot A saw B sweating a lot and asked B:  
 ↗kore, karaku nai ↑ (Deaccented)  
 'Isn't this spicy?'

Rather, the speaker already has tasted the soup, and hence she has evidence which supports the proposition 'This soup is spicy'. Thus, in the current framework, if a sentence is marked GIVEN, there is evidence that supports the proposition represented by the sentence.

Now, a question arises as to what counts as evidence. Here, we adopt the idea of McCready and Ogata (2007). They analyze Japanese sentence-final auxiliaries and propose that a piece of information  $e$  is regarded as evidence for the prejacent proposition  $p$  just in case it raises the agent  $a$ 's subjective probability of  $p$ :

- (21)  $EV_p$ , relativized to agent  $a$ , indicates that:  
 a. some information  $e$  has led  $a$  to raise the subjective probability of  $p$   
 b.  $a$  takes  $p$  to be probably but not certainly true ( $.5 < P_a(p) < 1$ ) after learning  $e$ .

In (20), the speaker has tasted the soup, which reasonably raises the probability of the proposition denoted by the positive answer, 'This soup is hot'. Thus, there is enhanced evidence which supports the positive answer.

Given the above definition (19), a deaccented biased question  $p$ -GIVEN-*nai*? in Japanese has the same seeming paradox as English clarity assertions. The speaker is indicating that the positive answer is already given, and does not need information about the actual state of the world.

We extend Barker's (2009) analysis of clarity assertions to the Japanese biased questions with enhanced evidence. In Barker's original terms, a clarity assertion requires "public" evidence. The term "public", however, does not fit well with the case of Japanese deaccentuation. Since some of the predicates discussed in this study involve predicates of personal taste, it is impossible to obtain "public" evidence for the propositions that contain those predicates. Rather, what is at stake is the evidence newly acquired in the discourse which enhances the bias for the positive answer. Furthermore, this study investigates questions rather than assertions. Instead of announcing the justification of the evidence as in the English case, therefore, the speaker expresses uncertainty about the sufficiency of the evidence acquired in the discourse: 'Is the enhanced evidence clear enough to conclude that  $p$ ?'. In order to ask this question, there must already be enhanced evidence available in the discourse. That is, the common ground must already be restricted so that all the worlds in the common ground support that the enhanced evidence is available for the proposition  $p$  as in (22-a). Hence, the deaccentuation (i.e., GIVEN-marking) is only possible in the enhanced evidence context. Once this presupposition is satisfied, the question meaning inquires whether the clarity of the enhanced evidence exceeds the standard in the discourse. To model a question, a simple Hamblin-style (1973) semantics suffices. Thus, the meaning of  $p$ -GIVEN-*nai*? is a set which contains the proposition 'The enhanced evidence justifies that  $p$ ' and its complement 'The enhanced evidence does not justify that  $p$ ' as in (22-b).

- (22) a.  $\llbracket p$ -GIVEN-*nai* ? $\rrbracket$  is defined at  $(w, d)$  iff there is enhanced evidence which supports  $p$  in any world in  $\bigcap f(w)$ .  
 b. Where defined,  
 $\llbracket p$ -GIVEN-*nai* ? $\rrbracket$   
 $= \{ \llbracket \text{The enhanced evidence justifies } p \rrbracket, \llbracket \text{The enhanced evidence does not justify } p \rrbracket \}$ ,  
 where  $\llbracket \text{The enhanced evidence does not justify } p \rrbracket$   
 $= W \times D - \llbracket \text{The enhanced evidence justifies } p \rrbracket$ ,  
 and  $D$  is the set of discourses.

To illustrate, in order to ask the question (13) with deaccentuation, the common ground must already support that there is some evidence that the soup is spicy. If so, the side effect of the question partitions the common ground into two blocks, which are represented by the proposition ‘The enhanced evidence justifies that the soup is spicy’ and its complement ‘The enhanced evidence does not justify that the soup is spicy’. Therefore, the question with enhanced evidence does not inquire about the fact about the world but inquires about the epistemic standard for justification of the public evidence for  $p$ .

In short, the biased question with deaccentuation presupposes that enhanced evidence for the positive answer is available. The main effect of the question is superfluous, as the evidence which supports the positive answer is already available; the side effect of the question is informative, because the speaker is uncertain about whether the clarity of the available evidence is strong enough compared to the discourse standard.

#### 4. Interim summary

We have presented semantic analyses of the effects of the prosodic cues in biased negative polar questions in Mandarin and Japanese, based on native-speaker judgments. In both languages, the additional prosodic cue on a negative polar question requires a context where the speaker has new evidence which reinforces the bias. Representationally, both prosodic features are treated as floating morphemes which are paratactically associated to sentences. Semantically, the addition of a prosodic cue indicates enhancement of the bias and yields a meta-discourse effect. The difference in prosodic features is reflected in the semantic difference between the two representations. The focus produced by stress invokes alternative semantics, while deaccentuation indicates givenness. In fact, focus and givenness are two sides of the same coin in Information Structure. Despite their different realizations, both prosodic cues are thus responsible for highlighting (i.e., increasing the salience of) the possible answers to the polar question. In Mandarin, sentence-final stress generates an alternative set  $\{p, \neg p\}$ , which induces an epistemic conflict between the proposition at issue and the speaker’s previous belief. In Japanese, deaccentuation of the adjectives marks the positive answer as GIVEN, which results in the indication that the speaker has a stronger bias for the positive proposition and seeks the addressee’s agreement.

In the rest of the paper, we aim to strengthen the empirical foundation of our proposal, as the analyses so far are based only on our own introspection. We conducted two naturalness rating experiments, using data elicited from pools of speakers who are naive to the linguistic phenomenon and theory in question (see Schütze (1996), Cowart (1997), Kawahara (2011) and Myers (2009) for why such experimentation is useful and necessary).

#### 5. Experiment I: Mandarin sentence-final stress

As discussed in Section 2, in Mandarin Chinese, having sentence-final stress indicates an epistemic conflict between the speaker’s previous belief and the incoming proposition. Therefore, our proposal predicts that a sentence uttered with sentence-final stress is more natural in contexts where the speaker has sufficient evidence for the alternative proposition (and thus is strongly biased) than in contexts where the speaker is unbiased or weakly biased. The prediction is tested in Experiment I, where the degree of bias is manipulated by the evidentiality of the context. That is, when a context suggests that the speaker has compelling evidence for a proposition, the speaker is taken to have a strong bias toward the proposition.

##### 5.1. Method

The experiment was a naturalness rating study in which native speakers of Mandarin judged the naturalness of different combinations of stress and evidentiality.

*Stimuli.* As exemplified by (23) and (24), each stimulus consisted of a context distinguishing evidentiality, plus a target rising negative question with or without final stress. The two fully-crossed factors, evidentiality and stress, resulted in four conditions. Each condition had 16 items. Thus, 64 target stimuli plus 64 fillers were created. See Appendix A for the full list of the target stimuli.

- (23) a. Enhanced Evidence Context: A knows B studies French in college and asks B how to say “I love you” in French. B looks puzzled. So A asks B, . . .  
 b. Baseline Context: A asks B how to say “I love you” in French and B looks puzzled. So A asks B, . . .
- (24) Ni<sub>21</sub> bu<sub>51</sub> dong<sub>21</sub> fa<sub>35</sub>yu<sub>21</sub>?  
 You NEG know French  
 ‘You don’t know French?’

*Recording.* A female native speaker of Mandarin Chinese, who was naive to the purpose of the experiment, pronounced all the stimuli in a sound-attenuated room at Research Laboratory for Phonetics and Cognitive Studies of City

University of Hong Kong. She produced all the stimuli in isolation. The stimuli were presented in Chinese characters printed on paper. She was asked to pronounce each sentence with a final rise and was instructed to manipulate the presence of stress on the final word. We did not provide the pragmatic contexts to the speaker. Though the utterances might have been more naturally produced if the contexts were provided with the target sentences, as an anonymous reviewer suggested, we believe that recording sentences in isolation fits the purpose of the experiment better. If we had shown the pragmatic contexts to the speaker, the speaker might also have included prosodic cues other than the sentence-final stress to make the utterances fit the contexts. Since our purpose was to pin down the effect of the sentence-final stress, only the target prosody was manipulated in the experiment. Her speech was recorded using a digital recorder (Tascam HD-R1 solid state recorder) and a microphone (Shure dynamic microphone SM48) at a 44.1k sampling frequency with 176kbps bit rate. The third author, who is a native speaker of Mandarin Chinese, made sure that all the stimuli contained the intonation for each condition properly reflecting the target interpretation, i.e., the question rise with and without sentence-final stress.

*Procedure.* The rating experiment was also conducted in a sound-attenuated room at Research Laboratory for Phonetics and Cognitive Studies of City University of Hong Kong. The stimuli were presented with Perception, an assessment management software program. The participants listened to the stimuli through headphones.

The first page of the experiment showed the instructions and a sample test item. In the main section, the participants were asked to read the context and listen to each stimulus, and then judge the naturalness of the stimulus on a 5-point scale (shown in Chinese): completely natural, somewhat natural, undecidable, somewhat unnatural, completely unnatural. The stimuli were shown one by one, that is, each page contained only one stimulus. They were asked to judge the naturalness of the intonation against the context. In particular, they were explicitly instructed to pay attention to the naturalness of how the sentences are pronounced rather than the content of the stimuli. They were also reminded not to rate the naturalness in terms of the social appropriateness of the speech, but instead judge the naturalness in terms of everyday conversation, as if they were talking with people of the same social status, e.g., friends. This instruction was made because stimuli with final stress might sound discourteous when there is a difference in social status among the conversation participants.

The main experiment was organized into four blocks separated by three break signs. Each block contained 16 stimuli and 16 fillers. None of the stimuli were repeated, and the order of the stimuli within each block was randomized by the Perception software. No minimal pair sentences appeared next to each other. Thus, each participant listened to 128 sentences in total. Each participant saw both contexts of each target sentence. We randomized the order between the Enhanced Evidence context and the Baseline context for each sentence to prevent any fatigue or satiation effects (Snyder, 2000) from affecting one particular condition.

*Participants.* Twenty native speakers of Mandarin participated in the rating experiment and received 80 Hong Kong dollars as compensation. All of them were undergraduate students recruited from the City University of Hong Kong.

*Data analysis.* The ratings were converted into numerical values: completely natural = 5, somewhat natural = 4, undecidable = 3, somewhat unnatural = 2, completely unnatural = 1. 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 Development Core Team, 2011). In the analysis, stress and evidentiality were the fixed factors and speakers and items were the random factors. The `lme4` package does not compute *p*-values, since the exact procedure to calculate degrees of freedom has not been discovered. The *p*-values were thus calculated by the Markov chain Monte Carlo method using the `LanguageR` package (Baayen, 2009). If the preference for final stress depends on the evidentiality of the context, the dependency is expected to result in a significant interaction between stress and evidentiality.

## 5.2. Results

Fig. 6 shows the average naturalness ratings in each condition. In the evidenced contexts, speakers judged questions with final stress as more natural (Stressed = 4.29; Unstressed = 2.62), whereas in the baseline contexts, speakers preferred sentences without final stress (Stressed = 2.11; Unstressed = 3.9). Because of this asymmetry, the interaction between stress and evidentiality was significant ( $t = 18.70$ , std. error = 0.17,  $p < .001$ ).

## 5.3. Discussion

The results show that Mandarin speakers prefer to have sentence-final stress for the evidenced contexts, while they prefer not to have sentence-final stress in baseline contexts.<sup>10</sup> This asymmetry supports the hypothesis that

<sup>10</sup> As mentioned above, the experiment had a within-subjects design. An anonymous reviewer expressed a concern that if the participants has been shown both contexts of the same sentence, they might realize the association between a particular context and a particular prosody, which might have exaggerated the effect of prosody. However, even if that is the case, the result shows that the direction is correct. Conducting a similar experiment with a between-subjects design would strengthen our current results.

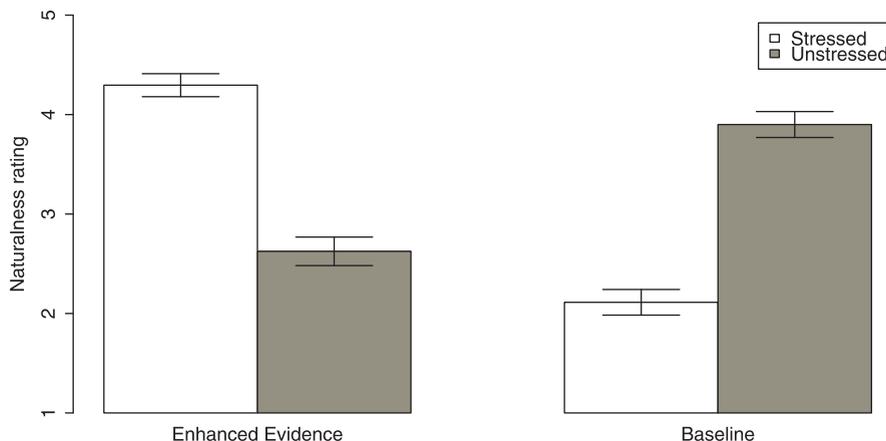


Fig. 6. Average naturalness ratings. The error bars represent 95% confidence intervals.

sentence-final stress indicates the salience of the alternative proposition  $p$ , i.e., the proposition with the polarity opposite to the surface sentence  $\neg p$ . The evidence in the context causes the speaker to believe in  $p$  and hence enhance his or her bias toward  $p$ . Therefore, the utterance with sentence-final stress indicates that the speaker has a stronger bias for the proposition  $p$  than the utterance without stress does.

## 6. Experiment II: Japanese deaccentuation

In Experiment II, native speakers of Tokyo Japanese judged the naturalness of different combinations of accent pattern and evidentiality of the context. Section 3 described the deaccentuation of adjectives as a marker for strong evidentiality. It is predicted that deaccented adjectives are preferred when the context suggests that the speaker's bias for a positive answer is enhanced by newly acquired evidence.

### 6.1. Method

*Stimuli.* The stimuli had two fully-crossed factors—accentedness and evidentiality, which resulted in four conditions. The evidentiality manipulation is exemplified by (25) and (26) (repeated from (14) and (15) above). In the *Enhanced Evidence* contexts, the speaker has newly acquired evidence which supports the target proposition, while in the *Baseline* contexts, the speaker is neutral or only weakly biased.

#### (25) Enhanced Evidence Context

A went to a Korean restaurant for the first time with B. A tasted the soup B ordered, which was burning hot. A saw B sweating a lot and asked B.

#### (26) Baseline Context

A went to a Korean restaurant for the first time with B. A saw that the soup B ordered was red with chilli peppers in it. A said to B before eating.

Each context was followed by a target sentence which contained an adjective predicate with an underlying lexical accent. Each condition had 16 items, resulting in 64 target sentences (16 items \* 4 conditions). Responses to 3 data sets were removed from the analysis due to a potential confound, as pointed out by one of the reviewers. Each target sentence was pronounced with and without an accent. 64 fillers were included. See Appendix B for the full list of the target stimuli.

*Recording.* The recording procedure was almost identical to that of Experiment I, except that the stimuli was pronounced by a native female speaker of Tokyo Japanese.

*Procedure.* The procedure was also almost identical to Experiment I except that the rating experiment was conducted in a sound-attenuated room in the Sound Lab at the University of Tokyo. Participants were asked to judge the naturalness of the intonation against the context. They were also reminded not to rate the naturalness in terms of the social appropriateness of the speech. This precaution was made since the deaccented rendition can be perceived as casual speech, and some participants might judge the deaccented sentences as “prescriptively inappropriate” (see Tanaka, 2010, for related observations).

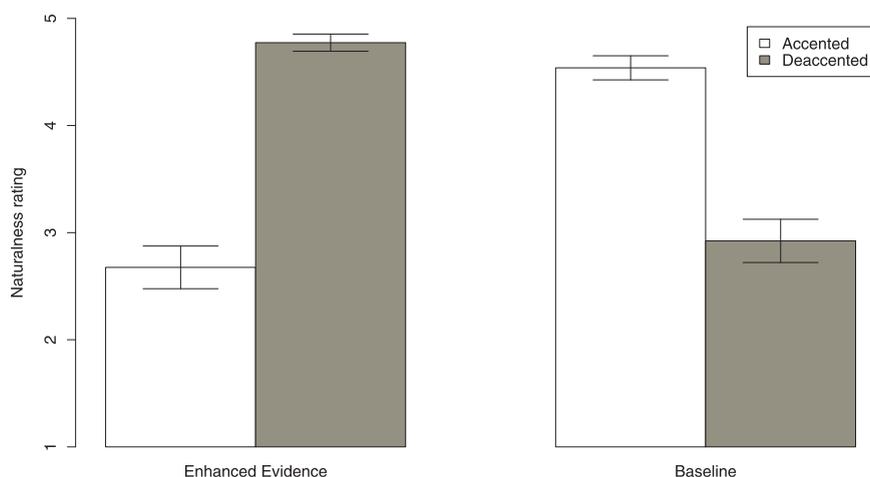


Fig. 7. Average naturalness ratings.

*Participants.* Fourteen native speakers of Tokyo Japanese participated in the rating experiment. They were undergraduate students recruited from the University of Tokyo and received 1000 Japanese yen as compensation.

## 6.2. Results

Fig. 7 shows the average naturalness ratings in each condition. In the contexts with enhanced evidence, the speakers gave higher ratings to the predicates without accents (Accented = 2.67; Deaccented = 4.77). On the other hand, in the baseline contexts, the speakers judged the predicates with accents as more natural (Accented = 4.53; Deaccented = 2.92). Because of this asymmetry, the interaction between accentedness and evidentiality was significant ( $t = 24.7$ , std. error = 0.15,  $p < .001$ ).<sup>11</sup>

## 6.3. Discussion

The results show that deaccentuation requires a context with strong evidence for the embedded proposition (i.e., the positive answer). Hence, deaccentuation is discouraged in the baseline context in (26). In a context with enhanced evidence like (25), by contrast, deaccentuation is encouraged.

## 7. Concluding remarks

We have investigated prosodic markers added to negative polar questions in Mandarin Chinese and Japanese. In both cases, negative polar questions reflect the speaker's bias toward the positive answers. We first observed that having a prosodic cue on a negative polar question enhances the bias. We tested this observation by conducting naturalness rating experiments on Mandarin sentence-final stress and Japanese adjective deaccentuation. In both experiments, we found a significant interaction between context and intonation, confirming our hypothesis that the prosodic cues are used when the speaker's bias is enhanced. Nevertheless, there are differences between the two languages in terms of phonetic realization and discourse effect. In Mandarin, the prosodic cue is sentence-final stress, which induces a set of alternative propositions; in Japanese it is deaccenting, which indicates that the positive answer is GIVEN. Accordingly, Mandarin sentence-final stress along with the final tone indicates an epistemic conflict between the speaker and the addressee, while Japanese deaccenting indicates that the speaker is seeking agreement. In either case, the question is not interpreted as an information-seeking question, but as a meta-question about the discourse. Our paper thus shows that stress and deaccenting, both of which are often analyzed as markers of focus structure, can be analyzed as markers of meta-discourse.

Mandarin Chinese sentence-final stress and Japanese deaccenting have similar yet different discourse effects in negative polar questions. In both cases, by adding a prosodic cue, the speaker is posing a question which is not simply information-seeking. In Mandarin, sentence-final stress emphasizes the salience of the alternative proposition  $p$ . In effect,

<sup>11</sup> The result reported in the main text is based on the 13 items out of the 16 sets (see *Stimuli* in Section 6.1 above). The original summary of the 16 items is the following: In the contexts with enhanced evidence, the speakers judged the predicates without accents as more natural (Accented = 2.75; Deaccented = 4.71); in the baseline contexts, the speakers judged the predicates with accents as more natural (Accented = 4.42; Deaccented = 2.95). The interaction between accentedness and evidentiality was significant ( $t = 24.5$ ,  $p < .001$ ).

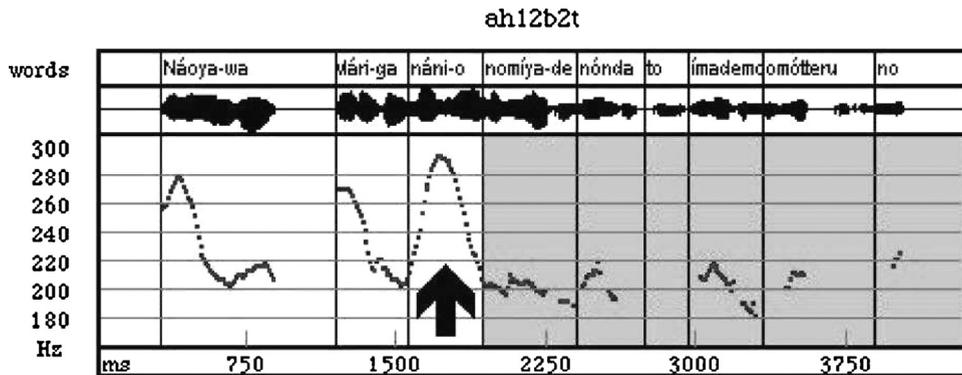


Fig. 8. Matrix *wh*-question (Ishihara, 2007, p. 158).

the speaker indicates that there is a conflict between his or her previous belief and the incoming proposition  $\neg p$ , while asking for more information to resolve the conflict. In Japanese, deaccenting marks the positive answer as GIVEN. As a result, the speaker seeks agreement regarding the clarity of the enhanced evidence. Thus, Mandarin sentence-final stress carries a connotation of surprise, while Japanese deaccentuation does not.

There are remaining issues to be addressed in future studies. First, in terms of experimental design, the current results can and should be replicated using different methodologies such as a between-subjects design or a magnitude estimation task (Bard et al., 1996).<sup>12</sup>

Second, it is an important and interesting future step to investigate whether it is possible to further integrate these seemingly different prosodic patterns within a single framework such as information structure. As for Mandarin, the connection is transparent in that sentence-final stress is a focus-marker. Instead of focusing a constituent, SFS focus-marks the Ident operator and generates the alternatives. In the case of Japanese, the deaccenting of adjectives resembles the post-focus-reduction observed and analyzed in the Japanese prosody literature (Deguchi and Kitagawa, 2002; Sugahara, 2003; Ishihara, 2003, 2007; Tomioka, 2009; Hirofani, 2012; Smith, 2013) as noted above in Section 3. Consider the following pair of examples from Ishihara (2007). It has been argued that there is a strong correlation between the scope of a *wh*-question and the prosody of the sentence (Deguchi and Kitagawa, 2002; Ishihara, 2007; Hirofani, 2012). When a *wh*-word is inside an embedded clause and associated with the matrix *Q*-morpheme as in (27), the post-focus-reduction continues till the end of the sentence, as depicted in Fig. 8.

- (27) a. Matrix *wh*-question  
 b. naoya-wa mari-ga nani-o nomiya-de nonda to imademo omotteiru no?  
 Naoya-TOP Mari-NOM what-ACC bar-at drank COMP even.now think Q  
 'What<sub>i</sub> did Naoya still think that Mari drank <sub>t<sub>i</sub></sub> at the bar?'

(Ishihara, 2007, p. 158)

On the other hand, when the *wh*-word is associated with the embedded *Q* and interpreted as an embedded question as in (28), the post-focus-reduction terminates at the embedded *Q*, as can be seen in Fig. 9.

- (28) a. Embedded *wh*-question  
 b. naoya-wa mari-ga nani-o nomiya-de nonda ka imademo oboeteru.  
 Naoya-TOP Mari-NOM what-ACC bar-at drank Q even.now remember  
 'Naoya still remembers what Mari drank <sub>t<sub>i</sub></sub> at the bar.'

(Ishihara, 2007, p. 159)

The adjective-deaccenting phenomenon discussed in this paper is reminiscent of post-focus reduction not only in terms of prosodic features, i.e., lost or reduced lexical accents, but also in terms of pragmatic conditions. Although (27-b) is grammatical with the suggested prosody, it is pragmatically heavily loaded.<sup>13</sup> That is, the discourse participants are assuming that Naoya still thinks Mari drank something at the bar. In other words, the proposition represented by the entire

<sup>12</sup> We would like to thank an anonymous reviewer for the suggestion. However, we also note that Magnitude Estimation may not be the best method for linguistic judgment experiments, as argued in Sprouse (2011).

<sup>13</sup> In fact, Watanabe (1992) regarded a construction parallel to (27-b) as ungrammatical as it violates a subadjacency condition, though there was no reference to the prosody.

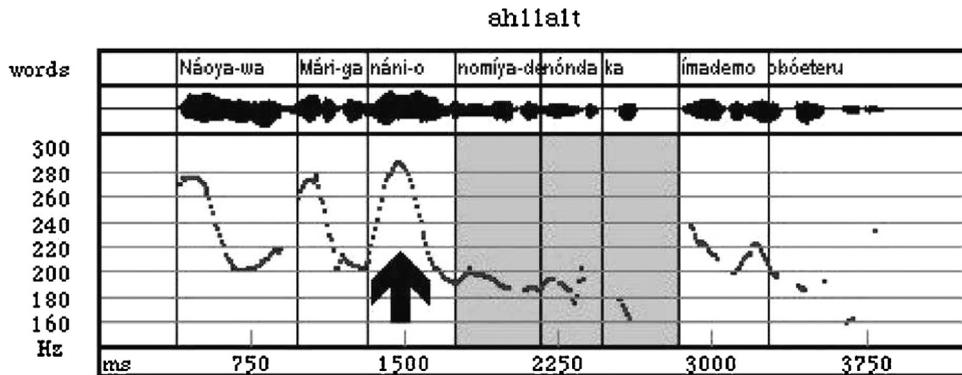


Fig. 9. Embedded *wh*-question (Ishihara, 2007, p. 159).

post-focus-reduced matrix clause is GIVEN. In contrast, (28-b) does not impose such a contextual requirement. Although it is too early to draw any conclusion from these resemblances, it would be a promising enterprise in the theory of prosody and information structure if both reduction and elimination of lexical accent can receive a unified account in terms of givenness.

Finally, in Japanese, there seem to be some interesting restrictions on the kinds of predicates that can undergo deaccentuation. Generally, verbs cannot be deaccented, as shown in (29).

- (29) ano hito hashira nai?  
 that person run NEG  
 'Doesn't that person run?'  
 a. ✓hashira' nai↑ (Accented)  
 b. \*hashira nai↑ (Deaccented)

Interpreting adjectives always requires the standard in the discourse context. However, Japanese also has a class of modifiers similar to adjectives, sometimes known as *adjectival nouns* (e.g., *kirei* 'pretty' and *sinsetsu* 'kind'). The adjectival nouns are similar to adjectives, since they modify nouns and can be modified by adverbs like *totemo* 'very' (i.e., they are gradable predicates). These predicates cannot be deaccented, as shown in (30) (see Tanaka, 2010, for sporadic cases of deaccentuation of other types of predicates).

- (30) ano hito kirei ja nai?  
 that person pretty COP NEG  
 'Isn't that person pretty?'  
 a. ✓kirei' ja nai↑ (Accented)  
 b. \*kirei ja nai↑ (Deaccented)

One possible explanation is that adjectival nouns are morphologically more complex than adjectives. They have to be followed by an inflecting copula *da*, whose negative form, *ja*, is a contracted form of *de-wa* (copula plus topic). See Shibatani (1990) and Tsujimura (2007) for the discussion of the adjectival and nominal features of the adjectival nouns. Hence, we might be able to maintain the gradability condition of the deaccentuation while ruling out the deaccentuation of the adjectival nouns due to their morphological complexity. Follow-up analyses will reveal whether any phonological, morphological or syntactic features of these items interfere with the availability of the deaccentuation.

To recapitulate, our study of prosodic cues on biased questions can be regarded as case studies of the overall program which aims to reveal the interaction between prosody and information structure.

## Acknowledgments

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Sano, Yasutada Sudo, Satoshi Tomioka, Jiwon Yun, the audience at WCCFL 29 and Experimental and Theoretical Advances in Prosody 2 and the anonymous reviewers for their helpful comments.

## Appendix A. Mandarin stimuli

- Tones are not shown.

- (1) a. Baseline Context:  
Dazhi he Daqiang qu fanguan chifan, Dazhi bu tai neng chi la, yushi ta xunwen fuwuyuan:  
'Dazhi and Daqiang are dining in a restaurant. Dazhi is not very accustomed to spicy food, so he asks the waiter.'
- b. Enhanced Evidence Context:  
Dazhi he Daqiang zai fanguan chifan, zheng-ge-guocheng zhong Dazhi xian de hen zhengchang, keshi shenwei sichuanren de Daqiang jue de fanguan-de-cai bu shi yiban-de-la, yushi ta wen Dazhi:  
'Dazhi and Daqiang are dining in a restaurant. Dazhi seems calm in the whole process, yet Daqiang, who is a Sichuanese and very accustomed to spicy food, finds the food here extremely spicy, so he asks Dazhi:'
- c. Zhe-xie-cai bu la?  
this-CL<sub>PL</sub>-dish NEG spicy  
'These dishes aren't spicy?'
- (2) a. Baseline Context:  
Xiaomei shichuan le yi-tiao-lv-qunzi zhihou shuo ta bu xihuan qunzi-de-yanse, yushi Xiaojing wen:  
'Xiaomei tried on a green dress and says she does not quite like the color, so Xiaojing asks:'
- b. Enhanced Evidence Context:  
Xiaomei shichuan le yi-tiao-lv-qunzi zhihou shuo ta bu xihuan qunzi-de-yanse. Xiaojing zai Xiaomei jia jiangdao-guo henduo lvse-de-dongxi, yushi Xiaojing wen:  
'Xiaomei tried on a green dress and says she does not quite like the color. Xiaojing has seen a lot of green stuff in Xiaomei's house, so Xiaojing asks:'
- c. Ni bu xihuan lvse?  
you NEG like green-color  
'You don't like the color green?'
- (3) a. Baseline Context:  
Dazhi wen Xiaojing 'wo ai ni' yong fayu zenme shuo, Xiaojing mian lu kunhuo, yushi Dazhi wen:  
'Dazhi asks Xiaojing how to say 'I love you' in French. Xiaojing looks puzzled, so Dazhi asks:'
- b. Enhanced Evidence Context:  
Dazhi wen Xiaojing 'wo ai ni' yong fayu zenme shuo, Xiaojing mian lu kunhuo. Dazhi zhidao Xiaojing shi fayuxi de, yushi ta wen Xiaojing:  
'Dazhi asks Xiaojing how to say 'I love you' in French. Xiaojing looks puzzled, yet Dazhi knows that Xiaojing studies French in college, so he asks:'
- c. Ni bu dong fayu?  
you NEG know French  
'You don't know French?'
- (4) a. Baseline Context:  
Zaochen, Xiaojing gei Xiaomei da dianhua, Xiaomei-de-shengyin ting qilai huan mei shuixing, yushi Xiaojing wen:  
'In the morning, Xiaojing calls Xiaomei. Xiaomei's voice sounds half asleep, so Xiaojing asks:'
- b. Enhanced Evidence Context:  
Zaochen, Xiaojing gei Xiaomei da dianhua, Xiaomei-de-shengyin ting qilai huan mei shuixing, keshi Xiaojing zaochen mingming zai zaocandian kandao-guo Xiaomei, yushi Xiaojing wen:  
'In the morning, Xiaojing calls Xiaomei. Xiaomei's voice sounds half asleep, yet Xiaojing just caught sight of Xiaojing in the cafeteria, so Xiaojing asks:'
- c. Ni mei qichuang?  
you NEG get-up  
'You didn't get up?'

- (5) a. Baseline Context:  
Daqiang shuo ziji meiyou yundong-de-xiguan, ta xunwen Dazhi na-zhong-fangfa bijiao hao, yu shi Dazhi wen:  
'Daqiang says he has not the habit of exercising and asks Dazhi which way is best for him, so Dazhi asks:'
- b. Enhanced Evidence Context:  
Daqiang shuo ziji meiyou yundong-de-xiguan. Dazhi zai-gongyuan-manpao-de-shihou mingming jingchang kandao Daqiang ye zai pao, yushi Dazhi wen:  
'Daqiang says he has not the habit of exercising. Yet Dazhi always sees Daqiang jogging when he exercises in the park, so he asks:'
- c. Ni pingchang bu paobu?  
you usually NEG jog  
'You don't usually jog?'
- (6) a. Baseline Context:  
Xiaojing qu ting Laoluo-de-jiangzuo, zai yanjiangting-li yishi mei zhaodao Xiaomei, jiu wen Dazhi:  
'Xiaojing attends Laoluo's lecture and cannot find Xiaomei in the lecture theatre in a moment, so she asks Dazhi:'
- b. Enhanced Evidence Context:  
Xiaojing qu ting Laoluo-de-jiangzuo, zai yanjiangting-li yishi mei zhaodao Xiaomei, keshi Xiaojing gangcai mingming kandao-guo Xiaomei, yushi Xiaojing wen:  
'Xiaojing attends Laoluo's lecture and cannot find Xiaomei in the lecture theatre in a moment, yet Xiaojing did just see Xiaomei, so Xiaojing asks Dazhi:'
- c. Xiaomei mei lai?  
Xiaomei NEG come  
'Xiaomei didn't come?'
- (7) a. Baseline Context:  
Xiaojing-de-zhangfu yaoqing xin-jiao-de-pengyou Dazhi lai jiali chifan, ta meiyou rang Xiaojing zhunbei jiu, Xiaojing wen ta zhangfu:  
'Xiaojing's husband wants to invite his new friend Dazhi to dine at home. He does not ask Xiaojing to prepare alcoholic drinks, so Xiaojing asks her husband:'
- b. Enhanced Evidence Context:  
Xiaojing-de-zhangfu yaoqing ta-de-pengyou Dazhi lai jiali chifan, ta meiyou rang Xiaojing zhunbei jiu, keshi Xiaojing zhidao mei-ci Dazhi lai jiali chifan, dou yao yizui-fangxiu, yushi Xiaojing wen ta zhangfu:  
'Xiaojing's husband wants to invite his friend Dazhi to dine at home. He does not ask Xiaojing to prepare alcoholic drinks. Xiaojing knows that every time Dazhi visits, he and her husband drink until they are intoxicated, so she asks her husband:'
- c. Dazhi ta bu hejiu?  
Dazhi he NEG drink  
'Dazhi doesn't drink?'
- (8) a. Baseline Context:  
Xiaomei zhe-ci-shuxue-kaoshi jieguo bu lixiang, ta xiang tongxue Xiaojing qingjiao na-xie-ti gai zenme jie, Xiaojing youdian chiyi, yushi Xiaomei wen:  
'Xiaomei didn't do well on the math exam. She asks Xiaojing how to answer the test questions correctly, yet Xiaojing looks a bit hesitant, so Xiaomei asks:'
- b. Enhanced Evidence Context:  
Xiaomei zhe-ci-shuxue-kaoshi jieguo bu lixiang, ta xiang tongxue Xiaojing qingjiao na-xie-ti gai zenme jie, Xiaojing youdian chiyi, keshi Xiaomei zhidao Xiaojing kao-le quanban diyi, yu shi Xiaomei wen:  
'Xiaomei didn't do well on the math exam. She asks Xiaojing how to answer the test questions correctly, yet Xiaojing looks a bit hesitant. Xiaomei knows that Xiaojing came first in the exam, so Xiaomei asks:'
- c. Ni bu hui zuo na-xie-timu?  
you NEG can do that-CL<sub>PL</sub>-question  
'You can't answer those questions?'

- (9) a. Baseline Context:  
Dazhi shuo ziji zuijin meiyou gouzhi shenme xin-de-dianzi-chanpin. Daqiang zheng pansuan yao-bu-yao mai iphone4, yushi shi wen Dazhi:  
'Dazhi says he does not buy any new electronic products. Daqiang cannot decide whether he should buy an iphone4, so he asks Dazhi:'
- b. Enhanced Evidence Context:  
Dazhi shuo ziji zuijin meiyou gouzhi shenme xin-de-dianzi-chanpin. Daqiang qianjitian mingming piedao Dazhi zai pingguo wangzhan shang dinggou iphone4, yushi Daqiang wen:  
'Dazhi says he does not buy any new electronic products. Yet Daqiang caught sight of Dazhi ordering an iphone4 on the apple website the other day, so Daqiang asks:'
- c. Ni mei mai xin-de-pingguo-shouji?  
you NEG buy new-DE-apple-mobile-phone  
'You didn't buy the new iphone?'
- (10) a. Baseline Context:  
Daqiang shuo ziji bu gan kan kongbupian. Dazhi ziji ting xihuan kan kongbupian, jiu wen Daqiang:  
'Daqiang says he is too scared to watch horror movies. Dazhi himself quite likes horror movies, so he asks Daqiang:'
- b. Enhanced Evidence Context:  
Daqiang shuo ziji bu gan kan kongbupian, keshi Dazhi zengjing kan dao Daqiang-de-shujia-shang you henduo kongbupian DVD, er qie huan zai dianyingyuan shangying kongbupian shi zhuangjian-guo Daqiang, yushi Dazhi wen:  
'Daqiang says he is too scared to watch horror movies, yet Dazhi saw many DVDs of horror movies on Daqiang's bookshelf and he also caught sight of Daqiang in the movie theatre when it was showing horror movies, so Dazhi asks:'
- c. Ni bu kan kongbupian?  
you NEG watch horror-movie  
'You don't watch horror movies?'
- (11) a. Baseline Context:  
Xiaomei kan-shangqu dui liuxing geshou mei shenme xingqu, Xiaojing ziji ting xihuan Wangfei, jiu wen Xiaomei:  
'Xiaomei doesn't seem to be interested in pop singers. Xiaojing herself quite likes Wangfei, so she asks Xiaomei:'
- b. Enhanced Evidence Context:  
Xiaomei kan-shangqu dui liuxing geshou mei shenme xingqu, keshi Xiaojing zhidao Xiaomei shi Wangfei fensi houyuanhui de huiyuan, hai zai Wangfei-de-yanchanghui shang kandao-guo Xiaomei, yushi Xiaojing wen Xiaomei:  
'Xiaomei doesn't seem to be interested in pop singers. Yet Xiaojing knows Xiaomei joined Wangfei's fan club and also caught sight of Xiaomei in Wangfei's live concert, so Xiaojing asks Xiaomei:'
- c. Ni bu ting Wangfei-de-ge?  
you NEG listen Wangfei-DE-song  
'You don't listen to Wangfei's songs?'
- (12) a. Baseline Context:  
Xiaomei kandao Dazhi jicongcong-de zouxiang jiaoshi, wen:  
'Xiaomei sees Dazhi hurrying towards the classroom and asks:'
- b. Enhanced Evidence Context:  
Dazhi manyouyou-de zoujin jiaoshi, Xiaomei yi kan biao faxian Dazhi wandao-le zhengzheng yi-ge-xiaoshi, yushi wen:  
'Dazhi dawdled into the classroom with ease, Xiaomei takes a look at her watch and finds Dazhi was a whole hour late, so she asks:'
- c. Ni mei chidao?  
you NEG late-arrive  
'You didn't arrive late?'

- (13) a. Baseline Context:  
Xiaomei shuo ta dui yinyue mei shenme xingqu, Dazhi benshen shi ge yaogunmi, yushi ta wen Xiaomei:  
'Xiaomei says she is not much interested in music. Dazhi himself is a fan of rock music, so he asks Xiaomei.'
- b. Enhanced Evidence Context:  
Xiaomei shuo ta dui yinyue mei shenme xingqu, keshi Dazhi mingming shichang zai yaogun yanchu xianchang peng dao Xiaomei, yushi Dazhi wen:  
'Xiaomei says she is not much interested in music, yet Dazhi saw Xiaomei many times in rock gigs, so Dazhi asks.'
- c. Ni bu ting yaogunyue?  
you NEG listen rock-music  
'You don't listen to rock music?'
- (14) a. Baseline Context:  
Dazhi he tongxue qu ktv changge, qijian Xiaoqing yizhi ting anjing de, yu shi Dazhi wen:  
'Dazhi and his classmates go to a Karaoke bar. Throughout the time, Xiaoqing seems rather quiet, so Dazhi asks.'
- b. Enhanced Evidence Context:  
Dazhi he Xiaoqing yiqi qu ktv, zhiqian Xiaoqing shuo ziji bu tai hui changge, jieguo yi chang jiu zhua zhe huatong bu fang, Dazhi wen Xiaoqing:  
'Dazhi and Xiaoqing go to a Karaoke bar. Xiaoqing used to say she cannot sing, yet it turns out she holds on to the microphone the whole time, Dazhi asks Xiaoqing.'
- c. Ni bu hui changge?  
you NEG can sing-song  
'You can't sing?'
- (15) a. Baseline Context:  
Dazhi zai bangong dalou wai chouyan shi kan dao yi-ge-tongshi, jiu huang-le-huang shouli-de-yan, wen:  
'Dazhi is smoking outside the office building and catches sight of a colleague. He shakes the cigarette in his hand lightly and asks.'
- b. Enhanced Evidence Context:  
Dazhi zai bangong dalou wai chouyan shi kan dao yiqian jingchang he ta yiqi chouyan de tongshi. Ta di gei na tong shi yi-ge-yan, ke ta tongshi ju jue le, yushi Dazhi wen:  
'Dazhi is smoking outside the office building and catches sight of a colleague who used to smoke with him. Dazhi hands a cigarette to the colleague but is declined, so he asks.'
- c. Ni bu chouyan?  
you NEG smoke-cigarette  
'You don't smoke?'
- (16) a. Baseline Context:  
Xiaoqing tingshuo Shanghai ge-fangmian dou bi Xianggang bianyi henduo. Ta zhunbei qu Shanghai lvyou, jiu wen xiang Shanghai bendiren Xiaomei xunwen lvyou-de-huafei, ta wen:  
'Xiaoqing hears that the cost of living in Shanghai is a lot cheaper than that in Hong Kong. She is going to travel to Shanghai, so she asks Xiaomei, a Shanghai local, about the cost of the trip.'
- b. Enhanced Evidence Context:  
Xiaoqing ting Xiaomei shuo Shanghai ge-fangmian dou bi Xianggang bianyi henduo. Ke shi Xiaoqing shangxingqi qu Shanghai lvxing shi, faxian jiaotongfei he Xianggang xiangchawuji, yu shi Xiaoqing wen:  
'Xiaoqing hears from Xiaomei that the cost of living in Shanghai is a lot cheaper than that in Hong Kong. Xiaoqing traveled to Shanghai last week and found that the cost of transportation was almost the same as in Hong Kong, so Xiaoqing asks.'
- c. Shanghai jiaotong bu gui?  
Shanghai transportation NEG expensive  
'The cost of transportation in Shanghai is not expensive?'

**Appendix B. Japanese stimuli**

- (1) a. Baseline Context:  
udetatefuse-o shita koto nai A-san wa, B-san-ga udetatefuse gojukkai shita no o mite, iimashita:  
'A, who has never done a push-up, saw B doing push-ups 50 times and said.'
- b. Enhanced Evidence Context:  
A-san, B-san tomoni yattonokotode, hajimete udetatefuse nijukkai ni seikou shimashita. A-san ga iimashita:  
'Both A and B finally finished doing twenty push-ups for the first time. A said.'
- c. udetate gojukkai kitsuku-nai?  
push-up fifty-times hard-NEG  
'Aren't fifty push-ups hard?'
- (2) a. Baseline Context:  
Dorian-o tabeta koto ga nai A-san ga, tabeta koto no aru B-san ni iimashita:  
'A, who has never had Durian, told B, who has eaten it.'
- b. Enhanced Evidence Context:  
A-san mo B-san mo, Dorian-o tabeta koto ga ari, A-san ga iimashita:  
'Both A and B have eaten Durian. A said.'
- c. Dorian, kusu-nai?  
Durians stinky-NEG  
'Aren't Durians stinky?'
- (3) a. Baseline Context:  
Hajimete itta kankoku resutoran de B ga chuumon shita nabe ga tougarahi de akaku natteiru no o mite,  
taberu mae ni A ga B ni iimashita:  
'A went to a Korean restaurant for the first time with B. A saw that the soup B ordered was red with chilli  
peppers in it. A said to B before eating.'
- b. Enhanced Evidence Context:  
Hajimete itta kankoku resutoran de, A wa B ga chuumon shita nabe o tabetemiruto, kuchi ga yakedo suruka  
to omou hodo karakatta. B mo kao kara ase o nagashite iru no o mite, A ga iimashita:  
'A went to a Korean restaurant for the first time with B. A tasted the soup B ordered, which was burning hot. A  
saw B sweating a lot and asked B.'
- c. kore, karaku-nai?  
This spicy-NEG  
'Isn't this spicy?'
- (4) a. Baseline Context:  
Mada googuru nashi de me o akete oyoida koto no nai A wa, B ga me o akete oyoideiru no o shiri, B ni  
iimashita:  
'A, who has never swum with his eyes open without goggles, found B swimming with his eyes open and  
said.'
- b. Enhanced Evidence Context:  
A to B wa, googuru nashi de puuru de oyogi hajimeta. A wa, enso no sei de me ga itakatta. Me o akaku  
shiteiru B ni A ga iimashita:  
'Both A and B started to swim without goggles. The chlorine hurt A's eyes. A saw B's eyes were red and  
said.'
- c. me, itaku-nai?  
eyes pain-NEG  
'Don't your eyes hurt?'
- (5) a. Baseline Context:  
Hajimete arabiago kyoushitsu ni kayou koto ni natta A. A wa saisho no kurasu ni ikumae ni, sudeni shokuyuu o  
rishuu shiteiru B ni A ga iimashita:  
'A started to go to an Arabic school for the first time. Before taking the first lesson, A said to B who had already  
completed the beginner's class.'

- b. Enhanced Evidence Context:  
Arabiago-o narai hajimete ikkagetsu. omottayori shuutoku ga kantan dewa nai to wakatta B. kurasumeito B ni, A wa iimashita:  
'B has started to learn Arabic and one month has passed. Learning Arabic was not as easy as B had expected. A said to B, who was his classmate:'
- c. Arabiago-tte, muzukashiku-nai?  
Arabic-TOP difficult-NEG  
'Isn't Arabic difficult?'
- (6) a. Baseline Context:  
Mainichi, airongake o shiteiru hahaoya ni mukatte, airongake o shitakoto nai kodomo A ga iimashita:  
'A, who has never used an iron, said to his mother who uses an iron everyday:'
- b. Enhanced Evidence Context:  
Kateika no jikan de, airongake o naratta kodomo A. jissai ni, ie de otetsudai shitemite, A ga iimashita:  
'A learned how to use an iron in his home science course. After trying to use it at home, A said to his mother:'
- c. okaasan, airon-kakeru-no-tte mendokusaku-nai?  
mom, iron-do-NML-TOP troublesome-NEG  
'Mom, isn't ironing troublesome?'
- (7) a. Baseline Context:  
Tozan ga shumi no B ni, fujitozan ni sasowareta A. A wa yamanobori no keiken wa naku, B ni iimashita:  
'B, who likes mountain climbing, asked A to go to climb Mt. Fuji. A had no experience of mountain climbing and said to B:'
- b. Enhanced Evidence Context:  
Tozan ga shumi no B ni, yamanobori ni sasowareta A. A wa gakuseijidai, ichido dake yama ni nobotta koto ga ari, taihen datta no o oboeteiru. A ga iimashita:  
'B, who likes mountain climbing, asked A to go to climb a mountain. A remembered that he had tried to climb a mountain once and it was very hard. A said:'
- c. Yamanobori-tte, shindoku-nai?  
Mountain.climbing-TOP hard-NEG  
'Isn't mountain-climbing hard?'
- (8) a. Baseline Context:  
Hitorigurashi o shiteiru B ni, kazoku to doukyo shiteiru A ga iimashita:  
'A, who was living with his family, said to B, who was living alone:'
- b. Enhanced Evidence Context:  
A to B wa tomo ni hitorigurashi. tokidoki hounmushikku ni naru B ni A ga iimashita:  
'Both A and B were living by themselves. Sometimes B got homesick. A said:'
- c. Hitorigurashi-tte, sabishiku-nai?  
Living-alone, lonely-NEG  
'Isn't living alone lonely?'
- (9) a. Baseline Context:  
A to B wa honkon de hajimete kaisuiyoku ni ikukotoni natta. honkon ni kansuru chishiki ga amari nai A ga iimashita:  
'A and B have a plan to go to a beach to swim in Hong Kong for the first time. A, who has very little knowledge of Hong Kong, said:'
- b. Enhanced Evidence Context:  
A to B wa, atsuku nattekita no de, issho ni, umi ni hairu. kaisui wa, chairoku nigotte ite, tokidoki gomi mo uiteiru. A ga B ni iimashita:  
'A and B felt it getting hot. So they got into the sea. The color of the water was brown and turbid, and even some garbage was floating. A said to B:'
- c. Honkon-no-umi, kitanaku-nai?  
Hong.Kong-GEN-sea, dirty-NEG  
'Isn't Hong Kong's sea dirty?'

- (10) a. Baseline Context:  
Hon kon de, jimoto no shiriai ni kamezerii o susumerareta A. Miru no mo taberu no mo hajimete. A wa, zerii o supuun de sukutte kara, jitto mite, taberu mae ni yuujin B ni iimashita:  
'In Hong Kong, a local acquaintance recommended A to try tortoise jelly. A had never seen or tried it before. A then tried to scoop it up with a spoon and stared at the tortoise jelly. Before eating, A said to B:'
- b. Enhanced Evidence Context:  
Senjitsu, honkon de hajimete kamezerii o tabeta A wa, nigakute amari suki ni wa narenakatta. Yuujin B ni sono hanashi o shita tokoro, B mo saikin tabeta tonoko. Sokode A wa, B ni iimashita:  
'A has recently tried to eat tortoise jelly. A didn't like it very much because it was bitter. When A told B the story about tortoise jelly, A learned that B also tried it recently. A said to B:'
- c. Kamezerii, mazuku-nai?  
tortoise-jelly bad-NEG  
'Doesn't tortoise jelly taste bad?'
- (11) a. Baseline Context:  
Honkon no daigaku de MBA shuutoku o kangaete iru A. sudeni MBA koosu o jukou shiteiru B ni iimashita:  
'A was planning to get an MBA in a university in Hong Kong. B has already started an MBA course. A said:'
- b. Enhanced Evidence Context:  
Honkon no daigaku de MBA shuutoku koosu o jukou chuu no A. muzukashii jugyou naiyou to, amarinimo ooi kadai ni, doukyuusei B ni taishite iimashita:  
'A has been taking an MBA course in a university in Hong Kong. A found that the course contents were very hard and too many assignments were required. A said to B, who was his schoolmate:'
- c. Kono-koosu-tte, kibishiku-nai?  
This-course-TOP, strict-NEG  
'Isn't this course strict?'
- (12) a. Baseline Context:  
Kugatsu kara honkon funin ga kimatta toukyou honsya no A wa honkon ni itta koto ga arimasen. A wa, honkon ni sundeiru chijin B ni denwa de iimashita:  
'A, who works for the head office in Tokyo, will be transferred to Hong Kong this September. A has never been to Hong Kong. B, who is A's acquaintance, lives in Hong Kong. A called B and said:'
- b. Enhanced Evidence Context:  
Honkon de kurashi hajimete ikkagetsu tatta A wa, nihon to wa chigau nangoku no atsusa ni mairu koto mo shibashiba. A to onajiku, hajimete honkon de kurashi ikkagetsu tatta B ni A ga iimashita:  
'One month has passed since A started to live in Hong Kong. A sometimes cannot stand the heat in the southern country, which is different from Japan. Just like A, one month has passed since B started to live in Hong Kong. A said:'
- c. Honkon-tte, atsuku-nai?  
Hong.Kong-TOP, hot-NEG  
'Isn't it hot in Hong Kong?'
- (13) a. Baseline Context:  
Honkon ni tsuita bakari no A wa, chijin B kara nikkei suupaa ga nihonsan yasai o atsukatte iru to kiku. A wa, sono chijin B ni iimashita:  
'A, who has just arrived in Hong Kong, heard from B, who is A's acquaintance, that there are Japanese vegetables in Japanese supermarkets. A said:'
- b. Enhanced Evidence Context:  
Yuujin B to nikkei suupaa ni iki, nihonsan yasai o mitsuketa A wa, kakaku ga nibai ijou mo surunoni kizuki, B ni iimashita:  
'A went to a Japanese supermarket with his friend B and found out that the price of Japanese vegetables is more than twice as high as in Japan. A said:'
- c. Nihon-no-yasai, takaku-nai?  
Japanese-GEN-vegetables, expensive-NEG  
'Aren't Japanese vegetables expensive?'

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