

Nandao-Qs: When Surprise Sparks Inquiry

Anshun (Asher) Zheng

University of Texas at Austin

The Problem

Nandao is a Mandarin adverb that has been traditionally analyzed as a rhetorical question marker that enhances rhetorical force (Alleton, 1988; Shuxiang and Shengshu, 2012; Xu, 2012), as exemplified in (1). However, other scholars argue that *nandao* questions (hereafter, *nandao*-Qs) convey uncertainty or bias (Gong, 1995; Xu, 2017), illustrated in (2).

- **Rhetorical question**: A and B are talking about a colleague, Lee, who is going to work on Sunday. B does not think people usually go to work on Sunday.
- A: Lee zhoumo ye dasuan qu shangban. ('Lee is planning to work on weekends too.') B: nandao ta fafeng-le ma?
- nandao he become.crazy-perf y/N-Q \approx 'ls he crazy?'
- **Biased question**: A sits in a windowless room working. A believes it is not raining. At 10, B enters the room with a dripping raincoat. A asks B:
- A: Nandao waimian xiayu-le ma? nandao outside fall.rain-perf y/N-Q \approx 'It is not the case that it is raining outside, right?'

Nandao has been analyzed as necessarily conveying a negative epistemic bias (i.e., $\neg p$ when the sentence radical is p, and vice versa). This bias can be either strong (as in rhetorical questions) or weak (as in information-seeking biased questions).

However, a new piece of data as shown below, reveals that nandao-Qs can be used even when there is no epistemic bias or rhetoricity.

- (3) A sits in a windowless room working. A has no expectation about the weather. At 10, B enters the room with a dripping raincoat. A asks B:
- A: Nandao waimian xiayu-le ma? nandao outside fall.rain-perf y/N-Q \approx 'ls it raining outside?'

Empirical Claim 1: *nandao-Qs* are evidence-driven

In contrast to prior claims that *nandao* encodes epistemic bias (e.g. Xu 2017), I argue that *nandao*-Qs are evidence-driven. Consider the minimally differing contexts in (4), which vary only in the contextual evidence available, while the speaker has no prior epistemic bias. In context 1, the speaker can felicitously use a *nandao* question, but not in context 2. This contrast highlights that one function of *nandao*-Qs is to encode the presence of a particular kind of evidence. My proposal is that *nandao*-Qs conventionally encode a positive evidential bias (in the sense of Sudo, 2013).

(4) Context 1: A is sitting in a windowless room working. A doesn't know the weather or have any expectations that people will wear raincoats. At 10, B enters the room with a dripping raincoat. Context 2: A is sitting in a windowless room working. A doesn't know the weather or have any expectations that people will wear raincoats. At 10, B enters the room. Context 3: A thinks it will not rain today. At 10, <u>B enters the room</u>. A asks B: Nandao waimian xiayu-le ma? nandao outside fall.rain-perf y/N-Q \approx 'ls it raining outside?'

ØContext 1 # Context 2 # Context 3

In addition, the infelicity in context 3 indicates that epistemic bias is not a sufficient condition of a felicitous use of *nandao*. Moreover, the evidence should be indirect (as in Willett 1988's source of information).^a

Empirical Claim 2: *nandao-Qs* do not encode epistemic bias

Context 1: A is sitting in a windowless room working. A doesn't know the weather (5) or have any expectations that people will wear raincoats. At 10, B enters the room with a dripping raincoat. Context 2: A is sitting in a windowless room working. A believes it is not raining outside. At 10, B enters the room with a dripping raincoat. A asks B: A: Nandao waimian xiayu-le ma? nandao outside fall.rain-perf y/N-Q \approx 'ls it raining outside?'

ØContext 1 ØContext 2

The second empirical claim is that *nandao*-Qs do not conventionally encode the speaker's epistemic bias. Consider two minimally differing contexts in (5), which vary only in the speaker's epistemic bias. The speaker can use the same *nandao* question both when they have no bias (context 1) and when they have a negative bias (context 2).

^aI am aware that questions usually are not very felicitous when presenting direct evidence; but I'd like to note it is not impossible.

Empirical Claim 3: The evidence is unexpected

Felicitous use of *nandao*-Qs requires the contextual evidence to be unexpected to the speaker. Consider the examples in (6): in context 1, the event of Lee going to work on Sunday is unexpected to the speaker (i.e., felicitous in an unexpected context), whereas in context 2, it is not (i.e., # in an expected context).

- (6) Context 1: A and B are talking about a colleague, Lee, who is going to work on Sunday. B does not think that people (including Lee) usually go to work on Sunday. Context 2: (same as above) B knows Lee usually goes to work on Sunday
- B: nandao ta hen.mang ma? nandao he very.busy y/N-Q

\approx 'Is he busy?'

Unexpectedness as High Information Value

What does unexpectedness amount to in contexts where the speaker does not have any specific expectations regarding an event/state p (e.g., example 3)? I define unexpectedness of the prejacent as obtained in the contextual evidence that is highly informative following Van Rooy and Safarova (2003). Under this view, by default (Givón, 1978), the occurrence of an event or state p is more informative than $\neg p$ (i.e., a grammatical prior). Therefore, an event (e.g., wearing a raincoat) is by default more surprising than its negated counterpart (i.e., not wearing a raincoat). In addition, when the speaker holds the belief that it is not raining, then the information value of the occurrence of the evidence will decrease, which makes the contrast from default more salient.

- (7) Assume p is the contextual evidence
 - a. $inf(p) > inf(\neg p)$
 - b. $inf(p) > inf(\neg p) \downarrow$

Empirical Claim 4: Learning the prejacent resolves the unexpectedness

The prejacent expresses content that follows from the evidence (i.e., an epistemic inference) in the immediate context.^a In addition, learning that the prejacent is true at that context and adding that content to one's information state necessarily resolves the unexpectedness. If A confirms to B that it is not raining (i.e., rejects the prejacent), B is unable to draw any conclusion from this information. Instead, the event of B wearing raincoat becomes even more unexpected. B is left confused and unable to reconcile the evidence, prompting them to ask a "why"-question to specifically inquire about the unexpected event.

- (8) Continuation.
- A: meiyou-ba (No) / dui-a (Yes)
- B: na ni weishenme chuan yuyi a? then you why wear raincoat A?
 - 'Why are you wearing a raincoat?'

Proposal: nandao encodes an incompatible Kernel

I propose that *nandao* is an epistemic modal adverb whose role is to make sense of an **unexpected** context by learning that the prejacent is true. We could follow a traditional Kratzerian Modality Semantics, with additional adjustments to the conversational backgrounds. However, for the current proposal, we directly adopt the Kernel model from Von Fintel and Gillies (2010), who are looking at evidential signals in epistemic modals.

The Kernel represents the privileged information (i.e., very direct information in the context or follows from what is direct) in a contextually supplied modal base at the world.

- (9) **Definition of Kernel and Base**: K is a kernel for B_K , B_K is determined by the kernel K, only if:
 - i. K is a set of propositions (if $P \in K$ then $P \subseteq W$) ii. $B_K = \bigcap K$

Proposal of semantics of *nandao*

- I introduce an upper bound $U \subseteq W$, representing the constraints of not-direct-but-not-inferred information. U is the intersection of priorly acquired knowledge, including generalizations about the world and is sensitive to the grammatical prior.
- The evidential signal encoded by *nandao* differs from that encoded in *must/might*, where the evidential content may or may not be expected with the speaker's pre-utterance information state.

^aThis is where *nandao* is different from German precondition particle *denn* in Theiler (2017), in the sense that the latter does not strictly requires such following relationship.

A: Lee zhoumo ye dasuan qu shangban. ('Lee is planning to work on weekends too.')

ØContext 1 #Context 2

[Default] [Disbelief]

⊠No # Yes

Von Fintel and Gillies (2010, 25)

Cont. Proposal of semantics of *nandao*

Nandao is obligatorily a mirative signal: it requires that the evidence is not expected given the speaker's information state. Hence, I argue the semantics of *nandao* features an incompatible Kernel with the speaker's information state and propose its semantics in terms of the felicity condition illustrated below in (10):

- ii. $[\![\phi?]\!]^c$ is not directly settled in K.
- resolve the unexpectedness.

Accounting for infelicity with Wh-questions

Suppose we no longer impose the constraint that *nandao* must select a polar question. The prejacent is no longer a proposition. Then, to evaluate the semantics of *nandao*, we must first clarify what it means for something to follow from the prejacent, and what it means to learn that the prejacent is true. To address this, following many works on highlighted semantics (e.g., Theiler 2017), we assume that the prejacent is one of the instantiations of the highlighted property of Q. Based on this, we reformulate the felicity condition as follows:

- c. [*nandao* Q?]^{c,w} is defined iff:
 - $(\bigcap K) \cap U = \emptyset$
 - (Adapted from Theiler, 2017, 137)
- thus, learning this proposition is indeed necessary.
- learn (* Condition ii).

Accounting for use with rhetorical questions

Nandao-Qs inherently signal a state in which the speaker experiences epistemic conflict. Many instances of *nandao* usage involve what can be described as a d-inconsistent state (Farkas, 2023). However, not all instances of *nandao-Qs* involve such a state (e.g., ex 3).

(12) *nandao* \sim d-inconsistent state

Rhetorical polar questions p always entail doxastic inconsistency because p and $\neg p$ cannot simultaneously coexist in the information state of the speaker. That is why if a speaker wants to make a rhetorical point, *nandao-Qs* is always a good candidate. Note there are the asymmetric implications:

- (13) Rhetorical PQ \rightarrow Closed PQ Closed PQ \rightarrow Rhetorical PQ
- (14) Closed PQ \rightarrow d-inconsistent state d-inconsistent state \rightarrow Closed PQ

References

Alleton, V. (1988). The so-called "rhetorical interrogation" in mandarin chinese. *Journal of Chinese Linguistics*, 16(2):278–297. Farkas, D. F. (2023). Rhetorical questions revisited. Talk at the University of Tübingen. Givón, T. (1978). Negation in language: Pragmatics, function, ontology. In Pragmatics, pages 69–112. Brill. Gong, J. (1995). "nandao" de duoyixing yu "nandao"ju de qiyixing (on polysemy of "nandao" and ambiguity of "nandao"-sentences). Cishu Yanjiu (Lexicographical Studies).

Shuxiang, L. and Shengshu, D. (2012). Xiandai hanyu cidian. Shanwu Yinshuguan. Sudo, Y. (2013). Biased polar questions in english and japanese. In Beyond expressives: Explorations in use-conditional meaning, pages 275-295. Brill.

Theiler, N. (2017). The precondition particle: Towards a unified analysis of german denn. Van Rooy, R. and Safarova, M. (2003). On polar questions. In *Semantics and linguistic theory*, pages 292–309. Von Fintel, K. and Gillies, A. S. (2010). Must... stay... strong! Natural language semantics, 18:351–383. Willett, T. (1988). A cross-linguistic survey of the grammaticization of evidentiality. *Studies in Language. International Journal sponsored by the*

Foundation "Foundations of Language", 12(1):51–97. Xu, B. (2012). Nandao-questions as a special kind of rhetorical questions. In Semantics and Linguistic Theory, pages 508–526. Xu, B. (2017). Question bias and biased question words in Mandarin, German and Bangla. Rutgers The State University of New Jersey, School of Graduate Studies.

Felicity condition for *nandao*: Fix a c-relevant kernel K:

p is a piece of direct information in c and ϕ is a proposition that follows from p.

iii. [*nandao* ϕ ?]^{*c,w*} is defined iff ($\bigcap K$) $\cap U = \emptyset$ and the speaker s_c needs to learns [ϕ]^{*c*} to

(11) **Felicity condition of** *nandao*: Fix a c-relevant kernel K, p is a piece of direct information in

 s_c considers learning one instantiation (ϕ) of the highlighted property of Q as a necessary precondition to resolve the unexpectedness/proceed in discourse.

iii. $\forall \phi \in \text{highlighted property of } Q, \phi \text{ follows from } p, \text{ and } ?\phi \text{ is not directly settled by } K.$

• If Q is a polar question, there is only one instantiation of the highlighted property (e.g., ϕ_i). Therefore, learning one proposition suffices for the speaker to resolve his unexpectedness;

• if Q is a wh-question, there are multiple instantiations of the highlighted property (e.g., ϕ_i, ϕ_j, \ldots). Most wh-questions (e.g., those headed by what, who etc.) do not satisfy condition iii. why-Qs under exhaustive reading will satify the third condition, but all of its instantiations are sufficient to explain the evidence, which then in turn makes none of them necessary to