nandao-Qs: When Surprise Sparks Inquiry

Anshun Asher Zheng

1. Introduction

This paper presents a semantic-pragmatic analysis of a Mandarin adverb, *nandao*. Traditionally it has been analyzed as a rhetorical question marker that enhances rhetorical force (Alleton 1988, Lü & Ding 2012, Xu 2012), as exemplified in (1). Some scholars also argue that *nandao* questions (hereafter, *nandao*-Qs) convey uncertainty and speaker bias (Gong 1995, Xu 2017), illustrated in (2).

(1) **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.[1]
A: Lee zhouri ye dasuan qu shangban. ('Lee is planning to work on Sunday too.')
B: nandao ta fafeng-le ma?
nandao he go.crazy-PERF Y/N-Q
≈ 'Is he crazy?'

(2) **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
≈ 'It is not the case that it is raining outside, right?'

The current study presents a usage of *nandao*-Qs that has been largely neglected in the existing literature, as illustrated in (3). In this new context, it is clear that the question is not used as either a biased question or a rhetorical question. Prior accounts of *nandao*-Qs fail to accurately account for such examples. Therefore, this paper aims to clarify the semantic-pragmatic function of the adverb, accommodating both old and new data.

(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
≈ 'Is it raining outside?'

I argue that nandao-questions are fundamentally evidence-driven, marking the high informational value of immediate contextual evidence. The current proposal draws on the Kernel account of epistemic modals (Von Fintel & Gillies 2010) to encode such evidential signals within the adverb. This treatment has important implications for understanding various properties of the adverb—such as its natural occurrence in rhetorical questions—and for examining how language communicates contextual confrontation at a higher level. It also connects to existing work on question bias (Romero & Han 2004, Asher & Reese 2008, Sudo 2013, Rudin 2022) and belief revision (Alchourrón & Makinson 1982, 1985, Alchourrón et al. 1985). The proposal outlines one communicative strategy for making sense of contextual information, and I show how such a strategy may interact with other grammatical properties.

* I would like to thank Ashwini Deo for her meticulous guidance and UT Syntax and Semantics Group for insightful discussion. I also thank Yewen Li, Baorian Nuchged, Xiya Wang, Qing Yao, Yanzi Zhao, and Ruihuan Zheng for Mandarin data judgements.

[1] The additional statement about B not considering going to work on Sunday is not strictly necessary, as this is typically the default assumption in real-world contexts. As one reviewer asks, I want to clarify that I included it simply to indicate that this is a normal-case scenario, rather than an unusual one—such as a workaholic context in which B might not find going to work on Sunday surprising.

The paper is organized as follows. Section 2 introduces new data alongside existing examples to provide a clearer empirical profile of *nandao*-Qs. In Section 3, I propose a semantics for *nandao*-Qs, drawing on insights from Von Fintel & Gillies (2010) and Theiler (2021). I also discuss the type of evidential signals encoded by *nandao* and how these relate to the speaker's epistemic bias. Section 4 shows that *nandao*'s exclusive selection for polar questions naturally follows from its semantics, which requires the prejacent to follow from contextual evidence in order to resolve the context. Section 5 investigates the connection between *nandao*-Qs and rhetorical questions, drawing on Farkas (to appear)'s model to demonstrate how nandao aligns with two key properties she attributes to rhetorical questions. Finally, section 6 concludes by summarizing the findings and discussing their broader implications.

2. An Empirical Profile of *nandao*

Polar questions are known to convey speaker bias (Ladd 1981, Romero & Han 2004, Asher & Reese 2008). Following Sudo (2013), the source of such bias can be classified as either epistemic or evidential. Epistemic bias refers to a bias that stems from the speaker's private belief state, whereas evidential bias arises from contextual evidence available in the immediate context and accessible to all interlocutors. I also adopt the assumption that epistemic bias is relative to the belief state prior to the acquisition of contextual evidence; otherwise, it would be difficult to distinguish the two types of bias. Although I primarily discuss the speaker's belief state in the following sections, epistemic bias is not always tied to belief alone—it can also reflect other modal flavors such as bouletic or deontic, as Sudo (2013) has already noted. Unless explicitly noted, let us assume the epistemic bias does not have other modal flavors.

2.1. Association with negative epistemic bias

Previous accounts, such as Xu (2017), have argued that *nandao*-Qs necessarily encode the speaker's negative epistemic bias. As shown in (4), if the speaker believes that there is no one in the room, then only asking "*nandao*there is someone in the room?" will be felicitous. Hence, if the speaker holds prior beliefs, they must be the opposite of the prejacent. I agree with the judgment regarding the negativity of the epistemic bias, but I contend that the context Xu provides is incomplete without specifying the state of evidential bias, which may conflate the claim he intended to make. For example, if there is no contextual evidence—such as the light being on—to suggest that someone is in the room, then the utterance in (4b) is still infelicitous. This at least suggests that while negative epistemic bias may be present, it is not a sufficient condition for the use of *nandao*-Qs. In the next section, I will also show that it is not a necessary condition.

(4) The speaker believes that there is no one in a room. (Xu 2018: 449)

a. # Nandao wuli mei ren?
nandao room.in no person
≈'It is not the case there are not people in the room, right?'
Int. 'It is not the case there are people in the room, right?'

b. Nandao wuli you ren?
nandao room.in exist person
≈'It is not the case there are people in the room, right?'

2.2. nandao*-Qs encode positive evidential bias*

In (5), I offer three contexts that differ in the speaker's private belief state and the presence of evidence supporting the prejacent. If we contrast contexts 1 and 2, the speakers do not hold any prior beliefs about the weather outside, but they differ in contextual evidence—one has evidence suggesting it is raining, while the other does not. We see that *nandao*-Qs are only felicitous when used in the context where the speaker has seen the dripping raincoat (i.e., a source of positive evidential bias). This suggests that a positive evidential bias is at least sufficient, while a negative epistemic bias is not necessary. Moreover, if we compare contexts 2 and 3, both speakers lack evidence suggesting it is raining, but only one holds

the belief that it is not raining (i.e., a negative epistemic bias). However, neither context allows for the felicitous use of *nandao*-Qs, indicating that a positive evidential bias is necessary, while a negative epistemic bias is not sufficient. This property of marking evidential bias is not surprising, as Xu (2017)'s systematic comparison with not-at-issue content markers already shows that *nandao*patterns closely with evidentiality markers.

(5) 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, B enters the room. A asks B:
Nandao waimian xiayu-le ma?
nandao outside fall.rain-PERF Y/N-Q
≈'Is it raining outside?' **☑Context 1 # Context 2 # Context 3**

2.3. The contextual evidence is of high informational value

In addition to the immediate presence of contextual evidence, the felicitous use of *nandao*-Qs requires that the contextual evidence be unexpected to the speaker. Before turning to the data, it is necessary to clarify what unexpected means. In both linguistics and computer science, unexpectedness or surprise is commonly evaluated in terms of the probability of an event or state: the lower the probability, the higher the informational value. From an information-theoretic perspective, rare events carry more information.

Rather than appealing to probabilistic distributions, however, we adopt an alternative view: information is measured by the number of possible worlds that an event or state excludes. Following Van Rooy & Safarova (2003), building on Givón (1978), we assume that the positive form of an event/state typically carries greater informational value than the negative form. For instance, the positive sentence "It is raining" restricts the world to a subset of raining worlds, thereby excluding all non-raining worlds. In contrast, "It is not raining" merely excludes raining worlds and leaves all other possibilities open. Yet, this default assumption about informativeness can be overturned. There are at least three important factors that can flip this default:

1. Epistemic: If the speaker already believes it is raining, then asserting "It is raining" does not exclude any worlds and thus carries no new information.

2. Deontic: If, for example, it is the norm in a certain workplace to work on weekends, then "I'm working on Sunday" would be uninformative, since it aligns with expectation.

Bouletic states are also possible but they are more complex, as they involve how a speaker's preference structure (Condoravdi & Lauer 2012) interacts with the informational status of a proposition rather than simple exclusion of worlds. We set this aside due to space limitations.

Because unexpectedness/expectation can be computed relative to different states—beliefs, norms, preferences—different modal flavors can arise in interpreting *nandao*-Qs. Importantly, however, it is also possible to use *nandao*-Qs even under the default state (i.e., without a prior belief/norm/desire; ex 5, context 1), which prevents me from making the claim that its use necessarily reflects an epistemic bias. In English, so-called "epistemic bias" is often associated with negative polar questions, which Van Rooy & Safarova (2003) argue are typically licensed when the negative form of the prejacent is more informative. The presence of negation in such questions already indicates a deviation from the default informational state (i.e., there is no way negative polar questions can be used under default information state), triggering inferences grounded in epistemic, deontic, or bouletic modalities. In this light, an explanation in terms of information value is in fact more accurate and cross-linguistically stable.

Having introduced a rather clear definition of unexpectedness, let us 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) by changing the belief state of the speaker.

(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

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

B: nandao ta hen.mang ma?
nandao he very.busy Y/N-Q
≈ 'Is he busy?' **☑Context 1 #Context 2**

2.4. Learning the prejacent resolves the unexpectedness

As we saw in previous examples, the high informative contextual evidence (e.g., raincoat) is actually not directly reflected in the questions themselves. Instead, it is the inferences (e.g., raining) from the evidence that serve as the prejacent of the questions.[2] Moreover, learning that the prejacent is true resolves the unexpectedness, as shown in (7): because the inference offers a plausible explanation for the evidence, confirming its truth diminishes the evidence's informational value, whereas rejecting the inference would instead prompt the speaker to ask follow-up why-questions.[3] In this sense, *nandao* parallels the German preconditional particle *denn* (Theiler 2021), which likewise functions to make sense of the context by asking questions.

(7) 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.
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?' **☑No # Yes**

3. Proposal

To capture the properties discussed above, an accurate semantics of *nandao* should (1) recognize highly informative evidence in the context and (2) specify the relation between that evidence and the prejacent. The present proposal largely builds on the account of epistemic modals in Von Fintel & Gillies (2010). This is because it directly provides a way to handle evidential signals (e.g., evidence and the inferences drawn from it in the immediate context), although we acknowledge that following traditional Kratzerian Modality Semantics would also be a viable direction. While we adopt some aspects of their analysis, we deliberately avoid engaging with the debate on weak/strong modals, as it is not directly relevant to our proposal and also would have little impact on it.

3.1. Kernel (Von Fintel & Gillies 2010)

Kernel is a layer of traditional modal base (see 8). It represents privileged information (i.e., very direct information in the context or follows from what is direct)[4] in a contextually supplied modal base

[2] One might ask why the interlocutor does not directly ask about the surprising evidence itself, but instead formulates a question targeting the inference drawn from it. In fact, the interlocutor could inquire about the evidence directly, but this would typically be done through why-questions rather than *nandao*-Qs. I suggest that this is because both the evidence and the inferences it licenses are immediately accessible to the speaker (in the Kernel) (Von Fintel & Gillies 2010). As a result, people first rely on these inferences to make sense of the evidence, and only afterward turn to asking why-questions.

[3] By saying this, I do not mean that the evidence becomes entirely uninformative. Rather, because the intersection of the "raining" worlds and the "raincoat" worlds is already excluded, the set of worlds that wearing a raincoat could eliminate is reduced.

[4] The direct information is encoded as a "(finite, non-logically closed)" set of propositions (e.g., "it is raining" is not logically following from"wearing a raincoat").

in the world. This provides a foundation from which we can further identify and specify the contextual evidence.

(8) **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. $B_K = \bigcap K$ Von Fintel & Gillies (2010: 25)

3.2. Semantics of nandao *in terms of its felicity conditions*

An accurate felicity condition should first connect the prejacent to the contextual evidence. This is straightforward: as I have argued, the prejacent can be viewed as an inference that follows from the contextual evidence. Formally, let the prejacent be ϕ and the contextual evidence be p ($p \in K$); then ϕ is an inference that follows from p:

(9) **Felicity condition for *nandao***: Fix a c-relevant kernel K. $[\![nandao\ \phi?]\!]^{c,w}$ is defined iff:
   i. $\exists p.\exists \phi.p \in K \wedge P(\phi|p) >> P(\phi))$.

Second, we need to encode the unexpectedness in the context. To this end, I introduce U[5], an additional body of information distinct from what is directly available in the immediate context (i.e., K). In theory, U represents the body of information that leads to the information state prior to encountering the immediate contextual evidence. It may include, for example, the speaker's beliefs, desires, social norms (i.e., epistemic bias), and what establishes a default state[6]. Under normal circumstances, we would expect these bodies of information to be consistent (i.e., $\bigcap K$ is compatible with $\bigcap U$), meaning there is nothing remarkable about the contextual evidence. By contrast, contexts where *nandao*-Qs are felicitous are those in which the prior information state (i.e., $\bigcap U$) is opposite to the information state indicated by the contextual evidence (i.e., $\bigcap K$). Thus, another felicity condition is that the information encoded by K and U be incompatible.

(10) **Felicity condition for *nandao***: Fix a c-relevant kernel K. $[\![nandao\ \phi?]\!]^{c,w}$ is defined iff:
   i. $\exists p.\exists \phi.p \in K \wedge P(\phi|p) >> P(\phi))$.
   ii. $(\bigcap K) \cap (\bigcap U) = \emptyset$

Lastly, there is a more general constraint that ϕ must not be directly "settled" in K. In other words, ϕ itself should not be directly present in K; otherwise, p would cease to be highly informative. This resonates the analysis of epistemic modals in Von Fintel & Gillies (2010). While this constraint may seem trivial in the context of questions—since it is uncommon to ask about information that is directly accessible (e.g., seeing that it is raining and then asking whether it is raining)—such questions can still arise rhetorically or for other pragmatic reasons. However, in the case of *nandao*-Qs, the presence of ϕ in K is prohibited.

(11) **Felicity condition for *nandao* (Final Version)**: Fix a c-relevant kernel K. $[\![nandao\ \phi?]\!]^{c,w}$ is defined iff:
   i. $\exists p.\exists \phi.p \in K \wedge P(\phi|p) >> P(\phi))$.
   ii. $(\bigcap K) \cap (\bigcap U) = \emptyset$.
   iii. $[\![\phi]\!]^c$ is not directly settled in K.

4. Implication 1: Accounting for infelicity with Wh-Qs

One important property of *nandao* is that it is incompatible with declaratives and wh-questions (12).[7] Previous accounts, such as Xu (2012), address this selectional constraint by adding a presupposition to the semantics of *nandao*. While this approach fits the empirical data, it offers limited explanatory power regarding why such a presupposition should be encoded in the first place. In contrast, under the semantics I propose, the incompatibility with wh-questions naturally follows from the analysis.

[5] This is closely related to what Von Fintel & Gillies (2010) term "not-direct-but-not-inferred" information.

[6] In this paper, I do not treat the default state as a form of epistemic bias, though I remain open to other possibilities.

[7] Here, declaratives refer to those with falling intonation. We treat declaratives with rising intonation as another means of forming polar questions, alongside overt question syntax and discourse markers.

(12) The distribution of *nandao* (Xu 2012: 510,512)

a. *Nandao Lisi hui lai (*ma)
nandao Lisi will come Y/N-Q
Int. 'Lisi will not come' [*DECL]

b. *Nandao Zhangdan weishenme qu xuexiao (ma)?
nandao Zhangsan why go school Y/N-Q
Int. 'Why does Zhangsan go to school?' [*WH-Q]

Suppose we no longer impose the constraint that *nandao* must select a polar question. In that case, the prejacent is no longer necessarily propositional. To evaluate the semantics of *nandao*, we must then clarify what it means for the prejacent to follow from the contextual evidence and what it means to learn that the prejacent is true which resolves the unexpectedness. But first, what counts as the prejacent of a wh-question? One could argue that, because no such "prejacent" exists for wh-questions, the meaning of *nandao* would simply be undefined. Instead of taking this route, I adopt the framework of highlighted semantics (e.g., Theiler 2021), where the prejacent of a question Q is treated as an instantiation of Q's highlighted property (denoted as f). Under this view, polar questions involve a 0-place property with a single instantiation, which serves as the prejacent, whereas wh-questions involve an n-place property (determined by the number of wh-phrases), where the prejacent is any one of its instantiations.[8] Based on this, we reformulate the felicity condition as follows:

(13) **Felicity condition of *nandao***: Fix a c-relevant kernel K, p is a piece of direct information in c. $[\![\textit{nandao}\ Q?]\!]^{c,w}$ is defined iff:

i. $\exists p.\forall\phi.\exists Q.p \in K \wedge \phi \in f(Q) \wedge P(\phi|p) >> P(\phi)$.
ii. $(\bigcap K) \cap (\bigcap U) = \emptyset$.
iii. $[\![\phi]\!]^c$ is not directly settled in K.

Under this derivation, most wh-questions are filtered out automatically. For wh-questions headed by wh-phrases other than *why*, the instantiations of their highlighted property often fail to meet the requirement that they follow from the evidence (i.e., condition [i]). For example, given the context where the speaker encounters the unexpected raincoat, a wh-question like *What is the weather outside?* may have instantiations such as *It is rainy* or *It is snowy* that satisfy the condition, but others like *It is sunny* or *It is cloudy* do not. There is, however, one apparent exception: why-questions with a mention-all reading, where all instantiations would indeed follow from the evidence. For instance, answers to *Why are you wearing a raincoat?* would meet all the conditions formulated here. Why, then, are such questions nevertheless blocked?

I argue that the instantiation the speaker learns must also be necessary one so that to resolve the source of incompatibility ($((\bigcap K) \cap (\bigcap(U + \phi)) \neq \emptyset$.). As we have seen, in scenarios where the speaker holds explicit prior beliefs, *nandao*-Qs help directly address those beliefs, since they are the source of the conflict. Polar questions enable the speaker to point precisely to this source. In contrast, why-questions have an answer space that is too broad: learning any one answer may be sufficient to alleviate the unexpectedness, but it does not necessarily target the specific belief or assumption that caused the incompatibility. Thus, why-questions are merely a sufficient strategy for understanding the unexpected evidence, whereas *nandao*-Qs function as both a sufficient and necessary strategy for understanding the context as well as resolving explicit conflicts. While why-questions can usually be used in contexts where *nandao*-Qs are felicitous, *nandao*-Qs are preferred when there is an explicit source of incompatibility that needs to be resolved.

5. Implication 2: Accounting for use with rhetorical questions

nandao-Qs are frequently argued to occur in rhetorical contexts, even though their semantics does not explicitly encode rhetorical usage. Intuitively, the connection between unexpectedness and rhetorical

[8] For readers unfamiliar with highlighted semantics: in a polar question like "Did Mary eat the cake?", the highlighted content is a 0-place property (i.e., *Mary ate the cake*), yielding a single instantiation (the proposition itself). In contrast, in a wh-question like "Who ate the cake?", the highlighted content is a 1-place property ($\lambda x.x$ ate the cake), whose instantiations include propositions such as "Mary ate the cake."

contexts is not difficult to see: people often resolve surprising situations either by persuading themselves or by persuading others. Here, I aim to make this intuitive connection explicit by formally showing that the contexts in which *nandao*-Qs are felicitous also make them good candidates for making a rhetorical point (à la Farkas (to appear)).

5.1. Farkas (to appear)

Farkas (to appear) defines two necessary conditions for rhetorical questions, which provide a basis for understanding what makes a question rhetorical.

(14) a. Closed Question Condition: Farkas (to appear: 9-10)
In order for a question to be interpreted as a RhQ, Sp must be taken as assuming that the issue raised by the question is closed in c_i. (A question expressing an issue I is closed in c iff $\forall p \in I$ such that $p \notin cg_c$, $p \cup cg_c$ is not d-consistent.)

b. Rhetorical Point Condition:
In order for a question to be interpretable as a RhQ, Sp must be taken as intending to convey a rhetorical point, i.e., as intending to persuade Ad of the truth of a proposition p by making Ad reach the conclusion that p is true on his own.

To put it simply, the first condition holds if the question is already settled (i.e., answered) in the common ground, or if adding any proposition from its question set (where a question is treated as a set of propositions) would create doxastic inconsistency—i.e., would contradict the speaker's doxastic base. The second condition, in turn, requires that the question be used to make a rhetorical point, aiming to prompt the addressee to independently conclude that a particular proposition p is true.

5.2. How do nandao-*Qs' environments satisfy the two conditions?*

5.2.1. D-inconsistency and closed question condition

nandao-Qs inherently signal a state in which the speaker encounters highly informative evidence that is incompatible with their prior information state. As discussed earlier, this incompatibility may stem either from a grammatical prior or from a belief, desire, or norm. Consequently, many instances of *nandao* usage correspond to what can be described as a d-inconsistent state (i.e., when the incompatibility originates in the speaker's belief state). However, not all cases of *nandao-Qs* involve such belief-based inconsistency—for example, when the unexpectedness arises from a grammatical prior, adding any proposition from the question to the common ground would not yield doxastic inconsistency. Thus, while *nandao*-Qs contexts often correlate with d-inconsistency, this is not universally the case.

(15) *nandao*-Qs ~ d-inconsistency state

nandao-Qs are polar questions. Meanwhile, rhetorical polar questions always entail doxastic inconsistency, since p and $\neg p$ cannot simultaneously hold in the common ground.[9] Thus, when a speaker intends to use a rhetorical polar question, *nandao-Qs* are always suitable candidates. This yields the following asymmetric implication:

(16) Rhetorical PQ $\rightarrow$ Closed PQ
Closed PQ $\not\rightarrow$ Rhetorical PQ

(17) Closed PQ $\rightarrow$ d-inconsistent state
d-inconsistent state $\not\rightarrow$ Closed PQ

[9] To clarify: for a polar question to be closed there are two scenarios: (1) if the polar question is resolved in the common ground (e.g., p is in the common ground), then adding $\neg p$ would create doxastic inconsistency; (2) if the question is unresolved but closed, then by definition both p and $\neg p$ would lead to doxastic inconsistency, which is impossible. Therefore, the question must be resolved in the common ground, and doxastic inconsistency necessarily follows.

5.2.2. Rhetorical point

Whenever speakers aim to make a rhetorical point, they must use a closed question. *nandao*-Qs provide a favorable environment for this, as they typically give rise to closed questions. However, it is not necessarily the case that every use of *nandao*-Qs is rhetorical (e.g., in the weather inquiry contexts discussed earlier). Only when the speaker's intention is to persuade the addressee to adopt a particular proposition can a *nandao*-Qs be interpreted rhetorically.

6. Conclusions

This paper provides a novel account of Mandarin particle *nandao*. The current proposal is compatible with prior analyses such as Xu (2017), but it shifts the focus from epistemic bias toward evidential bias, and from bias centered on the prejacent to the role of unexpected contextual evidence. This analysis highlights that unexpected evidence is the primary trigger for *nandao-Qs*, while the unexpectedness of the prejacent (i.e., the speaker not expecting the prejacent to be true) is what follows from that evidence. In this way, it extends earlier accounts that primarily focus on the prejacent by integrating the evidence in the immediate context. This approach also sheds light on the selectional properties of *nandao* and reframes the distinction between so-called biased questions and rhetorical questions—not in terms of the strength of bias, but in terms of their correlation with doxastic inconsistency states.

References

Alchourrón, Carlos E, Peter Gärdenfors & David Makinson. 1985. On the logic of theory change: partial meet contraction and revision functions. *The journal of symbolic logic* 50(2). 510–530.

Alchourrón, Carlos E & David Makinson. 1982. On the logic of theory change: contraction functions and their associated revision functions. *Theoria* 48(1). 14–37.

Alchourrón, Carlos E & David Makinson. 1985. On the logic of theory change: safe contraction. *Studia logica* 44. 405–422.

Alleton, Viviane. 1988. The so-called" rhetorical interrogation" in mandarin chinese. *Journal of Chinese Linguistics* 16(2). 278–297.

Asher, Nicholas & Brian Reese. 2008. *Intonation and discourse: biased questions*. Universitätsbibliothek Johann Christian Senckenberg.

Condoravdi, Cleo & Sven Lauer. 2012. Imperatives: meaning and illocutionary force. *Empirical issues in syntax and semantics* 9(37-58).

Farkas, Donka F. to appear. Rhetorical questions revisited. In *Proceedings of the sixtieth annual meeting of the chicago linguistic society (cls 60)*.

Givón, Talmy. 1978. Negation in language: pragmatics, function, ontology. In *Pragmatics*, 69–112. Brill.

Gong, Jiazhen. 1995. *"nandao" de duoyixing yu "nandao"ju de qiyixing (on polysemy of "nandao" and ambiguity of "nandao"-sentences)*. Cishu Yanjiu (Lexicographical Studies).

Ladd, D Robert. 1981. A first look at the semantics and pragmatics of negative questions and tag questions. In *Papers from the regional meeting of the chicago linguistic society*, 164–171.

Lü, Shuxiang & Shengshu Ding. 2012. *Xiandai hanyu cidian (the contemporary chinese dictionary)*. Shangwu Yinshuguan (Commercial Press).

Romero, Maribel & Chung-hye Han. 2004. On negative yes/no questions. *Linguistics and philosophy* 27(5). 609–658.

Rudin, Deniz. 2022. Intonational commitments. *Journal of Semantics* 39(2). 339–383.

Sudo, Yasutada. 2013. Biased polar questions in english and japanese. In *Beyond expressives: explorations in use-conditional meaning*, 275–295. Brill.

Theiler, Nadine. 2021. Denn as a highlighting-sensitive particle. *Linguistics and Philosophy* 44(2). 323–362.

Van Rooy, Robert & Marie Safarova. 2003. On polar questions. In *Semantics and linguistic theory*, 292–309.

Von Fintel, Kai & Anthony S Gillies. 2010. Must... stay... strong! *Natural language semantics* 18. 351–383.

Xu, Beibei. 2012. Nandao-questions as a special kind of rhetorical questions. In *Semantics and linguistic theory*, 508–526.

Xu, Beibei. 2017. *Question bias and biased question words in mandarin, german and bangla*. Rutgers The State University of New Jersey, School of Graduate Studies.

Xu, Beibei. 2018. Dedicated bias word nandao as an illocutionary modifier. In *35th west coast conference on formal linguistics*, 448–457.