

The Hindi-Urdu *NA* and reasonable inference

Ahmad Jabbar*

Stanford University

jabbar@stanford.edu

Penultimate draft; to appear in *Proceedings of the 59th annual meeting of the Chicago Linguistic Society (CLS 59)*

1 Introduction

This paper presents a study into *na* as a sentence-final particle. Although also used as a topic marker and negation, *na* occurs sentence-finally across clause-types. To our knowledge, most of the work on this particle, of which there isn't much, has happened in the past few years. While [Brown \(2022\)](#) explores *na*'s bias in questions, [Jabbar and Kanamarlapudi \(2023\)](#) explore *na*'s role in a grounding move in Hindi-Urdu dialogue.¹ In this paper, we focus on *na*'s distribution across clause-types.² In light of the data, we think the following hypothesis offers the best fit:

- (1) *na* signals the speaker's belief that the content of *na*'s containing clause is a reasonable inference, given what's common ground.

The notion of reasonable inference is intuitive but not straightforward to systematize. [Stalnaker \(1976\)](#)'s work on indicative conditionals features the notion of reasonable inference too. However, our notion is weaker. For now, we use the notion under its pre-theoretical sense. To wit, if you are on vacation, it has rained all week, and you've just woken up with

*Special thanks to Christopher Potts for detailed discussions and comments! Thanks to Madelaine Brown, Cleo Condoravdi, Judith Degen, Ashwini Deo, Thomas Icard, Veda Kanamarlapudi, Pravaal Yadav, Xuetong Yuan, audiences at *Chicago Linguistic Society*, *Stanford Construction of Meaning*, and to four anonymous reviewers for their feedback and time. Mistakes are my own.

¹Other Hindi-Urdu particles, including the polar question particle *kya*, have been studied more extensively ([Bhatt and Dayal \(2020\)](#); [Biezma et al. \(2022\)](#); [Deo \(2022, 2023a\)](#)).

²We take as inspiration a wide range of insightful work on discourse particles [Rojas-Esponda \(2014\)](#); [Yuan \(2020, 2021\)](#); [Theiler \(2021\)](#); [Deo \(2022\)](#).

the curtains fully covering the windows, it would be reasonable for you to infer that it's raining today as well. It won't be reasonable to infer that a tornado's afoot. First, note that this notion is clearly not entailment. Second, reasonable inference is quite similar to the notion of speaker expectation. There's precedent in the literature for use of speaker expectation to explain linguistic phenomena, most notably Rett (2011)'s work on exclamatives. We explore this relation between expectation and inference in §6. We systematize it in a model-theoretic framework, making connections to Kratzer (2012) and recent work on modeling of inductive knowledge as in Goodman and Salow (2023).

We start with some ground-clearing remarks in §2. In §3-5 we present data reflecting *na*'s distribution in declaratives, questions, imperatives, exclamations, and exclamatives. In §6, a systematic treatment of reasonable inference is presented. We conclude in §7 with two puzzles to motivate future inquiry into *na*.

2 Ground-clearing

For starters, *na* is a discourse particle in Hindi-Urdu. It is also used similarly in Punjabi and South Asian English. For this paper, we focus primarily on *na*'s usage in Hindi-Urdu, leaving open for now the extent to which our study extends to Punjabi and South Asian English. *Na* can occur sentence-finally across clause-types as in (2)-(5).

- (2) Barish ho rahi hai NA.
It is raining NA.
- (3) Tum khush ho NA?
you happy be NA
You are happy NA?/Are you happy NA?
- (4) Kaam kar-o NA!
Work NA!
- (5) John kya mazedaar desserts banata hai NA
What delicious desserts John bakes NA³

³We take this example from Rett (2011)'s insightful paper. Rett classifies this as a *wh*-exclamative.

Some clarificatory remarks are in order regarding (3). To foreshadow the discussion we take up in §4.2, the following reasons lead us to believe that *na* doesn't occur in questions. First, [Bhatt and Dayal \(2020\)](#) and [Biezma et al. \(2022\)](#) recently explore the polarity question particle *kya*. Although optional to use with polar questions, to use it with the sentence-final *na* is infelicitous as in (6).

- (6) # Kya tum aa-o-ge NA?
PQP you come.2PL.FUT NA?

Moreover, in South Asian English, which features *na* too, *na* appended to polar questions turns out to be bad as in (7).

- (7) # Is it raining NA?

We delay the discussion of whether (3) is indeed a question or not to §4.2. However, we note that *na* is categorically bad to use in *wh*-questions as in (8) below. This can be taken as another reason to believe that *na* doesn't feature in questions.

- (8) # Party par kon aaya NA?
Party on who came NA?
Who came to the party NA?

Then, in addition to explaining its sentence-final effects, our account ought to explain why *na* is bad in *wh*-questions. We have foreshadowed a discussion that we take up fully in §4.2. First, let's get a broader sense of *na*'s distribution, before we blinker ourselves to sentence-final uses. Like many other discourse particles, *na* can also mark the topic in a sentence as in (9) and act as negation as in (10).

- (9) mujh-ko NA chai pasand hai
I.ACC NA tea like be.PRS.SG
I like tea

- (10) aa-e NA ter-i yaad un-ko [Jain \(2021\)](#)
come.IPFV NA you.POSS.F thought them.DOM
your thought doesn't come to them

We said that in addition to its sentence-final uses, *na* can mark topic and act as negation. Do we have any reason to believe that it is the same lexical item across the three use-types? For this paper, we remain agnostic about the question of possible ambiguity. We limit our inquiry only to *na*'s contribution as a sentence-final particle. Let's start with declaratives.

3 Declaratives

In this section, we construct minimal pairs of contexts to bring out the discourse anaphoric effects of *na*. We use each one of these effects to test the generalization stated in (1). First, consider HOMEWORK below.

[HOMEWORK]: A is baby-sitting a kid and offering help with the kid's homework. B is familiar with this. According to plan, B arrives at the doorstep at 4pm to take A out for coffee. B is surprised to see that A is still baby-sitting the kid.

- (11) B: What's up? Why are you still baby-sitting?
 A: Us-ne apna homework khatam nahi kiya NA.
 A: *He hasn't completed his homework NA.*

The proposition that the kid hasn't completed his homework is entirely new to B. This information is private to A. However, A's utterance in (11) is entirely felicitous. (1) predicts this as A considers it a reasonable inference from the context due to B's knowledge that A was offering homework help to the kid. For a minimal pair, we can construct another similar dialogue for HOMEWORK, where use of *na* is infelicitous.

- (12) B: What's up? Why are you still baby-sitting?
 A: # Us-ko food-poisoning ho gai NA.
 A: # *He got food-poisoning NA.*

The problem here is that nothing about the context invites the inference that the kid is ill. However, A's utterance above is totally fine to use if the baby has regularly gotten food-poisoning before and B is familiar with this regularity. The regularity makes the prejacent reasonable to infer. B might be familiar with this by way of A telling B. Is A's telling of B relevant? Not necessarily, as can be noted in the context below.

[MANCHESTER]: A and B are in Manchester. Their plans to play cricket outside have been delayed every single day due to rain. It's a new day now. A grabs his phone and lies down on the couch. B takes that as a signal that A is planning to stay in. Unbeknownst to B, before placing himself comfortably on the couch, A was sitting close to the window, from which he took a peek at the heavy rain outside.

- (13) B: Wait, why aren't we going outside?
 A: Barish ho rahi hai NA.
 A: *It's raining NA.*

The context above is set such that B doesn't know that it is raining. Moreover, A hasn't told B prior to A's utterance that it is supposed to rain. Therefore, although A's private beliefs may be relevant, A's discourse commitments, in the [Gunlogson \(2008\)](#) and [Farkas and Bruce \(2010\)](#) sense, aren't. Nonetheless, A's utterance of a proposition marked with *na* is felicitous. The inference that it's raining is invited by the following two facts: first, there's a regularity of raining events in Manchester which A takes B to be familiar with; second, A was party to the cricket plan, but behaves as if they aren't anymore. Note, by the way, A's response also works in (14), where B's question is not a *why*-question but a polar question, and A's answer is not a canonical *yes/no* answer to the polar question asked by B. Therefore, we can't draw the conclusion that *na* is only licensed in declaratives that are asserted as answers to *why*-questions.

- (14) B: Wait, aren't we going outside?
 A: Barish ho rahi hai NA.
 A: *It's raining NA.*

Does our generalization in (1) hold up for all of the data considered so far? In all of the contexts above, one of the following two things is going on. Either the speaker takes the proposition *p* of the containing clause of *na* to be such that the interlocutor should know that *p*, or the proposition of the containing clause is such that it is normal, according to the speaker, given how things are in the world. (1) provides an explanation for both of these effects. Typically things that are normal give rise to reasonable inference; after all, inductive knowledge arises out of regularities. Moreover, if *p* is a reasonable thing to infer, the speaker may think that the addressee ought to know that *p*. Let's test our generalization further. Below, we discuss a tricky case that *prima facie* presents a challenge for our theory.

[MINA'S MUM]: A group of friends, who are in their twenties, is discussing what their mothers do for work. Mina is a new addition to this group of friends. Everyone answers, apart from Mina. Neha notices this and asks:

- (15) Neha: Mina, you didn't tell us what your mum does.
 Mina: Oh, meri maa mar chuki hai NA.
 Mina: *Oh, my mum's dead NA.*

Above, Mina's response is not supposed to signal to Neha that Neha should know that Mina's mum is dead. The sort of pragmatic meaning that one

gets from (15) is that Mina wants the proposition to be accommodated without fuss. Then, even if the prejacent might not be a reasonable inference given that Mina is just in her twenties, by use of *na*, Mina conveys the attitude towards the prejacent that she takes it to be a reasonable inference. It is through this attenuation of the prejacent's surprise that Mina is able to signal that she doesn't want to cause much fuss by talking about her mum's passing away. However, the attitude that one considers a given proposition to be a reasonable inference can only be taken towards certain propositions. Consider the context above again, but tweak Mina's response slightly.

- (16) Neha: Mina, you didn't tell us what your mum does.
 Mina: # Oh, meri maa ko aliens ne abduct kar liya tha NA.
 Mina: # Oh, my mum was abducted by aliens NA.

Not only is the above utterance infelicitous, it would also be infelicitous for Mina to say that her mum died in a car crash as in (17) below.

- (17) # Meri maa car crash mein mar gai thi NA.
 # My mum died in car crash NA.

We can note two things here. Mina's utterance in (16) is too unexpected and surprising—perhaps because it's implausible that such a thing happened. Moreover, Mina's utterance in (17) contains more information than her utterance in (15). In the set of worlds where Mina's mum is no more, a subset of those are such that her death is due to a car crash. Therefore, one requires more information in the context to infer that Mina's mum died in a car crash than what's required for inferring that Mina's mum is dead. To sum, the prejacent cannot be too implausible, given how things are in the world, and the less information the prejacent encodes, the easier it is to accommodate it. This is certainly in line with the generalization stated in (1). To be more systematic, let's list the effects so far noted.

- (18) *Na*'s use:
- a. is licensed when the proposition of the containing clause is either private to the speaker or not.
 - b. is not licensed when the proposition is too implausible as in (16).

- c. is not licensed when the proposition encodes a lot of information given the context as in (17)
- d. can signal that the addressee should know the proposition of the containing clause.

All of the above noted effects are quite varied but related. We take this to suggest that many of these effects are a function of the semantic contribution of *na* and how it interacts with the context. We think that our generalization stated in (1) explains all of the above uses. If the speaker takes a proposition *p* to be inferable from what's common ground, then *p* has some additional properties. *p* cannot be too implausible as in (16); this explains (18b). Moreover, given two propositions *p* and *q*, where *p* encodes less information than *q*, we typically take *p* to be more easy to infer than *q*. For instance, if it has rained all week, you may infer that it's raining. That it's raining at a certain volume per hour is a slightly harder inference to make. Moreover, if the speaker takes *p* to be inferable from what's common ground, then the speaker can expect the addressee to know that *p*. This explains (18d). Our way of explaining (18d) is helpful also because it doesn't take that the addressee should know the prejacent to be part of *na*'s conventional meaning.

Now, we move on to compare an effect of *na* that seems similar to that of the German discourse particle *überhaupt*. Rojas-Esponda (2014) notes that the unfocused *überhaupt* serves two purposes: (i) terminating a line of inquiry; (ii) invalidating a presupposition by the addressee. The focused *überhaupt* only serves (i). The effect that we note for *na* is like *überhaupt* in that *na* is felicitous to use with a statement that terminates inquiry. Moreover, *na* is also felicitous to use with presupposition-challenging statements as responses to inquiries. Consider the following conversation between A and B.

- (19) A: Would you like some chocolate cake?
 B: Nope!
 A: Would you like strawberry cake?
 B: No!
 A: Carrot cake?
 B: Main cake nahi khata NA.
 B: *I don't eat cake NA.*

B terminates the line of inquiry by A, while also invalidating the presupposition that A eats cake. B could have instead also used (20) or (21), where

the speaker doesn't really invalidate a presupposition of the addressee.

- (20) Main cake nahi khaon ga NA.
I won't eat cake NA.
- (21) Main cake nahi khana chahta NA.
I don't want to eat cake NA.

Now, B could have easily terminated the line of inquiry by simply saying *I don't eat cake*. What's crucial to note is that *na* can only be used in a response that terminates the inquiry. It would be infelicitous had B instead said (22).

- (22) # Main carrot cake nahi khata NA.
 # *I don't eat carrot cake NA.*

(22) is fine if B had pointedly told A sometime ago that B hates carrot cake. Without such shared history, it's bad. Shared history makes it inferable. A related effect is that *na* marks declaratives that are put forth as exhaustive explanations to questions.

[INTROVERT] A and B are PhD students in a department. A is a bit introverted, skips lunch with his peers, but is still friends with B. B tells A about some interesting gossip and A is amazed by not being privy to any of it.

- (23) A: Wow! I don't know any of this gossip you're telling me.
 B: Tum humare saath lunch par nahi aate NA.
 B: *You don't come to lunch with us NA.*

B's use of *na* above serves to convey that the *na*-marked proposition exhaustively explains as to why A doesn't know any of the gossip. It would be weird for B to say *Well, for starters, you don't come to lunch with us NA*. In other words, there's no other reason, but only that A doesn't come to lunch with their peers, due to which A doesn't know the gossip. Further, *na* can also be used to signal one's ignorance with regards to the question under discussion. This means that we cannot let the condition for *na*'s felicitous use be this: that the prejacent is a resolving answer to a question under discussion. Consider (24) below.

- (24) A: (while coding) Why am I getting this error? (some pause) Tell me!
 B: Mujhe nahi pata NA.
 B: *I don't know NA.*

The pause above is important. It indicates that B didn't reply to A's question. Without the pause, B's utterance can be felicitous if A has reason to believe that B is at least as bad at coding as A is, and this comparison is shared belief between A and B. If A and B have just met and have been randomly assigned to a work-group, and A's turn didn't include a pause, it would be odd for B to say *I don't know na*. All of the above can be classified under the inquiry-termination effect. While (19)-(23) are instances where the proposition of *na*'s containing clause resolves the QUD, (24) involves speaker's expression of ignorance w.r.t. the QUD.⁴

In (24) we noted that the pause was crucial for B's response *I don't know na*. If the speaker doesn't answer the question, the speaker can take it to be a reasonable inference that the speaker doesn't know the answer. Moreover, this use has an antagonistic flavor to it, which can be explained from the fact that it's not a reasonable inference that the speaker doesn't know the answer, but the speaker takes it to be. This antagonistic effect is attenuated in (19), as it is followed by a series of denials on B's part, which perhaps makes it more reasonable to infer that B doesn't eat cake. This prediction about the extra-linguistic effect of antagonism is something we get in addition to explaining the pragmatic effects of *na*. But what about the inquiry-termination effects? We think that these effects are explained by the fact that in declaratives, *na* gets the falling intonation. It is this prosodic difference between (29) and (31) for instance that brings out the difference in their sentential force. Moreover, there's a lot of work that explores how cooperative speakers mark their answers for exhaustivity via prosodic cues like falling intonation (cf. Xiang (2022)). It is this falling intonation on *na* in declaratives that signals exhaustivity, and thus has the inquiry-termination effect. This meaning isn't carried by *na* on its own. This keeps our explanation simple, while acknowledging the various pragmatic effects of *na*. Now we move on to questions.

⁴In procedural models of discourse structure, as in Roberts (2012), the inquiry-termination can be taken to be modeled by popping the question of the stack. A question is popped either after resolution or when it's considered not fit for inquiry.

4 Questions

4.1 Bias?

Earlier, we noted that whether *na* is felicitous in polar interrogatives is a controversial issue. For that reason, we don't translate the examples below as English polar questions. In questions like (25), *na* conveys a bias that the speaker has for one of the alternatives. Consider the following context.

[LA TRAVEL]: Suppose that John is traveling to LA. He's on a phone call with Mary who is in LA. John has no reason to believe that it's raining in LA. The following question is infelicitous for John to ask:

- (25) # Barish ho rahi hai NA?
It's raining NA?

Now contrast this with GOING TO CT.

[GOING TO CT]: John is traveling to Storrs. It's thunderstorm season, which John is very familiar with, having lived on the east coast before. He's on a phone call with Mary. Asking (25) would NOT be marked.

It's quite clear that in GOING TO CT, John is biased towards the proposition that it is raining, and in LA TRAVEL, he isn't. One way to characterize this bias is the following: by asking a NA-marked question, the speaker conveys that the speaker takes one of the alternatives to be more likely to be true than the other. This is again captured by (1); if a speaker A takes proposition *p* to be a reasonable inference given what's common ground, then it makes sense for A to be biased towards *p*. There's a certain type of use that the bias account seems too strong for.

[HOPING IN MANCHESTER]: Tina wants to play cricket outside, but she is also aware that it's almost always raining in Manchester. Seth comes from outside. Tina hopes that it's not raining. She asks Seth,

- (26) Barish nahi ho rahi NA?
It's not raining NA?

Tina's utterance above seems to have a dreaded flavor or one which conveys that she hopes that it's not raining. The English equivalent of (26) would be *Please tell me it's not raining*. Only under such an interpretation is (26) felicitous. Here, Tina has no reason to be biased towards the proposition that it is not raining. *Na* is then used simply to convey a hope that Tina has. Tina can certainly say *Ugh, it's always raining here*, after Seth tells Tina that it is in fact raining. That would be felicitous.

Now, to account for (26), do we have to construe bias very widely so as to include non-doxastic bias like hope too? We don't think so. First, note that in the above context, for Tina to say *It's raining NA?* is totally fine too. However, it would be very weird for Tina to say (26) if Seth came from outside with a wet umbrella. Therefore, although it has rained continuously in the past few days and Tina is aware of this, Tina is not aware of the fact that it is raining today. Tina's use of *na* signals that she considers it a reasonable inference that it is not raining. However, our knowledge that Tina is aware that it has regularly rained in the past few days is at odds with Tina's belief about inferability of the prejacent in (26). It is due to this tension that we resort to interpreting Tina's utterance as having the hoping flavor similar to *Please tell me it's not raining*. We take this interpersonal and metalinguistic reasoning to be responsible for the hoping flavor to Tina's utterance, rather than that of genuine belief or bias.

Let's take a step back now. The more basic effect of *na* conveying bias in questions can easily be explained by (1). The speaker takes the proposition of the containing clause of *na* to be a reasonable inference given what's common ground. There may be a problem here. If (25)-(26) are questions, then what are we referring to by *proposition* in (1)? But, are (25)-(26) really questions? What if *na*'s badness in *wh*-questions is a special case of its badness in questions. We explore these related issues below.

4.2 Question meaning for real?

Above, we observed that *na* cannot be felicitously appended to a non-polar *wh*-question.

- (27) # Party par kon aaya NA?
Who came to the party NA?

Following Theiler (2021), we take that the varying felicity of a particle in *wh*-questions and polar interrogatives cannot be explained in terms of the difference in the answerhood conditions for the two types of questions.⁵ What if *na* is bad in *wh*-questions because *na* is bad in questions *tout court*? What if its felicitous uses in questions are akin to the English rising declarative, or something else? But what if Deo (2023b) and Brown (2022) are

⁵See Theiler (2021) for a good argument against using answerhood conditions for this purpose. Theiler uses it for the German particle *denn*, but it is easily extendable to *na*.

right in taking *na* to be operating on question meaning? Do we have an account for *na*'s infelicity in *wh*-questions? First, assuming that all the above examples are indeed questions, we show a strategy to account for *na*'s specific badness in *wh*-questions. We can modify (1) to include the phrase *highlighted proposition*, instead of just *proposition*. Roelofsen and Farkas (2015) argue that at a level of representation, both declaratives and polar interrogatives have the same semantic content, i.e. a 0-place property, which they take to be a proposition. In other words, the highlighted property for both polar interrogatives and declaratives is a proposition. Given that we can tweak (1) to make reference to highlighted propositions, we can take (1) to be ill-defined for *wh*-questions, as *wh*-questions don't denote highlighted propositions, but instead *n*-place properties, where $n > 0$. We hereby show that (1) can be easily extended to explain *na*'s use in polar interrogatives too, while explaining its infelicity in *wh*-questions. However, we think that the evidence suggests that *na* doesn't operate on question meaning. We consider two reasons here.

First, it's striking that the polar question particle (PQP) *kya* is infelicitous to use with *na* in a polar interrogative. All of our examples of *na* in purported polar questions lack the PQP *kya*, which Bhatt and Dayal (2020) explore in depth. Granted that *kya* is optional to use, to use it with NA in a question turns out to be infelicitous as in (28).

- (28) # Kya tum aao-ge NA?
 # PQP you come.2PL.FUT NA?

While Bhatt and Dayal (2020) think of *kya* as an optional PQP, Biezma et al. (2022) argue that *kya* is an uncertainty marker. Then, it could be that *na* interacts with an uncertainty marker in such a way that the use of *kya* and the use of *na* are at total odds—just like von Stechow and Gillies (2021) note for *perhaps* and *must* as in *It must be raining, but perhaps it isn't*. However, there's more evidence against construing *na* as operating on question meaning. In South Asian English, *na* is used ubiquitously too, as in (29).

- (29) It's raining NA ↓.

However, *na*'s use is infelicitous in (30), while totally fine in (31)

- (30) # Is it raining NA ↑?
 (31) It's raining NA ↑?

Therefore, that *na* operates on question meaning is not a given. That's the weakest conclusion we can draw. The stronger conclusion would be to say that it doesn't. For the account we present, it doesn't matter how conservatively we draw the conclusion, as we also present an independent explanation for *na*'s badness in *wh*-questions, noting a difference in the highlighted properties. Now that we have shown that it's not a given that *na* operates on question meaning, *na*'s infelicity in *wh*-questions can also be taken as a piece of evidence against construing *na*-questions to involve *na*'s operation on a question meaning.

Our account as stated in (1) seems to fit the data well so far. Moreover, it also makes sense of crucial extra-linguistic effects as in (15) and (26). We have also presented evidence against taking *na*-questions as involving *na*'s operation or comment on some question meaning. Now we turn to imperatives and exclamatives.

5 Imperatives and exclamatives

5.1 Imperatives!

Na can occur sentence-finally in imperatives too, as in (32).

- (32) Chal-o NA.
Walk-IMP.2 NA.
Walk NA.

There are certain contexts where the use of *na* in imperatives is quite marked. Consider the following context.⁶

[MATMUL 1]: It's A's first ever coding class. It is common ground that A has no working knowledge of numpy. B is a seasoned Python programmer. A's code is taking forever to run.

- (33) A: My code's still running.
B: # (takes a look at the code) Matmul use kar-o NA!
B: # (takes a look at the code) Use matmul NA!

However, tweak MATMUL 1 to MATMUL 2. B's utterance *Use matmul na!* in (33) is totally felicitous given MATMUL 2.

⁶For a simple background, numpy is a Python package. Matmul is a numpy function that makes matrix multiplication more efficient than implementing it via for-loops.

[MATMUL 2]: B is a seasoned programmer. A and B just had a conversation about how numpy is such a handy package. But as A is fond of running for-loops, he has implemented a for-loop, instead of using matmul. A's code is taking forever to run.

Similarly, consider a context where A asked B to shut the door. B responded with *mhmm* or *sure*. A minute passed and B still didn't get up to shut the door. In this context, it would be fine for A to utter (34).

- (34) Darvaza band kar-o NA!
Shut the door NA!

Just out of the blue, it's bad to use (34). However, if a gust of wind is incoming and causing the loose sheets of paper to fly off the table, it would be totally fine for A to use (34)—especially if B is sitting close to the door and noticing the mess being caused. In imperatives, *na* seems to bring the effect that there was no need for the speaker's use of the imperative; as it was obvious that the addressee should have been performing the salient action. In MATMUL 1, B can't expect A to know about Matmul, so B's use of *na* there is infelicitous. (1) can be extended to account for this easily. The addressee should have performed the action without the speaker's explicit imperative use because it is inferable given the context that the addressee should perform the action—or so the speaker, who marks the imperative with *na*, thinks. However, (1) makes reference to a proposition, as in *the proposition of the containing clause of na*. How do we get a proposition from an imperative? We can follow Kaufmann (2011)'s and Condoravdi and Lauer (2012)'s work on imperatives who associate the denotation of an imperative with a proposition.⁷ Then, (1) requires that for *na*'s felicitous use in an imperative, this proposition be inferable in the context. We move on to exclamatives now.

5.2 Exclamatives!

There's not much work on Hindi-Urdu exclamatives. Here, we note two striking facts about *na* with exclamatives. Rett (2011) makes a distinction between exclamations and exclamatives. While (35) is an exclamation, (36) is an exclamative.

⁷To avoid gross oversimplification of these accounts, the guiding thought is for denotations to take a backseat, and pragmatic constraints and dynamic force to take center-stage.

(35) (Wow,) John bakes delicious desserts!

(36) (Whoa,) what delicious desserts John bakes!

According to Rett's classification, an exclamation is one formed with a declarative sentence, while an exclamative isn't; (36) is formed with a *wh*-clause. The crucial thing we note is that *na* is totally fine to use sentence-finally with exclamatives as in (38), but it's infelicitous to use with exclamations as in (37).

(37) # (Vah,) Bohat acha mausam hai NA!

(Wow,) *the weather's very nice NA!*

(38) Kitna acha mausam hai NA!

How nice the weather is NA!

To understand the above pattern, we take it important to understand the common ground requirement for exclamatives. Zanuttini and Portner (2003)'s account requires the content of the exclamative to be common ground; Rett (2011) doesn't. Rett's counterexample to the common ground generalization includes John's exclamative in (39) as an opening to the letter to Mary while he's visiting Crete.

(39) What a magnificent place Crete is!

The content of (39) is not common ground between John and Mary. However, in such exclamatives where the content isn't common ground, to use *na* is infelicitous. It would be bad for John to start the letter with (40).

(40) # Crete kitni kamaal jagah hai NA!

What a magnificent place Crete is NA!

Na is licensed only in exclamatives whose content is common ground. However, the common ground requirement is stronger; for *p* to be common ground between A and B, A and B both must know that *p*, A must know that B knows that *p*, *ad infinitum*. However, if A thinks that the context is such that it invites B to believe that *p*, the content of the exclamative, A can felicitously use *na* with the exclamative. This is exactly the requirement for *na*'s felicitous use as stated in (1). It would be fine for John to say (40) if John tells Mary that there are several modern art museums in Crete, and in the past, John and Mary have loved every place that has a modern art museum. The context inviting B's belief that *p* is exactly what it means to reasonably infer *p*.

Moreover, careful readers may have picked up on our removal of *whoa* in (38). To use (38) with an expression of surprise as in *whoa* or *vah*, as is typical for exclaimatives, is infelicitous. The fact that the content of the exclamative must be a reasonable inference for *na* to be licensed also explains this fact. Why *na* is bad in exclamations is more straightforward. We note that there's a relation between expectation and what can be reasonably inferred. Propositions that aren't expected at all in the discourse aren't reasonably inferred given what's common ground. The exclamation involving the proposition p simply signals violation of the speaker expectation that not p or speaker's agnosticism w.r.t. p . When the speaker expects not p or doesn't expect p , we can say that the speaker doesn't consider p to be a reasonable inference given what's common ground. Therefore, our generalization about *na* in (1) predicts that for such a proposition, the speaker cannot use *na*. Recall that (1) predicts that the speaker uses *na* only with propositions that the speaker thinks are reasonable inferences from what's common ground. Then it is extremely weird to express one's surprise w.r.t. p by an exclamation and also mark p to be a reasonable inference given what the speaker knows. Using the pre-theoretical notion of inferable or to reasonably infer, we have achieved a nice fit over all of the data we presented across clause-types. However, we think that we need to give, at the very least, a vague idea as to how one may systematize *inferable* or *to reasonably infer*.

6 Reasonable inference

Let's restate our generalization from (1). *Na* signals the speaker belief that the content of *na*'s containing clause is a reasonable inference given what's common ground. It would be nice to be able to understand reasonable inferences in model-theoretic terms. In intensional semantics, entailment between two propositions can be defined via the subset relation. Can we do something similar to systematize reasonable inference? First, we note that reasonable inference is a relation between two pieces of content. For our purposes, we take it to be a relation between the context set (cs) and the proposition of the containing clause of *na*.⁸ This formalization helps us in accounting for data like (23) as well. We can say that every entailment

⁸ cs , the formal counterpart to the common ground, is a set of worlds, obtained by intersecting all the propositions that are common ground (cf. Stalnaker (1978)).

from *cs* is a reasonable inference from *cs*. As it is already common ground that A doesn't come to lunch, B can take this to be a reasonable inference. Construing entailments to be reasonable inferences also helps in explaining what Deo (2023b) calls reminding uses of *na*, as reminders are for *p* that are already known. Further, two agents can have different opinions about whether *q* is a reasonable inference to make from *p*. There's no notion of reasonable inference independent of a speaker's considering something to be so. This can also account for why Sherlock Holmes can add *na* to his involved inferences, because he takes them to be reasonable inferences from the context. Such uses of *na* can certainly cause frustration for others, as their inference abilities don't allow them to see as reasonable what Holmes may consider a reasonable inference. Keeping in sight that reasonable inference is a mind-dependent relation between *cs* and a proposition, we present possible candidates for understanding it more systematically.

First, although what's common ground is shared between discourse participants, participants can order the worlds in *cs* differently. We are familiar with the stereotypical conversational background from Kratzer (1981, 2012). This can also serve as an ordering source for *cs*. Further, we can associate each discourse participant with a stereotypical ordering source. What can this amount to? While it may not be common ground that it's raining, A might consider the raining worlds to be better and B might consider the non-raining worlds to be better. We can model (1) as the speaker's stereotypical ordering source yielding the best worlds w' in the context set to be such that the proposition of the containing clause of *na* is true in w' . That's one way to understand our hypothesis (1) in a model-theoretic framework. Goodman and Salow (2023) model inductive knowledge using a comparative notion of normalcy, where *as normal as* is considered a relation between worlds that aren't ruled out by one's evidence. The basic thought behind Goodman and Salow (2023)'s framework is to model knowledge that goes beyond one's evidence, i.e., inductive knowledge. We can say that what one can reasonably infer is equivalent to this body of knowledge. Moreover, there's a connection between what one can reasonably infer and what's expected given what's common ground. (1) can also be thought as saying that the speaker expects that the proposition of the containing clause of *na* is true, given what's common ground—after all one reasonably infers what one can also expect to be true. We made reference to this interchangeability of reasonable inference and expectation in explaining *na*'s distribution in exclamatives. This gives us another

way to model (1). Yalcin (2012) layers the Stalnakerian common ground with probabilistic structure such that discourse participants can assign credences to propositions, in addition to categorical belief. We can appeal to such context probabilism to ground (1) as well. With a slightly better understanding of reasonable inference in frameworks familiar to us, we can move on to more puzzling data that eludes straightforward semantic explanation.

7 More puzzles

In this section, we present two puzzles that our account doesn't straightforwardly explain. This exercise is not undertaken to note the shortcomings of our account, but instead, to invite linguists to work on the amazing puzzles posed by *na*, as some phenomena discussed here may be syntactic or even psycholinguistic.

7.1 Scramble it!

Hindi-Urdu is a scrambling language. Both (41) and (42) are felicitous sentences.⁹

- (41) Yeh vaali daal bana-o
This one lentil make-IMP.2PL
- (42) Yeh vaali bana-o daal
This one make-IMP.2PL lentil

However, in imperatives, *NA* can occur felicitously only after IMP as can be seen in (43), (44), and (45).

- (43) Yeh vaali daal bana-o NA
This one lentil make-IMP.2PL NA
- (44) # Yeh vaali bana-o daal NA
This one make-IMP.2PL lentil NA
- (45) Yeh vaali bana-o NA daal
This one make-IMP.2PL NA lentil

⁹We follow Kaur (2020); Mishra and Archana (2022) in glossing *-o* as IMP.2PL

As noted above, in Hindi-Urdu, imperatives come with an imperative ending *-o*.¹⁰ It is striking then that when there is a marker that is responsible for sentential force, it is that marker that is appended with *NA* in its felicitous cases. Usually the imperative ending *-o* as in (41) occurs sentence-finally and when *NA* marks it, *NA* occurs sentence-finally. (1) doesn't provide us with any restriction to understand this fact.

7.2 Conditional questioning

In Hindi-Urdu, *na* can mark antecedents in conditionals. Before delving into their effect, let this be another observation about *NA*'s felicitous distribution.

- (46) Agar unhon.ne Bach bajaya NA, toh Alice nahi aae.gi.
If they play Bach NA, then Alice won't come.

However, when antecedents are marked by *NA*, consequents cannot be questions.

- (47) # Agar unhon.ne Bach bajaya NA, toh (tab) (kya) Alice jaa.e.gi?
 # *If they play Bach NA, then will Alice go?*

This is striking. Moreover, note that without *na*, (47) is totally felicitous. (1) doesn't lend any straightforward explanation for the question blocking effect with *na*-marked antecedents.

8 Conclusion

To take stock, we take our contribution to be empirical and theoretical. An extensive dataset for *na*'s use across clause-types is presented. A generalization is put forth that fits the data well. A way to ground the generalization in familiar frameworks is presented. We started off by relying on the notion of highlighted proposition from Roelofsen and Farkas (2015). However, in light of imperative and exclamative data, we took *na* as making a comment about the denoted content of speech acts. This led us to rely on accounts of speech acts like Kaufmann (2011); Rett (2011); Condoravdi and Lauer (2012) that make available a proposition for us to make

¹⁰Or the null morphology as in $-\emptyset$ for 2nd person singular subject (cf. Kaur (2020)).

reference to in our generalization as in (1). Perhaps for *na*'s meaning across speech acts, the important notion isn't that of the dynamic force of speech acts, but instead of what they denote.

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