

BIAS CONDITIONS IN POLAR QUESTIONS AND ANSWERS:
A STUDY OF BIAS EFFECTS IN FARSI

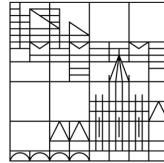
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After a long flight, I was waiting in a passport control line at an airport. Among all the passengers in the queue, the officer came to me and asked, '*Are you from the EU countries?*'. It was a simple positive polar question, a well-known neutral question type, but there were also many other things: his gesture, my Mediterranean appearance, his previous experiences, my previous experiences, his emphasis on 'ARE' in the question or maybe my sensitivity to intonation, and etc. After all, my work on bias has made me biased when it comes to judging bias. Nonetheless, what I can confidently say is that bias is a nuanced phenomenon, influenced by various linguistic and paralinguistic factors.

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I have been consistently amazed by Maribel's wisdom and passion during the last four years. One can feel the magic of the words, when they come from Maribel. Her patience and commitment as well as her smart comments not only improved the study but also taught me how to write precisely. Selecting the third referee was a daunting task, and I couldn't imagine anyone better suited than Manfred Krifka. Given his boundless knowledge, Manfred's works are on nearly every page of my dissertation. While I was afraid by his big name in the field, I soon found his heart bigger than his name. His insightful feedbacks and suggestions were always helpful.

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Abstract

Polar questions and answers are commonly employed in everyday conversations. At first glance, the structure appears straightforward: the speaker inquires whether or not ϕ is true, and the addressee provides either ϕ or $\neg\phi$ as the answer. Nevertheless, the situation becomes intricate due to the existence of various types of polar question and different usage of response particles. Consider examples (1)–(3), all of which essentially inquire whether John won or not. Although each question type can receive either a positive or a negative answer, the compatibility with response particles varies. Specifically, examples (1) and (3) are exclusively compatible with *Yes* in (B1) and *No* in (B4), whereas (2) allows for both *Yes* in (B1, B2) and *No* in (B3, B4).

- | | |
|--------------------------|---------------------|
| (1) A: Did John win? | B1: Yes, he did. |
| | B2: Yes, he didn't. |
| (2) A: Did John not win? | B3: No, he did. |
| | B4: No, he didn't. |
| (3) A: Didn't John win? | |

It is evident that each type of questions has distinctive profile, not only in terms of the polarity of the question proposition, but also in their potential to convey bias. For example, the high negative polar question in (3) is employed when the speaker initially believed *that John won* but has recently received information contradicting her belief. Furthermore, the selection of an appropriate response particle may depend on both the polarity and the bias profile of the question type. This nuanced interplay between question types and response particles contributes to the complexity of the analysis of polar question and answers.

This dissertation undertakes the intricate role of bias in polar questions and answers, focusing on Farsi, a Western Iranian language spoken in Iran, Tehran. Farsi introduces bias in polar questions through the incorporation of discourse particles and various types of tag questions. It also employs a response system similar to the one presented above. The cross-linguistic data offers novel insights for the analysis of bias in the following two main sections:

I. Bias Profile: The existing literature has proposed various theoretical frameworks to elucidate the inherent bias found in each type of biased questions. Scholars argue that bias, as an epistemic implication, is contingent upon the speaker's prior beliefs and/or contextual evidence. In Chapter 2, we will highlight the non-epistemic instances of biased questions. Chapter 3 presents the contribution from Farsi, demonstrating that certain types of biased questions inherently convey the speaker's non-epistemic attitudes. In particular, my study investigates polar questions employing *ke*, *dige*, *mage* particles, along with two types of tag questions, i.e., particle tags, and verbal tags. Furthermore, we will argue that current analyses fall short in distinguishing between specific question types that are felicitous under the same bias conditions. We propose that biased questions vary across three dimensions: (i) the projected answer as the next conversational move, (ii) the felicity conditions they necessitate, and (iii) the speaker's attitude toward the projected answer. The attitude serves as the primary factor upon which the other two dimensions depend.

II. Response Particles: Chapter 4 shifts the focus to responsive polar particles by reviewing relevant literature. We present data from particles *âre* 'Yes' and *na* 'No' in Farsi. These particles are used not only in declarative responses but also in interrogatives, forming tag questions and alternative questions. In our analysis, we contend that these particles exhibit ambiguity in response to biased negative questions, a characteristic not observed in their responses to unbiased negative questions and interrogatives. Building upon the framework proposed by Roelofsen and Farkas (2015), we develop a unified analysis of polar particles in both functions by introducing distinct lexical entries for each particle. The analysis is extended to the Scoreboard model, advocating for distinct discourse referents for each reading of the particles. Chapters 5 and 6 present experimental evidence supporting the proposed account.

Zusammenfassung

Entscheidungsfragen und Antworten auf diese werden häufig in alltäglichen Gesprächen verwendet. Auf den ersten Blick erscheint ihre Struktur einfach: Der Sprecher erkundigt sich, ob ϕ wahr ist oder nicht, und der Adressat antwortet entweder mit ϕ oder $\neg\phi$. Dennoch ist die Situation aufgrund der verschiedenen Fragetypen und der Verwendung von Responsivpartikeln komplexer. Deutlich wird dies an den Beispielen (1)–(3), die im Wesentlichen die Frage aufwerfen, ob John gewonnen hat oder nicht. Speziell sind (1) und (3) ausschließlich kompatibel mit *Yes* in (B1) und *No* in (B4), während (2) sowohl *Yes* in (B1, B2) als auch *No* in (B3, B4) als Antwort ermöglicht.

- | | |
|--------------------------|--|
| (1) A: Did John win? | B1: Yes, he did. |
| (2) A: Did John not win? | B2: Yes, he didn't.
B3: No, he did. |
| (3) A: Didn't John win? | B4: No, he didn't. |

Es zeigt sich deutlich, dass jeder Fragetyp nicht nur hinsichtlich der Polarität des vorangestellten Fragethemas, sondern auch bezüglich seines Potenzials zur Übermittlung von Bias eine charakteristische Struktur aufweist. Zum Beispiel könnte die Engscheidungsfrage mit hoher Negation in (3) verwendet werden, wenn der Sprecher ursprünglich glaubte, *dass John gewonnen hat*, aber kürzlich Informationen erhalten hat, die seinem Glauben widersprechen. Es ist plausibel, dass die Auswahl einer geeigneten Responsivpartikel von der Polarität als auch vom Bias-Profil des Fragetyps abhängen kann. Dieses nuanierte Zusammenspiel zwischen Fragetypen und Responsivpartikeln trägt zur Komplexität der Analyse von Fragen und Antworten bei.

Diese Dissertation widmet sich der komplexen Rolle des Bias in Entscheidungsfragen und -antworten, mit Fokus auf dem Farsi, einer westiranischen Sprache, die im Iran, insbesondere in Teheran, gesprochen wird. Farsi verwendet nicht nur ein Antwortsystem, das dem oben beschriebenen ähnelt, sondern führt auch Bias in Entscheidungsfragen durch die Verwendung von Diskurspartikeln und verschiedenen Arten von Refrainfragen (Tag-Fragen) ein. Die sprachübergreifenden Daten bieten neuarige Erkenntnisse für die Analyse von Bias in zweierlei Hinsicht:

I. Bias-Profil: In der Literatur sind verschiedene theoretische Ansätze vorgeschlagen worden, um den inhärenten Bias in jedem Typ von Biasfragen zu erläutern. Es wird argumentiert, dass Bias als epistemische Implikation von den vorherigen Überzeugungen des Sprechers und/oder dem kontextuellen Beweismaterial abhängt. Im Kapitel 2 werden die nicht-epistemischen Fälle von tendenziösen Fragen hervorgehoben. Kapitel 3 zeigt am Beispiel des Farsi auf, dass bestimmte Arten von Biasfragen die nicht-epistemischen Einstellungen des Sprechers inhärent vermitteln. Insbesondere widmet sich meine Studie Entscheidungsfragen mit den Partikeln *ke*, *dige*, *mage*, sowie zwei Arten von Tagfragen, Partikel-Tags und Verb-Tags. Darauf hinaus wird argumentiert, dass bereits vorhandene Analysen Schwierigkeiten haben, zwischen spezifischen Fragetypen zu unterscheiden, die unter denselben Biasbedingungen als gelungen gelten. Es wird vorgeschlagen, dass Biasfragen in drei Dimensionen variieren: (i) die projizierte Antwort als nächster Gesprächsschritt, (ii) die Gelungenheitsbedingungen, die sie erfordern, und (iii) die Einstellung des Sprechers gegenüber der projizierten Antwort. Die Haltung des Sprechers dient als das primäre Signal, von dem die anderen beiden Dimensionen abhängen.

II. Responsivpartikeln: Kapitel 4 richtet den Fokus auf reaktive Polaritätspartikeln, und gibt einen Überblick über die dafür relevante Literatur. Außerdem werden Daten zu den Responsivpartikeln *âre* ‘Ja’ und *na* ‘Nein’ präsentiert. Diese Partikeln werden nicht nur in deklarativen Antworten verwendet, sondern auch in interrogativen Sätzen, um Tagfragen und Alternativfragen zu bilden. Im Zuge dieser Analyse wird argumentiert, dass Responsivpartikeln eine Mehrdeutigkeit in der Reaktion auf tendenziöse negative Fragen aufweisen, eine Eigenschaft, die in ihren Antworten auf Fragen ohne Bias und interrogative Sätze nicht beobachtet wird. Aufbauend auf dem von Roelofsen and Farkas (2015) vorgeschlagenen Modell wird eine einheitliche Analyse von Responsivpartikeln in beiden Funktionen durch die Einführung unterschiedlicher lexikalischer Einträge für jede Partikel entwickelt. Diese Analyse wird auf das Scoreboard-Modell ausgedehnt, und es wird für unterschiedliche Diskursreferenten für jede Interpretation der Responsivpartikeln plädiert. In Kapitel 5 und 6 werden experimentelle Ergebnisse zur Untermauerung des Modells präsentiert.

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Symbols and Abbreviations

\approx	Defeasible Entailment	QUD	Question Under Discussion
\models	Entailment	RDecs	Rising Declaratives
\rightsquigarrow	Implicature	RFR	Rise-Fall-Rise (tune)
\searrow	Falling Contour	SOV	Subject-Object-Verb Order Language
\nearrow	Rising Contour	ToBI	Tones, Break, Indices
ACC	Accusative	TQs	Tag Questions
Agr	Agreement	TopP	Topic Phrase
AltQs	Alternative Questions	uPol	Unvalued Polarity
CB	Contextual Bias		
CC	Contradiction Contour		
CF	Contrastive Focus		
CG	Common Ground		
CG*	Projected Common Ground		
CIs	Conventional Implicatures		
DAgr	Disagreement		
DR	Discourse Referent		
DC	Discourse Commitment		
DC*	Projected Discourse Commitment		
FocP	Focus Phrase		
HNQPs	High Negation Polar Questions		
LNPQs	Low Negation Polar Questions		
LF	Logical Form		
MLI	Metalinguistic Issue		
Neg	Negative		
NPIs	Negative Polarity Items		
NPQs	Negative Polar Questions		
OB	Original Bias		
OT	Optimality Theory		
PolP	Polarity Phrase		
PolPrts	Polar Particles		
Pos	Positive		
PPIs	Positive Polarity Items		
PPQs	Positive Polar Questions		
PQs	Polar Questions		

Chapter 1

Introduction

This dissertation delves into the intriguing domain of bias effects on polar questions and answers in Farsi, presenting fresh insights derived from experimental research. With the exception of the introductory Chapter 1 and the concluding Chapter 7, the dissertation is structured into two main parts. The first part comprises Chapter 2, which investigates biased polar questions within existing literature, and Chapter 3, which examines biased questions in Farsi. This investigation delves into tag questions and polar questions featuring (biased) discourse particles, specifically *ke*, *dige*, and *mage*. In the second part, Chapter 4 concentrates on response particles, *âre* ‘Yes’ and *na* ‘No’, and explores the influence of bias on the nature of responses. Subsequent chapters, Chapter 5 and Chapter 6, serve as integral extensions, providing additional empirical evidence.

1.1 About Polar Questions

Following Hamblin (1973), the semantics of polar questions (PQs), $[\phi?]$, denotes the set of potential answers, namely $\{\phi, \neg\phi\}$ (cf. Karttunen 1977). Therefore, questions in (1)–(3) have the same semantic truth-condition by raising the same issue, whether or not John went. However each question has distinctive characteristics with respect to the bias in the question. Roughly speaking, biased questions convey information about the higher likelihood/preference of a potential answer for the next discourse

move, let's call it the *projected answer*.

- (1) Did John go? (2) Did John not go? (3) Didn't John go?

Numerous studies have attempted to explain the bias implication in different questions within various semantics and/or pragmatic accounts (Ladd 1981, Büring and Gunlogson 2000, Van Rooy and Šafářová 2003, Romero and Han 2004, Asher and Reese 2008, Krifka 2015, AnderBois 2019, amongst others). Positive polar questions (PPQs) as in (1) are often taken as the default form to be used in neutral contexts. Negative polar questions (NPQs) with low negation (LNPQs) as in (2) can but not necessarily indicate bias (Romero and Han 2004). However, in proper contexts, both forms can express bias implication. While the unbias reading of LNPQs might be controversial, high negation in questions (HNPQs) as in (3) mandatorily express bias. Therefore, the presence of bias seems to be optional in PPQs and (possibly in) LNPQs, whereas obligatory in HNPQs

Furthermore, bias implication could be raised by different linguistic means, for instance syntactically (e.g., by the presence and position of negation or different word order), lexically (e.g., by *really* or discourse particles), pragmatically (e.g., by different speech acts as in rising declaratives, TQs) or phonologically (e.g., by prosodic stress like verum accent). For instance, PPQs with *really* as in (4) and PPQs with verum accent on the auxiliary verb (Höhle 1992), indicated by CAPS LOCK as in (5), convey speaker's bias against the uttered proposition. Romero and Han (2004) introduce VERUM as a meta-conversational operator and explain the obligatory presence of bias in *really*-questions and focused PQs similar to HNPQs in (3).

- (4) Did John really go? \rightsquigarrow The speaker expects that John didn't go.
(5) DID John go? \rightsquigarrow The speaker expects that John didn't go.

Therefore, regarding the meaning of PQs and the bias implication, various types of questions not only share the same semantics of $\{\phi, \neg\phi\}$, but also exhibit (similar) bias implication. Even though, they are felicitous in different contexts.

Biased questions require specific felicity conditions with respect to two types of bias, namely original bias (OB) and contextual bias (CB) (Ladd 1981, Romero and Han

2004, Büring and Gunlogson 2000, amongst others). The former type concerns speaker's prior belief/expectation, while the latter indicates an expectation introduced by a piece of evidence in the context that is mutually available for the interlocutors in the discourse. While some scholars have concentrated on one type of bias and missed/ignored the other one (Van Rooy and Šafářová 2003, Romero and Han 2004, AnderBois 2011, amongst others), experimental studies investigate the possible crossing of the OB and CB (Roelofsen et al. 2013, Domaneschi et al. 2017). They support the fundamental distinction between the two types of bias and show their effect on different types of questions. Therefore, biased questions have their own profiles concerning the required OB and CB, although certain types of questions may share the same felicity conditions.

Moreover, previous studies have explored the gradable strength of bias as another distinctive feature in biased questions (Reese 2007, Asher and Reese 2008, Northrup 2014, Farkas and Roelofsen 2017, Bill and Koev 2023b). For instance, bias strength in tag questions (TQs) may differ in terms of intonation or the polarity of the question. Asher and Reese (2008) claim that falling reverse TQs as in (6) convey no doubt (and strong bias) of the speaker towards the propositional anchor. Conversely, rising reverse TQs as in (7) express speaker's uncertainty and doubt (weaker bias) (see also the discussion of the same and reverse polarity TQs in Krifka 2015, Malamud and Stephenson 2015).¹

(6) John went, didn't he? ↘

(7) John went, didn't he? ↗

Taken together, biased questions can manifest variations depending on different features. They may either include bias implication towards positive or negative propositions on an optional or mandatory basis. Moreover, the strength of bias they convey and the specific felicity conditions they necessitate can vary. Consequently, a comprehensive framework becomes crucial to capture all these facets through a nuanced analysis. Chapter 2 presents an overview of the primary frameworks of biased questions in the literature, and Chapter 3 provides insights from Farsi.

¹Notice that the anchor and the tag can constitute either a single intonational phrase or separate phrases, post-nuclear and nuclear tags, respectively (Ladd 1981, Huddleston and Pullum 2002).

1.2 About Response Particles

A substantial body of the existing literature concerning responsive polar particles (PolPrts) is grounded in the work of Pope 1976 (see also Kramer and Rawlins 2009, Holmberg 2013, Krifka 2015, Roelofsen and Farkas 2015, among others). Pope points out that PolPrts, cross-linguistically, can serve two distinct functions: they may signify whether a response is positive or negative, or they may convey agreement or disagreement with an initiative, including assertions and polar questions. The former function is referred to as the *polarity* reading, while the latter is termed the *conformity* reading (see footnote 1 in Chapter 4). Some languages exclusively employ one of the readings, whereas in others, the same particles can have both readings.

For instance, in English, *Yes* can indicate a positive response or agreement with an initiative, and *No* can indicate a negative response or disagreement. Therefore, PolPrts convey the same proposition in response to positive questions like (8). However, they generate different propositions in response to negative questions, as in (9).

- (8) A: Did John come to the party?

B1: Yes, he did.	Polarity[Positive]/Conformity[Agreement]
B2: No, he didn't.	Polarity[Negative]/Conformity[Disagreement]

- (9) A: Did John not come to the party?

B1: Yes, he DID.	Polarity[Positive]
B2: Yes, he didn't.	Conformity[Agreement]
B3: No, he DID.	Conformity[Disagreement]
B4: No, he didn't.	Polarity[Negative]

While bare PolPrts may lead to ambiguity in response to negative initiatives, prosodic saliency is commonly employed for positive answers to negative questions as in (9.B1, B3), presented in CAPS. Thus, the prosody, referred to as the *intonational peak*, *rejecting accent*, *verum focus*, or *contradiction contour* in various studies (Kramer and Rawlins 2009, Krifka 2013, Roelofsen and Farkas 2015, Goodhue and Wagner 2018, respectively), aids in disambiguating the interpretation.

Although some research has rejected the idea of ambiguity and argued that positive

responses to negative initiatives necessitate an explicit short answer, e.g., ‘*he did*’ (Kramer and Rawlins 2009, Holmberg 2013), other scholars have identified different sources of ambiguity, proposing that it is rooted in either the antecedent or the particle. In the first line of thought, Krifka (2015) claims that negative clauses, syntactically, introduce both negative and positive discourse referents (DRs), resulting in ambiguity by PolPrts. Conversely, positive clauses only present a single positive DR, leaving no alternative choice for PolPrts. In the second line of thought, Roelofsen and Farkas (2015) introduce two features with two values: the *Absolute* feature including [*Positive*, *Negative*] and the *Relatives* feature including [*Same*, *Reverse*] values. The authors posit that PolPrts are feature markers and they contribute to ambiguity by performing disjunctive feature marking functions.

Both studies focus on the concept of the salient/highlighted proposition within the initiative and aim to predict the optimal choice when multiple particles are available. Krifka (2015) suggests two constraints within Optimality Theory (OT) to penalize the selection of the **NonSalient* DR and **DisAgreement* with the salient DR, leading speakers toward the response with the lower penalty. Roelofsen and Farkas (2015), on the other hand, present two constraints, *Markedness* and *Realization*, where the optimal choice is determined by the feature markedness scale, in the sense that more marked the feature is, the stronger pressure for overt realization. Despite both accounts predicting a preference for one particle over the other, recent experimental studies (Claus et al. 2017, Repp et al. 2019) indicate inter-individual variation (see Roelofsen and Farkas 2019 for the revised accounts in gradable OT).

Overall, these studies underscore how small words like *Yes* and *No* can give rise to substantial questions about the underlying function of PolPrts and the potential sources of ambiguity. Moreover, the decision-making process behind selecting one particle over another and the interpretation of the reading (in ambiguous cases) are crucial considerations within PolPrts studies. An extensive and expanding body of research has concentrated on polar response particles in English. Chapter 4 contributes new perspective from Farsi to the existing literature, and Chapters 5 and 6 present experimental data to further enrich the discussion.

1.3 What About Farsi?

1.3.1 Introduction

In this dissertation, I refer to Farsi as the language spoken in Iran, specifically focusing on the dialect spoken in Tehran. The judgments presented in this study are not only based on the author's intuition but have been consulted by a small group of informants, through in-person or online interactions. The informants were native speakers of Farsi residing in Tehran. Additionally, in certain instances, the judgments have been tested and validated through experimental works.

From a typological perspective, Farsi is an SOV word order language. However, in practice, it operates as a free word order, which adds an element of complexity and interest to its role as an object language in linguistic studies. Moreover, Farsi functions as a null-subject and pro-drop language, implying that if the speaker explicitly mentions the subject, it may sound marked or carry implicated meaning, such as topic/focus emphasis. While I try to use the SOV order as the canonical structure and name an individual as the subject, examples are designed to closely mirror how speakers naturally speak in everyday conversations. Consequently, in order to achieve unmarked utterances, the word order and subject pro-forms might vary.

Let's begin with assertions presented as falling declaratives in Farsi. Examples (10) and (11) exhibit a minimal pair of positive and negative declaratives in Farsi, marked with a final falling contour (↘). Throughout the remainder of this study, the symbol ↘ will be omitted, and a full-stop (.) will indicate the declarative form.

- (10) Ali Sara ro did. ↘
Ali Sara ACC saw
'Ali saw Sara.'

- (11) Ali Sara ro na-did. ↘
Ali Sara ACC NEG-saw
'Ali didn't see Sara.'

Morphologically, the propositional negation in Farsi is the prefix *ne-* (with allophones *ne-*, *na-*, *ni-*), attached to the verb.² Within the literature, there is a debate re-

²Farsi incorporates numerous compound verbs, consisting of a noun and a light verb. For example, *kar kardan*, literally translating to 'work do', conveys 'to work', *otu zadan*, translating to 'iron hit', signifies 'to iron', and *bidar šodan*, translating to 'awake become', conveys 'to wake up'. In such instances, negation is affixed to the light verb (i).

garding whether the interpretation of negation requires higher positioning through LF movement or if negation holds its low surface position (see Taleghani 2008, Kwak 2010, Kahnemuyipour 2017, amongst others).³ Given that the debate over negation’s position falls outside the scope of my study and that it does not influence my analysis, I leave the discussion for future studies. Following Kahnemuyipour (2017), I assume the negation in Farsi in the low position.

1.3.2 Polar Questions

Canonical polar questions in Farsi are typically formed by final rising contour (↗). This implies that, on the surface, examples (12) and (13) resemble the previous declarative instances. However, the rising contour transforms them into a positive and a negative polar question, respectively. Throughout the remainder of this study, I omit the symbol ↗, employing a question mark (?) to denote the interrogative form.

- | | |
|--|---|
| (12) Ali Sara ro did? ↗
Ali Sara ACC saw
‘Did Ali see Sara?’ | (13) Ali Sara ro na-did? ↗
Ali Sara ACC NEG-saw
‘Did Ali not see Sara?’ |
|--|---|

It is important to note that Farsi has an interrogative particle, *âyâ* ‘whether’, which is optionally employed in formal speech and written communication. Notably, even in the presence of *âyâ*, rising intonation remains essential. While this particle is not commonly used in everyday conversations (in that the author has no intuition for the particle), I have chosen not to incorporate it into my data. I defer discussions about *âyâ* and its potential impact on (biased) questions to future studies (for more information on *âyâ*, see Mameni 2010). In my analysis, I posit that intonation scopes

-
- | |
|--|
| (i) Ali lebasha ro otu na-zad.
Ali cloths ACC iron NEG-hit
‘Ali didn’t iron the cloths.’ |
|--|

³Taleghani (2008) proposes that the interpretation of negation is subject to Agreement relation between the negative morpheme and the [Neg] feature within *NegP* situated above *TP*. This, in turn, licenses Negative Polarity Items (NPIs) like *hičkas* ‘nobody’ in both subject and object positions. Conversely, Kahnemuyipour (2017) investigates nominalization in Farsi and argues that negation resides in a lower position, as the domain of nominalization in Farsi is the *vP*, which can include sentential negation. Frana and Rawlins (2019) noted a similar phenomenon in Italian, where there is one surface position for negation, yet NPQs yield both inner and outer negation readings.

over the (illocutionary) force phrase, where Assertions contain a silent operator, and Questions may entail an overt or covert question operator, denoted as $\hat{a}y\hat{a}_{Op}$ or \emptyset_{Op} , respectively, situated within the CP.

1.3.3 Biased Polar Questions

While PPQs and NPQs in Farsi have the potential to convey bias optionally in suitable contexts, there are other question types that inherently express bias, either through the use of discourse particles or by their syntactic structure, as observed in tag questions (TQs). In this dissertation, my focus is on three discourse particles: *ke*, *dige*, and *mage*, alongside two varieties of TQs: Particle-tags, where the tag employs a polar particle, specifically *âre* ‘Yes’ or *na* ‘No’, and Verbal-tags, wherein the tag comprises the same verb from the anchor in reverse polarity.⁴

1.3.3.1 Discourse Particles

The first group of biased questions introduces bias lexically through specific discourse particles, namely *ke*, *dige*, and *mage*. It is worth noting that, given the free word order in Farsi, the particles can appear freely anywhere within a sentence. To prevent the potential interaction with other factors, such as position (and consequently, topicalized/focused constituents), I present all examples with fixed positions either at the beginning or the end, where the particles scope over the proposition (with broad focus, where the entire IP is focus-marked).⁵ Given that, particles *ke* and *dige* typically occur in the final position, while *mage* is frequently found at the beginning of a sentence. These three particles can be attached to both PPQs and NPQs, suggesting

⁴To narrowed down the study, I exclude the invariant tags, in which the tag include lexicons like *bâše* ‘deal’, *qabul* ‘agree’, *doroste* ‘right’, *hamintore* ‘is that so’, and more. TQs.

⁵For instance, in (i) and (ii), the presence of the particle after the focused constituent could change the question’s meaning. However, examples in (14) and (15) have no focused constituent.

- | | |
|---|--|
| (i) ALI ke diruz umad?
Ali KE yesterday came
(Amongst other people,) did Ali come
yesterday? | (ii) Ali DIRUZ ke umad?
Ali yesterday KE came
(Amongst other days,) did Ali come
yesterday? |
|---|--|

that the speaker holds a particular opinion regarding a potential answer. I will argue that these questions diverge in the speaker's attitude toward the projected answer. In brief, the empirical data demonstrates the following:

- **Particle *ke*** expresses speaker's hope for the uttered proposition in the question.

- | | |
|--|---|
| (14) Ali umad ke?
Ali came KE
'Did Ali come KE?'
~~ The speaker hopes Ali came. | (15) Ali na-yumad ke?
Ali NEG-came KE
'Did Ali not come KE?'
~~ The speaker hopes Ali didn't come. |
|--|---|

- **Particle *dige*** conveys speaker's conclusive inference for the uttered proposition.

- | | |
|---|--|
| (16) Ali umad dige?
Ali came DIGE
'Did Ali come DIGE?'
~~ The speaker infers Ali came. | (17) Ali na-yumad dige?
Ali NEG-came DIGE
'Did Ali not come DIGE?'
~~ The speaker infers Ali didn't come. |
|---|--|

- **Particle *mage*** indicates speaker's surprise, in the sense that the speaker didn't expect the uttered proposition, while the context supports it.

- | | |
|--|---|
| (18) mage Ali umad?
MAGE Ali came
'Did Ali really come?'
~~ The speaker didn't expect Ali came. | (19) mage Ali na-yumad?
MAGE Ali NEG-came
'Did Ali not really come?'
~~ The speaker didn't expects Ali didn't come |
|--|---|

1.3.3.2 Tag Questions

Lastly, we will delve into examples of TQs, including Verbal Tag Questions (VTQs) and Particle Tag Questions (PTQs). On one hand, in VTQs, the tag consists of the remnant verb from the prejacent, presented in reverse polarity as seen in (20) and (21). It is important to note that I loosely translate Farsi TQs as English TQs, however they are not necessarily direct equivalents.

- | | |
|---|---|
| (20) Ali umad, na-yumad/*umad?
Ali came NEG-came/came
'Ali came, didn't he?'
~~ The speaker doubts Ali came. | (21) Ali na-yumad, umad/na-yumad?
Ali NEG-came came/NEG-came
'Ali didn't come, did he?'
~~ The speaker doubts Ali didn't come. |
|---|---|

In PTQs, on the other hand, the particles *âre* ‘Yes’ and *na* ‘No’ can accompany both positive and negative anchors, as illustrated in (22)–(23) and (24)–(25), respectively.

- | | |
|--|---|
| (22) Ali umad, <i>âre</i> ?
Ali came yes
'Ali came, didn't he?'
~~ The speaker is (tentatively)
certain that Ali came. | (23) Ali umad, <i>na</i> ?
Ali came no
'Ali came, didn't he?'
~~ The speaker is (tentatively) certain
that Ali didn't come. |
| (24) Ali na-yumad, <i>âre</i> ?
Ali NEG-came yes
'Ali didn't come, did he?'
~~ The speaker is uncertain
that Ali came. | (25) Ali na-yumad, <i>na</i> ?
Ali NEG-came no
'Ali didn't come, did he?'
~~ The speaker is uncertain that Ali
didn't come. |

The examples of VTQs and PTQs appear quite similar, to the extent that speakers might use them interchangeably in numerous contexts (particularly *âre* and *na* tags), closer investigation reveals nuanced distinctions in the attitudes expressed by the speaker. It will be argued that VTQs indicate speaker’s doubt regarding their belief in light of conflicting evidence in the context. In *âre* tags, the speaker exhibits a higher level of confidence in their belief (due to the presence of supporting evidence), rendering the questions indicative of the speaker’s tentative certainty. Conversely, in *na* tags, the speaker has lower confidence (due to the absence of compelling evidence), thereby conveying the speaker’s uncertainty.

The Farsi data underscores the crucial role of the *attitude* facet in the examination of biased questions. It will be argued that the felicity conditions of biased question are not native to the questions and they can be derived by the attitude implication. Chapter 3 presents novel data from Farsi, investigating three fundamental aspects of biased questions: (i) the projected answer, (ii) the felicity conditions, and (iii) the attitude implication. I contend that the attitude facet serves as the key factor, not only distinguishing between various questions within the same felicity conditions but also establishing the semantic coherence of a singular question across diverse conditions.

1.3.4 Response Particles

Moving on to the second part of this dissertation, Farsi employs two responsive polar particles: *âre* 'Yes' and *na* 'No'.⁶ These particles can be interpreted in terms of both polarity and conformity readings. To distinguish between each reading, I superscripted the particles accordingly: *Pos* and *Neg* for the positive and negative answers by the polarity reading, and *Agr* and *DAgr* for the agreement and disagreement answers by the conformity reading, as exemplified in (26) (for the sake of brevity, I omit the responses to positive initiatives).

- (26) A: Ali mehmuni na-raft?
 Ali party NEG-went
 'Did Ali not go to the party?'

B1: <i>âre^{Pos}</i> raft.	B3: <i>na^{DAgr}</i> raft.
yes went	no went
'Yes, he DID.'	'No, he DID.'
B2: <i>âre^{Agr}</i> na-raft.	B4: <i>na^{Neg}</i> na-raft.
yes NEG-went	no NEG-went
'Yes, he didn't.'	'No, he didn't.'

Regarding the potential use of both particles in response to negative initiatives, I will argue that the bias inherent in the initiative plays a crucial role in selecting the optimal particle. The argument is illustrated by a comparison of responses to

⁶Note that *na* can also function as a constituent negation, as shown in (i), or resemble the structure of *neither...nor...* in English, as illustrated in (ii):

- (i) Ali ye ketab xarid na daftar
 Ali one book bought no notebook
 'Ali bought a book not a notebook.'
- (ii) A: Do you know any language; English, French, Spanish?
 B: man na englisi balad-am na faranse, faqat yek kam spaniae balad-am.
 I no English know-am no French only one little Spanish know-1SG
 'I know neither English nor French, but a little Spanish.'

The scope and behavior of *na* in such roles are distinct from its responsive form. Furthermore, the sentential negation prefix *na-* and the constituent negative particle *na* are considered different lexicon but homophones (Rasekh 2018). Constituent negation has no allophones (see Section 1.3.1) and stands as an independent lexicon with its own meaning. Conversely, sentential negation functions as a prefix requiring attachment to a verb (e.g., *na-raft* for NEG-went). I leave the discussion of constituent negation for future investigations (see Rasekh 2019 and Rasekh and Harris 2021).

examples (27) and (28), where bias is demonstrated to be obligatory or optional, respectively, by the presence or absence of the particle *dige*. The experimental data outlined in Chapter 5 shows that in response to optionally biased questions, as in (27), speakers tend to degrade the particles in the conformity reading (\succ). However, their acceptability improves significantly in response to obligatorily biased questions to the extent that they become equally acceptable (\approx) as the polarity reading, illustrated in (28). Thus, the polarity reading is almost always acceptable, regardless of the initiative, while the acceptability of the conformity reading is contingent upon the presence of bias.

- (27) A: Ali mehmuni na-raft?
 Ali party NEG-went
 ‘Did Ali not go to the party?’

- (28) A: Ali mehmuni na-raft dige?
 Ali party NEG-went DIGE
 ‘Did Ali not go to the party *dige*?’

B1: $\hat{a}re^{Pos} \succ na^{DAgr}$, he did.
 B2: $\hat{a}re^{Agr} \prec na^{Neg}$, he didn’t.

B1: $\hat{a}re^{Pos} \approx na^{DAgr}$, he did.
 B2: $\hat{a}re^{Agr} \approx na^{Neg}$, he didn’t.

While PolPrts have been extensively examined in declarative responses to polar initiatives, it is important to note that they also find application in questions, such as in tag questions (see the examples above), as well as in alternative questions (AltQs), as demonstrated below. While particle *âre* is infelicitous in AltQs, *na* as in (30) is commonly used to indicate speaker’s symmetric interest on either of the possible answers. Note that AltQs featuring a negative clause in (32) may have a marked reading (%) in comparison to (30), however they are felicitous within a context where the speaker faces a challenge as to whether Ali didn’t go and seeks clarification (see the conventions of order in AltQs, as discussed in Van Rooy and Šafářová 2003).

- (29) # Ali raft yâ *âre*?
 Ali went or yes

- (31) # Ali na-raft yâ *âre*?
 Ali NEG-went or yes

- (30) Ali raft yâ *na*?
 Ali went or no
 ‘Did Ali go or not?’

- (32) % Ali na-raft yâ *na*?
 Ali NEG-went or no
 ‘Did Ali not go or did he?’

Although the data concerning the responsive form of PolPrts indicates that with a negative antecedent PolPrts exhibit ambiguity between the polarity and conformity readings, this ambiguity is absent in both TQs and AltQs. Chapter 4 presents an extensive analysis of PolPrts and proposes a dynamic discourse account, utilizing the Scoreboard model. We will argue that each reading of PolPrts serves as an anaphoric reference to distinct discourse referents (DRs) situated at different positions on the scoreboard. The argument posits that the lack of ambiguity in PolPrts within interrogatives and the preference for bias-driven interpretations in declarative responses both derive from the presence of required DRs. Experimental data for supporting the bias effect are presented in Chapters 5.

1.4 Summary

This dissertation investigates the role of bias in polar questions and answers, divided into two distinct parts:

(I) Biased polar questions:

Chapter 2 presents an exhaustive review of the existing literature, wherein various scholars put forth different theoretical frameworks to capture the bias inherent in polar questions. Three primary theoretical perspectives are outlined: (i) Decision Theory: This framework delves into the utility value and projected issue of biased questions, as proposed by Van Rooy and Šafářová (2003) and AnderBois (2019) respectively. (ii) Epistemic Operator: This perspective posits the existence of an operator in certain types of biased questions. We will review VERUM account by Romero and Han (2004) and FALSUM account by Repp (2006). (iii) Discourse Commitment Account: Under this view, Krifka (2015) argues that bias governs discourse commitment in relation to speech acts, while Malamud and Stephenson (2015) present their accounts of commitment roles through the Scoreboard model. We will also review the felicity conditions of each type of biased questions. The chapter concludes by highlighting the lack of distinction between certain types of questions.

Chapter 3 provides a substantial amount of data from Farsi, including polar ques-

tions with discourse particles *ke*, *dige*, and *mage*, as well as tag questions with verbal and particle tags. The felicitous conditions for each type are outlined, and it is established that even when some questions share the same felicity conditions, they still diverge in the speaker’s attitude. The inherent attitude of each question type is crucial for differentiating questions that seem similar in terms of felicity conditions and for explaining the coherence of a single question type across diverse contexts. This chapter suggests that biased questions can vary across three critical features: (i) the projected answer, (ii) the felicity conditions, and (iii) the bias attitude.

(II) Response Particles:

Chapter 4 begins with a comprehensive literature review, classifying primary accounts into syntactic and semantic perspectives. In the syntactic view, Kramer and Rawlins (2009) and Holmberg (2013) introduce PolPrts as polarity interpreters, unambiguous in their bare forms due to the requirement for an explicit polarity phrase in positive answers. The semantic viewpoint introduces PolPrts as propositional anaphorics to the discourse referents (DR) in the initiative. The accounts of Krifka (2013) and Roelofsen and Farkas (2015) are provided with different arguments about the source of ambiguity. Subsequently, I present data from PolPrts in Farsi, with both polarity and conformity readings. Building upon Roelofsen and Farkas (2015), the study offers a unified analysis of PolPrts in both declarative responses and interrogative TQs and AltQs (Mohammadi 2022). We extend the account to the Scoreboard model (inspired by Malamud and Stephenson 2015), arguing for distinct DRs for each reading of PolPrts (Mohammadi and Romero 2024).

Chapter 5 presents an acceptability experiment on the optimal particle in response to different initiative types, including simple NPQs (as optionally biased forms), *dige*-NPQs (as obligatorily biased questions) and Assertions (as the extreme case of bias in the form of full commitment). The results demonstrate consistently high acceptability for the polarity reading, regardless of initiative type. However, the acceptability of the conformity reading improves in respect to bias in the initiative, showing marginal acceptance in NPQs and higher acceptability in *dige*-NPQs and assertions. The data supports the bias sensitivity of the conformity reading of PolPrts. We put forth a

dual-pathway model for selecting the optimal particle, contingent upon the presence of appropriate DRs within the scoreboard. In the first pathway, the semantics of all initiatives provide the necessary DRs for the polarity reading. Consequently, the speaker employs the particle in the polarity reading as a means to signal the polarity of the answer. In the second pathway, the inherent bias within the initiative prompts the addressee to express their agreement/disagreement with the speaker's expectation via the conformity reading. This prompts the speaker to adopt either response path when faced with obligatorily biased forms (Mohammadi to appear).

Chapter 6 conducts two audio experiments aimed at exploring the roles of prosody and bias on PolPrts. The first experiment focus on the prosodic patterns of PolPrts in both accepting and rejecting responses to PPQs and NPQs. The findings align with the data in the literature (Goodhue and Wagner 2018), wherein only rejecting answers to NPQs exhibit focal stress. The followed-up experiment tested the prosody in rejecting answers to both optionally biased questions and obligatorily biased questions with *dige*. This time, focal stress was detected in the rejecting answers to both PPQs and NPQs containing *dige*. I propose the existence of two distinctive types of focal stress, namely contrastive focus and verum focus, each endowed with distinct functions. The observed focal stress in rejecting answers to NPQs in the first experiment denotes contrastive focus, serving to disambiguate the various readings of the same particle in the alternative set. This explains its presence in responses to NPQs, where PolPrts exhibit ambiguity, and its absence in response to PPQs, where PolPrts are unambiguous. In contrast, within the domain of obligatory biased initiatives, i.e., *dige*-PPQs and *dige*-NPQs, the observed focal stress points to verum focus. This signals the interplay between the speaker's expected answer and the addressee's actual answer, regardless of the polarity of the original initiative (Mohammadi 2023b).

Chapter 7 marks the conclusion of the dissertation, presenting a summary of the findings and outlining suggestions for future research.

Chapter 2

Biased Questions

2.1 Introduction

The semantics of polar questions is traditionally defined as a set of potential answers, resulting in a two-valued semantics of $\{p, \neg p\}$ (Hamblin 1973, Groenendijk and Stokhof 1984). This view does not differentiate between positive polar questions (PPQs) as in (33) and negative forms (NPQs) as in (34), since they rise to the same denotation. Furthermore, assuming that the denotation of polar questions is their true answers (Roberts 1996, cf. embedded questions in Karttunen 1977), or related to the uttered proposition in the question (as the highlighted form) it is not still sufficient to explain the distinction between the following examples, for instance (34) and (35).

- | | |
|-------------------------------|-----------|
| (33) Did John win? | PPQs |
| (34) Did John not win? | LNPQs |
| (35) Didn't John win? | HNPQs |
| (36) John didn't win, did he? | npTQs |
| (37) John won, did he? | ppTQs |
| (38) Did John really win? | really-Qs |

While all questions can be interpreted as biased in appropriate contexts, the existing literature typically categorize polar questions into two main types: canonical (un-

biased) questions and non-canonical (biased) questions. Canonical questions merely seek information, either p or $\neg p$, while non-canonical questions convey additional information, namely *Bias Implication*, in the sense that the question indicates an (expected) answer over the alternative option. Therefore, semantically, all examples in (33)–(38) seek an answer from the set $\{p, \neg p\}$.¹ While PPQs, as in (33), are commonly used in neutral contexts, the remaining examples intuitively exhibit bias/expectation towards a specific proposition within the set.

While the presence (and position) of negation in (34) and (35) can contribute to bias, in tag questions (TQs), bias can stem from the structure itself, as the declarative anchor inherently signals the speaker’s expectation (cf. speaker’s vs addressee’s view in Malamud and Stephenson 2015). However, to distinguish between example (36) with negative-positive (npTQs) and (37) with positive-positive (ppTQs) forms, the polarity relation between the anchor and the tag, in the *same* or *reverse* polarity, needs to be considered too (Asher and Reese 2008).² Finally, certain lexical items like *really* or *even* can imply bias morphologically, exemplified (38) (for *really* see Romero and Han 2004, and for *even*, see Guerzoni 2004).

Taken together, the bias implication might indicate a similar concept of expectation for an answer over its alternative, leading to similar expected answer across different questions. However, these questions may vary in other respects. While bias implication can be conveyed through various means, such as the presence and position of negation, changes in word order (in free word order languages), prosodic saliency, discourse particles, and speech acts, etc.³ we might not be surprised that they inherent different profiles. These distinctions not only enable their felicity in different contexts but also constantly manifest across various contexts.

This directs our attention to a crucial aspect often overlooked within the existing literature: the modal flavor in biased questions. While certain scholars acknowledge

¹Notice that there exist other forms of biased questions, such as rising declaratives, questions with *even*, polarity/verum focused questions, and etc. The questions mentioned here are chosen due to their similarity to the Farsi forms that are under investigation in Chapter 3.

²There are more factors related to TQs, such as the impact of intonation, e.g., *nuclear* and *postnuclear* forms (Ladd 1981). A detailed discussion of TQs will be provided in Section 3.3.3.

³Some of these means can be combined, e.g., asking a negative question with focus stress on the negation, which adds complexity to the analysis. In this study, I focus on one mean at a time.

that questions can adopt different modal flavors, such as epistemic, deontic, and bouletic (Huddleston and Pullum 2002), others predominantly explore epistemic bias either as the speaker’s prior expectation or evidential context bias (as in works of Romero and Han 2004 and Büring and Gunlogson 2000 respectively, among others). However, the type of bias are often considered as the felicity conditions of biased questions, rather than a distinct feature that contributes to the flavor of bias.

In this chapter, I will first present the main frameworks that address biased questions in different semantics-pragmatics aspects. I will argue that while the existing accounts effectively explain the core data, they overlook the distinction between certain types of questions. I will also explore speaker’s prior bias and contextual bias, illustrating that although the felicity conditions help distinguish various question types, they raise two points: Some biased questions share similar requirements, while others can arise in multiple contexts. I will argue that a nuanced approach is essential to capture not only the distinction between different questions within the same contexts but also the similarities of the same type of question across various contexts. In Chapter 3, I will further illustrate the urgency of a fine-grained account, providing Farsi data.

This chapter is structured as follows. Section 2.2 examines the existing literature, dividing them into three main approaches, namely the decision theory accounts, the epistemic operators, and the discursive accounts. In Section 2.3, we review the studies that have investigated the felicity conditions of biased questions, examining examples related to different types of bias. Finally, in Section 2.4, I provide a brief summary of all the discussed accounts and highlight the required considerations.

2.2 Theoretical Frameworks

According to the popular semantics of polar questions (PQs), the meaning of PQs can be characterized as a set of potential answers, namely $\{p, \neg p\}$ (Hamblin 1973, Groenendijk and Stokhof 1984). Extensive scholarly attention has been devoted to the examination of biased questions, resulting in a multitude of studies (Ladd 1981, Culicover 1992, Büring and Gunlogson 2000, Van Rooy and Šafářová 2003, Guerzoni 2004, Romero and Han 2004, Reese 2007, Asher and Reese 2008, Northrup 2014,

Krifka 2015, Malamud and Stephenson 2015, Farkas and Roelofsen 2017, among others). These works offer valuable insights into different aspects of biased questions, indicating the factors that trigger bias and the methodologies employed to formulate bias across various questions. In the upcoming section, I review the approaches that hold the highest relevance to the Farsi data in Chapter 3. These approaches deal with English examples that share similarities with those in Farsi as presented in this dissertation, including PPQs, NPQs, TQs, and questions with lexical items (even though they might not be direct equivalents across both languages).

While these perspectives may share certain ideas, the existing literature can be categorized into three primary strands of research that have had significant influence on the subsequent studies. The first framework is the decision theory model, which offers a theoretical analysis grounded in the notion of answer *usefulness*. This approach considers how an (expected) answer moves the speaker closer to their beliefs or desired goal (Van Rooy and Šafářová 2003, AnderBois 2019). The second group of studies introduces meta-conversational operators, namely *VERUM* and *FALSUM*, as the engines of bias. These operators signal speaker's certainty or uncertainty regarding whether the prejacent proposition should be added to the common ground (Romero and Han 2004, Repp 2013). The third group of research focuses on the analysis of dynamic conversational states and explores the impact of bias within such states. Scholars within this line of taught examine how bias influences the flow and development of conversations (Krifka 2015, Malamud and Stephenson 2015).

2.2.1 Decision Theory

The existing literature presents decision-making models that aim to understand the factors influencing speakers' choices among various question forms. These accounts are generally based on the concept of the *usefulness* of the answer to the speaker, wherein the selection of a particular question type is contingent upon the speaker's beliefs or desires. The notion of usefulness is represented as the *utility value* in the work of Van Rooy and Šafářová (2003) and as the *projected issue* in the research conducted by AnderBois (2011, 2019).

2.2.1.1 Utility Value

Van Rooy and Šafářová (2003) provide examples of various question types (such as PPQs, NPQs, TQs, and alternative questions) in different communicative settings (e.g., requests, invitations, rhetorical questions, etc.) and list the felicitous and infelicitous contexts for these questions. They argue that the differences between question types can be pragmatically captured by considering the usefulness of the available answers, which is determined by considering speaker's *beliefs* or *desires*. Therefore, the authors posit specific instantiations of the *Utility Value* (UV) functions,⁴ considering speaker's beliefs and desires/preferences.

The UV is calculated **(i)** with respect to the informativeness of the answer, denoted as $UV(q) = inf(q)$,⁵ which measures the value of learning that proposition q is true, and **(ii)** with respect to the speaker's desire-goal g , denoted as $UV(q) = P(g|q) - P(g)$, where the speaker's desire is to be in a world where g is true, or the speaker's goal is to bring about a state where g becomes true in the actual world. Let's see the intuition behind the account by an example. Regarding the informativity-UV, in the following instances the speaker treats the declarative (anchor) proposition as the most likely to be true, and the tag proposition as the most likely to be false. Consequently, the tag proposition is highly informative. In (39), (the UV of) learning q is higher than learning $\neg q$ (as the speaker already assumes $\neg q$). Conversely, in (40), (the UV of) learning $\neg q$ is higher than learning q (as the speaker already assumes q). Similar intuition is extended to PPQs and LNPQs, respectively.

(39) John didn't go to the party, did he?

(40) John went to the party, didn't he?

After discussing the technicalities (which is beyond this study), the authors provide

⁴To define the *Expected Utility* (EU), the authors follow Jeffrey (1965)'s decision theory account, in which utilities are functions mapping worlds/propositions to real numbers.

$$EU(p) = \sum_{w \in P} P(w) \times U(w)$$

⁵Van Rooy and Šafářová (2003) define the informativity of q as the *surprisal* value of q , where $inf(q) = -\text{Log } P(q)$. That is, for two propositions q and q' : $inf(q) > inf(q')$ iff $P(q) < P(q')$. For details about the technicalities see Van Rooy and Šafářová (2003): p. 300-301.

a comparative formula, deciding the felicitous question types for different formulas. The main idea is that polar questions are felicitous if the utility value of the uttered proposition, q , is higher than the utility value of the alternative. That is, the question uttered proposition q is always useful to the given discourse strategy, which contributes to bias. Based on either of the UV functions mentioned earlier, the authors posit the following predictions:

- $UV(q) > UV(\neg q)$
 - **PPQs** $[q?]$: PPQs can be evaluated based on both UVs of desire/goal and informativity. In the former, the speaker has a goal and prefers worlds in which she has achieved that goal, while in the latter, the speaker often assesses whether the recently received information is true and she should revise her previous beliefs.⁶ In other words, based on the informativity of PPQs, the speaker finds $\neg q$ more probable, but regarding some recent (situational/linguistics) information about q , she wants to assure if q is the true answer.
 - **(Falling) Reverse TQs** $[\neg q, q?]$: They have the UV of informativity, where the speaker considers the declarative sentence to be the most likely true proposition and the tag proposition to be the most likely false proposition. Thus, the tag proposition q is highly informative.⁷
- $UV(q) = UV(\neg q)$
 - **AltQs** $[q \vee \neg q?]$: AltQs are appropriate in a neutral context, and the UV of informativity indicates the speaker is seeking either of the answers, q or $\neg q$.

⁶These questions emphasize the truth value of the proposition and are often accompanied by prosodic stress, namely Verum focus. For example, ‘*IS John in London?*’ Van Rooy and Šafářová argue that there is no need to consider Verum as an epistemic operator, since the usefulness calculation of UV for informativity is sufficient for the analysis (further information on Verum can be found in Section 2.2.2.1).

⁷It is worth explaining the relation between informativity and probability. Regarding this analysis, asking polar questions is like asking TQs in reverse polarity, where $[q?]$ is a similar to $[\neg q, q?]$, while $[\neg q?]$ (outer-HNPQs) is similar to $[q, \neg q?]$. One asks $q?$ or $\neg q, q?$, iff $inf(q) > inf(\neg q)$. Following the definition of $inf(q)$ (see footnote 5), it means $P(q) < P(\neg q)$. Thus, the informativity of PPQs equals to the higher probability of $\neg q$. It comes from the *surprisal* concept of informativity, in which if the probability of $\neg q$ is high, then learning that the less probable q is the true answer is more *informative* and *surprisal* than learning the one with higher probability. The idea is explicitly expressed in TQs, uttering the more probable proposition in the anchor, while it is covert in PQs.

- $UV(q) < UV(\neg q)$
 - **NPQs** $[\neg q?]$: LNPQs and inner HNPQs with UV of desire/goal indicate that the speaker's goal is towards $\neg q$.
 - **NPQs** $[\neg q?]$: Outer HNPQs can be analyzed based on the UV of informativity of $\neg q$, where the speaker thinks the probability of q is high (see footnote 7).

Taken together, the account proposed by Van Rooy and Šafářová (2003) focuses on the usefulness of the answer to the speaker. It suggests that the speaker selects a question type based on the benefit of learning the uttered proposition, whether in terms of informativity or the desire. The account is an straightforward analysis that predicts the selection between positive and negative questions, as well as alternative questions. Furthermore, the different instantiations of UV, for beliefs and preferences, give an additional tool to determine which type of question can be used in which settings, as the authors gave some suggestions for *request*, *invitation*, *inferences*, etc. Although the authors didn't go into the details, the UVs can help predicting different flavor such as epistemic and bouletic for different questions (see Section 3.2).

In a general sense, the account primarily predicts differences based on the polarity of the question, however, it does not offer predictions concerning various forms of negation such as low and high negation, or different tag structures. In other words, the proposal does not distinguish between questions under similar UV. For instance, regarding the goal-oriented UV, it is not clear how the decision theory determines LNPQs vs inner-HNPQs, or PPQs vs reverse TQs, $[\neg q, q?]$. Furthermore, Van Rooy and Šafářová (2003) footnoted (see footnote 3) that they assume the same analysis of falling reverse TQs applies to rising TQs. This raises the question of the distinction between TQs with rising and falling intonation in their account. The authors did not address the same polarity tags in their study. Such questions could potentially lead to conflicts, as assuming the same proposition in the anchor and the tag simultaneously as the most likely to be true and false.

2.2.1.2 Projected Issue

In an alternative approach, AnderBois (2011, 2019) proposes a decision-making process for different question types based on the secondary projected issue. While many studies assume the same semantics for PPQs and NPQs (à la Hamblin 1973), attributing the differences only to pragmatics, AnderBois suggests that the distinction originates from semantics and it is extended in pragmatics. He provides a compositional semantic distinction between positive and negative questions, along with different pragmatic reasoning related to the speaker's attitudes towards the question and prospective answers.

It is worth noting that AnderBois challenges the ambiguity proposed by Ladd (1981) for HNPQs. He argues that HNPQs typically have an outer reading, while the inner reading is enforced by additional markers like NPIs (for more details, see AnderBois 2019, Sailor 2013). Additionally, He posits that LNPQs cannot be reduced to any reading of HNPQs (except in some archaic examples, which he excludes from his analysis). Thus, the author focuses on three types of questions: PPQs, LNPQs, and HNPQs (in the sense of the outer reading).

The argument for the semantic distinction between positive and negative questions is based on the non-vacuity of double negation in inquisitive semantics (Groenendijk and Roelofsen 2009, Ciardelli et al. 2013), as opposed to vacuous double negation in classical logic. In classical logic, $[\neg\neg p]$ yields $[p]$, resulting in both PPQs and NPQs having the same set $\{p, \neg p\}$ semantically. However, in inquisitive semantics, the concept of *informative*, along with components such as disjunction and quantifiers in the utterance, contribute to evoking alternatives/inquisitive elements, which plays a crucial role in the analysis (for more details on the alternative set, see AnderBois 2019:p. 21). In short, $[\neg\neg p]$ negates the alternatives within the radical sentence p . Consequently, the outcomes of $\{p, \neg p\}$ and $\{\neg p, \neg\neg p\}$ are different in this account.

While the new semantics differentiate questions polarity-wise, it is not sufficient to distinguish questions based on the position of negation. Thus, AnderBois proposes an updated framework referred to as the *two-tiered* inquisitive semantics, which in-

troduces two types of key issues: (i) *the main issue*, which involves establishing a new immediate question under discussion (QUD) with expected (obligatory) resolutions, and (ii) *the projected issue*, which represents a potential future QUD with resolutions that are not necessarily expected. The main issue remains constant across positive and negative questions, while the projected issue influences the direction of the next conversational move, leading to different sets of possible resolutions.

The concept of the projected issue is based on the inquisitive alternatives in inquisitive semantics, where alternatives are triggered as potential future topics of discussion (cf. Roothian perspective, where alternatives arise from prior discourse). AnderBois argues that polar questions, $[\phi?]$, posit whether or not ϕ as the main issue (asking a *Yes/no* question). However, their projected issue involves alternative propositions corresponding to the inquisitive elements of the uttered/radical proposition (cf. *highlighting* notation in Pruitt and Roelofsen 2013, Roelofsen and Farkas 2015).

To capture the proper alternatives of the radical sentence in polar questions, the author utilizes a flat inquisitive semantics and introduces three operators in the logical form as shown in (41): the polar question operator Q_{op} , a polarity operator valued by $[Pos_0]$ and $[Neg_0]$ inside the radical sentence (IP), and most importantly, the Σ_{op} operator (AnderBois 2019:p. 27). While the first two operators are familiar concepts and function as their names suggest, the Σ operator in ΣP is the key component that yields the two-tiered meaning. The author provides three values for ΣP , including Σ_{\exists} , Σ_{\forall} , and Σ_{Neg} for PPQs, LNPQs, and HNPQs, respectively, each generating the appropriate alternatives from the radical sentence of the corresponding question.

$$(41) \quad [CP \ [Q_{op} \] \ [\Sigma P \ [\Sigma_{op} \] \ [IP \ [NP \] \ [PolP \ [[Neg_0/Pos_0] \] \ [vP \] \] \] \]]$$

Details aside, the compositional semantics of PQs produces an ordered pair output, consisting of the main issue that necessitates a *yes/no* answer and the projected issue specific to each question type. PPQs and LNPQs project the issue related to the alternatives associated with the uttered proposition, while HNPQs do not project any issue (via Σ_{Neg}) and only focus on the main issue of whether or not ϕ .⁸ To illustrate

⁸It is worth noting that AnderBois (2019) argues that the use of inquisitive double negation

the basic idea, examples (42)–(44) (adopted from AnderBois 2019) demonstrate the main issue in the QUD, whether Amelia brings a Mexican dish or not. However, they differ in terms of the projected issue they involve.

- (42) Is Amelia bringing a Mexican dish?
- (43) Is Amelia not bringing a Mexican dish?
- (44) Isn't Amelia bringing a Mexican dish?

AnderBois argues that in the examples mentioned, the projected issue is contributed by the indefinite phrase *a Mexican dish*, limited to two options: *Tacos* and *Tamales*. In (42), the projected issue consists of positive alternatives of the form *Amelia is bringing x*, while in (43), it includes negative alternatives of the form *Amelia is not bringing x*. Put simply, PPQs and LNPQs highlight the potential discourse futures where various propositions related to the mentioned forms are expected to be discussed. On the other hand, HNPQs in (44) do not raise a projected issue, therefore, they do not highlight any subset of possible answers. As a result, the focus remains on the truth-value of the main issue. Figure 2-1 (adopted from AnderBois 2019:p. 36-38) illustrates the main issue and the projected issues of PPQs, LNPQs, and HNPQs.

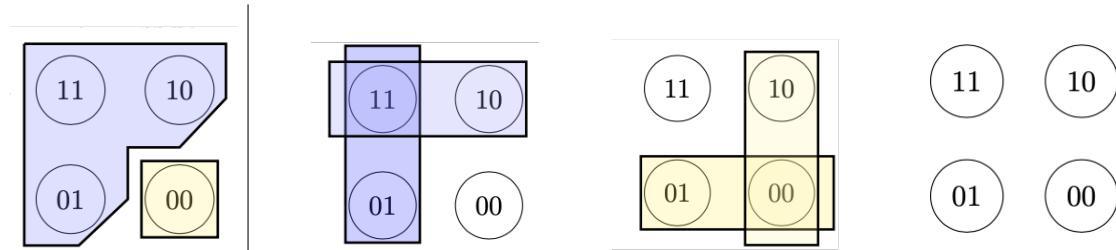


Figure 2-1: The inquisitive semantic schema of the main issue (the left image) of PQs and the projected issues of PPQs, LNPQs, and HNPQs, respectively.

The author argues that the projected issue explains ellipsis answers, such as the ones given below in response to (42), while such responses are infelicitous for (43) and (44). Such responses intuitively serve to address what the speaker requested by providing (additional) information that potentially resolves the projected follow-up request.

also eliminates the need for a verum operator (following Romero and Han 2004), while providing a compositional account of the proper reading of HNPQs (for further discussion, see AnderBois 2019).

B: Yeah, Tacos.

Lastly, AnderBois introduces the *utility principle for projected issues* as an instantiation of the Maxim of Relation. This principle states that cooperative speakers select projected issues whose resolution is expected to be useful in the discourse. From a pragmatic perspective, this principle justifies the decision-making process based on projected issues. The predictions of this account can be summarized as follows:

- **PPQs** [$q?$] are used in contexts that convey a weak bias towards the proposition q being true, as well as speaker's expectation for discussing a positive answer. Additionally, PPQs can also be used in neutral contexts as a default or unmarked reading. In such cases, the selection of PPQs is determined by the Maxim of Manner (see AnderBois: p. 36).
- **LNPQs** [$\neg q?$] are employed in contexts that convey a weak bias towards the proposition $\neg q$ being true, as well as speaker's expectation for discussing a negative answer.

Following the utility principle, the pragmatic reasoning behind the decision making between PPQs and LNPQs is as follows:

- The projected issue of PPQs and LNPQs promotes the discussion of sub-issues related to positive and negative answers, respectively.
- The speaker selects PPQs when she not only prefers a positive answer but also intends to extend the conversation towards any subset of positive answers. In contrast, LNPQs are chosen when the speaker expects a negative answer and wishes to explore negative alternatives.
- The addressee decodes the speaker's intention and provides a refined positive or negative answer with respect to the alternatives in the projected issue.

The author highlights that while PPQs and LNPQs share a similar pattern in their projected issue, resulting in a similar weak bias reading, there is an asymmetric distinction between the two types. PPQs have an unmarked reading, which allows for a neutral interpretation, while LNPQs have a marked reading.

- (outer) **HNQPs** [$\neg q?$] indicate four notable properties: (i) they emphasize the truth value of the uttered proposition, (ii) they indicate speaker's prior belief towards q , (iii) they may convey contextual bias towards $\neg q$, although it is not obligatory in a *suggestion* context. In both scenarios, the question proposes a conversational move wherein the speaker argues the addressee to give an answer, and (iv) they express a (default) preference for a positive resolution, indicating a general bias against belief revision (to avoid revising speaker's prior belief).
 - In contrast to PPQs and LNPQs, the projected issue of HNQPs does not highlight any alternatives. Instead, HNQPs emphasize the truth/falsity of the main issue and discourage further discussion beyond the main issue.
 - From a utility perspective, the speaker uses HNQPs to signal a specific conversational state (i.e., a conflict) in which obtaining a negative answer is not only important but also restricts the immediate discussion to the main issue without introducing alternative possibilities in the projected issue.
 - Consequently, HNQPs convey that finding a negative answer would be of particular significance, as it was not initially expected or desired, and the speaker would need to revise their prior belief.

It is worth noting that both HNQPs and LNPQs highlight the negative answer. However, unlike LNPQs, HNQPs do not suggest further discussion regarding the subset answerhood. Furthermore, the author suggests that the bias in HNQPs is stronger than in other types, as the speaker aims to maintain their prior belief despite publicly available contextual evidence.

All together, the projected issue account provides a semantic distinction between PPQs, LNPQs, and HNQPs, as well as a pragmatic reasoning for determining the appropriate type of question based on potential conversational topics. However, extending the account to other types of questions like *really*-Qs or TQs, the author does not address how the similar projected answers in different questions would differentiate the questions from others.

Moreover, although the concept of expected subset answerhood as the next conversational move seems intuitive, and using context or focal stress might help capturing the potential intended alternatives (as the author suggests), it can be challenging to determine the alternatives for certain questions. It is also not evident how strong the inclination for a follow-up projected issue can be. That is, not all PPQs and LNPQs inherently prompt further discussions. In cases, where the speaker simply wants to know whether p or $\neg p$ is the answer, the question may not evoke any specific alternatives. Thus, the notion of a projected issue would be a broad generalization.

For instance, in example (45), when A asks if her son went to the party or not, she may only be interested in a straightforward *yes* or *no* answer. In this case, assuming the proper name *John* as a definite existential closure for the proposition *x went to the party*,⁹ the predicted answers based on the account may not be felicitous.

- (45) Context: A is John's mother. She thinks John may have attended his friend's party last night (instead of studying). She sees B, John's friend, and asks him:
A: Did John go to the party?

B1: Yes, he did.

B3: No, he didn't.

B2: # Yes, Sue did too.

B4: # No, Sue did.

Further research is required to explore potential solutions for refining the projected issues and identifying the appropriate contexts where subset answerhood is relevant.

2.2.2 Epistemic Operator

Certain analyses of biased questions have been proposed, suggesting the inclusion of epistemic operators to indicate the status of the proposition in relation to Common Ground. In this section, two notable studies by Romero and Han (2004) and Repp (2006) will be discussed, presenting *VERUM* and *FALSUM* operators, respectively.

⁹One can assume any other potential sets like *John went to x*, which results the same.

2.2.2.1 VERUM Operator

Romero and Han (2004) introduce an epistemic conversational operator called *VERUM*, which implicates speaker's prior belief. They argue that questions conveying *VERUM* necessarily indicate an epistemic bias, while other question types may or may not signal bias. Furthermore, the authors posit that the *VERUM* operator can manifest in different representations. It can be a silent operator, as observed in HNPQs, or it can be expressed lexically through the adverb *really*,¹⁰ or prosodically by focal stress, namely verum focus (à la Höhle 1992) on the auxiliary verbs or negation (e.g., DID or NOT).¹¹ As a result, the authors offer a unified analysis that includes various question types, including HNPQs, *really*-questions, and focused polar questions, while also providing an explanation for their distinctions from PPQs and LNPQs.

Notably, Romero and Han distinguish between HNPQs and LNPQs by introducing the concepts of *preposed* and *non-preposed* positions for negation, respectively.¹² Regarding the syntactic position of negation, they assume that questions with preposed negation (HNPQs), as exemplified in (46), necessarily convey the (silent) *VERUM* operator, implying that the speaker believes or at least expects the positive proposition as the answer. However, the presence of such implicature and *VERUM* in questions with non-preposed negation (LNPQs), as illustrated in (47), is optional. In other words, questions with *VERUM* obligatorily raise bias.

(46) Didn't John go? \rightsquigarrow The speaker believes or at least expects that John drinks.

(47) Did John not go? No epistemic implicature necessary.

Let's now turn our attention to the denotation of *VERUM* in (48). Here, *x* is a free

¹⁰Note that epistemic *really* as in (ii) is different from the intensifier (i), in which the latter is a modifier on gradable adjectives, while the former is a conversational implicature, inherently focused (Bill and Koev 2021a).

(i) John is really clever.

(ii) John REALLY is clever.

¹¹It is important to note that in languages like English, phonological stress is ambiguous between contrastive focus and Verum accent. For further details, see Romero and Han (2004):p. 21.

¹²Romero and Han propose a model where the position of negation is relative and not fixed. They argue that while preposed negation in English typically appears in C^0 , examples from languages such as Spanish and Modern Greek demonstrate that the same epistemic implicature can arise when negation occurs outside of C^0 position (for more details see Romero and Han 2004:p. 6, footnote 3).

variable, contextually identified with the addressee/speaker. $Epis_x(w)$ is the set of worlds of x 's epistemic knowledge in w , and $Conv_x(w')$ is the set of all worlds where x 's conversational goals are fulfilled. Finally, $CG_{w''}$ is the set of propositions that the speaker assumes in w'' to be true in CG .

$$\begin{aligned}
 (48) \quad & \llbracket VERUM_i \rrbracket^{gx/i} = \llbracket \text{really}_i \rrbracket^{gx/i} \\
 & = \lambda p_{<st>} \lambda w. \forall w' \in Epis_x(w) [\forall w'' \in Conv_x(w') [p \in CG_{w''}]] \\
 & = \text{FOR-SURE-}CG_x
 \end{aligned}$$

The VERUM operator indicates that the speaker believes p should be added to common ground (CG), however, she is not entirely certain to utter it as an assertion. As a result, VERUM questions seek to determine the degree of certainty (For-Sure) associated with adding the proposition to CG. Therefore, an example such as (49) yields the following meaning.

$$(49) \quad \llbracket \text{really } p? \rrbracket = \{\text{FOR-SURE-}CG_x(p), \neg\text{FOR-SURE-}CG_x(p)\}$$

However, an important question arises: Why would a question that seeks to ascertain certainty be considered biased? The authors provide an answer based on the partition view of questions and by invoking the Maxim of Quantity.

- **Maxim of Quality:** Say ϕ only if you have at least indirect evidence that ϕ is true.

Romero and Han introduce two types of conversational moves. Firstly, the Assertion move, which serves as an instruction to add a proposition to CG. Secondly, the Question move, functioning as a meta-conversational move where the speaker inquires about the instruction of adding a proposition to the CG. Following the partition perspective presented in Groenendijk and Stokhof (1984), the denotation of questions can be modeled as a partition of the set of possible answers. In this model, unbiased questions offer balanced/equal partitions of $\boxed{p \quad \neg p}$. With regard to the Maxim of Quality, a speaker can utter p if she possesses *at least* indirect evidence for p . As a result, VERUM questions, which seek the degree of certainty, propose unbalanced partitions of $\boxed{\text{FOR-SURE-}CG(p)} \quad \boxed{\text{NOT-FOR-SURE-}CG(p)}$, wherein the first cell represents absolute certainty about adding p to CG, while the

second cell includes any other degree of certainty, leading to unbalanced partitions:

ABSOLUTELY(p)	MAYBE(p) / LIKELY(p) / POSSIBLY(p)
-------------------	--

Before applying the account to different types of questions, it is worth delving deeper into HNPQs. Romero and Han resolve the ambiguity of HNPQs, i.e., the inner and outer readings (introduced by Ladd 1981), as a matter of scope ambiguity. They posit that negation and the VERUM operator can appear in two different orders, resulting in two logical forms. In (50), where the negation scopes over the VERUM (and VERUM scopes over p), the speaker double-checks the truth of p . However, in (51), where the negation scopes over the proposition (and VERUM scopes over the negative proposition), the speaker double-checks the truth of $\neg p$ (corresponding to the outer and inner readings, respectively).

(50) $[Q [\neg [VERUM [p]]]$

(51) $[Q [VERUM [\neg [p]]]$

All together, based on their similarities of some biased questions, the work of Romero and Han (2004) introduces VERUM operator and categorizes questions with and without VERUM. Their findings can be summarized as follows:

- **Non-VERUM questions:** This category includes **PPQs** and **LNPQs** (non-preposed NPQs). The authors present examples of simple positive and negative questions (see examples (10) and (11) in the original paper), arguing that both can be used in neutral contexts in the sense of epistemically unbiased contexts, without implying bias. They can also be employed in biased contexts, triggered, for instance, by contextual evidence or desire (referred to as "mild" bias).
- **VERUM questions:** including **HNPQs** (preposed NPQs), ***really*-Qs**, and **PPQs/LNPQs+verum focus**. All of these question types necessarily indicate speaker's epistemic bias and, as a result, cannot be used in unbiased

¹³It should be noted that Romero and Han differentiate between purely epistemic operators like *be (not) sure* and the VERUM group. The latter are not used to assert that the speaker is entirely certain about the truth value of p , but rather serve as conversational implicatures that indicate the speaker's lack of certainty regarding whether the proposition should be added to CG.

(neutral) contexts. Regarding the scopal ambiguity in HNPQs, we have outer-HNPQs (distinguished by PPIs) and inner-HNPQs (distinguished by NPIs). Based on this, VERUM questions are divided into two intended readings:

■ **Double-checking p :** This category includes only outer-HNPQs. The authors paraphrase them as ‘*Are you certain we should add p to CG?*’ or ‘*Do you have any (weak or strong) doubts about p ?*’ or ‘*Can you provide information that would make me doubt p ?*’

- These questions can be used in suggestive settings without any compelling evidence against the speaker’s belief. In such cases, the speaker has a weak belief and seeks to double-check it by asking whether it can be added to CG.

■ **Double-checking $\neg p$:** This category includes inner-HNPQs, PPQs/LNPQs with verum focus, and *really*-questions. The authors paraphrase them as ‘*Are you certain we should add $\neg p$ to CG?*’ or ‘*Do you have complete evidence for $\neg p$?*’ or ‘*Can you provide information that would make me conclude $\neg p$?*’

- These questions require contextual evidence in favor of $\neg p$ (in conflict with speaker’s belief), making them unsuitable for suggestive settings. In such cases, the speaker has a strong belief and seeks to double-check the certainty of contextual $\neg p$ by asking for evidence to support that conclusion.

■ **Reverse-TQs:** Romero and Han suggest that their verum analysis can be extended to reverse Truth Questions (TQs), where the pattern of $[q, \neg q?]$ and $[\neg q, q?]$ follows the same distribution as preposed negation and PPQs with Verum accent. As a result, the reverse polarity pattern and its discourse effects can be analyzed similarly to the epistemic implicature questions. The only difference is that the epistemic implicature is overtly expressed in the anchor.

The study by Romero and Han (2004) highlights the effect of speaker’s (prior) epistemic belief as compared to the role of contextual bias in earlier studies. It provides an additional tool for characterizing different question types with respect to speaker’s and contextual bias. However, there are some points worth noting. While the use of the VERUM operator can clearly distinguish the obligatory presence of bias in

certain question types from the optionality of bias in others, the difference between the questions within the VERUM group remains unclear. In other words, the study does not delve into the details of the distinction between questions, such as [*really* $\neg p$?] and PQs with verum accent or HNPQs.¹⁴

Furthermore, while I agree with Romero and Han that negative questions can be used in proper neutral contexts, what they refer to as a *neutral context* should not be confused with pure neutrality. For instance, consider example (10) in their study, represented as (52), where individual B lacks a prior belief, but it is evident that she prefers $\neg p$, i.e., *that Jane doesn't come*. The distinction between true neutrality and the absence of a prior belief (but not preference) is a crucial aspect to consider.

- (52) **Context:** B hates both Pat and Jane. The prospect of an excursion without them pleases B. B doesn't have previous belief about whether either of them is coming.

A: Pat is not coming.

B: Great! Is Jane not coming (either)? That would be the best!

According to the goal-oriented bias proposed by Van Rooy and Šafářová (2003), the question expresses bias, though in a bouletic sense (see footnote 18 in Romero and Han 2004:p. 643). However, this bias is considered "mild" and distinct from the strong epistemic bias implicature indicated by VERUM. In other words, the context is considered epistemically unbiased or neutral, while the question is biased. Therefore, further investigation is required to determine the felicity of simple polar questions, especially LNPQs, within more constrained neutral contexts (see Section 3.3.1).

Moreover, some authors (see Romero 2006, Reese 2007) raise an issue regarding the response partitions. Based on the assumption that responses to polar questions refer to potential alternatives, one would expect that the answer in (53) indicates the modalized option in the partitions, however, it does not (for the lack of modalized meaning behind response particles, see also Krifka 2017, Bill and Koev 2023b).

- (53) A: Is Jane really coming?

B: No.

¹⁴Bill and Koev (2021a) propose their account for a single lexical entry for the intensifier and conversational meaning of *really* (footnote 12). They propose to derive the bias associated with conversational *really* compositionally via contrastive focus (for more details see Bill and Koev 2021a).

\approx Jane is not coming.

$\not\approx$ I am not sure we should all agree that Jane is coming.

Krifka (2017) also highlights the unresolved nature of negating VERUM. While VERUM functions as a nonpropositional pragmatic operator, and negation serves as a propositional operator, a more comprehensive explanation is needed to fully grasp the implications of negating VERUM (for a more details see Krifka 2017:p. 363).

2.2.2.2 FALSUM Operator

The study conducted by Repp (2006) explores the concept of negation by comparing its meaning in two different positions: high position with wide scope and low position with narrow scope. Although her primary focus is not on biased questions, her investigation significantly contributes to the analysis of HNPQs as a well-known type of biased questions. The core concept in her study revolves around specific linguistic components, such as modal particles and operators like VERUM and FALSUM (to be introduced shortly), which serve as CG-managing operators. These elements indicate the status of a proposition relative to the CG. Syntactically, an utterance comprises not only a Force Phrase but also a Strength Phrase, as shown in (54) (adopted from Repp 2006: p. 24). According to this model, CG-operators are located within the StrengthP, signaling whether the embedded proposition should be considered a part of the CG and, if so, to what degree of certainty.

- (54) [ForceP Force [StrengthP Strength [TopP Top [FocP Foc [FinP Fin [IP]]]]]]]

Repp observes intriguing distinctions in the negation of gapping structures when specific intonation and focus are applied, leading to different meanings compared to the common form. She identifies two potential readings: the *wide scope reading*, $\neg(A \& B)$, and the *distributed/narrow scope reading*, $(\neg A \& \neg B)$, illustrated in (55) and (56), respectively (adopted from Repp 2006:p. 1-2).

- (55) Kim DIDn't play bingo and Sandy sit at home all night. (I am sure Sandy went to a club herself. That's what she always does when Kim plays bingo.)

- (56) John didn't buy the book and Mary the magazine.

The present study does not delve into the arguments and analysis concerning gapping, as it lies beyond the scope of this research. Nonetheless, Repp posits that the narrow scope reading represents propositional negation, while the wide scope reading operates at the level of speech act, which she refers to as *Denial* (cf. *metalinguistic negation* in Horn 1984).¹⁵ Denials function as illocutionary negations, eliminating (part of) previously introduced content, such as propositions, presuppositions, and implicatures, from the CG (and correcting the information in the context).

Repp extends her observations (from gapping) to HNPQs, demonstrating that outer-HNPQs share certain characteristics with the high scope reading (denials). This includes similar intonation patterns, (im)possibility of polarity items, and syntactic restrictions (for further details, see Repp 2006:p. 14). Building on Romero and Han (2004)'s analysis of the dual LF in VERUM-HNPQs, Repp introduces the notion of negation above the VERUM in (50) as a speech act negative operator, named FALSUM. In other words, rather than positing a single epistemic operator, VERUM, which generates two logical forms with different orders interacting with negation, Repp proposes the existence of two distinct operators. While FALSUM functions as a negative operator (akin to denial) as illustrated in (57), VERUM in (58) operates as a positive operator, both of which operate at the speech act level.¹⁶

$$(57) \quad [Q [FALSUM_{op} [p]]]$$

$$(58) \quad [Q [VERUM_{op} [\neg [p]]]]$$

In her analysis, Repp (2006) proposes that both FALSUM and VERUM function as operators indicating the strength of certainty conditions within a speech act. In the same vein of the analysis of VERUM in (48), FALSUM, as defined in (59) indicates that the speaker believes the proposition p should not be included in the CG.

$$(59) \quad \llbracket FALSUM \rrbracket^x = \lambda p_{<st} \lambda w. \forall w' \in Epi_x(w) [\forall w'' \in Conv_x(w') [p \notin CG_{w''}]]$$

¹⁵The concept of denial aligns with Ladd (1981)'s proposal, where the negation in outer-HNPQs lies outside the scope of the questioned proposition. However, Ladd did not fully elucidate the implications of placing the negation outside the questioned proposition and its effects on the proposition. Evidently, Repp (2006) resolves this puzzle.

¹⁶Notice that there is no overt negation in (57), since FALSUM is a negative operator itself.

Applying the account on data, in example (60) the speaker expresses a low degree of certainty for the truth-value of *Jane is coming* to be in CG. Conversely, in (61), the speaker indicates a high degree of strength for adding *Jane is not coming* to CG.

- (60) Isn't Jane coming (too)? LF: [Q [FALSUM [Jane is coming]]]
- (61) Isn't Jane coming (either)? LF: [Q [VERUM [not [Jane is coming]]]]]

Repp (2006) extends the notion of the CG to include not only a set of shared propositions between interlocutors but also to indicate the degree of certainty associated with these propositions. Hence, the speech act operators effectively operate over the certainty condition of illocutionary forces. Consequently, it is reasonable to encounter operators representing varying degrees of certainty, ranging from a very low to an extremely high level of certainty. Furthermore, Repp (2006) argues that the resemblance between the high negation found in denials (in declaratives) and outer-HNPQs serves as evidence supporting a unified view of negative speech act operators. When using FALSUM/Denials, the speaker conveys a low degree of certainty, signaling a desire to exclude the proposition from the CG. In contrast, VERUM indicates a high degree of certainty, suggesting speaker's intention to include the proposition in the CG.

The proposed account proves particularly valuable for achieving a unified analysis of the similar behavior exhibited by the wide scope reading of negation across various types of utterances, including assertions, polar and constituent questions, and imperatives. However, as previously noted, Repp (2006)'s study concentrates on high negation and does not directly address biased questions. Therefore, it cannot be extended to other types of biased questions like TQs or rising declaratives.

2.2.3 Discourse Commitment

The third line of the thoughts in biased questions is modeled in discourse commitment development, which share the idea of the importance of CG management in dynamic conversation. I will show first Krifka (2015), who similar to previous accounts believes that the negation in outer reading scopes over speech act and is a denial, although he illustrates his model with respect to different speech acts instead of using any oper-

ator. Then, we will see Malamud and Stephenson (2015), presenting conversational scoreboard with some new updates.

2.2.3.1 Speech Act Development

Krifka presents a theoretical framework centered on the notion that bias governs the commitment space in semantics (Cohen and Krifka 2014, Krifka 2015, Krifka 2017). Within this model, speech acts are functions that operate from one world-time to world-time pairs (Szabolcsi 1982, Krifka 2014), and their impact extends beyond only shaping speakers' commitments to influencing the future development of the conversation. Krifka's proposal associates each (syntactic) type of sentence with a corresponding speech act and posits that these speech acts function as mappings from one set of commitments to another. Consequently, the change of commitment spaces allows for meaningful differentiation between various linguistic forms. The author conducts a comprehensive study that links syntactic structures to semantic forces through pragmatic usage. Although the intricate details and assumptions of the study cannot be fully elaborated upon in this section, we can provide a concise overview of its fundamental points.

To elucidate this account, Krifka introduces the concept of *Commitment Space* (C), which includes *commitment states* (c) representing the propositions publicly shared among conversation participants, along with the potential development of the commitment space (cf. CG-managing in Repp 2006). According to Krifka, speech acts have the capacity to influence the commitment space in different ways. For instance, Assertions update the commitment space and modifying the root (\sqrt{C}), thereby impacting the current content of CG. On the other hand, Questions influence the potential development of the conversation by constraining the range of plausible continuations. As a result, Questions do not directly affect the CG's current content but rather manage the future CG, refer to them as *meta speech acts*.

Krifka further distinguishes between two types of questions based on their effect on future commitments. The first type, known as *monopolar* questions, exhibits bias towards a specific answer (akin to biased questions). The second type, termed

bipolar questions, presents an equal choice between positive and negative alternatives (resembling canonical questions). In the case of bipolar questions, the commitment space could be updated by either of the proposed propositions, while in the case of monopolar questions, the speaker suggests a particular expected continuation to the addressee. Illustrations of each question type can be found in Figure 2.2.3.1, adapted from Krifka (2015):p. 334-336.

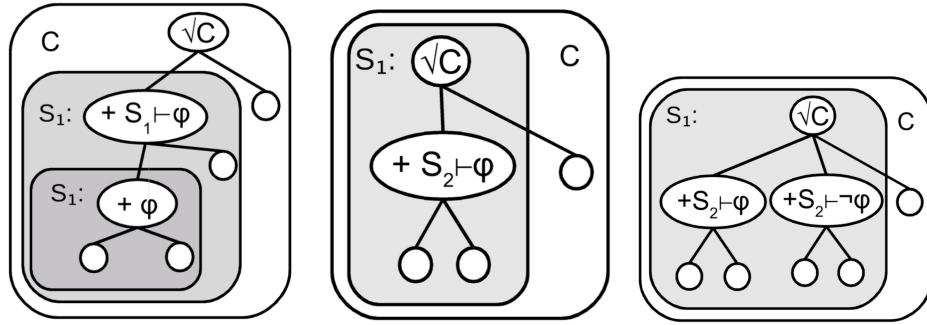


Figure 2-2: Commitment Space of Assertions, Monopolar and Bipolar questions.

Regarding the illustrations in Figure 2.2.3.1, an assertion $[\phi]$ as in example (62) updates C in the sense that it is reduced to the set that includes speaker's commitment to ϕ (depicted in the first picture). In questions $[\phi?]$, two readings emerge: first, biased questions like (63) suggest an update of C , where the uttered proposition ϕ (rather than the alternative) is included (depicted in the second picture as monopolar). On the other hand, unbiased questions such as (64) present both potential options of ϕ and $\neg\phi$ for updating C (represented in the third picture as bipolar).

(62) John went.

(63) Didn't John go?

(64) Did John go?

Finally, Krifka (2017) introduces three illocutionary operators: the *Assertion* operator, ASS_{op} , the *Question* operator, Q_{op} (*QU* in his term), and the *Request* operator, REQ_{op} . While the first two operators receive propositional inputs,¹⁷ the REQ_{op}

¹⁷Krifka (2017) defines the proposition as represented by the syntactic category of TP. He also assumes in Questions, the wh-operator (e.g., *whether* in embedded PQs and a silent operator in root PQs) takes a TP proposition and returns a set of propositions, denoted as TPQ. Consequently, the syntactic radical sentence (input) of the Assertion speech act is a TP, while in Questions, it becomes a set of propositions, TPQ. Notice that the discourse references are defined syntactically by the TP category (for more details see Krifka 2017:p. 374).

operator is primarily applied to speech acts such as Assertions.¹⁸ The simplified logical form and commitment update schemes of the speech act operators are as follows (adopted from Krifka (2017), where S_1 and S_2 represent the speaker and the addressee, respectively (for further technical details, see the original paper):

- (65) **Assertion:** $[ForceP \text{ ASS}_{op} [TP \phi]]$
 $= <..., C > + \text{ASS}_{S_1, S_2}(\phi) = <..., C > + [S_1 : \phi] + [\phi \in CG]$
 $= <..., C, C + [S_1 : \phi], C + [S_1 : \phi] + [\phi \in CG] >$
 $= <..., C, \{c \in C | \sqrt{C} \cup \{[S_1 : \phi]\} \subseteq c\}, \{c \in C | \sqrt{C} \cup [S_1 : \phi] \cup [\phi \in CG] \subseteq c\} >$
- (66) **Question:** $[ForceP \text{ Q}_{op} [TPQ \phi]]$
 $= <..., C > + \text{Q}_{S_1, S_2}(\phi) = <..., C, C + \text{QUESTION}_{S_1, S_2}(\phi) >$
 $= <..., C, \{\sqrt{C}\} \cup \{c \in C | \exists p \in \phi [\sqrt{C} + [S_2 : p] \subseteq c\} >$
- (67) **Request:** $[ForceP_1 \text{ REQ}_{op} [ForceP_2 \text{ SAct} [\phi]]]$
 $= <..., C > + \text{REQ}_{S_1, S_2}(\text{SAct}) = <..., C, \{\sqrt{C}\} \cup C + \text{SAct}_{S_2, S_1} >$

It is worth noting that the updates of Assertions presented in (65) involve two distinct components triggered by different mechanisms.¹⁹ According to Krifka, the first update $[S_1 : \phi]$ is syntactically triggered by the declarative form, while the second component $[\phi \in CG]$ results from the presence of a prosodic nuclear accent H^* .

This separation is beneficial in analyzing complex speech acts such as rising declaratives (RDecls) or TQs, where the declarative form triggers the first update component, but the absence of H^* prevents the occurrence of the second update (for details, see Krifka 2017).

The commitment update of Questions, as demonstrated in (66), involves the development of the future commitment state, combining the root \sqrt{C} of the current state with either of the potential answers contingent upon the addressee's response. Lastly, the commitment update of Requests, as in (67), relies on the embedded speech act, but roughly speaking, it restricts the continuations of the commitment space to those

¹⁸Based on the information presented in Krifka (2017), the REQ_{op} operator, is primarily applied to Assertions. However, I wonder if the operator always requires an Assertion or if it can be used with other speech acts like Questions or Imperatives. I leave it for further discussions.

¹⁹Krifka (2017) posits that Assertions express two commitments, hence the two-step updates. In the first step, the speaker expresses a commitment to the asserted proposition and holds the responsibility for its truth. In the second step, the speaker conveys an expectation that the addressee will also accept the proposition, leading it to be integrated into the CG. Noticing that the second update is not obligatory, which can be evidential in sentences like *Believe me or not, I won.*

associated with a performance of the embedded speech act. Now, let us apply this proposal to differ types of questions:

- **PPQs:** Krifka argues that PPQs exhibit ambiguity between bipolar and monopolar readings (see Figure 2.2.3.1). In neutral contexts, PPQs assume a bipolar reading, expressed by the Q_{op} operator, as illustrated in (66), where both positive and negative answers are equally considered. Furthermore, in biased contexts, PPQs can convey speaker’s expectation for proposition p . In this case, PPQs are interpreted as monopolar questions, assuming the presence of REQ_{op} operator applied to an *Assertion*.²⁰ Hence, the uttered proposition is suggested for future discourse update.
- **LNPQs:** While Krifka (2017) does not explicitly discuss LNPQs, he presents examples such as *Is there no vegetarian restaurant here?* as instances of negated polarity questions.²¹ These examples are analyzed in a similar manner in biased PPQs, but with the replacement of the radical sentence p with its negation $\neg p$ for future commitment space updates. As a result, LNPQs, functioning as monopolar questions, can be represented by the application of REQ_{op} to the speech act $ASS(\neg p)$, where the negation conveys the speaker’s biased expectation towards $\neg p$ by restricting the commitment space.²²

²⁰The analysis of biased PPQs aligns with that of rising declaratives (RDecls) in (i). Krifka argues that the REQ_{op} can be expressed prosodically through H^* , as in RDecls, or syntactically, for example, through head movement of auxiliary verbs as in PQs (see examples (49) and (53) in Krifka 2017). Accordingly, RDecls function as monopolar questions, wherein the final rising intonation conveys bias in that the speaker has evidence supporting the truth of the radical sentence and seeks validation from the addressee. Moreover, since the utterance is syntactically a declarative form, the author suggests the presence of the REQ_{op} , which operates over an *Assertion*, as defined in (i). As previously discussed, the syntactic declarative form triggers the first update component $[S1 : \phi]$ of Assertions in (65). However, RDecls do not involve the second component, $[\phi \in CG]$, due to the absence of a prosodic nuclear accent.

(i) **RDecls:** $[ForceP1\ REQ_{op}\ [ForceP2\ ASS\ [\phi]\]]\$
 $<..., C> + REQ_{S1, S2}(ASS(\phi)) = <..., C, \{\sqrt{C}\} \cup C + [S2 : \phi]>$

Thus, the speaker employs RDecls to prompt the addressee to continue and affirm the potential future development of the CG. Consequently, the bias observed in RDecls arises from their monopolar proposal within the commitment space development.

²¹I assume *no-negated* questions exhibit similar behavior to LNPQs such as *Did John not come?*.

²²While biased PQs form monopolar questions by embedding an Assertion under a Request oper-

- **HNPQs:** According to Krifka, HNPQs share similarities with other monopolar questions in expressing the *Request* speech act. However, the high negation operates as *denegation*. He introduces the concept of denegation (\sim) to signify a refusal to perform a speech act, which should be distinguished from propositional negation (\neg) in LNPQs. Krifka argues, unlike in LNPQs, in response to HNPQs, polar response particles like *Yes/No* cannot be associated with the negative proposition (see Chapter 4 for the interchangeable use of *Yes/No* with a positive or negative discourse references). This evidence suggests that the interpretation of the NegP occurs at the speech act level and does not generate the required negative discourse referent at the propositional level. Consequently, Krifka’s proposal effectively accounts for the high position of denegation, wherein the NegP embeds the ForceP of the Assertion, resulting in the following commitment space updates:

$$(68) \quad [ForceP_1 \text{ REQ}_{op} [NegP \text{ } n't [ForceP_2 \text{ ASS}_{op} [TP \phi]]]] \\ < \dots, C > + \text{REQ}_{S_1, S_2}(\sim \text{ASS}(\phi)) = < \dots, C > + \sim \text{ASS}_{S_2, S_1}(\phi)$$

- **Matching TQs (MTQs):** According to Krifka (2015), MTQs can be analyzed as a *conjunction* of the Assertion anchor and the monopolar Question tag.²³ He argues that MTQs are often produced as a single intonational phrase (cf. postnuclear contour in Ladd 1981), wherein the combination of the Assertion and the monopolar Question tag occurs, and form an integrated complex speech act. Consequently, the speaker proposes to the addressee that both parties are committed to the proposition ϕ . In other words, the form of MTQs expresses the addressee’s opinion, assuming ϕ is already understood as the commitment held by the addressee. Specifically, the Assertive anchor reflects what the speaker tends to believe, while the proposed update in the monopolar Question tag represents the most likely belief of the addressee, both of which convey ϕ . Hence, the speaker invites the addressee to acknowledge this shared commitment.

- **Reverse TQs (RTQs):** Krifka (2015) presents an analysis of RTQs as a *dis-*

ator, Krifka posits that Alternative questions are represented by REQ_{op} applied to the disjunction of two Assertions, $[\text{REQ}_{op}[\text{ASS}(p) \vee \text{ASS}(\neg p)]]$. For a more details, see Krifka 2017:p. 390.

²³The update formula from Krifka (2015): $[C + S1 : \phi] \cap [\sqrt{C \cup C + S2 : \phi}]$

junction between the Assertion anchor and the monopolar Question tag.²⁴ He considers the negation as a form of low negation, although he acknowledges the possibility of an analysis with high negation as well.²⁵ The disjunction model reflects speaker’s commitment to ϕ , which restricts potential moves in two ways: either by $[\phi \in CG]$, when the addressee accepts the speaker’s commitment to ϕ , or by the proposed move (in the monopolar Question tag) $[S2 : \neg\phi]$, wherein the addressee asserts and commits to the negation of ϕ .

Taken together, Krifka presents a comprehensive account rooted in the discourse commitment content and management. He classifies unbiased questions as bipolar Questions governed by the Q_{op} operator, and biased questions as monopolar Requests by REQ_{op} , scoping over an Assertion. The account effectively models the core data, differentiating between positive and negative questions, as well as biased and unbiased questions. However, it falls short in explaining different functions and felicitous conditions of the questions. For example, the analysis of PPQs and rising declaratives (RDecs) are both rendered through the similar form of Request. However, the difference between the two types are not clear. Additionally, while the embedded *Assertion* in RDecs is conveyed by the syntactic form, it remains unclear how such justification applies to PQs. Finally, concerning the strength of bias in various types of questions (Farkas and Roelofsen 2017), the model does not capture the effect of gradable bias in discourse management. This aspect warrants further investigation and refinement to provide a comprehensive understanding of biased questions’ nuances.

2.2.3.2 Conversational Scoreboard

In this section, we will explore the conversational scoreboard representation, focusing on its foundation in speech acts and their effects on the conversation’s elements

²⁴The update formula from Krifka (2015): $[C + S1 : \phi] \cup [\sqrt{C} \cup C + S2 : \neg\phi]$

²⁵The author does not specifically address the intonational patterns of RTQs, i.e., whether the anchor and the tag have separate nucleus pitch accents or if the pitch contour on the tag continues from the one in the anchor, resulting in a single intonation, known as *nuclear* and *postnuclear* contours, respectively. While either contour can influence the pragmatics of questions, this aspect remains open for further investigation, although I incline to align the analysis with the postnuclear contour (see Reese and Asher 2007).

(Farkas and Bruce 2009, Farkas and Roelofsen 2012, Malamud and Stephenson 2015). Notably, recent developments have introduced the concept of *projection* (*), differentiating between actual changes in the current state and proposals for future changes, thus providing a more nuanced analysis of speech acts' impact on both CG-content and CG-management (cf. Krifka 2015). Let's review the fundamental notations outlined by Farkas and Bruce (2009), with the inclusion of certain updates from Malamud and Stephenson (2015).

- *Table* is a set of propositions structured as a stack of at-issues to be discussed.
- DC_X represents the discourse commitments held by each interlocutor, including both the speaker A and the addressee B .
- DC_X^* denotes the tentative discourse commitments of the speaker, DC_A^* , or alternatively, it refers to the speaker's best estimate of the addressee's commitment, DC_B^* , thus introducing expectations for the next conversational move.
- *Common Ground (CG)* is a set of propositions, shared among the interlocutors.
- *Projected CG (CG*)* is a set of potential CGs, signifying potential resolutions for the current issue on the *Table* as the next move.²⁶

Malamud and Stephenson introduce the notion of DC_X^* , which implies a delay in making a commitment. Essentially, the speaker has complete access to her DC_A , while the projected DC_A^* can be interpreted by the addressee as the speaker's uncertainty or best guess about the addressee's commitment, leading to a tentative commitment. To illustrate this, the authors employ *taste* and *vague* predicates, which are subjective and rely solely on the experiencer's judgment, not that of the other interlocutors.²⁷ The authors employ the use of predicates to distinguish between speaker-oriented and addressee-oriented perspectives in the DCs.

²⁶It is worth noting that CG^* is the similar concept of the *Projected Set* as proposed by Farkas and Bruce (2009) and *CG-management* as discussed by Krifka (2015). Notice that CG^* should be consistent with CG , and CG^* can be updated with a new proposition p , provided that p is member of the topmost issue on the *Table*.

²⁷For instance, when the speaker claims something is delicious, it reflects the speaker's personal judgment, without necessarily implying the addressee shares the same view.

To comprehend their analysis of the scoreboards, we must introduce the concept of metalinguistic issues (MLI), building on the work of Ginzburg (1997). According to Malamud and Stephenson (2015), certain speech acts not only function as conversational moves but also raise metalinguistic issues as part of their move. When a speech act involves a commitment while simultaneously addressing a metalinguistic issue, it indicates that the commitment is projected within the resolution of the MLI.

Specifically, the authors examine the scoreboard analysis of three types of biased questions: Reverse-Polarity TQs (RP-tags), Same-Polarity TQs (SP-tags), and rising declaratives (Non-Interrogative Rising or NI-rise).²⁸ Figure 2-3 (adapted from Malamud and Stephenson 2015:pp. 289, 292, 297) illustrates these examples, shedding light on the interplay between speech acts and metalinguistic issues in their analysis.

A utters p with an RP-tag:

(Proposition q is already in the CG.)

	Previously	(i) after A's move (uttering p with RP-tag)
DC_A	{}	{}
DC_A^*	{()}	{(p)}
DC_B	{}	{}
DC_B^*	{()}	{(p)}
Table	$\langle \rangle$	$\langle (p) \rangle$
CG	{q}	{q}
CG*	{(q)}	{(q, p)}

A utters p with an SP-tag:

(Proposition q is already in the CG.)

	Previously	(i) after A's move (uttering p with SP-tag)
DC_A	{}	{}
DC_A^*	{()}	{(p)}
DC_B	{}	{}
DC_B^*	{()}	{(p)}
Table	$\langle \rangle$	$\langle (p) \rangle$
CG	{q}	{q}
CG*	{(q)}	{(q)}

A utters p with an NI-rise:

(Proposition q is already in the CG.)

	Previously	(i) after A's move (uttering p with NI-rise)
DC_A	{}	{}
DC_A^*	{()}	{(p)}
DC_B	{}	{}
DC_B^*	{()}	{(p)}
Table	$\langle \rangle$	$\langle MLI^p, (p) \rangle$
CG	{q}	{q}
CG*	{(q)}	{(q, R1), {q, R2}}

Figure 2-3: Scoreboard representation of Reverse polarity (RP) TQs, Same polarity (SP) TQs, and non-interrogative rising (NI-rise) questions

Before exploring the suggested analysis, it is worth to acknowledge that Farkas and Bruce (2009) put forth their analysis for Assertions, PPQs, and LNPQs. De-

²⁸It should be noted that Malamud and Stephenson (2015) present their analysis of RP-tags with a *post-nuclear* contour, following the approach of Ladd (1981), wherein a single intonational boundary is formed for both the anchor and the tag. They assert that while some of their arguments might be applicable to *nuclear* tags as well, they defer the examination of nuclear and *falling tune*-tags to future research endeavors.

spite minor differences in the surface representations of their Scoreboard, the authors distinguish Assertions $[p.]$ from PQs $[p?]$ by introducing $CG = \{CG \cup p\}$ and $CG = \{CG \cup p, CG \cup \neg p\}$ for each type, respectively, wherein Assertions demonstrate a bias favoring the confirmation of the expressed proposition (note the *projected set* in Farkas and Bruce (2009) corresponds to CG^*). Subsequently, they argue that PPQs and LNPQs differ concerning the issue being negotiated on the *Table*. Although both add $\{p, \neg p\}$ to the *Table*, PPQs highlight p , while LNPQs highlight $\neg p$. However, Farkas and Bruce do not delve further into the potential bias in the questions or the distinction between LNPQs and HNPQs. Nevertheless, they do suggest that in biased cases, the future updates of CG^* might be affected (as demonstrated in their analysis of *oare*-Questions in Romanian).

Turning to the proposed scoreboards in Malamud and Stephenson (2015), we can see the characteristics of the listed questions:

- **RP-tags:** Malamud and Stephenson claims that in RP-tags, the speaker is not directly committing to the assertive anchor p , but expressing that if p is confirmed (by the addressee), she is also committed to it. Therefore, the model introduces p on the *Table*, on the speaker's DC_A^* and on the CG^* .
 - DC_A^* represents speaker's opinion as her tentative commitment to the anchor proposition, while she has reasons to avoid making a full commitment.
 - CG^* indicates that the speaker invites the addressee to express his opinion (amongst the proposed options, which is the same as hers in DC_A^*).
- **SP-tags:** The authors propose that in SP-tags, the question is acceptable when the addressee's judgment is at issue. Thus, speaker does not present neither her commitment (belief) nor present anything as the CG^* . The model introduces the declarative anchor p on the *Table* and on the addressee's DC_B^* .
 - DC_B^* captures speaker's guess about the addressee's potential commitment. Since it is an inferred commitment of the addressee, it is contingent to his feedback. If the addressee accepts his DC^* , p will be moved to his DC .

- Remember that in both RP-tags and SP-tags, what is on the *Table* is the negotiated topic, which is the proposition in the anchor.
- **NI-rise:** Finally, the speaker employs NI-rise when she is uncertain about making a commitment to p . Concerning p , MLI^p represents a contextually determined set of propositions, one of which would resolve MLI^p . Therefore, the model introduces the declarative p on DC_A^* , as well as adding both p and MLI separately on the *Table*.
 - Since the *Table* operates as a stack (last-in-first-out), MLI^p is placed on top and given higher priority for resolution.
 - CG^* is assumed to be developed only once per conversational move, after completing the updates to the *Table*. Thus, the potential resolutions of the top issue, namely MLI, (e.g., R1, R2) are proposed in CG^* . Once the MLI is resolved, p can be retrieved from the *Table* and would be added to CG^* .
 - The addressee is expected to first resolve MLI^P , while the speaker indicates her inability/unwillingness to resolve it (i.e., asking whether to commit to p). If the addressee agrees, p will be added to the speaker's DC , and while p is on the *Table*, the addressee's acceptance adds p to their own DC and, consequently, to the current CG. It is worth noting that all movements in NI-rise occur simultaneously, similar to an Assertion move. The only difference is that NI-rise raises and resolves an MLI, which is necessary for its felicity, whereas an assertion does not raise an MLI. The occurrence of the MLI can be signaled by various contextual factors (such as content and form), prosodic focus, or speech rate (for more details, see Malamud and Stephenson 2015:p. 297).

Drawing on the components of the Scoreboard, Malamud and Stephenson argue for the acceptability and unacceptability of each type of question in certain contexts. Overall, the account revolves around the main idea of managing discourse commitments, whether of an individual or all interlocutors in the conversation. To achieve this, Malamud and Stephenson employ the Scoreboard model, following the approach

of Farkas and Bruce (2009), to implement their analysis effectively. While Farkas and Bruce differentiate PQs (including PPQs and LNPQs) and Assertions based on their proposed future moves in *CG**, the authors propose that biased questions can also convey bias by indicating a tentative commitment from either interlocutor. The speaker, while intentionally avoiding definitive commitments, might offer contingent commitments based on the feedback from the addressee.

Since the analysis lacks a compositional account, it remains uncertain to what extent the Scoreboard effects of various questions arise from semantics versus pragmatics. Furthermore, these studies do not delve deeply into the origins of bias, although they briefly mention the possibility of inference from world knowledge or prior information. Finally, while the proposal for tentative discourse commitments can be extended to other types of biased questions like HNPQs, the distinction between similar structures like LNPQs and HNPQs need to be further investigated (AnderBois 2011, see also Chapter 4 and Mohammadi and Romero 2024 for our suggestions).

2.3 Felicity Conditions

In addition to theoretical analyses of biased questions, certain researches have been dedicated to examining the felicity conditions of each question. Scholars have primarily focused on two major types of bias conditions: Contextual Bias (CB) and Original Bias (OB). Contextual Bias refers to evidence present in the conversational context that is mutually accessible to both interlocutors (Büring and Gunlogson 2000). Original Bias relates to the speaker's personal beliefs or stance based on their (epistemic) state of mind prior to the current context (Ladd 1981, Romero and Han 2004). Finally, Domaneschi et al. (2017) consider the influence of both types of bias. This section explores the findings of the primary studies concerning each type of bias.

2.3.1 Contextual Bias (CB)

Büring and Gunlogson (2000) conduct a thorough examination of the contextual conditions for PPQs and NPQs. The authors argue that, in neutral contexts, a question

does not exhibit any bias towards a specific answer. However, in biased contexts, there exists compelling evidence supporting a particular proposition ϕ , which allows the participants to reasonably justify the proposition. The authors define contextual evidence as evidence that has recently become mutually available to the participants in the current discourse situation (Büring and Gunlogson 2000: p. 7).

- (69) **Contextual Evidence:** Evidence that has just become mutually available to the participants in the current discourse situation.

It is important to highlight that according to Büring and Gunlogson, contextual evidence excludes the private beliefs of the speaker and the common ground knowledge. In other words, contextual bias refers to evidence that is currently accessible to all participants in the context, independent of their individual beliefs. Building on this notion, the authors provide examples of PPQs, as shown in (70), adapted from Büring and Gunlogson (2000): p. 6, which can be used both in neutral contexts and to signal bias towards proposition p based on contextual evidence.

- (70) A: What's the weather like out there? Is it raining?

Neutral Context: A and B are talking long-distance on the phone.

Evidence for p : B enters A's windowless room, wearing dripping raincoat.

Regarding NPQs, Büring and Gunlogson present examples of two types of negation, inner and outer HNPQs (à la Ladd 1981). For outer-HNPQs, they use expressions like English *not some* and German *nicht ein*, while for inner-NPQs, they employ negative determiners such as English *no* and German *kein*. It should be noted that, although the negative determiners differ from inner-HNPQs in Ladd (1981), where propositional negation *not* sits in a lower position, I only report the authors' results on inner-NPQs as they relate to LNPQs. They demonstrate that both LNPQs, as exemplified in (71), and outer-HNPQs, as shown in (72), are used in contexts favoring the negative proposition. However, only the former is acceptable in neutral contexts. These examples have been adapted from Büring and Gunlogson (2000):pp. 9-10.

- (71) A and B want to go out for dinner. B says that since A is a vegetarian, they cannot go out in the town, where it is all meat and potatoes.

A: Is there no vegetarian restaurant around here?

- (72) A and B want to go out for dinner. A has been in the town couple of years back. B says that since A is a vegetarian, they cannot go out in the town, where it is all meat and potatoes.

A: Isn't there some vegetarian restaurant around here?

The following table presents the summary of their findings:

CB	PPQs	inner-HNPQs	outer-HNPQs
p	✓	✗	✗
neutral	✓	✗	✓
$\neg p$	✗	✓	✓

Table 2.1: The summary of Contextual Bias based on Büring and Gunlogson (2000)

2.3.2 Original Bias (OB)

The concept of the speaker's belief has been extensively explored by Ladd (1981) in the context of the ambiguity of English HNPQs with both outer and inner readings. According to him, in both readings, the speaker has a prior assumption or belief concerning proposition p . In the outer reading, the speaker asks to double-check the negation of p , while in the inner reading, the speaker seeks to double-check $\neg p$ to confirm their own belief. As a result, the speaker's original bias (OB) reflects their expectation based on their prior state of mind. Building upon this framework, Romero and Han (2004) argue that the presence of the VERUM operator in HNPQs necessitates speaker's prior epistemic belief. Conversely, such a condition is optional for LNPQs due to the absence of VERUM (see Section 2.2.2.1). In other words, while both PPQs and LNPQs can be acceptable in neutral contexts, HNPQs inherently indicate the speaker's bias or expectation.

For instance, consider example (73) adapted from Romero and Han (2004). Asking LNPQs, as shown in (A1), is felicitous because it does not necessarily imply a prior

belief, whereas the HNPQs in (A2) are infelicitous as they express the speaker’s prior belief, which is not supported by the context.

- (73) A and B are organizing a party, and A is in charge of supplying non-alcoholic beverage. A is going through a list of guests, while she has no previous belief or expectation. B says that Mary doesn’t drink.

A1: OK, What about John? Does he not drink (either)?

A2: # OK, What about John? Doesn’t he drink (either)?

Romero and Han argue in HNPQs, such as (74), the question conveys an implicature, indicating that the speaker held a belief or expectation regarding proposition p .

- (74) John and Pat are phonologists, who are supposed to give an speech. B says that since Pat is not coming, they don’t have any phonologist in the program.
- A: Isn’t John coming either?

Furthermore, they provide examples of PPQs with the modifier *really*, which requires the speaker’s prior belief against p . Their findings are summarized in the following Table. Note that the gray cells denote conditions that were not addressed in their paper, and (✓) signifies that the questions can optionally (though not necessarily) convey the associated bias.

OB	PPQs	LNPQs	inner-HNPQs	outer-HNPQs	<i>really</i> -PPQs
p		(✓)	✓	✓	✗
neutral	✓	✓	✗	✗	✗
$\neg p$	(✓)		✗	✗	✓

Table 2.2: The summary of Original Bias based on Romero and Han (2004)

2.3.3 CB and OB

While the aforementioned studies primarily focus on investigating one type of bias, it is worth noting that some of their examples (indirectly) include the other type of bias as well. For instance, Ladd (1981) mentions that in inner HNPQs, the speaker has prior expectations for proposition p , yet asks to double-check $\neg p$ when they learn or

infer it from the context (see example (4) in Ladd 1981). In other words, the speaker holds a prior belief (OB), while the context provides evidence against it (CB), leading to an inference of $\neg p$. Similarly, Romero and Han (2004) report on the speaker's belief in their study, while some of their examples also signal contextual bias. For instance, in example (74), where speaker B states that *they don't have any phonologist*, one might infer that John is not a phonologist, which can be considered as contextual evidence for $\neg p$. On the other hand, Büring and Gunlogson (2000) primarily concentrate on the presence and absence of contextual evidence (CB), although some of their examples also reflect the speaker's bias towards proposition p . For instance, the HNPQs in (72) are asked in a context where the speaker has been to the town before and holds the prior belief that there is a vegetarian restaurant in the town (see also example (29) in Büring and Gunlogson 2000, for inner-HNPQs in a neutral context, while the context indicates the speaker's original bias).

In an experimental study, Domaneschi et al. (2017) investigate both CB and OB, shedding light on the felicity conditions of various types of biased questions (see also Roelofsen et al. 2013). The results of their experiments are summarized in the following table (The gray cells represent the conditions excluded in their experiment). As shown, certain questions require both types of bias (in reverse polarity, although contexts featuring both types of bias within the same polarity were not provided).

		Original Bias		
Context Bias		p	neutral	$\neg p$
	p		PPQs / <i>really</i> -PPQs	<i>really</i> -PPQs
	neutral	outer-HNPQs	PPQs	
	$\neg p$	outer/inner-HNPQs	LNPQs	

Table 2.3: The summary of OB and CB based on Domaneschi et al. (2017)

Upon examining Table 2.3, it is evident that some questions are felicitous under multiple conditions. For example, PPQs are valid in neutral contexts as well as in situations involving CB towards proposition p . Conversely, in some scenarios, more than one type of question is felicitous. For instance, in settings with CB towards $\neg p$, both LNPQs and outer-HNPQs are available. Therefore, it is crucial not only to

account for both types of bias but also to recognize the similarities of the same type of question in various contexts, as well as to differentiate between questions within the same setting.

2.4 Summary

This chapter has provided the review of the existing literature, categorizing the studies into three primary theoretical frameworks: (i) Decision Theory: This framework explores the value of an answer in terms of utility value or projected answer of biased questions (Van Rooy and Šafářová 2003, AnderBois 2019). (ii) Epistemic Operator: This perspective suggests the presence of an operator in certain types of biased questions. We examined the VERUM and FALSUM accounts (Romero and Han 2004, Repp 2006, respectively). (iii) Discourse Commitment Account: According to this view, bias functions as a mechanism for managing discourse commitments (Krifka 2015, Malamud and Stephenson 2015). We also analyzed the felicity conditions of various biased questions (Büring and Gunlogson 2000, Domaneschi et al. 2017).

While the existing accounts effectively address the core data, we highlighted some crucial issues. Firstly, bias has primarily been regarded as an epistemic implication, overlooking potential non-epistemic aspects of biased questions (Huddleston and Pullum 2002, Van Rooy and Šafářová 2003, Sudo 2013). Secondly, while felicity conditions distinguish between different types of biased questions concerning OB and CB, they are insufficient not only to differentiate between questions occurring in the same setting but also to describe the semantic coherence of the same type of question in different settings (see Sudo 2013, Domaneschi et al. 2017). Therefore, a nuanced account is essential to address these challenges effectively (for partial resolutions of the last issue, refer to works such as Romero and Han 2004 and Krifka 2015).

Chapter 3

Biased Questions in Farsi

3.1 Introduction

In Chapter 2, an exhaustive review of biased questions in English, including PPQs, NPQs (LNPQs and HNPQs), TQs, was undertaken. Despite certain shared characteristics among these question types, each maintains a distinct profile within its specific context. The review evaluated primary studies that presented varying perspectives on detecting bias in semantics and pragmatics (Ladd 1981, Büring and Gunlogson 2000, Van Rooy and Šafářová 2003, Romero and Han 2004, Repp 2006, Krifka 2015, Malamud and Stephenson 2015, AnderBois 2019, among others).

This chapter investigates biased questions in Farsi, enabling the exploration of new data and offering a fresh perspective on this topic. The focus is on two distinct categories of biased questions, both of which inherently convey bias. The first group includes polar questions that manifest bias through specific discourse particles, namely *ke*, *dige*, and *mage* (Section 3.3.2). The second group encompasses tag questions (TQs) in two forms: Verbal TQs (VTQs), where the tag mirrors the predicate of the anchor in reverse polarity, and Particle TQs (PTQs), where the tag adopts a polar particle, *âre* ‘Yes’ or *na* ‘No’. All these forms express bias through the proposition within their anchor (Section 3.3.3).

To establish a clear distinction between various types of biased questions, we propose that biased questions vary along three components:

(i) Projected Answer: While all polar questions allow for possible answers $\{p, \neg p\}$, biased questions may project either p or $\neg p$ as the (true) answer in the next conversational move (Farkas and Bruce 2009, Krifka 2015, AnderBois 2019). For instance, in the question ‘*Did Ali come to the party DIGE?*’, particle *mage* conveys that Ali came to the party is projected as the next answer move. Similarly, the question with *ke*, ‘*Did Ali come to the party KE?*’, expresses the same projected answer. Therefore, further exploration is required to differentiate between these questions. One potential solution lies in examining the felicity conditions associated with each question type, which comes in our second component.

(ii) Felicity Conditions: Biased questions are typically established under two types of bias: speaker’s original bias (OB) and contextual bias (CB). The questions vary in the required type of bias as their felicity conditions. For instance, ‘*Did Ali come to the party DIGE?*’ requires OB and/or CB in favor of the proposition that Ali came to the party, while ‘*Did Ali come to the party KE?*’ is felicitous in contexts where the OB conveys Ali came. Although the felicity conditions may distinguish these questions for specific settings, the questions still share certain similar conditions. For instance, *ke* and *dige* questions are felicitous in a setting with OB and they yield the same projected answer. This necessitates further exploration.

(iii) Bias Attitude: An additional dimension of biased questions, the *attitude* feature, merits scrutiny. While the bias types in the felicity conditions are rooted in epistemic notions, biased questions can also convey varied non-epistemic attitudes. This introduces a notable influence on the projected answer, as the speaker may exhibit an answer either more likely or more preferred. For instance, the question ‘*Did Ali come to the party KE?*’ signifies the speaker’s hopeful expectation, whereas ‘*Did Ali come to the party DIGE*’ indicates the speaker’s conclusive inference. Despite the distinction between epistemic and non-epistemic facets in the analysis of biased questions, the dimension of attitude has been relatively overlooked in existing literature. We contend that the speaker’s attitude is the key distinctive feature in biased questions, influencing both the projected answer and the felicity conditions.¹

¹It is essential to briefly delineate the term *expectation* in this study. While we demonstrate that

We posit that OB and CB, which facilitate the context for adopting biased questions, are not inherent to biased questions; rather, they can be derived by the bias attitude. Our analysis unfolds in two stages: firstly, we propose that the speaker’s (potentially non-epistemic) attitude is semantically encoded as a conventional implicature, either through lexical or syntactic structures. Secondly, we illustrate how the projected answer and felicity conditions are determined through this attitudinal implicature. Moreover, we argue that incorporating the attitude feature enriches the literature by providing a deeper understanding of biased questions cross-linguistically, as well as addressing the issues raised in Section 2.3.3 (see Mohammadi and Koev to appear).

Our argument contends that, on one hand, the attitude feature enables the differentiation of questions that share similar felicity conditions. For instance, while both *ke* and *dige* questions are felicitous in contexts where the speaker maintains a prior expectation in the question’s prejacent, however, they diverge concerning attitude: the former conveys hope, whereas the latter conveys a conclusive inference. In essence, both particles project the same answer within the same conditions, yet they differ in the speaker’s attitude toward that answer. On the other hand, the attitude sheds light on the semantic coherence of a specific question type across diverse contexts. For example, the particle *dige* can be employed in contexts where the speaker holds a prior belief or when there is contextual evidence supporting the proposition. Nevertheless, the conclusive attitude remains constant in both settings.

This chapter is structured as follows: We start by addressing two prevailing challenges in the existing literature, detailed in Section 3.2. Section 3.3 presents comprehensive data from Farsi, including simple PPQs and NPQs, questions featuring discourse particles, and various forms of TQs. In Section 3.4, our analysis of the semantics of biased questions unfolds, starting with a discussion on the most suitable linguistic category for characterizing bias. In Section 3.4.2, the proposed semantic denotation for each question type is expounded, taking into account the three distinctive features

biased questions carry diverse attitudes toward the projected answer, we employ *expectation* as a neutral term, devoid of inherent epistemic connotations (although it may have been utilized as an epistemic notion in some studies). Hence, when referencing the speaker’s expectation, it signifies that the speaker is not neutral or indifferent about the potential answer.

of biased questions. Moreover, Section 3.4.3 delves deeply into our proposed account, arguing that the incorporation of attitudinal implicature not only resolves existing issues but also introduces a new dimension to data analysis, resulting in a nuanced and fine-grained examination. Finally, Section 3.5 brings the chapter to a close with a brief summary of the main findings of the account.

3.2 Does Bias Have Flavor?

Before presenting Farsi examples, it is important to clarify certain concepts, particularly in terms of their relevance within our framework. Let us briefly revisit the definitions of OB and CB in polar questions [$\phi?$]. The definition of OB in (75) draw from the work of Romero and Han (2004) (cf. Ladd 1981, Domaneschi et al. 2017), while CB in (76) is adopted from the work of Büring and Gunlogson (2000).

- (75) **Original Bias (OB):** It is the speaker’s belief that ϕ is true based on her epistemic mental state prior to the current situation.
- (76) **Contextual Bias (CB):** It is the evidence for ϕ in the sense that it allows the participants to assume ϕ , i.e. the evidence could reasonably be considered to justify the inference that ϕ is true. The evidence is currently in the discourse and it is mutually available to the participants.

Both definitions pertain to ϕ as the projected answer; nevertheless, they include distinct components. OB, on one hand, incorporates the following attributes: (i) it signifies the belief of the individual speaker, (ii) it is temporally anchored in the past, preceding the ongoing conversational state, and (iii) it has an inherently epistemic nature. In contrast, CB is characterized by the following features: (i) it refers to the inference of all participants engaged in the conversation, (ii) it is applicable within the current temporal frame of discourse, and (iii) it exhibits an epistemic quality.

Notice that while OB is explicitly denoted as epistemic, the definition presented in (76) shares a close resemblance to the concept of epistemic as well. According to von Fintel and Gillies (2007), epistemicity is defined based on the presence of indirect

inference or deduction. Similarly, Anand and Hacquard (2013) define epistemic as an inference or deduction grounded in either the speaker's knowledge or evidential support. This notion aligns with the inferential process inherent in CB. Therefore, both OB (by its definition) and CB (by its characteristics) manifest epistemic notions. However, it will be demonstrated that biased questions convey various modal flavors, regardless of OB and CB conditions, which gives rise to two challenges:

(I) Non-epistemic bias implications: Romero and Han (2004) explore epistemic implicature in the context of the speaker's prior *original belief*.² Similarly, Sudo (2013) labels this phenomenon as *epistemic bias*, while Northrup (2014) uses the term *speaker bias*. However, the authors acknowledge the flexible nature of questions implications, which is not rigidly bound to the epistemic modality (cf. the *intent* notation in Romero and Han 2004, footnote 18). Sudo (2013) underscores that the modal flavor of the epistemic bias is not strictly tied to the speaker's belief (see also AnderBois 2019). Other scholars have also pointed out that bias may manifest in various modal flavors depending on the context.

For instance, Huddleston and Pullum (2002) provide examples of English questions that employ different modal flavors, including deontic (pertaining to norms and rules) as illustrated in (77), or bouletic (desiderative) as in (78) and (79). Additionally, Van Rooy and Šafářová (2003) present numerous of teleological (goal-oriented) examples like (80) in the context of finding a friend on a website (for more English examples, see Asher and Reese 2008, and for Japanese examples, refer to Sudo 2013).

- (77) Aren't you ashamed of yourselves? \rightsquigarrow The speaker thinks you ought to be ashamed.
- (78) Can I have some more ice-cream? \rightsquigarrow The speaker wants to have some ice-cream.
- (79) Doesn't she like it (the painting)? \rightsquigarrow The speaker wants her to like it.
- (80) Do you not have any friends? \rightsquigarrow The (speaker) intention is not having a friend.

Regarding the presented examples, the speaker can convey her bias expectation for ϕ based on her beliefs, desires, knowledge, preferences, wishes, goals, and other perti-

²In the work of Romero and Han (2004), the terms *belief* and *expectation* are frequently used together, referring to OB as an epistemic bias. To prevent any potential confusion with the neutral interpretation of *expectation* in my study, I mention the term *belief* from their definition.

nant considerations. Since the existing literature employs the *epistemic* label for OB in a broad and unrestricted usage, the examples in (77)–(80) all fall within the same type of epistemic bias, namely OB. Given that, it can be concluded that certain types of questions are typically associated with conveying an epistemic bias, although they have the potential to manifest non-epistemic bias within suitable context.

Indeed, Huddleston and Pullum (2002) present an intriguing context for example (79). In this scenario, the speaker *s* wants *her* to like the painting (given that *s* has chosen/painted it), yet *s* thinks that she might not. Consequently, the question conveys the speaker's (bouletic) desire for *p* and his (epistemic) belief in $\neg p$ simultaneously. This co-occurrence of different (modal) attitudes, often neglected in the literature (due to its contextual dependency), becomes remarkably apparent in our data.

A noteworthy contribution from Farsi to this challenge of the discourse lies in demonstrating that certain types of biased questions inherently convey speaker's attitude (with different modal flavors). For instance, exemplars involving particles *ke* as in (81) express speaker's hope, whereas the use of *dige* in (82) indicates speaker's conclusive inference. Importantly, both questions project the same answer *that Ali comes*.

- | | |
|--|---|
| (81) Ali miyâd ke?
Ali comes ke
'Does Ali come?'

~~ The speaker hopes that Ali comes. | (82) Ali miyâd dige?
Ali comes dige
'Does Ali come?'

~~ The speaker infers that Ali comes. |
|--|---|

The presence of (non-epistemic) modal flavors in biased questions, whether they arise contextually (as exemplified in (77)–(80) in English) or inherently (as demonstrated in (81)–(82) in Farsi), necessitates specific felicity conditions. Notably, the distinctive attitude of bias expressed in certain question types as in *ke* and *dige* questions remains consistent regardless of the context and the types of bias in the felicity conditions. This leads us to the second challenge.

(II) Various Felicity Conditions: The felicity conditions in Table 2.3 highlighted two points: firstly, certain biased questions exhibit similar felicity conditions, as observed in PPQs and *really*-PPQs, both of which are acceptable within a context featur-

ing contextual bias, $[CB(p)]$. Secondly, some questions may manifest under various conditions, exemplified by *really*-PPQs, which can be employed in a context characterized only by contextual bias, $[CB(p)]$, as well as in a context where the speaker's bias contradicts the contextual bias, $[OB(\neg p) + CB(p)]$. Distinguishing between various questions within the same setting and capturing the nuanced similarities and differences of the same question in various settings requires further consideration.³

The Farsi data reinforces this observation and provides a clear resolution to the issue. For instance, both *ke*-questions as in (81) and *dige*-questions as in (82) are felicitous in settings where the speaker holds a prior expectation for the question prejacent. This indicates that both examples share similar felicity conditions, denoted as $[OB(p)]$, and the same projected answer for p . However, they convey distinct attitudes: hope and conclusive inference, respectively. Moreover, *dige*-questions, exemplified in (82), can be felicitous in contexts where the speaker has a prior belief that Ali would come, and/or when contextual evidence supports this. Regardless of the scenario, the conclusive inference remains consistent.

It becomes evident that the type of bias in the felicity conditions is not inherent to the questions. Therefore, a nuanced analysis is required, not only to differentiate between different questions within the same context but also to maintain the semantic coherence of a given question across diverse contexts. Furthermore, it will be posited that although OB and CB are not native to biased questions, they can be determined by the pertinent attitude. For instance, the conclusive inference illustrated in (82) implies a reasoning process that can be associated with either the speaker's prior belief (OB) or the context (CB) (for details see Section 3.4.2).

This chapter constitutes a substantial empirical and theoretical contribution to the study of biased questions. Empirically, a clear distinction will be made among three aspects of biased questions: the projected answer, the felicity conditions of OB and CB, and the bias attitude. While prior studies have acknowledged the notion of the

³It is worth noting that Domaneschi et al. (2017) mentioned that the presence of *really*-questions in the setting of $[CB(p)]$ and neutral OB was an unexpected result. They explained it as a different reading of the stimuli, where the question might have been understood as expressing the speaker's interest or engagement rather than conveying bias. For further details, see to the original paper.

projected answer in biased questions (Krifka 2015, Malamud and Stephenson 2015, and AnderBois 2019, amongst others), it has yet to be thoroughly explored as an independent feature. Additionally, although the literature has briefly mentioned that biased questions might involve non-epistemic modal nuances, my original contribution lies in revealing that biased questions can simultaneously convey both epistemic and non-epistemic implications (as exemplified in *ke*-questions in Section 3.3.2).

Theoretically, the argument will be made that while some question types have the potential to express these layers, certain question types in Farsi serve as clear examples of how these layers are indispensable and intricately linked. I will introduce the semantics of biased questions, wherein the speaker’s (non-epistemic) attitude toward the projected answer is inherently encoded. Moreover, it will be demonstrated that OB and CB naturally emerge from the attitude implicature. Lastly, we posit that the attitudinal bias implicature not only resolves the aforementioned challenges (I and II) but also facilitates cross-linguistic investigations.

In the next section, Farsi examples will be provided to elucidate the attitude expressed in each question. It will be observed that in certain question types such as PPQs and NPQs, the attitude is contextually embedded (similar to examples (78)–(80) in English). In other question forms, the attitude could be determined lexically, as demonstrated in the case of discourse particles, or structurally, as seen in TQs (cf. modal flavor in modal predicates and attitude predicates). It is worth noting that since the discussion of modal flavors and attitude predicates extends beyond the scope of this study, only the pertinent facets necessary for comprehending the biased questions listed in this chapter will be introduced (for exploration of modalities, see Hintikka 1962, Kripke 1963, Kratzer 1977, von Fintel and Gillies 2007).

3.3 Core Data

In this section, I present various examples of different types of questions, focusing on three key components: (i) the projected answer, (ii) the felicity conditions, and (iii) the speaker’s attitude towards the projected answer. While the presence of bias

implicature signifies that the speaker is opinionated about a particular answer, she might manifest varied attitudes such as hope, belief, doubt, certainty and etc. We aim to capture the related attitudes for each question type.

We engaged five native speakers in addition to the author's judgment for the evaluation of these features.⁴ To determine the projected answers in biased questions, [$\phi?$], I presented my informants with the following query: "*Does the questioner think that ϕ is the answer? Or does she think that $\neg\phi$ is the answer?*" The judgments provided by the informants were recorded as the projected answer for each type of question. Additionally, in order to delineate the felicity conditions for these questions, informants evaluated numerous scenarios including both OB and CB within positive, negative, and neutral contexts, resulting in the identification of nine distinct contextual settings. In these contexts, CB referred to situations where indirect evidence for ϕ was accessible to all interlocutors in the conversation. In accordance with previous studies, OB was framed in a general (epistemic) sense, describing the speaker's prior mental state, as exemplified in sentences such as '*A thinks/heard/remembers ϕ* '.

For instance, in (83), the speaker maintains a prior belief that it is raining (p). However, the presence of evidence (wearing sunglasses) suggests the contrary, indicating that it is not raining ($\neg p$). This scenario establishes a context of [OB(p)+CB($\neg p$)].

- (83) A has checked the weather in the morning, and the weather-caster has predicted that it will rain today. While A is working in her windowless office, her colleague enters the room, wearing sunglasses. A asks...

A1: # bârun miyâd ke?
rain comes KE

A2: # bârun miyâd dige?
rain comes DIGE

A3: mage bârun ne-miyâd?
MAGE rain NEG-comes
'Isn't it raining?'

A4: bârun miyâd, ne-miyâd?
rain comes, NEG-come
'It is raining, isn't it?'

⁴I engaged in consultations with five native Farsi speakers, all residing in Tehran and aged above 25 years. I extend my sincere gratitude for their invaluable insights and feedback, especially when I encountered moments of perplexity, overthinking, and a loss of intuitive clarity. It is worth noting that certain questions conveyed highly similar meanings, presenting challenges in rendering judgments. In such instances, I prompt my informants to imagine a scenario where they entered a room and overheard someone asking the target question. This way enabled them to provide clearer distinctions between the questions.

A5: # bârun miyâd, âre?
rain comes, yes

A6: # bârun miyâd, na?
rain comes, no

In this study, our focus is on a specific set of biased questions, namely three discourse particles and tag questions (TQs). While simple positive and negative polar questions also have the potential to convey bias, the presence of bias, the projected answer, and the bias attitude in these questions are heavily contingent upon the context. In other words, unlike our selected biased questions, PPQs and NPQs are not inherently biased; their bias, if any, emerges from the context. Besides, the attitudes expressed by these questions can vary depending on the contextual cues, which in turn influence the felicity conditions of these questions. Given the intricate context-dependency of PPQs and NPQs, I have chosen to exclude them from my study. However, it is essential to briefly examine some examples to underscore their context-specific nature, particularly when contrasted with the context-independent bias exhibited by our selected biased questions. It is important to note that while my analysis is grounded in questions that conventionally implicate bias, there is no fundamental limitation preventing its extension to optionally biased questions.

Crucially, our exploration delves into the relative/comparative dimensions of bias in PPQs and NPQs. This scrutiny reveals contexts in which NPQs, often presumed to be inherently bias, maintain a neutral stance compared to PPQs, which signal bias within the same context. Additionally, in certain situations, these questions do not imply bias, rendering them suitable for use in neutral (unbiased) contexts. These contextual dependencies especially add complexity to the required felicity conditions. In Section 3.3.1, I will present examples of PPQs and NPQs, elucidating the projected answers and the speaker's attitudes. However, I defer the investigation on their felicity conditions to future studies.

3.3.1 Simple Polar Questions

In English, investigations into polar questions (PQs) often revolve around the presence and positioning of negation. However, negation in Farsi has one (surface) representation, outlined as a prefix to the predicate. Thus, my analysis focuses only on the

presence of negation. I will demonstrate in both PPQs and NPQs the presence of bias implicature is contingent on the context and can be canceled, making it optional. Additionally, both types of questions can elicit projected answers of p and $\neg p$ under specific contextual conditions.⁵ Finally, they are not restricted to specific attitudes; the potential bias can be expressed with various attitudes based on the context.

Polar questions in Farsi are in the form rising declaratives (Section 1.3.2). Consider Example (84), which illustrates a minimal pair of positive and negative polar questions in (A1) and (A2), respectively. Both questions are considered appropriate in contexts (a), where the positive (p) and negative ($\neg p$) answers are equally informative and goal-oriented for the participants. As a result, posing positive and negative polar questions in such contexts may not inherently introduce bias (I will address questions in *neutral* contexts later in this section).⁶

- (84) A1: Sara Corona gerefte?
 Sara Corona got
 ‘Did Sara get Corona?’
- A2: Sara Corona na-gerefte?
 Sara Corona NEG-got
 ‘Did Sara not get Corona?’

Context (a): A and B are working in a health insurance company, reviewing students’ medical records from a school with the aim of compiling two distinct lists: one for students who had Corona and another for those who did not. A proceeds by saying, ‘*OK, the next one on the list is Sara Mofidi*,’ and then poses either question (A1) or (A2).

⁵It is worth to note that prosody plays a crucial role in the bias implicatures. For instance, polar questions with focal stress on the predicate, exemplified in (i) and (ii), can signify speaker’s bias against the question prejacent (for the role of prosody see Bill and Koev 2023b).

- | | |
|---|---|
| (i) Ali [UMAD] _F ?
Ali came
‘DID Ali come?’
↵ The speaker expects that Ali didn’t come. | (ii) Ali [NA-YUMAD] _F ?
Ali NEG-came
‘Did Ali NOT come?’
↵ The speaker expects that Ali came. |
|---|---|

In my study, I try to avoid prosodic factors by carefully selecting contexts that do not provide any information which necessitates focal stress or specific emotions such as surprise, anger, or pleading, which could potentially influence the interpretation of the questions.

⁶Romero and Han (2004) also posit that PPQs and LNPQs can adopt a neutral reading in addition to indicating bias through VERUM, conveyed via verum accent.

Context (b): A and B are discussing about Corona and the health status of their friends. A says '*I haven't been in touch with Sara for a while, how is she doing?*', and then asks either question (A1) or (A2).

Context (c): Everyone has been instructed not to come to the office if they had any symptoms of Corona. Today, Sara did not come. A asks (A1).

Context (d): A and B are discussing about Corona. A asserts, '*Everyone got Corona,*' and then proceeds to ask (A2).

Context (e): A and B are discussing about Corona. A asserts, '*Anyone who has received the vaccination didn't get Corona. Sara received her vaccination last week,*' and then proceeds to ask (A1).

Context (f): A and B are discussing about the Covid regulations applicable to their experiment. A says, '*Participants must not have had Corona, and they are required to have a valid Covid pass. Sara has submitted her application, and I know that she has a Covid pass,*' and then proceeds to ask (A2).

The potential bias⁷ in both questions can be denied (cancelled), as seen in context (b), where the speaker states her lack of belief (and the context doesn't provide any evidence).⁸ Although both questions might suggest the speaker's expectation that Sara has Corona, NPQ (A2) is actually less biased in comparison to PPQ (A1) regarding such an implicature. Moreover, both types of questions can convey bias toward either a positive or a negative proposition (see footnote 5). The bias for p is conveyed by the positive question (A1) in context (c) and by the negative question (A2) in context (d). Conversely, the bias for $\neg p$ is expressed by both (A1) and (A2) in contexts (e) and (f), respectively.

⁷The potential bias in PQs can easily result in bias accommodation. In context (a), the addressee can assume/accommodate that speaker A asked (A1) because he considers it more likely that *Sara got Corona*, and A asked (A2) because he believes it is more likely that *Sara did not get Corona*.

⁸In PPQs and NPQs, bias cancellation/denial effectively nullifies the inference that the speaker holds a particular expectation for the answer. Conversely, this cancellation contradicts the inherent bias implied by certain types of questions.

It is crucial to consider the neutral reading of PPQs, a concept widely acknowledged in the literature. PPQs are often considered the *default* forms suitable for neutral contexts, while NPQs, when compared to PPQs, provide additional information by making $\neg p$ more informative/demanded (see Van Rooy and Šafářová 2003, AnderBois 2019, among others). Although I acknowledge the higher potential for bias in NPQs, I emphasize a critical point related to the concept of *comparison*. Krifka (2013) briefly alludes to contexts in which the negative proposition becomes salient (see footnote 19 in Chapter 4). I argue that in such contexts asking PPQs introduces bias compared to NPQs, which sound neutral.

For the sake of precision, I suggest using the term *familiarity* instead of *saliency* in these contexts. In the studies of response particles to polar questions, a proposition is considered salient (à la Krifka 2013) or highlighted (à la Roelofsen and Farkas 2015) when it is marked, for instance, by its utterance (cf. the semantic difficulty in Pope 1976). However, in our intended contexts, the negative proposition, as the negative event/state, is so familiar that it is considered the unmarked form (akin to what Krifka exemplified). This is distinct, if not entirely contradictory, to the notion of saliency. Therefore, I will denote these cases as *familiar* in the sense of being unmarked and unbiased, as illustrated in the following examples.

In everyday speech, our inquiries typically center around events or states that have occurred or existed, rather than those that have not. In essence, we often inquire about news, information, existing states, and past events. However, there are specific, albeit less common, situations where the negative event-state serves as the familiar form. In such instances, as exemplified in (85)–(88), NPQs function as the unmarked/unbiased questions when compared to PPQs, which carry bias.

In example (85), speaker B poses an NPQ for clarification. He does not imply anything but instead highlights $\neg p$ as a kind of (unbiased) fact. However, if B were to ask the question in a positive form, it would implicate B's belief/expectation that A does not hear well. This means although the fact that A doesn't hear well ($\neg p$) is acknowledged and familiar in this context, implicating it through PPQs instead of asking it through NPQs introduces bias in the former and maintains unbias in the latter.

- (85) **Context:** A, who has hearing difficulties and relies on hearing aids, is in a courtroom where she is being questioned by B regarding a crime happened in her building.

B: You have serious hearing problem, right?

A: Yes, I have been using hearing aids since I was a child.

B: bedune samak dorost ne-mišnavid?
without hearing-aids good NEG-hear

‘Do you not hear well without the hearing aids?’

In examples (86) and (87), the negative forms (A1s) do not imply bias, while the positive counterparts (A2s) suggest that the doctor is suspicious (bias) for *p*. In other words, these questions indicate the probability of $\neg p$ is higher than that of *p*, even though knowing about *p* is more crucial than $\neg p$. Consequently, the familiar negative form does not evoke any bias, unlike the positive forms that convey bias.⁹

- (86) **Context:** B went to her gynecologist for the annual checkup. A, the doctor, is about to perform a sonography.

A1: bârdâr ni-stid?
pregnant NEG-are
‘Are you not pregnant?’

A2: bârdâr hastid?
pregnant are
‘Are you pregnant?’
~~The speaker suspects B is pregnant

- (87) **Context:** B has a dental operation. A, the dentist, is preparing the anesthesia.

A1: be dâruie xâsi hasâsiat na-darid?
to medicine special allergy NEG-have
‘Do you have allergy to any medications?’

A2: be dâruie xâsi hasâsiat darid?
to medicine special allergy have
‘Do you have allergy to any medications?’
~~ The speaker suspects you have allergy.

⁹Van Rooy and Šafářová (2003) point out that while positive and negative propositions do not differ logically (in terms of sets of possible worlds), negative assertions are notably marked compared to positive ones. They argue that in a neutral context, asserting *My wife is pregnant* is acceptable, while *My wife isn't pregnant* sounds odd. The latter is appropriate only in a context where the positive proposition is presumed to be likely, making the negative statement more informative than the positive one. They posit that, by default, negative assertions are less informative than their positive counterparts.

Similarly, (A1) in example (88) is a conventional (frequently asked) question as compared to its positive counterpart (A2), which implies the speaker's belief or hope that the B might go to Berlin. Thus, the bias of the positive questions in these examples becomes apparent when compared to their negative counterparts within the contexts.

- (88) **Context:** A and B are friends. A lives in Berlin and B lives in Konstanz. They visit each other every other time, but not frequently. They are talking on the phone.

A1: invarha ne-miyâ?	A2: invarha miyâ?
here NEG-come	here come
'Will you not come here?'	'Will you come here?'
	~~ The speaker thinks B would come.

Finally, both PPQs and NPQs in (89) can be posed out of the blue. Here, neither does the speaker has a prior belief about whether the addressee would or wouldn't know about the bank, nor does the context offer any supporting evidence.

- (89) A is in the city center and looking for the nearest bank. She sees a passenger.

A1: bebaxšid, šoma midunid in-atrâf bank kojâ-st?
excuse-me you know here bank where-is
'Excuse me! Do you know any bank around here?'
A2: bebaxšid, šoma ne-midunid in-atrâf bank kojâ-st?
excuse-me you NEG-know here bank where-is
'Excuse me! Do you not know some bank around here?'

Although neither of the questions inherently carries obligatory bias, the potential implicature in each question may rely on the speaker's attitude. In (A1), the speaker's intention may involve a hope that the addressee knows the answer, while (A2) might imply that the speaker does not expect the addressee (a total stranger) to be aware of the answer. This subtle nuance could introduce the negative question with a sense of politeness, a topic left for future studies. It is worth noting that in both questions, the proposition p would contribute to fulfilling the speaker's goal (following the framework of Van Rooy and Šafářová 2003).¹⁰

¹⁰In these examples, the bias implicature resembles indirect speech acts, where the implicature is not conventionally encoded but inferred (see Searle 1979, Grice 1975).

Evidently, PPQs and NPQs do not inherently exhibit a specific attitude. Depending on the context, the speaker might convey various attitudes such as belief, thought, guess, hope, desire, or conclusion (see examples (77)–(80) in English). For instance, within specific contexts, the addressee can potentially infer the underlying attitude of the speaker, such as a (bouletic) goal in (90), a (desiderative) hope in (91), and an (epistemic) belief in (92) (the same applies to NPQs within suitable contexts). In any case, the conveyed attitude does not exert a strong force, as the speaker can deny any presumptions and cancel the bias implicature (see footnote 8).

- (90) A is talking with B, saying that she is looking for participants for her experiment.

A: tu âzmoone man šerkat-mikoni?
 in experiment my take-part
 ‘Will you take part in my experiment?’ \rightsquigarrow The speaker wants him to take part.

- (91) A is talking with B, saying that she didn’t see Ali for a while and she misses him.

A: Ali emšab mehmuni miad?
 Ali tonight party comes
 ‘Does Ali come to the party tonight?’ \rightsquigarrow The speaker hopes that Ali comes.

- (92) A is talking with B, saying that Ali has the same class as her tomorrow.

A: Ali farda danešgah miad?
 Ali tomorrow university comes
 ‘Does Ali come to the university tomorrow?’ \rightsquigarrow The speaker thinks Ali comes.

Therefore, a crucial insight highlighted from the Farsi data is that, while PPQs are typically perceived as unmarked (default) form compared to NPQs, the opposite scenario is also conceivable, albeit less common. That is NPQs can adopt the role of the unbiased questions, especially when the negative event/state holds a familiar status. While these instances are not frequent, the studies on biased questions underscore the relativity inherent in the concept of *bias*. This perspective implies that the preference for PPQs over NPQs is influenced by an uneven distributional competition between unmarked PPQs and unmarked NPQs. Consequently, PPQs prevail in this competition for being unbiased, primarily due to the predominant focus of information-seeking processes on identifying what constitutes the event/state rather than what does not.

In summary, I contend that the bias observed in Farsi PPQs and NPQs is not inherent but context-dependent. Firstly, the presence of bias in these questions is contingent upon the context and is relative to the opposing form, allowing them to be employed as unbiased forms. Secondly, these questions can project either a positive or a negative answer within appropriate contexts. Thirdly, their bias implications can exhibit varying attitudes of the speaker towards the projected answer, rooted in diverse aspects such as epistemic, bouleptic, teleological, and so on.

3.3.2 Discourse Particles

In this section, I examine three discourse particles: *ke*, *dige*, and *mage*. Similar to several other linguistic elements, these particles have dual functionalities, as they can be used with their lexical meanings in declarative assertions (cf. German particles *ja*, *doch*, and *denn* as discussed in Lindner 1991, Zimmermann 2011, Theiler 2021). For example, the particle *dige* can serve as a modifier conveying ‘another’ in (93), or ‘anymore’ in (94). In (95), *ke* functions as a complementizer ‘that’. Lastly, *mage* can be best interpreted as ‘unless’ within conditionals, as exemplified in (96).

- | | |
|--|--|
| (93) Ali yek qazâye dige mixâd.
Ali one food another wants
‘Ali wants another food.’ | (94) Ali ne-miyâd dige.
Ali NEG-comes anymore
‘Ali doesn’t come anymore.’ |
| (95) Sara goft ke Ali umade.
Sara said that Ali came
‘Sara said that Ali came.’ | (96) Sara ne-myiâd, mage Ali beyâd.
Sara NEG-come unless Ali comes
‘Sara wouldn’t come, unless Ali comes.’ |

The potential relation between the literal meanings of particles in declarative sentences and their discourse functions in polar questions presents an intriguing avenue for exploration (see Mohammadi 2023a for *mage*). This correlation could potentially contribute to a unified analysis of these particles’ dual functionalities. However, given the specific focus of this dissertation on polar questions, my examination is limited to the particles’ usage in PQs. The analysis of their roles in other forms is deferred to future research. Consequently, I treat the particles in declaratives and interrogatives as homonymous, centering my investigation on their discursive roles in PQs.

In the following examples, the particles are introduced into plain polar questions, transforming them into biased questions. These questions indicate that the speaker holds a particular expectation concerning the answer (see footnote 1 for *expectation*). Example (97)–(100) indicate the question prejacent as the projected answer. However, the judgments become murky in examples (101)–(102). In these instances, *mage* conveys that the speaker didn't expect the question prejacent. While this might be construed as the projected answer for the reverse proposition, the informants' judgment reveals the speaker predicts the question prejacent as the next answer move. This aspect will be more discussed shortly upon the introduction of the attitude facet.

- | | |
|---|---|
| (97) Ali umade ke?
Ali came KE
'Did Ali come?' | (98) Ali na-yumade ke?
Ali NEG-came KE
'Did Ali come?' |
| ~~ The speaker expects Ali came. | ~~ The speaker expects Ali didn't come |
| (99) Ali umade dige?
Ali came DIGE
'Did Ali come?' | (100) Ali na-yumade dige?
Ali NEG-came DIGE
'Did Ali come?' |
| ~~ The speaker expects Ali came. | ~~ The speaker expects Ali didn't come. |
| (101) mage Ali umade?
MAGE Ali came
'Did Ali come?' | (102) mage Ali na-yumade?
MAGE Ali NEG-came
'Did Ali come?' |
| ~~ The speaker didn't expect Ali came. | ~~ The speaker didn't expect Ali didn't come |

In addition to the projected answers, these questions exhibit different felicity conditions. Based on our test scenarios, the judgments suggest that *ke*-questions, $[\phi\text{-}ke?]$, are felicitous when the speaker holds certain beliefs, whereas *dige*-questions, $[\phi\text{-}dige?]$, are acceptable under both the speaker's prior expectation and/or contextual evidence. In both types of *ke*- and *dige*-questions, the bias is directed toward the question prejacent, ϕ . Conversely, *mage*-questions, $[\text{mage-}\phi?]$, require contextual evidence in favor of ϕ , in addition to speaker's belief against it. For instance, example (101) is felicitous in a context where the speaker receives contextual evidence supporting that *Ali came*, $CB(\phi)$, while the speaker didn't expect that he would, $OB(\neg\phi)$.

A closer examination reveals that native speakers distinguish between *ke-* and *dige-* questions, indicating distinct nuances in the speaker's attitude. Specifically, in *ke-* questions, the speaker's expectation may lack a solid foundation, merely reflecting a hopeful emphasis on the projected answer. Conversely, *dige-* questions indicate a stronger expectation, as if the speaker has a reason to draw such a conclusion. More examples will be explored to clearly illustrate this distinction.

In example (103), the student in (A1) forms an expectation through mathematical calculations, while the desire expressed in (A2) does not necessarily lead to the answer of 2+2. Importantly, in this case, the speaker's primary goal is to discover the answer rather than specifically arriving at the result of 4. However, the inference of 4 is drawn from logical reasoning and calculation.

(103) A is a first-grade student working on her math homework and asks her mom ...

A1: do bealâve do čâhâr miše dige? two plus two four becomes DIGE 'Does two plus two equal four?'	A1: # do bealâve do čâhâr miše ke? two plus two four becomes KE ~~ The speaker deduces that it does.
---	--

Similar contexts are evident in examples (104) and (105). In each of these instances, the speaker's expectation in (A1s) is derived from prior information, such as educational background and the common knowledge that the Persian Gulf is located in the south of Iran. However, (A2s) remain infelicitous within these contextual settings.

(104) A is studying biology, wherein the task involves classifying animals into categories such as mammals, fish, birds, reptiles, and etc.

A1: nahang pestândar-e dige? wale mammal-is DIGE 'Is wale a mammal?'	A2: # nahang pestândar-e ke? wale mammal-is KE ~~ The speaker deduces that it is.
--	---

(105) A is studying geography, focusing on rivers, including Karun, in south of Iran.

While identifying instances where *dige* is unacceptable posed a substantial challenge, it was relatively straightforward to find examples where *ke* is unacceptable. The challenge associated with *dige* may stem from the influence of general world knowledge and common sense, which often lead to accommodating a felicitous inference with *dige*.¹¹ Considering the provided contexts in examples (106) and (107), (A2) questions with *dige* are unacceptable (or highly degraded).¹²

In example (106), speaker A hopes B didn't hurt, while in example (107), A hopes that the dress has a reasonable price. However, in these contexts, (A2) questions with *dige* are infelicitous due to the lack of a reason to infer the expectations. It is worth noting that while one could potentially accommodate a reason and justify the felicity of *dige* questions, I refrain from making such judgments in this analysis.

- (106) A and B are going down an staircase. B loses his balance and falls from the last two stairs. A says *Are you OK?*...

- A1: čizit na-šod ke?
thing NEG-becomes KE
'Did you not hurt?'
~~ The speaker hopes he didn't.

A2: # čizit na-šod dige?
thing NEG-becomes DIGE

- (107) A is talking with her friend B, saying that she needs to buy a dress for a party.

B: I saw a nice dress in ZARA. It was small for me, but I think it fits you.

- | | |
|---|--|
| A1: gerun na-bud ke?
expensive NEG-was KE
‘Was it not expensive?’ | A2: # gerun na-bud dige?
expensive NEG-was DIGE |
|---|--|

↝ The speaker hopes that it was not.

¹¹A comprehensive study is necessary to incorporate limitations on the existing common ground and world knowledge within the context, thereby managing *dige* inference.

¹²While the judgments regarding rejecting *dige* examples were not as decisive as those for rejecting *ke* questions, the informants agreed that the *ke* questions are the preferred choice. To enhance the accuracy of judgments, native readers are encouraged to focus on the context, minimizing inferences from their existing knowledge. Additionally, one can approach the judgment from the addressee's perspective rather than the speaker's. In that case, *dige*-questions appeared overly strong, prompting addressee to question why such inferences were being indicated in (A2s).

I find it convenient to label *dige* instances as *conclusive* attitude, including a broad range of deductive inferences based on speaker's prior belief or concrete evidence in the context (Izvorski 1997).¹³ Thus, the conclusive interpretation of particle *dige* is not limited to evidential meaning (based on perceivable effects); it can also be based on the speaker's justification of her prior mental state. For example, in (99), the question is felicitous in a context where the speaker sees the lamp in Ali's office is on, or in a context where the speaker knows that Ali is usually punctual and should be in his office at that time. In both cases, the speaker draws conclusions based on specific information, indicating a conclusive attitude (see Anand and Hacquard 2013).

Lastly, the attitude expressed by *mage*-questions can be interpreted as a sense of *wonder* or *surprise*. In these questions, as (108), *mage* conveys the speaker didn't expect the question prejacent (*that B comes to the party*), while she received contextual evidence suggesting it (*that he is dressed up to go*). The contradiction between the speaker's and the context's bias leads her to wonder and seek an answer and explanation. Responses to *mage*-questions typically involve an explanation for the conflict as in (B1)–(B2), rather than a simple *yes/no* answer (which sounds inadequate).

- (108) A is getting ready to go to a party. She sees B, her flatmate, dressed up. A didn't expect B comes too as he is not a party person.

A: mage to ham miyâi? MAGE you too come 'Do you come too?'	B1: Yes, I'm so bored tonight. B2: No, I have an online interview.
--	---

Note that in *mage* questions, the speaker may not expect the question prejacent simply because it was not in her active mental state. In other words, in (108), the speaker doesn't need to believe *that B doesn't come*. The question is appropriate as long as the possibility of B coming to the party was not within the speaker's active

¹³Izvorski (1997) argues that "ordinary" epistemic modals, such as *must*, can be used with both (indirect) evidence and the speaker's justification regarding the truth of a proposition. On the other hand, (indirect) evidential markers, like *apparently*, necessitate observable evidence in the context. This distinction can be observed in the following examples (adapted from Izvorski 1997: p. 227).

- | | |
|---|---|
| (i) Knowing how much John likes wine...
...he must have drunk all the wine yesterday.
#...he apparently drank all the wine yesterday. | (ii) Seeing some empty bottles in John's room...
...he must have drunk all the wine yesterday.
...he apparently drank all the wine yesterday. |
|---|---|

belief (more discussions are in Section 3.4.2.1).

Now, we can explore more about the projected answer in *mage*-questions. Based on the context in (109), the judgment from informants reveal that although the speaker is surprised by the contextual evidence, as she initially thought they were heading home, the question projects *that they are not going home* as the next answer move.

- (109) A and B are in a car, returning from a party along their regular route home. However, near their house, A takes an exit and steers the car onto a different street.

A: mage xune ne-mirim?
 MAGE home NEG-go
 ‘Do we not go home?’
 ↪ The speaker wonders that they don’t.

It is important to emphasize that the presence of both types of bias introduces complexities in determining the projected answer in *mage*-questions (as well as VTQs). Native speakers, including my informants, find it challenging to differentiate between the speaker’s prior belief/expectation and the projected answer that is expected for the next move in the discourse. It is crucial to recall that OB represents speaker’s mental state formed before the current context; however, it does not necessarily persist for future answer move, as it can be influenced by the current (contrary) evidence. Notably, the informants interpret OB in *mage*-questions in the past tense, ‘*the speaker didn’t expect that...*’, as if the speaker is already convinced by the contextual evidence to change her mind. However, everything alike, they interpret OB in VTQs in the present tense. This leads to different projected answer of these types of questions in the conflicting conditions. This discussion will be further elaborated upon at the conclusion of the next section when we have collected data for VTQs as well.

The collected data is summarized in the following Table.

	Projected Answer	Felicity Conditions	Bias Attitude
ϕ -ke?	ϕ	$OB(\phi)$	<i>hope</i>
ϕ -dige?	ϕ	$OB(\phi)/CB(\phi)$	<i>conclusion</i>
<i>mage</i> - ϕ ?	ϕ	$OB(\neg\phi) + CB(\phi)$	<i>wonder/surprise</i>

3.3.3 Tag Questions

Ladd (1981) introduces two primary intonation patterns for English Tag Questions (TQs): the *nuclear* contour, characterized by separate nucleus pitch accents on the anchor and the tag, often with a noticeable pause in between, and the *postnuclear* contour, where the pitch contour on the tag continues from that of the anchor, resulting in a single intonation unit with a lesser pause. I refrain from making any claims regarding specific intonation patterns for TQs in Farsi due to the inherent difficulty in capturing precise pitch contours without phonological measurements. However, initial observations suggest the presence of a slight pause between the anchor and the tag, which leads me to tentatively assume the presence of a nuclear pitch contour in my analysis. However, it is important to emphasize that comprehensive phonological studies are required to make any firm phonological claims.

Farsi employs two primary types of tag questions: Particle Tag Questions (PTQs) and Verbal Tag Questions (VTQs). PTQs consist of a bare polar particle, either *âre* ‘yes’ or *na* ‘no’, functioning as the tag. In contrast, the tag in VTQs involves the same verb from the anchor but in reverse polarity. Although Farsi TQs might share certain similarities with English TQs, they have their own pragmatic profile. Thus, I refrain from translating them as English TQs. For now, I interpret all instances as polar questions with bias implicatures and explore their subtleties below.

On one hand, VTQs, exemplified in (110) and (111), cannot adopt the same-polarity form (contrary to English). PTQs, on the other hand, incorporating particles *âre* and *na*, can be attached to both positive anchor, as in (112) and (114) and negative anchor, (113) and (115). In a broad sense, all examples inquire about whether Ali came or not, where the questions project the anchor proposition as the next answer move.

- | | |
|-------------------------------------|--|
| (110) Ali umade, na-yumade /#umad? | (111) Ali na-yumade, umade /#na-yumad? |
| Ali came NEG-came come | Ali NEG-came came NEG-come |
| ‘Did Ali come?’ | ‘Did Ali not come?’ |
| ~~ The speaker expects that he did. | ~~ The speaker expects that he didn’t. |

- | | |
|---|--|
| (112) Ali umade, <i>âre</i> ?
Ali came yes
'Did Ali come?'

~~ The speaker expects that he did. | (113) Ali na-yumade, <i>âre</i> ?
Ali NEG-came yes
'Did Ali not come?'

~~ The speaker expects that he didn't. |
| (114) Ali umade, <i>na</i> ?
Ali came no
'Did Ali come?'

~~ The speaker expects that he did. | (115) Ali na-yumade, <i>na</i> ?
Ali NEG-came no
'Did Ali not come?'

~~ The speaker expects that he didn't. |

The judgments regarding the felicity scenarios were nuanced, with informants finding PTQs interchangeably acceptable in alternative settings. However, they agreed on the preference for one type over the other in specific settings (and their trivial differences). In example (116), three different contextual conditions are represented. Note that in all scenarios, the speaker holds a prior belief aligned with the anchor that it is raining. The *âre*-tag is preferred ✓ in C1 over C2, marked by %✓ to indicate it is less favored, where the evidence aligns with the speaker's belief, while the *na*-tag in (A2) is preferred in C2, where there is no evidence. The use of VTQs in (A3) is appropriate only in a context where there is contradictory evidence, as in C3.

(116) **Contexts:**

C1 [$OB(p) + CB(p)$]: A has checked the weather in the morning, and the weather-caster has predicted that it will rain today. While A is working in her windowless office, her colleague enters the room, carrying her umbrella. A asks...

C2 [$OB(p) + CB()$]: A has checked the weather in the morning, and the weather-caster has predicted that it will rain today. While A is working in her windowless office, her colleague enters the room. A asks...

C3 [$OB(p) + CB(\neg p)$]: A has checked the weather in the morning, and the weather-caster has predicted that it will rain today. While A is working in her windowless office, her colleague enters the room, wearing sunglasses. A asks...

- A1: bârun miyâd, *âre*?
rain comes, yes
'Is it raining?'

~~ The speaker expects it rains.

C1	C2	C3
✓	%✓	#

- A2: bârun miyâd, na?
 rain comes, no
 'Is it raining?'

C1	C2	C3
%✓	✓	#

↔ The speaker expects it rains.

- A3: bârun miyâd, ne-miâd?
 rain comes, NEG-comes
 'Is it raining?'

C1	C2	C3
#	#	✓

↔ The speaker expects it rains.

Based on speakers' final judgments, *âre*-tags are favored in situations where the speaker's prior belief and contextual evidence align, while *na*-tags are preferred when only the speaker held a prior belief. In contrast, VTQs require both types of bias in that the contextual evidence is against the speaker's belief.

Furthermore, while the anchor in the aforementioned instances indicates speaker's belief about the projected answer, each type of tag conveys additional information. Despite the apparent similarities in these questions, especially those featuring *âre* and *na* tags, their primary distinction lies in the strength of bias as we will explore below. To maintain brevity, I will focus on positive examples (110), (112), and (114), noting that the same analysis applies to their negative counterparts.

In example (110), the verbal tag indicates that the speaker doubts her belief expressed in the anchor (due to the contextual evidence). In other words, regarding their felicity conditions, the current contextual evidence leads the speaker to doubt her initial belief. For instance, in a context where the speaker initially believes that Ali came but notices that the lamp in Ali's office is off, question (110) reflects the conflict between the speaker's prior belief and the present context. Indeed, VTQs convey a lower degree of the speaker's credence (weaker bias) as they reflect speaker's doubt regarding the projected answer (for *credence*, see Farkas and Roelofsen 2017).

On the contrary, *âre*-tags exhibit a higher degree of credence (bias) when compared to *na*-tags (and VTQs), as exemplified in (112). In this instance, the speaker is quite certain about her belief and seeks confirmation from the addressee to validate it as the true answer. It is worth noting that in *âre*-tags, the speaker isn't certain enough

to assert her belief, but holds a high degree of credence in her prior belief (due to contextual evidence). However, in *na*-tags as illustrated in (114), the speaker has a lower level of credence in her prior belief (due to the lack of evidence). Consequently, *na*-tags signify the speaker's lower bias, in the sense that she expresses uncertainty about her prior belief.¹⁴

Returning to our earlier open discussion about the projected answer in conflicting situations from the previous section (see example (109)), we can now compare the projected answer in *mage*-questions and VTQs. We argued that in *mage* questions, OB relates to the previous mental state of the speaker and is not projected as the next answer move. While *mage* also requires CB, it seems the contextual evidence has convinced the speaker to consider it more likely than her prior belief, thus, she projects it as the next answer move. We observed that the informants interpreted OB in *mage*-questions in the past form: '*the speaker didn't expect that...*'. However, in VTQs, the OB is formed in the past but it also stays for the future answer. In other words, in VTQs, even though the current contextual evidence contradicts the prior belief of the speaker and makes her doubt, she still projects her belief for the next answer move, as *the speakers expects that....*

In example (117), A is quite sure that *Sol* is a vegan cafe, but B's suggestion of another cafe, *Voglhaus*, triggers a conflict with her belief that *Sol* is not a vegan cafe.¹⁵ In (A1), the speaker conveys her tentative belief that *Sol* is a vegan cafe, and although she may have doubts regarding the CB, she still projects *Sol is a vegan cafe* as the next answer move. While the scenario could potentially be a felicitous situation for *mage* in (A2), it is degraded (%), if not entirely infelicitous. This is because (A2) projects *Sol is not a vegan cafe* as the answer move, which does not align with the context. In other words, both (A1) and (A2) indicate that the speaker

¹⁴In my analysis, I use *doubt* to denote a weaker attitude compared to *uncertainty*. Specifically, doubt arises in the presence of contrary evidence, whereas uncertainty is linked to the absence of compelling evidence. I refrain from making any specific lexical specifications in this regard.

¹⁵It is worth noting that in (117), the speaker is quite confident in her belief, making it a strong candidate for the use of *are*-tags, which convey (tentative) certainty, or even *na*-tags, which are a stronger form than VTQs. However, as we discussed, these types are felicitous in different settings. *are*-tags require CB to align with OB, while *na*-tags do not tolerate any CB. Neither of these settings aligns with the scenario in (117), which is correctly predicted to be infelicitous for PTQs.

has a prior mental state regarding p , and she receives contextual evidence supporting $\neg p$. However, in (A1), the speaker expects her prior belief to be considered as the answer, while (A2) interprets the evidence as the answer, leading to its degradation.

- (117) A and B want to go out for brunch. They are currently near a cafe called *Sol*. B says that he is a vegan and suggests going to *Voglhaus*, a vegan cafe farther away. A, however, is quite certain that *Sol* is also a vegan cafe.

A1: Sol ham vegan-e, ni-st?
 Sol too vegan-is, NEG-is
 ‘Is Sol not vegan?’

A2: % mage Sol vegan ni-st?
 MAGE Sol vegan NEG-is
 ‘Is Sol not vegan?’

It is important to acknowledge that the robustness of both evidence in CB and belief in OB plays a significant role in determining the applicability of *mage*-questions and VTQs in conflicting situations. Both question types require $[OB(\phi) + CB(\neg\phi)]$ conditions. However, the choice between *mage*-questions and VTQs is influenced by the relative strength of CB and OB. Apparently, speakers tend to employ *mage*-questions when they are quite convinced by the contextual evidence, indicating that the evidence is more compelling than their initial belief. Conversely, VTQs are used when speakers maintain their faith in their prior belief over the contextual evidence. Consequently, the projected answer in *mage*-questions aligns with speaker’s wonder about the current context, while in VTQs, it aligns with speaker’s doubt. Further investigations are required to confidently assert the felicity with respect to the bias strength. Unfortunately, in our study, we focused only on the presence of OB and CB without delving into the nuanced role of the bias strength.¹⁶

To summarize, all three types of tag questions exhibit common semantic features (for their underlying syntactic structure, see Section 4.4.1). In each case, they convey the speaker’s tentative belief in the (assertive) anchor as the projected answer. However, different tags convey distinct attitudes, each reflecting varying degrees of bias. *âre-*tags indicate the highest degree of credence, suggesting speaker’s certainty towards

¹⁶One interesting situation to be controlled is the context of suggestions. VTQs might be applicable in suggesting scenarios, where the speaker holds a prior belief but doubts it within the context. In such cases, the speaker might suggest their belief tentatively through VTQs (cf. Malamud and Stephenson 2015). For example, in (117), (A1) might suggest going to *Sol*, while (A2) cannot do so. Exploring these nuances in suggesting contexts remains an avenue for future studies.

the projected answer. It is crucial to emphasise that, given the interrogative nature of TQs, this certainty remains tentative, and the speaker still needs to pose the question to achieve full certainty/commitment. In contrast, *na*-tags express a lower degree of credence, signaling speaker’s uncertainty regarding the projected answer. The conflict between the speaker’s belief and the current evidence in VTQs reflects speaker’s doubt about the projected answer. The following Table summarizes TQs data. Note that the gray-color in the Table signifies that the condition is not necessary but was (strongly) preferred for the related tag type.

	Projected Answer	Felicity Conditions	Bias Attitude
PTQs: ϕ , <i>are</i> ?	ϕ	$OB(\phi) + CB(\phi)$	<i>certainty</i>
PTQs: ϕ , <i>na</i> ?	ϕ	$OB(\phi) + CB()$	<i>uncertainty</i>
VTQs: $\phi, \neg\phi?$	ϕ	$OB(\phi) + CB(\neg\phi)$	<i>doubt</i>

3.4 The Proposal

In this section, we conduct a semantic-pragmatic analysis of biased questions, aimed at addressing two challenges outlined earlier: (I) the non-epistemic implicatures and (II) various felicity conditions (see Section 3.2). To overcome these challenges, we introduce the attitude facet in biased questions as the key solution. Our analysis unfolds in two key steps: firstly, we define the semantics of biased questions through an attitudinal conventional implicature (CI). Secondly, we argue that both the projected answer and felicity conditions can be derived from the attitude implicature. This approach effectively addresses the aforementioned challenges. On one hand, it elucidates how the attitudinal dimension aligns with the pertinent (modal) flavors outlined in challenge (I). On the other hand, the attitude implicature not only distinguishes between different questions within the same felicity conditions but also maintains the semantic coherence of the same question in various conditions.

This section starts with a presentation of our rationale for the CI type of bias implicature. Subsequently, we delve into the semantics of our biased questions, commencing with discourse particles in Section 3.4.2.1 and proceeding to tag questions in Section 3.4.2.2. Finally, Section 3.4.3 provides an overview of the proposed account, illustrating its contributions to the study of biased questions.

3.4.1 Bias and Dimensions of Meaning

Before defining the bias implication, it is worth to identify the appropriate linguistic category that best characterises its nature. I will begin by exploring less controversial categories, excluding the at-issue meaning of the question. Following this, I will examine presupposition as a potential alternative and present my rationale for rejecting it. Finally, I will outline the characteristics of conventional implicatures (CIs) (Potts 2005, Gutzmann 2015) that align with bias implicatures in questions with obligatory bias, acknowledging that in plain PPQs and NPQs, bias is context-dependent and can be canceled, manifesting as a conversational implicature.

According to Roberts (1996), the at-issue meaning is intricately linked to the Question Under Discussion (QUD). In polar questions $[\phi?]$, the at-issue content pertains to whether or not ϕ , representing the semantic meaning of all PQs. Conversely, bias offers supplementary information about the next answer move, which cannot be solely challenged by the responses themselves. For instance, consider example (118): both responses (B1) and (B2) are acceptable. The former only addresses the at-issue content, while the latter also acknowledges the speaker's expectation and expresses curiosity about the projected answer. However, response (B3) is infelicitous as it fails to address the QUD and instead challenges the not-at-issue content. Thus, the content of bias does not form a part of the at-issue meaning concerning the QUD.

- (118) A: Ali mehmuni raft dige?
Ali party went DIGE

‘Did Ali go to the party?’ \rightsquigarrow The speaker concludes that Ali went.

B1: $\hat{a}re$ ‘Yes’.

B2: $\hat{a}re$, to az kojâ fahmidi?
yes you from where understand
‘Yes, how did you get it?’

B3: # to az kojâ fahmidi?
you from where understand
‘How did you get it?’

While I refrain from presenting a definitive argument against presuppositions, I contend that bias bear a closer resemblance to Conventional Implicatures (CIs). Firstly, it is widely

accepted that presuppositions must already be part of the CG shared between the interlocutors, either due to prior knowledge or through accommodation. In contrast, bias inference is inherently speaker-oriented, hinging on the speaker's prior belief. Conceptualizing speaker's mental state as an inherent shared information in CG is challenging. Furthermore, if a presupposition fails, the meaning of the sentence becomes undefined. Conversely, the failure of a CI does not render the sentence devoid of meaning. I will illustrate that the breakdown of bias does not impair the intended meaning of the question.

As demonstrated in Section 3.3, TQs and questions containing discourse particles consistently signal bias inference. This suggests that the presence of bias is not contingent upon the context and cannot be denied. However, PPQs and NPQs have the flexibility to evoke bias contingent on the context. Furthermore, the implicature in plain PPQs and NPQs can be defeated, whereas it remains fixed in questions with obligatory bias. Given that context sensitivity and cancelability are characteristic traits of conversational and conventional implicatures, I propose that the bias displayed in plain PPQs and NPQs in Farsi is best categorized as conversational implicatures, while aligning with conventional implicatures for TQs and discourse particles. Let us now explore some features of CIs within the framework of bias implicatures.

The following examples illustrate false propositions. In (119), the breakdown of presupposition, where the satisfaction of the possessive pronoun fails, renders the meaning of the question undefined, *whether Ali's dog is lost*. Consequently, B cannot respond using the appropriate particles. Conversely, in (120), when the parenthetical CI is falsified, the question's denotation remains intact. The response particles effectively answer the question, while the addressee corrects the CI. Similarly, in (121), B rejects the potential bias of the speaker, yet the question's meaning remains unchanged.

- (119) A: sage Ali gom šode?
 dog Ali lost became
 ‘Is Ali's dog lost?’
 B: (# Yes/#No,) Ali doesn't have a dog!

- (120) A: sage Ali, ke mariz bud, morde?
 dog Ali that sick was died
 ‘Is Ali's dog, which was sick, dead?’
 B: Yes/No, but he wasn't sick, he had an accident.

- (121) A: Ali rafte morxasi dige?
 Ali went vacation DIGE
 ‘Did Ali go on vacation?’ ↗ The speaker expects that he did.
 B: Yes/No, but he didn’t tell anyone! You couldn’t have known.

Additionally, following Potts, CIs often offer commentary on the at-issue content while maintaining logical and compositional independence from the at-issue entailment. Signaling $\{p\}$ or $\{\neg p\}$ through bias implicature can be viewed as a subset of the denotation of the question’s at-issue content, $\{p, \neg p\}$, which does not alter the question’s core meaning but rather provides insights about the question. Moreover, the speaker-oriented nature of CIs aligns with bias inference, revealing the speaker’s attitude toward the projected answer.

Examining the *Antibackgrounding* feature of CIs in contrast to backgrounding presuppositions enriches our understanding. According to Potts, CIs typically introduce novel information that is not inherently part of the CG at the time of utterance, providing new information. Consequently, CIs are not easily backgrounded unless specific contextual circumstances permit the backgrounding of the at-issue content. On the other hand, presuppositions are often treated as integral components of the CG, although it is feasible to introduce novel information alongside a discourse effect, such as accommodation. Potts classifies CIs into two categories: supplemental expressions and expressives, both contributing discourse-new and speaker-oriented content. To illustrate the antibackgrounding trait of supplemental CIs, Potts provides examples like (122) (adapted from Potts 2005: p. 34). However, expressives appear to exhibit more flexibility, as exemplified in (123).

- (122) Lance Armstrong survived cancer.
- # When reporters interview Lance, a cancer survivor, he talks about the disease.
 - And most riders know that Lance Armstrong is a cancer survivor.
- (123) I hate John’s dog. The damn dog is is too noisy.

Bias implicature appears to bear a resemblance to expressive CIs. It often sounds redundant when expressed before the questions, as seen in (124). However, in some instances, it is not entirely infelicitous, as demonstrated in (125).¹⁷

¹⁷I am uncertain about how to interpret TQs within this test. Given that bias originates from the anchor, my assumption is that the speaker explicitly conveys her bias as new information, and it would be challenging to state that separately.

- (124) A: fekr-konam Ali emšab mehmuni mire. #/? mire dige?
 think Ali tonight party goes goes DIGE
 'I think that Ali goes to the party tonight. Dose he go?'
- (125) A: man xeili dust-dâram Ali beiad. miad ke?
 I very like Ali comes comes KE
 'I would like that Ali comes. Does he come?'

Overall, I refrain from making definitive claim for specific linguistic classifications of bias inference. Nevertheless, the observed data tends to align more with a CI, rather than presuppositional characteristics. Therefore, I propose that bias inference found in tag questions and questions with discourse particles be considered as conventional implicature. However, the classification of bias in plain PPQs and NPQs, where bias appears optionally, is treated as a conversational implicature. I defer further discussion on this topic for future explorations.

3.4.2 An Attitudinal Implicature

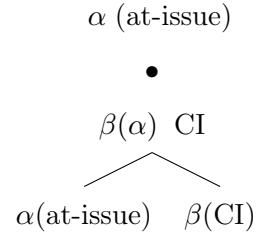
We can now proceed to define the semantic denotation of biased questions. I adopt the traditional approach presented by Hamblin (1973), where a question's meaning is determined by the set of possible answers. Additionally, I will consider distinct question operators in polar questions and TQs, each conveying its profile (Krifka 2015). Let's begin with the preliminaries, that is the semantics of the question operator in polar questions, PQ_{op} , as defined in (126). The operator, which is assumed to remain silent in Farsi,¹⁸ takes the expressed proposition ϕ and returns the equivalent of $\{\phi, \neg\phi\}$.

- (126) $\llbracket PQ_{op} \rrbracket = \lambda\phi_{<st>}. \lambda r_{<st>}. [r = \phi \vee r = \neg\phi]$

The question operator, shared across plain positive and negative polar questions, doesn't inherently indicate bias. Thus, the same operator in (126) shall be employed for plain questions as well as biased questions. As previously discussed, the potential bias within PPQs and NPQs emerges from the context. However, we emerge the bias in questions with discourse particles as a conventional implicature due to the presence of discourse particles. Since the work of Potts (2005), it has been widely accepted that not-at-issue contents, such as conventional implicatures, are semantically distinguished from the at-issue content (see also

¹⁸While polar questions in Farsi adopt the form of rising declaratives, I defer the exploration of employing rising intonation as a question operator for future inquiries.

Gutzmann 2015). Potts proposes a *multidimensional* approach to semantic interpretation, wherein semantic structures includes sets or tuples capturing denotations of both at-issue and not-at-issue contents. Multidimensionality facilitates the formal treatment of independent properties, ensuring that CIs are both compositionally and logically independent from the main intent of the utterance. The general schematic representation of this proposal is depicted below (adapted from Potts 2005: p. 48), where the dot/bullet (\bullet) serves as a metalogical device, separating independent contents, namely the at-issue and not-at-issue.¹⁹



3.4.2.1 Discourse Particles

Starting our exploration with biased questions featuring discourse particles, namely *ke*, *dige*, *mage*, the question operator generates the at-issue content $\{\phi, \neg\phi\}$, while the particles contribute bias implicatures related to the question prejacent ϕ . Although the at-issue meaning of all the questions with the particles, as defined in (127)–(129), is the same, at the CI level, each particle establishes its distinct bias profile. In these definitions, s denotes the speaker in the context c .

Building upon our data, we observed that *ke*-questions express the speaker's desire/hope. We interpret this desirability preference to reflect what the speaker considers realistic or likely, akin to the English verb *hope* and distinct from *want/wish* (see Heim 1992, Villalta 2008, Anand and Hacquard 2013, Portner and Rubinstein 2020). The particle *ke* in (127) conventionally implicates that among all the speaker's doxastic alternatives, the question prejacent p is more desirable (\succ) than its negation $\neg p$.

$$(127) \quad \llbracket \text{ke} \rrbracket^{c,w} = \lambda p . p \bullet \forall w' \in \text{Doxastic}_{s,w} : p \succ_{s,w'} \neg p$$

In other words, *ke* expresses a kind of emotive doxastic attitude, wherein the speaker hopes p in the sense that it is likely in her doxastic worlds. Given that, we can derive that the speaker

¹⁹Note the dot objects varies within the literature, contingent upon the specific linguistic structure. They are employed in the context of multi-dimensional semantics for conventional implicatures (Potts 2005) as well as complex speech acts (Asher and Lascarides 2001, Asher and Reese 2008).

projects her preference for p as the next answer move. That is she finds her hope likely to be the next answer move. Moreover, the speaker's doxastic (belief) preference regarding the prejacent necessitates her prior (doxastic) mental state, establishing the OB requirement as the felicity condition. It becomes evident that the presence of CB in *ke*-questions appears to be infelicitous. We posit that this infelicity arises from the inherent incompatibility between hoping and knowing p or $\neg p$ (Anand and Hacquard 2013, Portner and Rubinstein 2020). The presence of CB, whether in favor or against the prejacent, seems to function similarly to knowing p or $\neg p$, resulting in infelicity due to the incompatibility with hope. However, I acknowledge that this claim requires further investigation.

In (128), *dige* signifies that the question prejacent is defeasibly entailed (\approx) by the speaker's epistemic mental state. We define *defeasibly* as follow: A defeasibly entails B , $[A \approx B]$, if A plus certain normality assumptions logically entail B (cf. Stone 1994). In (128), the speaker draws an inference to the prejacent p , making p defeasibly entailed by her knowledge, rather than being strictly entailed (\models). Consequently, she poses a question instead of asserting her inference. In other words, *dige* conveys that p follows from the speaker's assumption through a particular indirect inference or prior knowledge (von Fintel and Gillies 2007). This inferential semantics for *dige* resonates with similar proposals for the English modal *must* (Stone 1994, Mandelkern 2019, Waldon 2021).

$$(128) \quad \llbracket \text{dige} \rrbracket^{c,w} = \lambda p . p \bullet \text{Epistemic}_{s,w} \approx p$$

From the question attitude, we can derive that the speaker projects her inferential proposition, p , as the next answer move. That is the conclusive inference makes the likelihood of p more than its alternative. Furthermore, the required felicity conditions of *dige*-questions align with the analysis presented by Anand and Hacquard 2013, where in epistemic modals, the speaker's inference arises from their prior knowledge or the available evidence in the context. This leads the conditions to the presence of prior belief (OB) and/or contextual bias (CB). It is crucial to note that any inconsistency between these bias types (i.e., OB and CB) is not tolerated, as it destroy the evidentiary basis on which such inferences rest.

Finally, the semantics of *mage* in (129) indicates that the question prejacent p is defeasibly entailed by the projected Common Ground (CG^*), despite being incompatible with the speaker's doxastic state. Extending on the CG^* in Malamud and Stephenson (2015), we assume that the indirect evidence supporting p within the context leads to a defeasible

inference of p in the CG^* . That is the indirect evidence for p is available to the interlocutors, but it is not yet added as a CG to their belief set. In other words, in the similar vein of our defeasible entailment concept, $[CG_{c,w}^* \approx p]$ implies that along with certain normality assumptions, p is defeasibly entailed by CG^* .

$$(129) \quad \llbracket mage \rrbracket^{c,w} = \lambda p. p \bullet CG_{c,w}^* \approx p \wedge p \cap Doxastic_{s,w} = \emptyset$$

Note that according to this definition, p is not within the speaker's belief state. This allows *mage*-questions in situations where p is not in the speaker's (active) belief state, as well as in cases where the speaker might anticipate $\neg p$, which reflects speaker's surprise (see the explanation for example (108)). While p is not part of the speaker's belief worlds, the speaker questions the validity of p , inferred from contextual evidence, to ensure it should be included in her belief state. If it turns out that p is true in the given context, the speaker must update her doxastic state to include p .

The implicature of *mage*-questions underscores two key aspects: the context suggests p , and the speaker didn't expect p , both of which revolve around p . Consequently, the question prejacent highlights p as the projected answer. In other words, the addressee perceives the conflict over p as the potential next move. Furthermore, the definition of *mage* in (129) precisely captures the essential conflicting setting between the ongoing evidential information in the context (CB) and the speaker's prior belief (OB). This interplay between contextual evidence and the speaker's prior belief forms the basis of the question's implicature, enhancing our comprehension of these biased questions.

3.4.2.2 Tag Questions

Shifting our focus to tag questions, we delve into a more intricate structure involving an declarative anchor and an interrogative tag. Prior research in this area can be broadly categorized into two main approaches: the *anchor-based* approach (Reese 2007, Malamud and Stephenson 2015, Krifka 2015) and the *tag-based* approach (Romero and Han 2004, Bill and Koev 2023a). The central premise of the anchor-based approach posits that the bias in TQs arises from the discourse effects of a declarative (assertive) anchor. In contrast, the tag-based approach suggests that the bias is introduced by the tag question itself, akin to the way it would occur if the tag were presented as a fully-formed question. Tag-based approaches often concentrate on reverse polarity tags and explore negative elliptical tag

questions as their corresponding forms in non-elliptical questions.

Our analysis predominantly aligns with the anchor-based approach, but we enhance the framework by incorporating the role of the tag on the attitude feature. Asher and Reese (2008) present an analysis for indirect and complex speech acts, such as TQs, using the *dot*-object, a linguistic construct that links distinct meanings within the same structure through rhetorical relations such as *elaboration*, *acknowledgement* and *confirmation* (for rhetorical relations, see Asher and Lascarides 2001; for TQs, see Reese 2007). The authors posit that tag questions are conventionally assigned a complex speech act type *assertion* • *question*. Building on this, I introduce a tag question operator (TQ_{op}), which offers a more nuanced understanding of the interplay between the anchor and the tag components.

I employ the same operator, TQ_{op} , for both verbal and particle TQs (VTQs, PTQs). So, let's briefly review the difference between our TQs. As elucidated in Section 3.3.3, it becomes apparent that in TQs, the speaker consistently projects the anchor proposition as the next answer move. Consequently, the projected answer remains consistent for ϕ across all three forms: $[\phi, \text{are?}]$, $[\phi, \text{na?}]$, and $[\phi, \neg\phi?]$.²⁰ However these forms diverge in the speaker's attitude, serving as the key distinguishing factor. In short, *are*-tags signify certainty, *na*-tags indicate uncertainty, and Verbal-tags convey doubts. Each of these attitudes is reflected in distinct required felicity conditions.

While the structure of VTQs and PTQs in Farsi comprises two propositions in the anchor and tag, they share numerous similarities.²¹ However, each tag type embodies distinct attitudes profile. Despite the absence of explicit elements in the predicate or the particles within the tag that encode the relevant attitude for each type, I propose the attitude of TQs emerges from the polarity relation between the propositions in the anchor and the tag.

Before delving into our proposal, it is crucial to briefly address the polarity of the omitted proposition within the tag. In VTQs, the remaining predicate explicitly carries the proposition's polarity, consistently adopting the reverse polarity form (i.e., $[\phi, \neg\phi?]$). However, in PTQs, whether the omitted proposition is positive or negative depends on the interpretation of the particle. In Farsi, polar particles (PolPrts) have dual readings: they can either mark a proposition as being positive (Pos) or negative (Neg) in the *polarity* reading, or they can

²⁰Note that ϕ can be either positive or negative, while $\neg\phi$ represents its complement.

²¹I consider the tag as a proposition with an ellipsis structure. While the particle (in PTQs) or the verb (in VTQs) stands as distinct remnants with an elided TP or VP, respectively, they yield the same type, namely a proposition (for further discussions on TQs' structure, see Section 4.4.1).

express agreement (Agr) or disagreement (DAgr) with an initiative in the *conformity* reading. In Chapter 4, I argue that PolPrts within tag questions may only be employed in the conformity reading. Consequently, the anchor proposition aligns with the same polarity in *âre*-tags $[\phi, \text{âre}^{Agr} \phi?]$ and the reverse polarity in *na*-tags $[\phi, \text{na}^{DAgr} \neg\phi?]$ (note that both particles function as identity functions; see (191)–(192) in Section 4.4.2.1).

Considering the underlying propositional structure in the tag, we propose that the distinction between TQs arises from two potential relationships between the anchor and the tag, namely, the same polarity $[\phi, \phi?]$ and reverse polarity $[\phi, \neg\phi?]$ relationships. The intuitive idea here is that not only does the anchor’s proposition play a role, but so does the tag’s proposition (cf. Krifka 2015 for the conjunction and disjunction relations of same and reverse TQs, respectively). Our proposed account integrates two insights from the literature. Firstly, building upon Malamud and Stephenson (2015), we assume that the discourse effect of declaratives anchors provides the speaker’s tentative belief.²² Secondly, following the concept of the salient proposition in polar questions, we consider the elliptical question prejacent as the highlighted proposition concerning the contextual setting (for saliency, see Krifka 2013, cf. highlighting in Roelofsen and Farkas 2015).

We posit that the bias in TQs involves the interaction between the two propositions in the anchor and the elliptical tag. On one hand, the anchor expresses the speaker’s prior belief, while the tag reflects the discourse context (the explanation about the contextual evidence and the tag proposition will be provided for each type of tag question shortly). On the other hand, the interplay between the propositions in these two parts shapes the bias attitude. It is crucial to emphasize that, given TQs’ interrogative nature, the anchor signals the speaker’s tentative belief. In other words, while the speaker holds a prior belief, she is not entirely certain to assert it confidently (due to the maxim of quality in Grice 1975).

We contend that the elliptical tag question highlights a proposition reflected from the context (evidence), which influences the bias attitude. Given that, two forms of TQs emerge: the same polarity $[\phi, \phi?]$ and the reverse polarity $[\phi, \neg\phi?]$. The same polarity relationship $[\phi, \phi?]$ conveys the speaker’s higher degree of credence, as she not only utters her tentative belief but also emphasizes the same proposition in the tag. Conversely, reverse polarity TQs $[\phi, \neg\phi?]$ indicate lower credence, as the speaker utters her tentative belief but highlights the

²²In the study by Malamud and Stephenson (2015), the anchor represents the tentative belief of either the speaker in reverse polarity TQs or the addressee in same-polarity TQs.

alternative proposition in the tag. Therefore, the same polarity relation represents more certainty on the speaker's attitude (higher credence), whereas the reverse polarity relation conveys an attitude of uncertainty (lower credence) (cf. the gradable bias strength in Farkas and Roelofsen 2017). We formulate our model as follow:

(130) **Relational Attitudes:**

- The question $[\phi, \phi?]$ indicates that the speaker's belief has high credence in the anchor. This is evident as the speaker not only utters her (tentative) belief in the anchor proposition but also highlights the same (polarity) proposition in tag.
- The question $[\phi, \neg\phi?]$ indicates that the speaker has lower credence in the anchor. That is evident as the speaker highlights the potential alternative option in the tag against her belief in the anchor.

Given the attitude relation, our proposed framework treats TQs uniformly.²³ It effectively derives the required bias types in the felicity conditions and determines the projected answer. With these considerations in mind, we can define the semantic denotation of TQs by employing the TQ_{op} operator and the relational attitude.

As depicted in (131), TQ_{op} takes the tag q and the anchor p propositions as input arguments, returning a polar question by q for the at-issue meaning.

$$(131) \quad \llbracket TQ_{op} \rrbracket = \lambda q. \lambda p. \lambda r. [r = q \vee r = \neg q]$$

$$\bullet \\ \left[\begin{array}{l} \text{if } q = p . \text{Doxastic}_{s,w} \vDash p \\ \text{if } q = \neg p . \text{Doxastic}_{s,w} \approx p \end{array} \right]$$

²³The support for the relational attitude and the intensity of bias in TQs is evident in other types of TQs too. For instance, invariant tags with the term *doroste* are employed when the speaker has a high level of credence in their belief and seeks confirmation from the addressee. The lexical meaning of *dorost-e* 'right-is' essentially inquiring, 'Is it right that...?'. Questions exemplified in (i) and (ii) demonstrate the speaker's high credence in the anchor, irrespective of the polarity of the anchor, given that the same proposition is presented in the tag question.

- | | |
|---|---|
| <p>(i) Ali mehmuni raft, <i>doroste?</i>
 Ali party went right
 'Ali went to the party, right?'
 ~ The speaker believes Ali went.
 LF: Ali went to the party, is that right
 that he went to the party?</p> | <p>(ii) Ali mehmuni na-raft, <i>doroste?</i>
 Ali party NEG-went right
 'Ali didn't go to the party, right?'
 ~ The speaker believes Ali didn't go.
 LF: Ali didn't go to the party, is that
 right that he didn't go to the party?</p> |
|---|---|

At the CI level,²⁴ if the anchor and tag propositions are identical, the question indicates p is entailed by the speaker's tentative beliefs. Conversely, if they are in reverse polarity, the anchor proposition is defeasibly entailed by the speaker's belief state. Thus, in the former relation, the bias attitude of the speaker towards her belief is stronger than in the latter form. It is worth emphasising the belief interpretation arising from the anchor is placed under a question speech act, making it a tentative belief rather than a full commitment/belief, as seen in declarative assertions.

With this foundation, we can derive both the projected answer and the felicity conditions of TQs. From the semantic denotation in (131), it is evident that in all TQs, the speaker projects her belief in the anchor as the next answer move, albeit with varying degrees of credence. In the same polarity relation TQs, the speaker expresses higher credence by signaling her tentative belief world compared to the defeasible entailment in reverse TQs, which signifies lower credence. Note in the reverse form, the anchor proposition is entailed by the speaker's doxastic framework, albeit defeasibly, under certain normality assumptions conditions. This leads to distinct projected answers in VTQs and *magie*-questions (see definition (129)).

Moving on to the felicity conditions, as discussed in Section 3.3.3, all TQs necessitate the presence of OB. We argue that the declarative anchor consistently embodies the speaker's tentative belief state, making the presence of OB in favor of the anchor proposition a constant requirement in the felicity condition of TQs. Furthermore, I proposed that the tag proposition reflects the CB in the tag proposition, which effects the attitude feature. The speaker employs different types of TQs to express varying attitudes regarding the presence of CB, either in favor or against her belief (OB), as well as cases without CB (cf. compelling evidence in Büring and Gunlogson 2000). Consequently, three distinct settings emerge, $[OB(\phi) + CB(\phi)]$, $[OB(\phi) + CB(\neg\phi)]$, and $[OB(\phi) + CB()]$, all fully derived from the question attitude.

Let's begin our analysis by examining VTQs, which explicitly appear in a reverse

²⁴It is worth to note that McCready (2010) proposes that certain linguistic elements contribute to both the at-issue and not-at-issue levels. This implies that these dimensions are not entirely distinct, and arguments have access to the alternate level (for more comprehensive insights, see McCready's work on the refinement of Potts's two-dimensional semantic system, L_{CI}^* , see also Gutzmann 2015). Building on that, the TQ_{op} operates within both at-issue and not-at-issue contexts.

polarity relation $[\phi, \neg\phi?]$. Empirical data demonstrates that VTQs convey speaker’s doubt and necessitate both $OB(\phi)$ and $CB(\neg\phi)$ conditions, which can be derived from our account. While the speaker needs prior mental state (OB) for her tentative belief, she may doubt by receiving contextual evidence (CB) against her belief. In essence, doubt in VTQs is triggered by conflicting bias types. Thus, the contradictory setting of OB and CB matches the speaker’s doubt in VTQs.

As discussed earlier, the use of *âre* in tags results in the proposition of the same polarity as the anchor $[\phi, \text{âre}(\phi?)]$. Furthermore, we have observed that *âre*-tags express speaker’s (tentative) certainty and they were favored in the setting with both $OB(\phi)$ and $CB(\phi)$ in the same polarity. This felicity condition aligns with the certainty attitude, where the speaker mirrors the contextual evidence in the elided tag proposition. Hence, the certainty attitude dictates that the speaker’s prior belief (OB) gains support from the contextual evidence (CB), and improve the bias credence.

In contrast, *na*-tags convey speaker’s uncertainty and were preferred in the presence of $OB(\phi)$ and neutral CB. We have argued that *na* in TQs results in a proposition in the reverse polarity of the anchor $[\phi, \text{na}(\neg\phi?)]$. Although this form is similar to VTQs, their felicity conditions differ, and this distinction can be attributed to the uncertainty attitude. While the speaker’s prior belief (OB) is determined by the declarative anchor, the absence of contextual evidence (CB) diminishes the degree of credence. Thus, *na*-tags exhibit uncertainty (a lower credence) regarding the lack of evidence for or against the speaker’s belief, aligning with its required felicity conditions.

It is crucial to address a notable point regarding reverse polarity TQs. The form $[\phi, \neg\phi?]$ is adopted by two types of TQs: VTQs and *na*-PTQs. One might question why the former conveys doubt while the latter expresses uncertainty. While providing a definitive explanation is challenging, we suggest that these readings have been conventionalized within each tag type through pragmatic competition. In other words, in VTQs, the conflict between OB and CB is highlighted by pronouncing the verb explicitly in reverse polarity, resulting in a doubt attitude.²⁵ On the other hand, *na*-PTQs

²⁵This may be related to the pitch accent carried by the verb in the tag, but I leave this aspect for further investigation.

denote the lack of certainty by the fully elided reverse proposition, which corresponds to the absence of CB. Although the logical form of *na*-PTQs and VTQs remains the same, their bias attitude and felicity conditions differ due to conventionalized pragmatic nuances. In other words, both *na*-TQs and VTQs semantically anticipate a lack of certainty. However, given their more explicit nature, VTQs intensify the uncertainty to the point of doubt. Consequently, when there is contextual bias favoring $\neg p$, VTQs are favored, whereas in the absence of CB, *na*-TQs are preferred.

3.4.3 Evaluating the Account

In the previous section, we examined our biased questions, defined their attitude implicature, and derived their projected answers and felicity conditions through the attitude facet. Within our framework, the semantics of biased questions inherently incorporate the speaker’s (potentially non-epistemic) attitude as a conventional implicature, either lexically or through syntactic structures. Additionally, the attitudinal implicature not only indicates the projected answer but also outlines the felicity conditions. Here, we argue that the incorporation of the attitude feature enriches the literature by addressing the challenges discussed earlier and deepening our understanding of biased questions. Let’s form our discussion in the following questions:

1. Why do we need the attitude feature in addition to the existing OB and CB?
2. Why discuss the projected answer when it is indicated by OB and CB?
3. How does the attitude feature enhance frameworks in biased questions?

The first question revisits the challenges discussed in Section 3.2, indicating the need for further tools in bias analysis. We propose to tackle these challenges by the attitude feature. Regarding the first challenge, (I) the non-epistemic (modal) flavors illustrate that biased questions may convey different modal senses, such as epistemic, doxastic, deontic, or bouletic meanings, irrespective of the felicity conditions, OB and CB. While some studies acknowledge such potential, the modal flavor of biased questions has not been thoroughly explored in the literature (Huddleston and Pullum 2002,

Asher and Reese 2008, Sudo 2013, among others, see also Van Rooy and Šafářová (2003) for informativity/goal-oriented view). Since the potential for such flavors was mostly context dependent, the scholars consider speaker’s prior bias in a broad sense, accommodating various flavors in specific contexts (see examples (77)–(80) above).

Our contribution from the Farsi data reveals specific non-epistemic modal flavors in certain question types. For instance, both *ke*-questions in (132) and *dige*-questions in (133) indicate that the question prejacent *that Ali passes the exam* is more expected than its alternative. However, *ke*-questions express speaker’s hope for the projected answer, while *mage*-questions convey speaker’s conclusive expectation. It is crucial to emphasize that the attitudes of the questions are maintained with the particle, regardless of the type of bias in the context, as evidenced by their felicity conditions.

- | | |
|---|---|
| <p>(132) Ali emtehān ro qabul-šod ke?</p> <p>Ali exam ACC passed KE</p> <p>‘Did Ali pass the exam?’</p> | <p>(133) Ali emtehān ro qabul-šod dige?</p> <p>Ali exam ACC passed DIGE</p> <p>‘Did Ali pass the exam?’</p> |
|---|---|

This observation leads us to the second challenge: (II) various felicity conditions, where we must explain the similarities and differences between two question types within the same setting and ensure the semantic coherence of a single type of question across different contexts. Table 3.1 provides an overview of our biased questions’ felicity conditions. Cells of the same color denote equivalent question types with question prejackets in reverse polarity.²⁶

		OB		
CB		<i>p</i>	neutral	$\neg p$
	<i>p</i>	<i>p,âre?</i> / <i>p-dige?</i>	<i>p-dige?</i>	$\neg p, p?$ / <i>p-mage?</i>
	neutral	<i>p,na?</i> / <i>p-ke?</i> / <i>p-dige?</i>	-	$\neg p,na?$ / $\neg p-ke?$ / $\neg p-dige?$
	$\neg p$	<i>p,âre?</i> / <i>p-dige?</i>	$\neg p-dige?$	<i>p,na?</i> / <i>p-ke?</i> / <i>p-dige?</i>

Table 3.1: The felicity conditions for biased questions in Farsi.

²⁶It is essential to acknowledge that due to the pragmatic nature of these conditions, native speakers might have varying judgments, finding a question acceptable in alternative circumstances. In such cases, the speaker might be disregarding specific context-provided information. For instance, *p-dige?* under $[OB(p) + CB(\neg p)]$ might be perceived as acceptable if the speaker overlooks contradictory evidence, especially if such evidence is weak (see footnote 12).

Regarding Table 3.1, on one hand, both *ke* and *dige* particles, exemplified in (132)–(133), are felicitous when the bias originates from the speaker’s prior belief. On the other hand, *dige*-questions are felicitous when the speaker’s original bias is preserved and/or concerning the contextual evidence, in all cases they consistently imply speaker’s conclusive inference. We propose the attitude feature serves as an indispensable tool, effectively characterizing the semantic coherence of a single question type, i.e., *dige*, across different contexts. Additionally, it helps elucidate the differences between various questions within the same setting.²⁷

We can now address our first question: (1) Why do we need the attitude feature in addition to the existing OB and CB types? We argue that OB and CB types have certain limitations. Firstly, they are inadequate for capturing the intrinsic non-epistemic nuances of specific question types. Secondly, they fall short in elucidating the differentiation between various questions in the same contextual setting. Our argument posits that the inherent attitude of each question type arises independently of these bias types. The inclusion of the attitude implicature within our framework not only addresses the presence of distinct non-epistemic modal flavors in biased questions (challenge I), but it also serves to maintain semantic coherence within of the same question across diverse settings and facilitates the differentiation of various question types within the same setting (challenge II).

Moving on to question (2), we address the objection that the projected answer can be derived via the bias types, rather than the attitudinal implicature. Previous studies have presented different accounts for biased questions, often employing the concept of bias implication where the question holds a higher likelihood for a particular answer. However, these accounts have not made a clear relation between the projected answer

²⁷It is noteworthy to address an objection I received from native speakers. Some individuals indicated that *dige* and *ke* questions also imply a form of conflict in the speaker’s beliefs. For instance, in (132), the speaker may contemplate the possibility that Ali did not pass the exam, while simultaneously hoping that he did. I do not interpret this as a conflict but rather as a required factor prompting the question. If the speaker were certain about her belief (even through the indirect evidence demanded by the Maxim of Quantity), she would not need to pose the question but easily assert it. The critic’s point largely centers on the speaker’s uncertainty (e.g., *Ali might not have passed the exam* vs. *she hopes he passed*). This distinction differs from the requirement of a conflict between OB and CB, as observed in questions involving the particle *mage*.

and the types of bias. In our analysis, we explicitly distinguish between the projected answer and the types of bias. While OB and CB must align with the projected answer, our investigation reveals that each type of question has a specific projected answer.

Regarding the types of bias (in the felicity conditions), we encounter two general settings to predict the next answer move. In settings where a question involves either one type of bias, such as $[OB(\phi)]$ or $[CB(\phi)]$, or both types in the same polarity $[OB(\phi) + CB(\phi)]$, the projected answer for ϕ can be directly derived from OB or/and CB, respectively. Consequently, the projected answer may correspond to the bias type(s) in these conditions. The issue arises when both bias types are present in reverse polarity, i.e., $[OB(\phi) + CB(\neg\phi)]$. In this setting, there are two potential projected answers: ϕ and $\neg\phi$, corresponding to OB and CB, respectively. Our investigation reveals that each type of question aligns with a particular projected answer, while different bias types may result in ambiguity.

Following Table 3.1, in the conflicting setting of $[OB(\phi) + CB(\neg\phi)]$, both *mage*-questions and VTQs are felicitous, each indicates a specific projected answer. One can suggest in such cases, the projected answer is conventionalized to one type of bias. For example, in *mage*-questions, the answer move is projected by the CB, while in VTQs, it is projected by the OB. Consequently, within the same condition, the projected answer in each type of question aligns with either type of bias. Although this view can explain the data, conventionalising bias types to the projected answer may contradict our observation that OB and CB were not native to question types. As we discussed earlier, *dige*-questions always project ϕ , whether triggered by $[OB(\phi)]$ or $[CB(\phi)]$. The attitudinal implicature of *dige* in (128) conveys that the question prejacent is defeasibly entailed by the speaker’s epistemic knowledge, which may originate from the speaker’s prior beliefs or contextual evidence. As a result, the projected answer can be inferred from the attitudinal implicature, regardless of the type of bias. Therefore, we suggest that the attitude implicature, shown in (127)–(131), as a more effective and intuitive solution for the time being. However, we leave the derivation of the projected answer from the bias types an alternative option.

It is worth noting that the conflicting setting in Farsi bears resemblance to HNPQs in

English, with inner and outer readings that double-check $\neg p$ and p , respectively (see Section 2.3.3). Examples (134) and (135), adopted from Romero and Han (2004), illustrate the speaker's prior belief for p , *that Jane is coming*, along with (indirect) contextual evidence for $\neg p$, resulting in $[OB(p) + CB(\neg p)]$.²⁸ Following the FALSUM and VERUM analysis in Section 2.2.2, in (134), the speaker expresses a low degree of certainty in adding *Jane is coming* to the CG. Conversely, in (135), the speaker indicates a high degree of confidence in adding *Jane is not coming* to the CG.

(134) A: A: OK, now that Stephan has come, we are all here. Let's go!

B: Isn't Jane coming (too)?

(135) A: Pat is not coming. So we don't have any phonologists in the program.

B: Isn't Jane coming (either)?

Therefore, in the setting of $[OB(p) + CB(\neg p)]$, it can be argued that in (134), the speaker expresses her prior belief in p , albeit with a low degree of certainty regarding the contrary evidence. That is she projects p as the next answer by double-checking its potential (as if she has still faith on her belief). Conversely, in (135), the speaker projects $\neg p$ as the answer move by double-checking it (as if she is already convinced by the contextual evidence and wants to revise her belief). Further investigations are needed for any claim about the projected answer in English questions.

To address the third question, (3) How does the incorporation of the attitude feature enhance frameworks in biased questions?, our proposal for the attitude feature provides the advantage of quantifying the likelihood/preference of the embedded proposition, indirectly influencing the projected answer. It is worth clarifying what I mean by quantification. While an assertion entails the speaker's full commitment to a proposition as their belief state, unbiased questions lack any level of commitment/belief.²⁹ In contrast, biased questions reveal varying degrees of expectation/preference for the projected answer. Thus, if we conceptualize belief as a gradable scale (ranging from

²⁸In (134), A's utterance allows one to infer no one else, including Jane, is coming ($\neg p$). In (135), given that Jane is a phonologist, one can infer that she is not coming ($\neg p$) based on A's statement.

²⁹By full commitment, I mean within the context of non-quantified assertions. It should be noted that assertions can also convey varying degrees of commitment through modifiers like *probably*, *likely*, *must*, *should*, *could*, etc.

0 to 1), assertions signify the highest degree of belief/commitment (≈ 1), while unbiased questions represent the lowest degree (≈ 0). Biased questions fall somewhere in between, their position on the scale varying based on the type of question (see gradable bias in Farkas and Roelofsen 2017).

Numerous scholars have contributed to discussions concerning the variability of bias implicatures across different types of questions, often emphasizing aspects such as attitude or bias strength. From one perspective, Huddleston and Pullum (2002) propose the existence of deontic and bouletic flavors in addition to the epistemic sense of bias in negative polar questions. Asher and Reese (2008) introduce the concepts of *acknowledgment* and *confirmation* rhetorical relations for reverse tag questions, respectively. Similarly, Malamud and Stephenson (2015) differentiate between speaker-oriented and addressee-oriented bias in questions of the same and reverse polarity.

The second perspective introduces varying degrees of bias strength for each question type. Farkas and Roelofsen (2017) employ the concept of *credence*, representing the degree to which the speaker believes a proposition to be more likely than its complement. Three levels of credence—low, moderate, and high—are proposed, with different levels assigned to different forms of biased questions. For instance, rising TQs indicate a moderate to high level of credence for the next answer move, while falling TQs denote a high level. Similarly, Bill and Koev (2023b) advocate for differentiating between weakly and strongly biased questions.

The attitudinal bias implicature proposal effectively integrates both the speaker's attitude (as discussed in the first perspective) and the strength of bias (as discussed in the second perspective). Building on Hintikka (1969), propositional attitudes can be conceptualized as (universal) quantifiers over possible worlds with different access flavors, including doxastic, epistemic, or bouletic. Therefore, attitude predicates like hope, believe, and know (similar to modal operators in Kratzer 1977) act as quantifiers aligned with the speaker's preference, belief, or knowledge.³⁰ This reflects the

³⁰In Hintikka (1969), it is pointed out that propositional attitudes involve quantification over the possibilities or likelihood of a proposition, a characteristic feature of representational attitudes (Bolinger 1968). Anand and Hacquard (2013) introduce a distinction between representational and non-representational attitudes. Representational attitudes such as *know*, *believe* pertain to the informational state and make predictions about the likelihood of a proposition across different

gradable strength of bias for the projected answer.³¹ Consequently, the bias attitude (modal base) is semantically embedded within each question, whereas the bias (modal) force/strength can shift contextually depending on the type of bias.

In our framework, the attitudinal implicature of each question is semantically defined and characterizes the cohesion of the same question across diverse conditions. However, the nature of bias conditions, OB and CB, influences the modal force of the attitudes, thereby impacting the bias strength. This variation in bias types serves as the distinguishing factor for questions of the same type within different contexts, as observed in *dige* questions (see Table 3.1). As we explained the semantic cohesion of *dige* in different settings through its deductive attitude, we can now extend our argument to state that *dige* can exhibit the deductive implicature with different strengths, facilitated by OB or/and CB.

The strength of modals and attitudes, operating as modal force, is contingent on the context. For instance, a statement like *You must stop singing*, uttered by a friend (due to one's poor singing skill), conveys less modal force compared to the same statement coming from a doctor (due to a throat injury).³² Similarly, the identical attitude within a question can imply varying degrees of bias strength depending on the type of bias resources employed. For example, a *dige*-question utilizing an OB resource might suggest a milder bias compared to the same question employing a CB source.³³ Hence, while the bias attitude is semantically embedded in each question,

possible worlds. Conversely, non-representational attitudes, like *desire*, establish a preference order. Moreover, Anand and Hacquard illustrate how preference attitudes can be integrated with degree modifiers. For instance, expressions like *what I want/wish the most* indicate the intensity of the preference (that means preference predicates are not binary). In the context of bias strength, I regard the quantitative property of epistemic attitudes and the gradable nature of preference of bouleptic attitudes to be comparable. Exploring the potential differences between these properties presents an intriguing area for future investigation.

³¹An advantage of incorporating the attitude feature, as opposed to only concentrating on bias strength, lies in the fact that bias strength is conveyed by the attitude itself (manifested through its quantitative or gradable nature, as discussed in footnote 30). However, the attitude flavor cannot be derived only from the bias strength. This signifies that relying only on the bias strength feature would not be sufficient due to the absence of attitude flavor. Conversely, incorporating both attitude and strength aspects would amount to redundancy, as the attitude feature inherently includes the strength dimension. Consequently, explicitly delving into the strength of bias is unnecessary, as this facet can be adequately explored through propositional attitudes.

³²Notice that in both cases, the modal flavor *must* remains the same (see Kratzer 1977).

³³It is essential to clarify that this does not imply that OB is inherently weaker or stronger than

the bias force or intensity can vary contextually.

Furthermore, the attitude facet introduces a novel tool that not only enriches cross-linguistic investigations, including different forms of biased questions but also facilitates a fine-grained analysis of questions that have the potential to express different attitudes in appropriate contexts. This development prompts a reconsideration of our perspective concerning PPQs and NPQs. As discussed in Section 3.3.1, these question types have the capacity to convey bias in specific contexts; however, this bias implication is not obligatory and can be inferred as a conversational implicature. Although we demonstrated that these questions can indeed express varying attitudes, further explorations are necessary to fully grasp their nuanced profiles. We hypothesize that our account can be extended to encompass these question types as well, providing a more comprehensive understanding of their biases and attitudes.

3.5 Summary

This chapter presented a substantial body of data from Farsi, including polar questions with discourse particles *ke*, *dige*, and *mage*, and tag questions featuring verbal and particle tags. We proposed that biased questions exhibit variation across three crucial dimensions: (i) the projected answer, (ii) the felicity conditions, and (iii) the bias attitude. We delineated the semantics of each question type, incorporating the speaker’s attitude as a hard-coded conventional implicature. Subsequently, we derived the projected answer and the felicitous conditions for each question type from this attitudinal implicature. We contended that the speaker’s attitude serves as the key point for addressing the existing challenges in the literature. Firstly, it accommodates both epistemic and non-epistemic interpretations of biased questions. Secondly, the attitude feature not only distinguishes between different question types within the same felicity conditions but also remains consistent for the same question type across different settings, thereby ensuring its semantic coherence.

CB, as both can be expressed with diverse degrees of strength, and the evidence can also weakly or strongly indicate an inference. A comprehensive investigation is left for future research.

Chapter 4

Polar Particles

4.1 Introduction

Pope (1976) points out that cross-linguistically, polar particles (PolPrts) may serve two distinct purposes. They can indicate a response as being either positive or negative, referred to as the *polarity* reading, observed in Chinese and Swedish. Alternatively, they can express agreement or disagreement with an initiative (including both assertions and polar questions), I call it the *conformity* reading,¹ as in Japanese. In some languages, such as English and Farsi, the same particles can have both readings. For instance, in English, *Yes* can indicate a positive response in the polarity reading or agreement with an initiative in the conformity reading. Similarly, *No* can express a negative response or disagreement with an initiative in the respective reading. Consequently, PolPrts, in either of the reading, end up expressing the same proposition in response to positive initiatives as in example (136), but generate different propositions in response to negative initiatives as in example (137).

(136) A: Did John come to the party?

B1: Yes, he did. Polarity[Positive]/Conformity[Agreement]

B2: No, he didn't. Polarity[Negative]/Conformity[Disagreement]

¹This reading is commonly referred to as the *truth-based* or *(dis)agreement* reading. However, the term *truth-based* might imply that the other reading does not involve truth values. Additionally, the term *(dis)agreement* can be confusing, as *agreement* and *disagreement* are used to denote the feature values of particles (*Yes* and *No*, respectively). Therefore, for the sake of clarity, I propose referring to it as the *conformity* reading.

- (137) A: Did John not come to the party?

B1: Yes, he DID.	Polarity[Positive]
B2: Yes, he didn't.	Conformity[Agreement]
B3: No, he DID.	Conformity[Disagreement]
B4: No, he didn't.	Polarity[Negative]

The acceptability judgments regarding different answers to negative initiatives may vary among speakers (in different languages). While both readings are felicitous, the presence of prosodic saliency² as in (137.B1, B3) can play a role in enhancing the acceptability of particular answers.

Although PolPrts often accompany a short answer referred to as the *prejacent* (e.g., ‘*he did*’ in the above examples), they can also occur in isolation, leading to ambiguity, as illustrated in (138).

- (138) A: Did John not come to the party?

B1: Yes.	meaning ‘ <i>he did</i> ’ or ‘ <i>he didn’t</i> ’
B2: No.	meaning ‘ <i>he did</i> ’ or ‘ <i>he didn’t</i> ’

At first glance, bare particles in response to polar questions may resemble *fragment* answers to Wh-questions, such as *Who came to the party? John*. While the fragment answer stands as the remnant constituent of the complete propositional answer, i.e., *John came to the party*, in which the gray part is elided, one might question if the same applies to PolPrts as in (138). This presents a puzzle in the literature of PolPrts, I refer to it as *the underlying structure* puzzle. This puzzle questions whether PolPrts are part of a larger form where the meaning comes from the (elided) prejacent or if they are anaphoric³ to a proposition in the initiative.

There are two additional puzzles that we will consider in this study. The second puzzle concerns *the source of ambiguity* in (bare) PolPrts.⁴ While some syntactic accounts

²I intentionally avoid using terms like *focus* since the type of focus is a topic of debate in the literature (Goodhue and Wagner 2018). In general, I refer to it as *prosodic saliency* and similarly *focal stress* in the sense of an increase in pitch range and/or duration (see Section 6.3.3).

³Note that in anaphoric accounts, the particle can still form a single proposition with a fully or partially elided prejacent (as a mono-clause) or independently refer to the antecedent while the prejacent has its own ellipsis form (as a bi-clause). We will talk about all of them in the next section.

⁴What I (and many researchers) refer to as *ambiguity* is referred to by different terms in the liter-

reject the ambiguity in examples like (138),⁵ the possibility of different propositions with the same particle in (137) is explained as a kind of relation between the polar particle and the polarity projection in the initiative or prejacent. Generally, one group claims that the ambiguity lies in the initiative, suggesting that negative initiatives offer two possible antecedents (Ginzburg 1997, Krifka 2013, Holmberg 2013), while the other group places the burden on the particles, which can indicate different features (Pope 1976, Kramer and Rawlins 2009, Roelofsen and Farkas 2015).

The existence of multiple options for responding to negative initiatives poses the third puzzle about the *optimal particle*. While different theoretical accounts propose various constraints to evaluate the available options and determine the most optimal one, experimental studies (Brasoveanu et al. 2012, Claus et al. 2017, Repp et al. 2019) show variation among speakers. This necessitates the incorporation of gradable optimality theories within current models to account for the observed variation. It is worth recalling the role of prosody in disambiguating the meaning, where focal stress can lead to rejecting answers as in (137.B1, B3). That is, the presence and absence of focal stress help the speaker and the addressee encode and decode the proper reading (for further discussion and experimental data, see Chapter 6).

Allow me to clarify two terms that will be frequently used in this discussion: *Accepting* and *Rejecting* answers.⁶ Adhering to their literal meanings, an Accepting answer denotes a response in which the addressee accepts the proposition uttered in the initiative. Conversely, a Rejecting answer signifies a response that refutes/rejects the question's proposition. The concepts are regardless of the polarity of the initiative and the answer. To illustrate, in the context of positive questions $[p?]$, such as in (136), response (B1) $[p]$ represents an Accepting answer, whereas (B2) $[\neg p]$ serves as the Rejecting. Conversely, in negative forms $[\neg p?]$, as in (137), responses (B2) and (B4) $[\neg p]$ are Accepting answers, while (B1) and (B3) $[p]$ are the Rejectings.

ature, such as *multifunctionality*, *negative neutralization*, or *interchangeability*, all of which roughly describe the ability of PolPrts to precede both positive and negative prejacent as in (137).

⁵In short, they claim that in (138), the only possible meaning is a negative answer (i.e., *he didn't*), and a positive answer necessarily requires an explicit prejacent (for more details, see Section 4.2.1).

⁶In my earlier papers (Mohammadi to appear, Mohammadi 2023b), I referred to these responses as *Affirmation* and *Opposition* answers, respectively. However, I found the terms confusing and decided to use Accepting and Rejecting instead.

In this chapter, I investigate polar particles in Farsi, namely *âre* ‘yes’ and *na* ‘no’, which have both polarity and conformity readings. Furthermore, they can be used in interrogatives, including tag questions (TQs) and alternative questions (AltQs). In terms of theoretical framework, I adopt an anaphoric approach to address the underlying structure puzzle and present Farsi examples, supporting a mono-clausal relation between the particle and prejacent. The data from Farsi contributes two noteworthy points to the existing literature. Firstly, I highlight the significance of initiative in determining the particle preference in declarative responses. Secondly, I will address the absence of ambiguity, which I refer to as *unambiguity*, in PolPrts used in interrogatives. This characteristic poses a challenge to existing accounts.

Therefore, I propose a solution for the second puzzle based on lexical ambiguity, positing separate entries for each reading of PolPrts. Furthermore, I argue that the different readings of PolPrts are anaphoric to distinct discourse referents (DRs). Consequently, I extend the analysis within the framework of dynamic discourse to account for the requisite DRs. This approach enables us to make predictions regarding the appropriate lexicon to be employed in interrogatives, while shedding light on the third puzzle. I put forth the notion of bias in the initiative as the primary parameter for selecting the optimal particle. The preference for a particular particle is contingent upon the type of initiative, which may exhibits bias inherently (in various strength). The comprehensive discussion of the three puzzles offers a syntactic-semantic-pragmatic perspective on PolPrts, elucidating their behavior and usage in Farsi.

This chapter is organized as follows: in the next section, I will review the literature on PolPrts and explore how they address the puzzles. In Section 4.3, I present the core data of polar particles from Farsi in both declarative responses and interrogatives. In Section 4.4, I present my analysis of the data, starting with our arguments about the underlying structure of PolPrts. Proposing our account in two main steps, I firstly define the lexical entries, and then, I extend the account within the framework of dynamic discourse, employing the Scoreboard model. The account is subsequently applied to the data. Finally, we briefly discuss the chapter in Section 4.5.

4.2 Previous Accounts

A substantial and expanding body of literature has been dedicated to the investigation of polar particles, particularly their usage in declarative statements as responses to polar questions (PQs) or reactions to assertions. Broadly speaking, the existing accounts can be categorized into two main perspectives: syntactic and semantic, each aiming to address the underlying structure and ambiguity puzzles associated with polar particles. In this section, I will categorize the studies into three primary approaches, acknowledging that there may be some overlap between them.

First, there are studies that do not support the idea of ambiguity in bare PolPrts. According to these accounts, polar particles serve as polarity interpreters in relation to the polarity projections of their prejacent. Syntactically, these accounts allow for a positive or negative prejacent to be elided, thereby restricting certain meaning for bare particles and necessitating the presence of an explicit prejacent for the other meaning. The second and third approaches both consider PolPrts as propositional anaphoras, referring back to a salient referent. However, they differ in their explanations for the source of ambiguity. The second approach posits that negative initiatives give rise to multiple (propositional) referents, thereby causing the ambiguity. The third approach, on the other hand, suggests that the particles themselves contribute to the ambiguity by performing dual functions.

4.2.1 Polarity Interpreter

Kramer and Rawlins (2009) propose an account based on ellipsis structure,⁷ where polar particles (PolPrts) adjoin the polarity projection ΣP of the prejacent with a TP complement. Thus, the particle and the complement form a single clause, let's call it *mono-clause* structure. The prejacent is licensed to be elided by the $[E]$ feature,⁸

⁷The discussion about ellipsis is mostly divided into LF-Copying and PF-Deletion (Chao 1988, Merchant 2001). In case of PolPrts, most studies (including Kramer and Rawlins (2009) and Holmberg (2013), that I summarize here) refer to PF-deletion, though they did not argue against the copying. The debate is beyond the scope of this study, and I follow them for the PF-deletion.

⁸Merchant (2005) introduces Ellipsis-feature $[E]$ necessary to elide a part of speech. An expression counts as E-given iff E has a salient antecedent A , and modulo \exists -type-shifting: **i**) A entails F-closure(E), and **ii**) E entails F-closure(A).

introduced by Merchant (2005), which is semantically identical to the antecedent. The authors define PolPrts as adverbial response markers with different polarity features. While *Yes* has no polarity feature [\emptyset] to mark, *No* carries a *Negative* [NEG] feature. They argue that particle *No* forms a negative concord⁹ with the remaining polarity projections, where only one of the negations in the chain can be interpretable [iNEG] and the rest are uninterpretable [uNEG].¹⁰ Consequently, this structure explains why a negative particle can co-occur with the sentential negation (e.g., *No, he didn't*) without resulting in double negation in standard English.

Now, let's examine their account for (bare) PolPrts. In this approach, the prejacent always exists but may be fully or partially elided. The elided part is represented in gray, and the LF (logical form) of the initiative is represented in blue. In positive polar questions (PPQs), as shown in (139), the elided TP in (B1) is identical to the initiative, allowing *yes* to easily express a positive answer.

(139) A: Did he come? [TP He [ΣP came]]

B1: Yes. (meaning 'he did.')

$[\Sigma P$ Yes $[\emptyset]$ $[\Sigma P_{[E]}$ [TP he [ΣP came]]]]

B2: No. (meaning 'he didn't.')

$[\Sigma P$ No $_{[uNEG]}$ $[\Sigma P_{[E,iNEG]}$ [TP he [$\Sigma P_{[uNEG:not]}$ came]]]]]

While the ΣP in the elided prejacent in (B2) may appear different from the initiative, the authors argue that the negative feature in the elided ΣP is not problematic for the semantic identity condition (à la Merchant 2005) because the feature in the ellipsis is uninterpretable. In other words, [uNEG] is semantically null and identical to the unvalued/null ΣP in the antecedent.¹¹ They propose that higher [iNEG] is a silent

⁹The authors did not explain how exactly the chain should be implemented and they refer to Zeijlstra (2004) for the general discussion.

¹⁰They assume that the interpretable negation [iNEG] should be located as low as possible in the concord chain, which is why they present it in the head of ΣP and not with the particle. This assumption is necessary for the identity condition to work, and they propose that it may be derived from a principle such as non-metalinguistic negation cannot scope high.

¹¹This implies that they assume if the feature is either unvalued or uninterpreted, it would not contribute to the identity condition. However, I am not sure why exactly the ΣP in the antecedent of (139) is not assigned a positive value at the first place? Does it mean that an unvalued projection is interpreted by default as a positive value? If so, the unvalued projection semantically means

negation, where its representation can be in the elided site.

Moving on to negative polar questions (NPQs) in (140), Kramer and Rawlins reject the possibility of a positive reading with bare PolPrts as in (B1) and (B2) due to the identity failure. They present (B3) and (B4) as the only possible readings, where the prejacent is identical to the antecedent.

- (140) A: Did he not come? $[\text{TP} \text{ He } [\Sigma P_{i\text{NEG}} \text{ didn't come }]]$

B1: #Yes. (meaning 'he did.')

$[\Sigma P \text{ Yes}_{[\emptyset]} [\Sigma P_{[E]} \text{ } \cancel{\text{TP he } [\Sigma P \text{ came }]}]]$ ✗ Identity failure

B2: #No. (meaning 'he did.')

$[\Sigma P \text{ No}_{[u\text{NEG}]} [\Sigma P_{[E]} \text{ } \cancel{\text{TP he } [\Sigma P \text{ came }]}]]$ ✗ Identity failure

B3: Yes. (meaning 'he didn't.')

$[\Sigma P \text{ Yes}_{[\emptyset]} [\Sigma P_{[E]} [\text{TP he } [\Sigma P_{i\text{NEG}} \text{ didn't come }]]]]$

B4: No. (meaning 'he didn't.')

$[\Sigma P \text{ No}_{[u\text{NEG}]} [\Sigma P_{[E,u\text{NEG}]} [\text{TP he } [\Sigma P_{i\text{NEG}} \text{ didn't come}]]]$

The authors mention that following the semantics of Hamblin (1973), the denotations of both PPQs and NPQs are the same ($p, \neg p$). Consequently, one might expect PolPrts to have the same meaning in response to both types of questions, or their functions should swap (i.e., in response to NPQs, *yes* should mean $\neg p$ and *no* should mean p). However, this is not the case (compare (140.B3-B4) to (139.B1-B2)). Kramer and Rawlins refer to the answers in (140) as exhibiting the *negative neutralization* property, where both particles appear to mean the same thing.

While they reject the ambiguity of bare PolPrts, they explain the puzzle as an interchangeable use of PolPrts with both positive and negative prejacent. The authors claim that PolPrts are available with a positive answer only if the polarity of the propositional prejacent is made explicit (e.g., by using the auxiliary verbs in English). Then, *Yes* as a featureless particle easily follows an explicit prejacent, as

a positive polarity and it cannot be semantically identical with [uNEG]. Notice that the authors present their account for PolPrts in response to polar questions, arguing that it could be extended to assertions too. However, even if we assume the ΣP in PQs is unvalued in the sense of null interpretation, similar to *open* value in Holmberg (2013), we cannot explain the same analysis in response to assertions.

shown in (B5). However, they introduce particle *No* in (B6) as a *Reversal-No* (lexically different from the other *No* in (140.B2)). It is worth noting that both responses below require corrective focus (hosted by the auxiliary verb in English) to indicate the incompatibility of the prejacent.¹²

- (140) B5: Yes, he DID. [Σ_P Yes[\emptyset] [TP he did [$vP_{[E]}$ come]]]
 B6: No, he DID. [Σ_P No[REV] [TP he did [$vP_{[E]}$ come]]]

Krifka (2013) raises a fundamental issue with this account, where it cannot prevent the answer in (141) as infelicitous. Since *Yes*, as a featureless particle, does not check any polarity agreement, when it precedes an explicit negative prejacent as in (B), it would not raise any syntactic issues.

- (141) A: Did John come?
 B: # Yes, he didn't

Furthermore, Roelofsen and Farkas (2015) point out that syntactic approaches do not establish any (anaphoric) link between PolPrts and the initiative, while explaining everything based on the polarity relation between the particle and prejacent. Thus, in the case of having a full prejacent, PolPrts could be used at the beginning of a conversation. For example, one can say, ‘*Yes! John comes to the party*’ out of the blue. They prevent such cases semantically by defining PolPrts as ‘response’ markers. In other words, they need semantics after all.

All together, from a lexical perspective, Kramer and Rawlins propose an asymmetric analysis of *Yes* and *No*. They introduce two morphosyntactic variants of *No*: one as a feature marker ([i/uNEG]) and the other as the *Reversal-No*. In contrast, they take the same *Yes* in different readings. Furthermore, their analysis restricts bare particles in response to negative initiatives, as illustrated in (140), to only one reading, namely the negative answer, despite the existence of ambiguity for both positive and negative meanings for many speakers.

¹²Kramer and Rawlins (2012) show that in languages with specific particle for positive answers to negative initiatives, like German *doch* or French *si*, the particles are exclusively indicating the reverse feature so that they don't necessarily need focus, and their bare form works unambiguously.

Another influential study from a syntactic perspective is Holmberg (2013), which primarily focuses on the potential meaning of bare PolPrts. He shares the polarity interpreter relation of PolPrts with the (elided) prejacent with Kramer and Rawlins (2009). However, the analysis proposed by Holmberg is based on the scope of negation in the initiative. In this account, Holmberg introduces three types of negation in English, which are structurally distinct based on their position.¹³

Holmberg posits that sentence-internal polarity projections (*PolP*) can take on one of the following values: $\{\text{affirmative}, \text{negative}, \text{open}\}$, where *open* represents an unvalued variable that is neither affirmative nor negative (see footnote 11). The author argues that certain types of initiatives, such as PPQs, have an open value, represented as an unvalued *[uPol]*, while other types, like declaratives, have a filled *PolP* with either an affirmative or negative value. Furthermore, Holmberg introduces PolPrts as variable binders that sit in the specifier position of the Focus Phrase (*FocP*) and accompany a prejacent that is identical to the proposition in the initiative.¹⁴

In short, in this analysis, PolPrts find the *[PolP]* and either assigning values to them (if unvalued) or ensuring that they are in agreement. Failure to do so leads to an infelicitous interpretation. Additionally, Holmberg introduces two types of *No* particles. One is inherently valued as an interpretable negation, used in negative responses to positive initiatives. The other *No* particle is uninterpretable and functions within a negative concord chain (following Zeijlstra 2004), used in negative responses to negative initiatives (cf. *[iNeg]* and *[uNeg]* in Kramer and Rawlins). Semantically, the former *No* is a complement function, while the latter is an identical function.

Let's begin by examining the analysis of PPQs. According to Holmberg, PPQs involve unvalued *[uPol]*. Consequently, in response to example (142), *Yes* in (B1) assigns an

¹³Holmberg introduces three types of negation in English: (i) the first type is referred to as outer negation, as described by Ladd (1981), where lexical negation (*not/n't*) is interpreted outside IP and has sentential scope. Holmberg labels this as the "highest negation". (ii) The second type involves cases of low negation, where *not* is interpreted with scope over vP/VP, negating that constituent. (iii) The third type is called middle negation, where *not/n't* are interpreted IP-internally, but with sentential scope. It is important to note that while Holmberg bases his account on these three types, he acknowledges that for some English speakers, *n't* does not have the middle negation reading.

¹⁴Holmberg (2013) claims that the elided prejacent has an *PolP* (IP in his term), which should be semantically and syntactically identical to the LF of the initiative.

affirmative value to $[uPol]$, while *No* in (B2) assigns a negative value. This leads to the formulation of positive and negative propositions, respectively.

(142) A: Did he come? $[FocP \text{ Did } [PolP \text{ he } [Pol'_{[uPol]} [vP \text{ come }]]]]$

B1: Yes. (meaning 'he did.')

$$= [FocP \text{ Yes}_{[Aff]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Aff]} [vP \text{ came }]]]]}^{\downarrow}$$

B2: No. (meaning 'he didn't.')

$$= [FocP \text{ No}_{[Neg]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Neg]} \text{ not } [vP \text{ come }]]]]}^{\downarrow}]$$

It is important to mention that in the analysis by Holmberg, the presence of a negative prejacent in (B2) does not violate the identity condition because the polarity feature in the antecedent is unvalued ($[uPol]$). As a result, the elided constituent and the antecedent are semantically identical up to the evaluation of variables, and an unvalued feature does not conflict with the identity condition (cf. Kramer and Rawlins 2009).¹⁵ Therefore, the negative feature in the response *No* is sufficient to express that the answer is a negative proposition, even if the negative answer is elided. Semantically, *Yes* can be understood as functioning as an identity function, while *No* appears to operate as a complement function.

Regarding negative questions, the author presents two syntactic structures (LF) with different *PolPs*, arguing bare PolPrts are exclusively available for negative interpretations. In example (143), LF1 involves low negation that scopes over the verbal phrase (vP), resulting in an unvalued *PolP* that requires assignment. In the responses, (B1) with *Yes* affirms the truth of the negative proposition, while (B3) with *No* exhibits negative agreement chain. However, responses with positive meanings, such as those in (B2) and (B4), are infelicitous due to (B2) failing to satisfy the identity condition of ellipsis and (B4) resulting in a negative elided proposition.

¹⁵Holmberg (2016) argues that the head of *PolP* in the ellipsis is a variable that is focus-bound. Following Merchant's F-closure definition, this variable does not count as a requirement for the identity condition (for a more detailed discussion, see Holmberg 2016).

(143) A: Did he not come?

LF1: $[FocP \text{ Did } [PolP \text{ He } [Pol'_{[uPol]} [vP \text{ not come }]]]]$

B1: Yes. (meaning ‘he didn’t.’)

$= [FocP \text{ Yes}_{[Aff]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Aff]} [vP \text{ not come }]]]} \checkmark \text{ Feature agreement}$

B2: # Yes (meaning ‘he did.’)

$= [FocP \text{ Yes}_{[Aff]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Aff]} [vP \text{ came }]]]} \times \text{ Identity failure}$

B3: No. (meaning ‘he didn’t.’)

$= [FocP \text{ No}_{[Neg]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Neg]} [vP \text{ not come }]]]} \checkmark \text{ Feature agreement}$

B4: # No. (meaning ‘he did.’)

$= [FocP \text{ No}_{[Neg]} \overbrace{[PolP \text{ He } [Pol'_{[uPol:Neg]} [vP \text{ not come }]]]} \times \text{ ‘he did’}$

LF2: $[FocP \text{ Did } [PolP \text{ He } [Pol'_{[Neg]} \text{ not } [vP \text{ come }]]]]$

B5: # Yes. (meaning ‘he didn’t.’)

$= [FocP \text{ Yes}_{[Aff]} \overbrace{[PolP \text{ He } [Pol'_{[Neg]} \text{ not } [vP \text{ come }]]]} \times \text{ Feature clash}$

B6: # Yes. (meaning ‘he did.’)

$= [FocP \text{ Yes}_{[Aff]} \overbrace{[PolP \text{ He } [Pol'_{[Neg]} \text{ not } [vP \text{ come }]]]} \times \text{ Feature clash}$

B7: No. (meaning ‘he didn’t.’)

$= [FocP \text{ No}_{[Neg]} \overbrace{[PolP \text{ He } [Pol'_{[Neg]} \text{ not } [vP \text{ come }]]]} \checkmark \text{ Feature agreement}$

B8: # No. (meaning ‘he did.’)

$= [FocP \text{ No}_{[Neg]} \overbrace{[PolP \text{ He } [Pol'_{[Neg]} \text{ not } [vP \text{ came }]]]} \times \text{ ‘he did’}$

On the other hand, LF2 employs middle negation, where the negation is already situated in the *PolP*. Thus, the particles can only be in polarity agreement with the

PolP, consequently, only (B7) results in a felicitous interpretation.¹⁶ Therefore, the author argues that in response to negative initiatives, with either LFs, bare particles exclusively convey a negative meaning, while a positive meaning requires an explicit prejacent (illustrated in (B9-B12) below).

Additionally, the author also proposed two LFs for high negation questions, where the inner-reading of HNPQs (with PPIs) is interpreted similarly to middle negation, as demonstrated in LF2 in example (143). Conversely, the negation in the outer-negation reading (with NPIs) is positioned higher than *PolP*, resulting in *PolP* being unvalued, as in example (144). As a result, the variable binders *Yes*[Aff] and *No*[Neg] indicate positive and negative propositions, respectively, similar to PPQs in (142).

- (144) Didn't he come? $[_{FocP} \text{didn't } [_{PolP} \text{he } [_{Pol'_{[uPol]}} [_{vP} \text{come }]]]]$

Finally, let's briefly examine the LF of negative declaratives. According to Holmberg, the *PolP* in declaratives is assigned a negative polarity value, as shown in (145). This LF is similar to the one found in LF2 of (143). Consequently, the behavior of *Yes* and *No* in response to declaratives (145) is similar to that seen in example (143.B4-B8), where there is no variable to be assigned by PolPrts and they can only serve as markers of polarity agreement. Therefore, in response to (145), bare *Yes* is unacceptable, while bare *No* agrees with the negation. However, this prediction appears too strong and is not supported by other studies and empirical data (see Brasoveanu et al. 2012, Roelofsen and Farkas 2015, Krifka 2015, Claus et al. 2017).

- (145) He didn't come. $[_{FocP} [_{PolP} \text{He } [_{Pol'_{[Neg]}} \text{didn't } [_{vP} \text{come }]]]]$

¹⁶Holmberg does not provide an explanation for the potential difference between (B3) and (B7). Furthermore, in contrast to his dedication of *No* particles, where the *uninterpretable-No* is employed in response to NPQs, Holmberg presents examples with adverbs like *sometimes* and *purposely* preceding the negation. In such cases, the negation is forced in the low position, and the *interpretable-No* is used, as seen in (B4'). According to the author, in these instances, the negative neutralization is canceled, and the response exhibits double negation, as in '*No he did not (sometimes) not come*', which conveys the meaning '*he came*'. Although the meaning is difficult to process (indicated by ?), it is accessible (for further details, see Holmberg 2013).

B4': ? No. (meaning 'he did.')
 $= [_{FocP} \text{No}_{[Neg]} \overbrace{[_{PolP} \text{He } [_{Pol'_{[uPol:Neg]}} \text{not } [_{vP} \text{not come }]]]]} \text{ not (not come) = come}$

One issue with Holmberg's account is the interaction of PolPrts with an explicit prejacent. In response to negative initiatives, such as (143), (B9)–(B11) serve well for polarity agreement with the polarity projection of the short answer. However, the [Neg] feature of *No* in (B12) conflicts with the *Affirmative* value of the *PolP*. Although the answer is felicitous, the account wrongly predicts infelicity.

(143) B9: Yes, he did.

$$= [FocP \text{ Yes}_{[Aff]} [PolP \text{ he} [Pol' [Aff] \text{ did} [vP \text{ come }]]]$$

B10: Yes, he didn't.

$$= [FocP \text{ Yes}_{[Aff]} [PolP \text{ he} [Pol' [Neg] \text{ not} [vP \text{ come }]]]$$

B11: No, he didn't.

$$= [FocP \text{ No}_{[Neg]} [PolP \text{ he} [Pol' [Neg] \text{ not} [vP \text{ come }]]]$$

B12: No, he did.

$$= [FocP \text{ No}_{[Neg]} [PolP \text{ he} [Pol' [Aff] \text{ did} [vP \text{ come }]]]$$

Another consideration is that Holmberg suggests the question force in PQs can be understood as asking, "Tell me the value for *[uPol]* such that the proposition is true" (Holmberg 2013: p.7). While this may hold for PPQs and low NPQs with *[uPol]*, it may not apply to middle NPQs, where the *[PolP : Neg]* is valued. Semantically, if in cases of *[uPol]*, the question seeks the polarity of the true answer, one might argue in cases of valued *[PolP]*, the question force seeks agreement with the polarity of the proposition. Although the author does not discuss this aspect, he points out the influence of bias on NPQs, resulting in distinct structures. This may account for different acceptability of PolPrts (which I claim depend on their reading in Section 4.3.1.2). Finally, the account presented by Holmberg does not provide a unified (and clear) analysis of PolPrts. While he only introduces two (morphosyntactic) *No* particles, it seems we also have two *Yes* particles, as *Yes* in PPQs assigns an affirmative value with a 'positive' polarity meaning, while in low NPQs, it conveys confirmation. In other words, *Yes* in (142.B1) means "It is a positive proposition that is true," while

in (143.B1), it means "It is true that the negative proposition is true."

In summary, the syntactic accounts provide a consistent analysis of response particles in polar questions and fragment answers in wh-questions, as remnants of a larger propositional answer. While they can explain the basic data in the literature, their main shortcoming is the inability to account for bare PolPrts with a positive reading in response to negative initiatives. Although such responses may be controversial or marked for some speakers, they are supported by empirical data. Thus, ignoring them would be a significant limitation, especially in cross-linguistic studies where such readings are widely available.

The next group of studies introduces PolPrts as propositional discourse anaphorics. I will begin with Krifka (2013), who proposes a straightforward account for proform PolPrts, then move on to Roelofsen and Farkas (2015) with a more complex model in inquisitive semantics.

4.2.2 Salient Discourse Reference

Krifka (2013) defines PolPrts as propositional proforms that are anaphoric to a salient antecedent (cf. *propositional lexemes* in Ginzburg and Sag 2000). Krifka argues that the ambiguity of PolPrts arises from multiple referents in the negative initiatives (cf. Holmberg 2013).¹⁷ He introduces three types of discourse referents (DRs): speech act referent (DR_1), propositional referent (DR_2 , DR_3), and event referent (DR_4).

(146) He didn't come.

$$[ActP_{\rightarrow DR_1} [ASS] [NegP_{\rightarrow DR_2} He_1 \text{ didn't}_2 [TP_{\rightarrow DR_3} t_1 t_2 [vP_{\rightarrow DR_4} \text{ come. }]]]]$$

Krifka proposes that PolPrts can freely refer to a propositional DR in the initiative. Therefore, since negative sentences¹⁸ as shown in example (146) provide two propositional referents, one for negative (DR_2) and one for positive (DR_3) references, they result in ambiguity. In his account, particle *Yes* as in (147) is an identity function,

¹⁷In a nutshell, PolPrts can be compared to pronouns like *he*, which can be ambiguous in a context with multiple male individuals to refer to.

¹⁸Krifka mentions that not all negative sentences offer both DRs and he establishes his account based on syntactic structure of sentential negation, for more details see Krifka (2013).

expressing the propositional referent, while *No* negates its input, as shown in (148). Note that Krifka claims that in English, PolPrts have the speech act in their semantic meaning, which explains why they cannot be used in embedded positions. However, in other languages such as German and French, the speech act is outside the semantic meaning of the particles, allowing for embedding.

$$(147) \quad \llbracket [ActP \text{ yes}] \rrbracket = \text{ASSERT}(p) \quad (148) \quad \llbracket [ActP \text{ no}] \rrbracket = \text{ASSERT}(\neg p)$$

Krifka stipulates that PolPrts and the prejacent are independent of each other, I call it a *bi-clausal* structure (as compared to mono-clause representation in the syntactic accounts in the previous section). That is, an answer like *Yes, he didn't* consists of two clauses, in which the prejacent has its own ellipsis structure that can be reconstructed via the identity condition to the initiative. Although the structure is not a crucial point for the account, it is important to understand the behaviour of the particles (especially because *No* works as a complement function).

let's illustrate the two possible readings of bare PolPrts in response to (146). The account easily allows for both positive and negative answers of bare particles based on the selected referent. On one hand, they express a positive proposition when *Yes* refers to (DR₃) as in (B1) and *No* refers to (DR₂) in (B3). On the other hand, they indicate a negative proposition if the particles swap the referents as in (B2) and (B4).

(146) He didn't come.

$$\begin{aligned} \text{B1: Yes.} & \quad (\text{meaning 'he did.'}) \\ & = \llbracket [ActP \text{ yes}_{DR_3}] \rrbracket = \text{ASSERT}(DR_3) \\ & = [ActP \text{ [ASS]} [TP \text{ He } [vP \text{ came.}]]] & = \text{He came.} \end{aligned}$$

$$\begin{aligned} \text{B2: Yes.} & \quad (\text{meaning 'he didn't.'}) \\ & = \llbracket [ActP \text{ yes}_{DR_2}] \rrbracket = \text{ASSERT}(DR_2) \\ & = [ActP \text{ [ASS]} [NegP \text{ He}_1 \text{ didn't}_2 [TP \text{ t}_1 \text{ t}_2 [vP \text{ come.}]]]] & = \text{He didn't come.} \end{aligned}$$

$$\begin{aligned} \text{B3: No.} & \quad (\text{meaning 'he did.'}) \\ & = \llbracket [ActP \text{ no}_{DR_2}] \rrbracket = \text{ASSERT}(\neg DR_2) \\ & = [ActP \text{ [ASS]} \neg([NegP \text{ He}_1 \text{ didn't}_2 [TP \text{ t}_1 \text{ t}_2 [vP \text{ come.}]]])] & = \text{He came.} \end{aligned}$$

$$\begin{aligned}
\text{B4: No.} & \quad (\text{meaning 'he didn't.'}) \\
= & \llbracket [ActP \text{ no}_D R_3] \rrbracket = \text{ASSERT}(\neg DR_3) \\
= & [ActP \text{ [ASS] } \neg([TP \text{ He } [vP \text{ came.}]]]) & = \text{He didn't come.}
\end{aligned}$$

Finally, the account predicts the optimal particle for each answer. According to Krifka (2013), in "typical cases" a negative initiative (including assertions and questions) occurs in a context where the positive proposition is salient. Although, there is a possibility of contexts, in which the negative proposition is the salient one¹⁹. Krifka proposes two constraints to penalize the selection of **NonSalient* and **DisAgreement* discourse referents. The first constraint is a general principle of anaphora resolution, which ensures that the most prominent referent is chosen. The second constraint is grounded in the inherent semantic/discourse difficulty associated with the process of disagreement. It suggests that accepting someone's proposal is typically an easier process compared to rejecting it (see Farkas and Bruce 2009).

The author suggests that the constraints have different costs, with violating the **DISAGR* resulting in a higher penalty compared to violating the **NONSAL*. Consequently, speakers are expected to choose the particle with the lesser penalty for the intended meaning. Table 4.1 (adapted from Krifka 2013, p. 13) illustrates the Optimality Theory model concerning the optimal particles in response to negative assertions.

Expression	Reference	Meaning	<i>*DISAGR</i>	<i>*NONSAL</i>	Favorite
Yes	q	he did	*		3
Yes	$\neg q$	he didn't		*	2
No	q	he didn't			1
No	$\neg q$	he did	*	*	4

Table 4.1: Optimal PolPrts in response to negative assertions

It is important to note that Krifka posits that particle preference is context and

¹⁹Example (i), adopted from Krifka (2013):p. 14, serves as an illustration of a salient negative discourse referent.

- (i) B: Which of the mountains on this list did Reinhold Messner not climb?
A: Well, let's see... He did not climb Mount Cotopaxi in Ecuador.
B: Yes. (= he didn't climb it) / No. (= he climbed it)

initiative-dependent. Specifically, the preference for a particular particle is influenced by whether the context highlights a positive or negative proposition, as well as whether the initiative is an assertion or a question. Firstly, he contends that in a context featuring a salient negative DR, as exemplified in footnote 19, the optimal particle is *yes*, with no violation of constraints. Note that Table 4.1 illustrates the order of preference in response to "typical" negative assertions with a salient positive DR, where *no* is deemed the most optimal particle (with no penalty). Secondly, Krifka observes that *yes* as a response to NPQs is more naturally interpreted *he did* rather than *he didn't*, contrary to the responses to negative assertions. Thus, he follows the assumption that negative questions convey a bias, albeit weaker than that expressed in assertions. In this regard, he suggests that in response to NPQs, the constraint **DisAgr* is ranked lower than the **NonSal* constraint, resulting in a higher preference for *he did* over *he didn't* with *yes* (for a more discussions, see Section 5.2.4).²⁰

Snider (2017) challenges the syntactic approach to discourse referents by highlighting its limitations (see also Snider 2019). Krifka argues that propositional DRs are sentential objects, where sentential negation introduces the positive and negative DRs in TP and NegP, respectively. However, other types of negation, such as negative morphemes *unequal* or *even though*, cannot offer such referents. Nevertheless, Snider (2017) presents various structures that offer DRs without syntactic constraints, e.g. small clauses²¹ in (149) and adverbs in (150) (adapted from Snider 2017: pp. 72,74):

- (149) Jonathan considers Nancy brave, but I don't think that's true.

?? *that*: Jonathan considers Nancy brave.

✓ *that*: Nancy is brave. herself.

²⁰While experimental studies conducted by Claus et al. (2017) in German and Goodhue and Wagner (2018) in English have rejected the concept of context sensitivity, our Farsi data substantiates Krifka's perspective on the variability in particle preference. In Section 4.3.1.2, I will argue that this variation in particle preference is, in fact, contingent upon the initiative. I will demonstrate that speakers exhibit a preference for specific particles contingent on the type of initiative. In essence, what Krifka attributes to the fluctuating saliency of positive or negative propositions in diverse contexts can be attributed to the presence of bias within the initiative.

²¹Roughly speaking, small clause constructions consist of a nominal and an adjective after a verb, which could be reduced to relatives, adverbial modifier phrases, etc. These constructions have a number of different functions such as introducing a predication, a cause, a result, or an epistemic state (Wilder 1991). The literature disagree on the syntactic constituent of small clauses, but they all agree that small clauses are below TP.

- (150) The magician presented a seemingly normal deck of cards, but I didn't believe that.
 #that: The magician presented a deck of cards.
 #that: The deck of cards was seemingly normal.
 ✓that: The deck of cards was normal.

In these examples, although neither the small clause, [*Nancy*] [*brave*], nor the adverb, *seemingly*, is syntactically a proposition, they allow for the presence of propositional demonstratives like *that*. This suggests that the syntactic account may be too strict in determining possible discourse references. While the syntactic approach may have limitations in providing possible DRs, Krifka's claim regarding the source of ambiguity is independent of the model that determines the DRs (see also Roelofsen and Farkas 2019 for the incompatibility of syntactic propositional DRs with PolPrts and other propositional anaphoras in Japanese).

A potential solution was offered by Goodhue and Wagner (2018), who propose that a discursive model can be replaced by a syntactic view. However, this approach might be too liberal, since not all propositional discursive DRs are accessible by PolPrts. Goodhue and Wagner acknowledge this and suggest that PolPrts are felicitous with DRs related to the Question Under Discussion (QUD, Roberts 1996). Although QUD-DRs idea seems intuitive, it filters out possible not-at-issue propositions. Snider shows example (151), adopted from Snider 2017:p. 16, where the QUD is in boldface. He argues the anaphorics *Yes* and *No* can accept or reject the not-at-issue content.

- (151) A:**Who was at the party last night?**
 B: Gabrielle said **Polly was there**.
 C1: Yes, that's true, but she's mistaken. **Polly was at the movies**.
 C2: No, that's not true, she said [PAULIE]_F was there, you must have misheard.

In (151.B), the QUD is addressed in the embedded clause, while the matrix clause introduces the source of the report, which is not QUD-related (not-at-issue). Nevertheless, the matrix clause is available for propositional anaphorics in (C1) and (C2). *Yes* in (C1) accept the reporting and then deny the content of the report, which addresses the QUD only in the final clause. *No* in (C2) denies the reporting itself and does not address the QUD (see also AnderBois et al. 2010 for appositives).

While Goodhue and Wagner did not discuss at-issueness, they briefly mentioned their observation of the QUD in terms of the *main point* in Simons (2007) (see footnote 15 in Goodhue and Wagner 2018). The discussion of QUD in the sense of at-issue/not-at-issue components or the main point of the utterance goes beyond the scope of this study, and I defer this debate to future research (see also Syrett and Koev 2014, Koev 2018). Although there could be a potential solution for capturing appropriate discursive DRs for anaphoric elements such as propositional demonstratives and PolPrts, it appears to be unrelated to PolPrts themselves. While DRs play a crucial role in establishing conventional referents for propositional anaphoras, I believe that the potential ambiguity of PolPrts is not fully dependent of the DRs (see Section 4.4.2.2).

4.2.3 Feature Markers

Another group of studies focusing on the anaphoric reading of polar particles attribute the ambiguity to the particles themselves rather than the initiative. Pope (1976) introduces two reading systems with binary features: *polarity*-reading with {positive, negative} values and *conformity*-reading with {agreement, disagreement} values. Cross-linguistically, languages employ either one of these systems or a combination of features.

Farkas (2011) extends Pope's proposal to analyze English and Romanian polar particles within the theoretical framework of Farkas and Bruce (2009) on discourse components. Roelofsen and Farkas (2015) further develop a detailed account based on Pope (1976), using inquisitive semantics (*InqSem*). They argue that to understand PolPrts as propositional anaphoric, we need a comprehensive understanding of their antecedents. Hence, in the first step, they capture the most highlighted proposition in various types of initiatives via InqSem (cf. salient proposition in Krifka 2013). Subsequently, they propose different constraints to introduce the optimal particle in ambiguous cases and address the third puzzle.

In this section, I will directly focus on the later study by Roelofsen and Farkas (2015), however, I would not present their inquisitive model. In short, InqSem has the advantage of treating both declaratives and polar questions similarly as sets of propositions,

with declaratives having a singleton set and polar questions having a binary set consisting of positive and negative propositions. In both types, the uttered proposition is the highlighted one. Therefore, the InqSem framework allows for a unified analysis of both declaratives and PQs, while correctly excluding PolPrts in response to other types of questions such as alternative questions and wh-questions (for a more detailed discussion of inquisitive semantics see Roelofsen and Farkas 2015).

The authors propose two polarity features: the *Absolute* feature with $[+,-]$ values and the *Relative* feature with [agree, reverse] values. They suggest that PolPrts mark disjunctive features, as shown below, and the ambiguity of PolPrts arises from their dual role in feature marking (where the order of the features doesn't matter). For more details about the following definitions, see Roelofsen and Farkas (2015):p. 385.

- (152) [Agree, +] presupposes that the context provides a unique most salient antecedent possibility α with positive polarity such that:

$$\llbracket \text{prejacent} \rrbracket = \{\alpha\}^\downarrow \quad \text{and} \quad \llbracket \text{prejacent} \rrbracket^\pm = < \{\alpha\}, \emptyset >$$

- (153) [Agree, -] presupposes that the context provides a unique most salient antecedent possibility α with negative polarity such that:

$$\llbracket \text{prejacent} \rrbracket = \{\alpha\}^\downarrow \quad \text{and} \quad \llbracket \text{prejacent} \rrbracket^\pm = < \emptyset, \{\alpha\} >$$

- (154) [Reverse, -] presupposes that the context provides a unique most salient antecedent possibility α with positive polarity such that:

$$\llbracket \text{prejacent} \rrbracket = \{\bar{\alpha}\}^\downarrow \quad \text{and} \quad \llbracket \text{prejacent} \rrbracket^\pm = < \emptyset, \{\bar{\alpha}\} >$$

- (155) [Reverse, +] presupposes that the context provides a unique most salient antecedent possibility α with negative polarity such that:

$$\llbracket \text{prejacent} \rrbracket = \{\bar{\alpha}\}^\downarrow \quad \text{and} \quad \llbracket \text{prejacent} \rrbracket^\pm = < \{\bar{\alpha}\}, \emptyset >$$

Following the distributed morphology proposed by Halle and Marantz (1993), the feature marking account introduces PolPrts as lexical items that morphologically realize polarity features. That is, while the syntax generates a certain combination of polarity features in the polarity phrase, morphology inserts lexical items, namely PolPrts, to realize these features. For instance, in English, *Yes* can mark the answer as positive or in agreement with the initiative, while *No* can mark the answer as negative or in disagreement with the initiative. While the combinations [Agree, +] and

[Reverse, $-$] are exclusively associated with *Yes* and *No* respectively, bare responses in (156) yield the correct readings.

- (156) A: Did John come? $\{\lambda w.come_w(j), \neg come_w(j)\} : \lambda w.come_w(j)$ is highlighted

B1: Yes. B2: No.

Yes_[Agree, +] = he did. No_[Reverse, -] = he didn't.

However, [Reverse, $+$] and [Agree, $-$] combinations can be realized by both *Yes* and *No*, and result in ambiguity in response to negative initiatives, as in (157).

- (157) A: Did John not come? $\{\lambda w.come_w(j), \neg come_w(j)\} : \lambda w.\neg come_w(j)$ is highlighted

B1: Yes. B2: No.

Yes_[Reverse, +] = he did. No_[Reverse, +] = he did.

Yes_[Agree, -] = he didn't. No_[Agree, -] = he didn't.

Pope (1976) argues that polarity features exhibit markedness in terms of semantic difficulty. That is, identity/agreement functions are considered less marked ($<$) compared to complement/reverse functions, as the latter are semantically more challenging.²² According to the author, morphologically marked features require explicit realization, while unmarked features may remain silent.²³ Based on the markedness behavior, Pope not only predicts which features need to be explicitly realized compared to covert features, but also determines the likelihood of feature combinations (1976: p. 120, see also Roelofsen and Farkas (2015):p. 394 for cross-linguistic predictions). Given that, Roelofsen and Farkas (2015) propose the *Realization Constraint*, which states that the more marked a feature is, the stronger the pressure to overtly realize it, and suggest the following markedness scale:

²²Pope (1976) points out that the phenomenon of markedness and its associated semantic difficulty have also been observed in language acquisition. Specifically, children tend to acquire marked features later than unmarked ones.

²³Pope (1976) highlights the distinction in the behavior of *markedness* between morphology and phonology. Drawing on the framework proposed by Chomsky and Halle (1968), in phonology, more marked phonemes (in terms of articulation) are less likely to occur in a language's phonemic inventory. However, in morphology, marked features require explicit realization, while unmarked features may remain silent (for further details, see Pope 1976: p. 130, footnote 2).

- **Overall markedness scale:** [Agree, +] < [Reverse, -] < [Agree, -] < [Reverse, +]

According to these rules, the authors argue that it is more likely for languages to have a particle to express the marked features (e.g., [-] or [Reverse, +]) rather than the unmarked ones (e.g., [+] or [Reverse, -]). This prediction has been truly observed across different languages (see Pope 1976; Roelofsen and Farkas 2015). The authors also suggest that [Reverse, +] is the most marked combination, therefore requiring explicit realization. This can be observed with specific particles such as *doch* in German and *si* in French, or through prosodic saliency in English.

Regarding the optimal particle, Roelofsen and Farkas argue that in ambiguous cases, there is a preference for realizing the marked feature over the unmarked one. Thus, in example (157), particle *No* should be preferred in both responses. When accepting the negative proposition [Agree, -], *No* is preferred because it realizes the marked feature [-], while *Yes* realizes the unmarked feature [Agree]. The same rationale applies when rejecting the negative proposition [Reverse, +]. *No* should be preferred as it realizes the marked feature [Reverse], while *Yes* realizes the unmarked [+].²⁴

Before closing this section, it is worth noting the relationship between PolPrts and the prejacent. Roelofsen and Farkas present their analysis in which PolPrts precede a prejacent, forming a mono-clausal structure (cf. bi-clausal structure in Krifka 2013). According to their account, PolPrts occupy the spec/head position of PolP, where the prejacent can be fully (or partially) elided as long as its semantic contribution can be recovered. While their account does not depend on the clausal structure, they mention that the same analysis works well with other structures, although the mono-clausal structure works better cross-linguistically and facilitates typological studies.

4.2.4 Summary

The syntactic accounts (Kramer and Rawlins 2009 and Holmberg 2013, see also Authier 2013) address the first two puzzles by proposing ellipsis structures. According to

²⁴Notice that Roelofsen and Farkas (2015) propose additional constraints like *Contrastive Markedness*, *Reversal Scale*, and *Expressiveness* to explain data from different languages, but these are not necessary for current analysis of English particles (see also Roelofsen and Farkas 2019).

these accounts, the interchangeable use of PolPrts is a matter of the polarity relationship between the particle and the polarity projections in the (elided) prejacent. These studies do not consider bare PolPrts in response to negative initiatives as ambiguous since the identity function of the prejacent necessitates the presence of negation in the complement. Thus, an explicit prejacent is required for positive answers. Consequently, such approaches do not address the third puzzle for the optimal particle.

Furthermore, these studies do not provide a unified analysis for both particles. Kramer and Rawlins (2009) explain the interchangeable use of *Yes* through the negative neutralization, while *No* has two morphosyntactic representations as *Reversal-No* and *Negative-No*. Semantically, *Reversal-No* is a complement function, whereas *Yes* and *Negative-No* serve as identity functions, with the former being inactive and the latter functioning as a feature marker. Holmberg (2013) also suggests that *Yes* has two readings: affirmative (positive polarity) and confirmation (affirming the truth of the negative proposition). Additionally, there is a particle *No* that functions as a complement and another *No* that agrees in features with the prejacent.

In terms of semantic approaches (Pope 1976, Krifka 2013, Roelofsen and Farkas 2015), the studies introduce PolPrts as propositional anaphorics to the salient proposition in the initiative. However, one perspective argues that the ambiguity arises from multiple referents in negative initiative, while the other suggests that the particles have dual functions, giving rise to two readings. These accounts do not emphasize any particular underlying structure of PolPrts, although one proposes a proform reading with an independent prejacent (*bi-clause*), while the other posits a connection between PolPrts and a (partially/fully elided) prejacent (*mono-clause*).

Finally, the semantic accounts consider the ambiguity of bare PolPrts and employ a kind of generate and filter approach within Optimality Theory. In other words, while the syntactic models prevent the generation of one reading and do not allow for the coexistence of two readings, the semantic models permit both readings and then filter them based on specific constraints to determine the optimal particle.

4.3 Core Data

In this section, I will present examples of polar particles *âre* ‘yes’ and *na* ‘no’ in Farsi, which have both polarity and conformity readings. To avoid any confusion, I represent the related readings with superscripts ^{Pos} and ^{Neg} for positive and negative features in the polarity reading, and ^{Agr} and ^{DAgr} for agreement and disagreement features in the conformity reading. When both features are possible, I present them together, separated by “/”. When the reading is not clear, no superscription is provided. Much of the research on PolPrts has focused on their function in declaratives as a response to polar questions and assertions. In the next two subsections, I will present examples of PolPrts not only in declaratives but also in interrogatives. One cannot talk about response particles in Farsi without mentioning particle *čerâ*, that exclusively expresses a positive response to negative initiatives (similar to ‘doch’ in German). However, I exclude *čerâ* in this study and I explain my reasons in Section 4.3.3.

4.3.1 Polar Particles in Declaratives

Here, for brevity, I provide examples of responses to positive and negative polar questions (in the form of rising declaratives, see Section 1.3.1), suggesting that the same particles and forms are used in response to assertions as well. Later, I will discuss the effect of the initiative type on particle preference, which is important for solving our third puzzle and determining the optimal answer. It is worth noting that PolPrts can be used in bare form or followed by a short answer. In Farsi, the short answer consists of the main verb which carries the polarity of the sentence.²⁵

Examples (158) and (159) demonstrate simple positive polar questions (PPQs) and negative polar questions (NPQs) respectively. The responses to (158) are clear: *âre* indicates a positive answer, while *na* indicates a negative answer, with or without an

²⁵In the case of compound verbs, the verb part is usually uttered, as shown in (i).

- | | | |
|--|---|--|
| (i) A: Ali lebas-hâ ro otu zad?
Ali cloth-PL ACC iron hit
'Did Ali iron the cloths?' | B1: <i>âre</i> zad
yes hit
'Yes, he did.' | B2: <i>na</i> na-zad
no NEG-hit
'No, he didn't.' |
|--|---|--|

explicit prejacent. On the other hand, in response to (159), we observe ambiguity with bare particles (B1) and (B4), but the presence of overt prejacent clarifies that both positive and negative answers can be followed by *âre* (B2) and (B3) as well as *na* (B5) and (B6). Furthermore, it is important to note that prosody can affect the acceptability and interpretation of the particles, particularly in their bare form. For example, in (159), both particles often carry focal stress when indicating a positive answer, *that they went*. Thus, we expect focal stress on *âre* and *na* in (B2) and (B5), as well as in (B1) and (B4) when they indicate *p* (Mohammadi 2023b). I did not present the focal stress here, since our focus is only on the acceptability of particles with positive and negative propositions (prosody will be addressed in Chapter 6).

- | | | | | | | | | | |
|---|---|------------------------------------|-----------------------------------|--------------|--------------|--------------------|--------------------------------------|-----------------------|---|
| (158) A: danešjuhâ mehmuni raftand? | (159) A: danešjuhâ mehmuni na-raftand? | | | | | | | | |
| students party went | students party NEG-went | | | | | | | | |
| ‘Did the students go to the party?’ | ‘Did the students not go to the party?’ | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B1: $\hat{a}re^{Pos/Agr}$.</td> <td style="vertical-align: top;">B1: <i>âre</i>.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">yes</td> <td style="vertical-align: top;">yes</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘Yes, they did.’</td> <td style="vertical-align: top;">‘Yes, they did.’ $(\hat{a}re^{Pos})$</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;"># ‘Yes, they didn’t.’</td> <td style="vertical-align: top;">‘Yes, they didn’t.’ $(\hat{a}re^{Agr})$</td> </tr> </table> | | B1: $\hat{a}re^{Pos/Agr}$. | B1: <i>âre</i> . | yes | yes | ‘Yes, they did.’ | ‘Yes, they did.’ $(\hat{a}re^{Pos})$ | # ‘Yes, they didn’t.’ | ‘Yes, they didn’t.’ $(\hat{a}re^{Agr})$ |
| B1: $\hat{a}re^{Pos/Agr}$. | B1: <i>âre</i> . | | | | | | | | |
| yes | yes | | | | | | | | |
| ‘Yes, they did.’ | ‘Yes, they did.’ $(\hat{a}re^{Pos})$ | | | | | | | | |
| # ‘Yes, they didn’t.’ | ‘Yes, they didn’t.’ $(\hat{a}re^{Agr})$ | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B2: $\hat{a}re^{Pos/Agr}$ raftand.</td> <td style="vertical-align: top;">B2: $\hat{a}re^{Pos}$ raftand.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">yes went</td> <td style="vertical-align: top;">yes went</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘Yes, they did.’</td> <td style="vertical-align: top;">‘Yes, they did.’</td> </tr> </table> | | B2: $\hat{a}re^{Pos/Agr}$ raftand. | B2: $\hat{a}re^{Pos}$ raftand. | yes went | yes went | ‘Yes, they did.’ | ‘Yes, they did.’ | | |
| B2: $\hat{a}re^{Pos/Agr}$ raftand. | B2: $\hat{a}re^{Pos}$ raftand. | | | | | | | | |
| yes went | yes went | | | | | | | | |
| ‘Yes, they did.’ | ‘Yes, they did.’ | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B3: # $\hat{a}re$ na-raftand.</td> <td style="vertical-align: top;">B3: $\hat{a}re^{Agr}$ na-raftand.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">yes NEG-went</td> <td style="vertical-align: top;">yes NEG-went</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘Yes, they did.’</td> <td style="vertical-align: top;">‘Yes, they didn’t.’</td> </tr> </table> | | B3: # $\hat{a}re$ na-raftand. | B3: $\hat{a}re^{Agr}$ na-raftand. | yes NEG-went | yes NEG-went | ‘Yes, they did.’ | ‘Yes, they didn’t.’ | | |
| B3: # $\hat{a}re$ na-raftand. | B3: $\hat{a}re^{Agr}$ na-raftand. | | | | | | | | |
| yes NEG-went | yes NEG-went | | | | | | | | |
| ‘Yes, they did.’ | ‘Yes, they didn’t.’ | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B4: $na^{Neg/DAgr}$.</td> <td style="vertical-align: top;">B4: <i>na</i>.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">no</td> <td style="vertical-align: top;">no</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘No, they didn’t.’</td> <td style="vertical-align: top;">‘No, they didn’t.’ (na^{Neg})</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;"># ‘No, they did.’</td> <td style="vertical-align: top;">‘No, they did.’ (na^{DAgr})</td> </tr> </table> | | B4: $na^{Neg/DAgr}$. | B4: <i>na</i> . | no | no | ‘No, they didn’t.’ | ‘No, they didn’t.’ (na^{Neg}) | # ‘No, they did.’ | ‘No, they did.’ (na^{DAgr}) |
| B4: $na^{Neg/DAgr}$. | B4: <i>na</i> . | | | | | | | | |
| no | no | | | | | | | | |
| ‘No, they didn’t.’ | ‘No, they didn’t.’ (na^{Neg}) | | | | | | | | |
| # ‘No, they did.’ | ‘No, they did.’ (na^{DAgr}) | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B5: # na raftand.</td> <td style="vertical-align: top;">B5: na^{DAgr} raftand.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">no went</td> <td style="vertical-align: top;">no went</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘No, they did.’</td> <td style="vertical-align: top;">‘No, they did.’</td> </tr> </table> | | B5: # na raftand. | B5: na^{DAgr} raftand. | no went | no went | ‘No, they did.’ | ‘No, they did.’ | | |
| B5: # na raftand. | B5: na^{DAgr} raftand. | | | | | | | | |
| no went | no went | | | | | | | | |
| ‘No, they did.’ | ‘No, they did.’ | | | | | | | | |
| <table border="0"> <tr> <td style="vertical-align: top; padding-right: 20px;">B6: $na^{Neg/DAgr}$ na-raftand.</td> <td style="vertical-align: top;">B6: na^{Neg} na-raftand.</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">no NEG-went</td> <td style="vertical-align: top;">no NEG-went</td> </tr> <tr> <td style="vertical-align: top; padding-right: 20px;">‘No, they didn’t.’</td> <td style="vertical-align: top;">‘No, they didn’t.’</td> </tr> </table> | | B6: $na^{Neg/DAgr}$ na-raftand. | B6: na^{Neg} na-raftand. | no NEG-went | no NEG-went | ‘No, they didn’t.’ | ‘No, they didn’t.’ | | |
| B6: $na^{Neg/DAgr}$ na-raftand. | B6: na^{Neg} na-raftand. | | | | | | | | |
| no NEG-went | no NEG-went | | | | | | | | |
| ‘No, they didn’t.’ | ‘No, they didn’t.’ | | | | | | | | |

It is worth emphasizing an important point: in languages where the same particles are used for both readings, the acceptability judgment of the conformity reading, for instance in (159.B3, B6), is often controversial. I have also received objections from native Farsi speakers regarding the unacceptability of PolPrts in the conformity reading.²⁶ However, the acceptability of this reading is much higher than its unacceptability in that we can dismiss the objection. Moreover, I find the reading to be less controversial in specific circumstances. The acceptability of the following examples, even among the most critical speakers, should alleviate any doubts.

In certain scenarios, as exemplified in (160), speakers have expressed unequivocal acceptance of the conformity reading as compared to the polarity one. For instance, *âre^{Agr}* in (B1) is even favored over (B2) with *na^{Neg}* in the polarity reading (this preference may relate to the predicate, indicating the state of mind).

- (160) **Context:** A and B know that Ali loves his car. B tells A that Ali sold his car.

A: bâvaram ne-miše Ali in kâr ro bokone.
believe NEG-become Ali this job ACC does
'I cannot believe that Ali does it.'

B1: *âre^{Agr}* man ham bâvaram ne-mišod, vali anjâm-dâd.
yes I too believe NEG-become but did
'Yes, I didn't believe too, but he did.'

B2: *na^{Neg}* man ham bâvaram ne-mišod, vali anjâm-dâd.
no I too believe NEG-become but did
'No, I didn't believe too, but he did.'

In some other cases, like in example (161), speakers find both readings noncontroversial. Thus, *âre^{Agr}* in (B1) and *na^{Neg}* in (B2) are equally felicitous.²⁷

²⁶The most frequent feedback I received was based on the so-called standard grammar that is taught in schools, wherein *âre* and *na* are employed for positive and negative responses, respectively.

²⁷It has come to my attention that in certain contexts, such as example (161), some speakers exhibit a preference for the particle in the conformity reading with a fully elided prejacent. Thus, in the minimal pair of (B1) and (B1') with *âre^{Agr}*, speakers find (B1) to be a more natural than (B1').

- (161) B1': *âre^{Agr}* na-dârim, in hafte mosâferat-am.
yes NEG-have this week journey-am
'Yes, we don't, I'm on a trip this week.'

(161) **Context:** B tells her student, A, that he has a paper at the upcoming conference.

A: pas in hafte kelâs na-dârim?
then this week class NEG-have
'Then, do we have no class this week?'

B1: *âre^{Agr}* in hafte mosâferat-am. B2: *na^{Neg}* in hafte mosâferat-am.
yes this week journey-am no this week journey-am
'Yes, I'm on a trip this week.' 'No, I'm on a trip this week.'

Based on the acceptability judgments of the conformity reading in the aforementioned examples, I reject the objection regarding the unacceptability of such reading in Farsi.

4.3.1.1 A Note on Embedding Position

PolPrts in Farsi, similar to languages like Italian and French (Servidio 2018, Pasquereau 2020), can also appear in embedded positions. Pasquereau (2020) suggests that embedded PolPrts in French are a subset of matrix PolPrts, exhibiting certain syntactic limitations (e.g., sensitivity to finiteness and obviation). In this study, the focus lies on the reading constraints of PolPrts. That is, as long as PolPrts in both readings are available in both matrix and embedded positions, they do not pose any issues for the analysis at hand. To illustrate this point, I provide examples of PolPrts in different positions, demonstrating their similar possibilities in both readings. The investigation of potential positional effects will be left for future studies.

Regarding the embedding position, two noteworthy points arise. First, speakers may employ the bare form of PolPrts less frequently in embedding positions, showing a preference for additional content, such as an explicit prejacent or a continuation of the conversation, particularly in ambiguous cases. Second, the conformity reading might be less preferred in the embedding position when compared to the polarity reading, although it remains available, especially when accompanied by an explicit prejacent. Both points primarily reflect speaker preferences rather than semantic or syntactic constraints on the possible readings.

As both particles demonstrate felicity in different embedding cases, I provide only one sample for each particle, while arguing that the other one is equally possible.

It is important to note that the presence of the predicate following the particles is optional, yet highly preferred, especially in specific examples, wherein the predicate is enclosed within parentheses. For clarity and simplicity, I present embedded PolPrts in response to PPQs as exemplified in (158), repeated below. These examples showcase PolPrts embedded under (i) predicates of speech (B9) and thought (B10), (ii) the antecedent clause of conditionals (B11), the consequent clause of conditionals (B12), and (iii) coordination structures (B13).

- (158) A: danešjuhâ mehmuni raftand?
 students party went
 'Did the students go to the party?'

- B9: Ali goft $\hat{a}re^{Pos/Agr}$ (raftand).
 Ali said yes went
 'Ali said that they did.'

- B10: ferk konam $na^{Neg/DAgr}$ (na-raftand).
 thought do no NEG-went
 'I think that not so.'

- B11: age $na^{Neg/DAgr}$, ta alân bâyad bargašte bâšand.
 if no, until now must return be
 'If not so, they must have returned until now.'

- B12: age ostâd unja bude, $\hat{a}re^{Pos/Agr}$ hatman (raftand).
 if professor there was yes sure went
 'If the professor was there, they did for sure.'

- B13: Ali $\hat{a}re^{Pos/Agr}$ vali Sara $na^{Neg/DAgr}$.
 Ali yes but Sara no
 'Ali did but Sara didn't.'

Notice that bare PolPrts in response to NPQs as in (159), repeated below, remain ambiguous in embedded positions, as seen in (B9) and (B10).²⁸ The conformity reading of na^{DAgr} in (B11) is distinguished through contrastive clauses in the presence of conjunctive *but*.²⁹

²⁸Native speakers who do not perceive any ambiguity are encouraged to read the examples (B9) and (B10) with explicit predicates, i.e., *raft* and *na-raft*, after each particle. This may provide a clearer understanding of the potential meanings.

²⁹It is worth emphasising that I do not claim any reading preference or the degree of acceptability judgments for PolPrts in the embedding positions. Here, my focus is only on demonstrating the

- (159) A: danešjuhâ mehmuni na-raftand?
 students party NEG-went
 'Did the students not go to the party?'
- B9: Ali goft *âre*.
 Ali said yes
 'Ali said that they did.' (*âre*^{Pos})
 'Ali said that they didn't.' (*âre*^{Agr})
- B10: ferk konam *na*.
 thought do no
 'I think so.' (*na*^{DAgr})
 'I think that not so.' (*na*^{Neg})
- B11: Ali na-raft vali Sara *na*^{DAgr} (raft).
 Ali NEG-went but Sara no went
 'Ali didn't but Sara did.'

Taken together, both readings of PolPrts are available in the matrix and embedded positions, exhibiting similar behavior. This finding may hold significance for accounts such as Krifka (2013), which posits that the absence of embedding in polar response particles in English stems from their speech act denotation. Further investigation into the potential effects of positions is beyond the scope of this study, and it is assumed that the analysis presented here supports data from both positions.

4.3.1.2 Bias Observation

Pope mentions that languages tend to favor one reading system over the other based on the bias representation in their structure. For instance, languages like Japanese, in which polar questions clearly express the speaker's bias or expected answer,³⁰ are more likely to employ the conformity system. On the other hand, languages with less obvious expected answers tend to utilize the polarity reading. I will demonstrate that this observation is also crucial in understanding the particle/reading preference

availability of the particles in the embedding positions, without evaluating the superiority of one reading over the other. Factors influencing preference judgments will be discussed in the next section as well as in Chapter 5.

³⁰There is a huge literature on *bias* in polar questions (see Chapter 2). However, Pope (1976) simply introduces biased questions, like NPQs, as 'leading' questions, where the speaker expects an answer for her question in comparison to PPQs that the speaker is open for either of the answers.

in languages where the same particles serve both roles. In short, if an initiative obligatorily represents bias, the preference for PolPrts in the conformity reading increases compared to cases without any bias or optionally biased initiatives.

Examples (162) and (163) present a minimal pair of negative questions, $[\neg p?]$ in Farsi, both implicating bias towards the uttered proposition ($\neg p$). As we saw in Chapter 3, simple NPQs like (162) are optionally biased, allowing the bias implicature to be canceled by the speaker. However, (163) is inherently biased, as the bias implicature is obligatorily expressed by particle *dige* (for further details, see Section 3.3). In response to both questions, (B1s) represent rejecting answers (p), while (B2s) represent accepting answers ($\neg p$), with each particle corresponding to a different reading.³¹

- (162) A: Ali mehmuni na-raft? (simple NPQs)

Ali party NEG-went

‘Did Ali not go to the party?’

B1: $\hat{a}re^{Pos} \succ na^{DAgr}$ raft.

yes no went

‘Yes \succ No, he did.’

B2: $\hat{a}re^{Agr} \prec na^{Neg}$, na-raft.

yes no NEG-went

‘Yes \prec No, he didn’t.’

- (163) A: Ali mehmuni na-raft *dige*? (dige-NPQs)

Ali party NEG-went DIGE

‘Did Ali not go to the party?’ \rightsquigarrow The speaker expects that Ali didn’t go.

B1: $\hat{a}re^{Pos} \approx na^{DAgr}$ raft.

yes no went

‘Yes \approx No, he did.’

B2: $\hat{a}re^{Agr} \approx na^{Neg}$, na-raft.

yes no NEG-went

‘Yes \approx No, he didn’t.’

Interestingly, speakers’ judgments³² reveal that, on one hand, in response to (162), as optionally biased questions, the conformity reading of the particles, i.e., na^{DAgr} in (B1) and $\hat{a}re^{Agr}$ in (B2), has lower acceptability (\prec) compared to the alternatives in

³¹As mentioned earlier, prosodic saliency plays a significant role, where PolPrts in rejecting answers bear focal stress (Mohammadi 2023b). However, all examples were presented in written form to the informants, who were free to read them with their own intonation. It should be noted that in examples (162) and (163), both particles in (B1) are equally expected to bear focal stress. For simplicity, focus marking is not represented here and will be discussed in Section 6.2.

³²This observation was initially made by consulting with six native Farsi speakers, including the author, who served as informants for this study. Based on the findings, an experiment was conducted with 40 adult participants, that will be presented in Chapter 6 (see also Mohammadi to appear). The experimental results aligned with the initial observation.

the polarity reading with $\hat{a}re^{Pos}$ and na^{Neg} . On the other hand, in response to (163), as obligatorily biased questions, the acceptability of the particles in the conformity reading improves to the extent that both readings are almost equally (\approx) and highly acceptable. The observation in (164) is further supported by experimental data, which will be discussed in Chapter 5 (see also Mohammadi to appear).³³

- (164) **Bias Observation:** The polarity reading of PolPrts consistently receives high acceptability in response to different initiatives. However, the conformity reading varies from degraded acceptability in response to optionally biased questions, which can but not necessarily convey bias, to high acceptability in response to obligatorily biased questions, which inherently convey bias.

This observation highlights the influence of bias in the initiative on particle preference, which plays a crucial role in resolving the third puzzle of optimal answer.

4.3.2 Polar Particles in Interrogatives

PolPrts have been extensively studied in declarative responses to polar initiatives, however, as discussed in Chapter 2, they also play a role in interrogatives. This section provides examples of PolPrts in tag questions and alternative questions.

4.3.2.1 Tag Questions

Tag questions consist of a declarative anchor followed by an interrogative tag. In Farsi, the tag part can be either a bare particle such as $\hat{a}re$ or na , known as polarity TQs (PTQs), or the reverse polarity of the predicate from the anchor, known as verbal TQs (VTQs). In this section, I will focus exclusively on PTQs (for additional data and further discussions, see Section 3.3.3).

Both $\hat{a}re$ and na can be used in TQs, preceding a positive anchor as shown in (165) and (167), or a negative anchor as in (166) and (168). Given that the anchor serves as

³³It is worth mentioning that during the experiment, I posed similar negative questions, as those used for the adults, to two children (aged 5-6 years). Neither of the them used PolPrts in the conformity reading to answer my questions, even in response to obligatorily biased questions. This finding is also mentioned by Pope (1976, p. 119), who states children acquire the conformity reading later due to its semantic difficulty. The acquisition of reading systems will be left for future studies.

the highlighted antecedent, PolPrts in (166) and (168) with a negative antecedent are expected to generate different propositions in the tag, potentially causing ambiguity. However, TQs do not exhibit any sense of ambiguity. Speakers' judgments for the distinction between *âre* and *na* tags suggest that in *âre*-tags, (165) and (166), the speaker is more certain/confident about her belief in the anchor, while *na*-tags, (167) and (168), indicate less certainty. In other words, *âre*-tags indicate a speaker's higher credence, whereas *na*-tags suggest a lower credence (see Farkas and Roelofsen 2017).

- | | |
|--|---|
| (165) Ali mehmuni raft, <i>âre</i> ?
Ali party went yes
'Ali went to the party, didn't he?' | (166) Ali mehmuni <i>na</i> -raft, <i>âre</i> ?
Ali party NEG-went yes
'Ali didn't go to the party, did he?' |
| (167) Ali mehmuni raft, <i>na</i> ?
Ali party went no
'Ali went to the party, didn't he?' | (168) Ali mehmuni <i>na</i> -raft, <i>na</i> ?
Ali party NEG-went no
'Ali didn't go to the party, did he?' |

In Section 3.4.2, I proposed that the polarity relation between the anchor and the tag accounts for the strength of bias. To capture the difference between *âre* and *na* tags, I introduced the concept of Relational Attitude.³⁴ The main idea is that when the propositions in the assertive anchor and the question tag share the same polarity, the question expresses the speaker's (tentative) certainty, whereas a reverse polarity relation indicates the speaker's uncertainty. The proposal was supported both intuitively and empirically by the judgments of the speakers, with *âre*-tags conveying higher credence and *na*-tags indicating lower credence in their belief.

It is important to emphasize that the judgments concerning the bias strength of each particle are consistent regardless of the polarity of the anchor. In other words, whether the speaker's belief in the anchor is a positive or negative proposition, *âre*-tags convey

³⁴The Relational Attitude was defined as in (130), repeated from Chapter 3:

- (130) **Relational Attitudes:**

- The question $[\phi, \phi?]$ indicates that the speaker's belief has high credence in the anchor. This is evident as the speaker not only utters her (tentative) belief in the anchor proposition but also highlights the same (polarity) proposition in tag.
- The question $[\phi, \neg\phi?]$ indicates that the speaker has lower credence in the anchor. That is evident as the speaker highlights the potential alternative option in the tag against her belief in the anchor.

higher credence (stronger bias) and *na*-tags indicate lower credence (weaker bias). Therefore, the particles in the tags (i) are unambiguous and (ii) consistently exhibit bias strength. Regarding the absence of ambiguity in (i), I argue that only one reading of PolPrts is applicable in TQs. To determine which reading satisfies (ii), we need to examine both readings for each particle carefully. Before proceeding, it is important to recall that, according to the analysis presented in Section 3.4.2, the tag consist of a proposition, and I present it as an elided proposition in gray.

Let's start with the polarity reading. In the polarity reading, $\hat{a}re^{Pos}$ and na^{Neg} always result in a positive and negative proposition, respectively. In other words, regardless of the polarity of the antecedent, $\hat{a}re^{Pos}$ -tags function as PPQs, while na^{Neg} -tags function as NPQs. Following the Relational Attitude, the polarity relation between the anchor and the tag (represented in the LFs) leads to different degrees of bias for the same particle. That is, $\hat{a}re$ in (165') and (166') implicates high and low credence, respectively, and *na* behaves conversely in (167') and (168'). These predictions contradict the consistent behavior exhibited by the particles in tags.

- (165') Ali raft, $\hat{a}re$?
Ali went yes

- (166') Ali na-raft, $\hat{a}re$?
Ali NEG-went yes

LF: Ali went, $\hat{a}re^{Pos}$ [Ali went]?

LF: Ali didn't go, $\hat{a}re^{Pos}$ [Ali went]?

✓ Relational Attitude: high credence

✗ Relational Attitude: low credence

- (167') Ali raft, *na*?
Ali went no

- (168') Ali na-raft, *na*?
Ali NEG-went no

LF: Ali went, na^{Neg} [Ali didn't go]?

LF: Ali didn't go, na^{Neg} [Ali didn't go]?

✓ Relational Attitude: low credence

✗ Relational Attitude: high credence

However, the conformity reading of $\hat{a}re^{Agr}$ and na^{DAgr} correctly predicts the consistent behavior of each particle. That is, the particles return either a positive or a negative proposition depends on the antecedent referent. As demonstrated below, $\hat{a}re$ -tags in both (165'') and (166'') indicate high credence, while *na*-tags in (167'') and (168'') convey low credence.

(165'')	Ali raft, $\hat{a}re$? Ali went yes	(166'') Ali na-raft, $\hat{a}re$? Ali NEG-went yes
	LF: Ali went, $\hat{a}re^{Agr}$ [Ali went]?	LF: Ali didn't go, $\hat{a}re^{Agr}$ [Ali didn't go]?
	✓ Relational Attitude: high credence	✓ Relational Attitude: high credence
(167'')	Ali raft, na ? Ali went no	(168'') Ali na-raft, na ? Ali NEG-went no
	LF: Ali went, na^{DAgr} [Ali didn't go]?	LF: Ali didn't go, na^{DAgr} [Ali went]?
	✓ Relational Attitude: low credence	✓ Relational Attitude: low credence

Of course allowing both readings, as exemplified in the following representations, leads to an ambiguity of high and low credence attitude readings in (166'') and (168''). Such ambiguity is incongruent with the intended interpretation and the judgments provided by the informants.

(165'')	Ali raft, $\hat{a}re$? Ali went yes	(166'') Ali na-raft, $\hat{a}re$? Ali NEG-went yes
	LF1: Ali went, $\hat{a}re^{Pos}$ [Ali went]?	LF1: Ali didn't go, $\hat{a}re^{Pos}$ [Ali went]?
	✓ Relational Attitude: high credence	✗ Relational Attitude: low credence
	LF2: Ali went, $\hat{a}re^{Agr}$ [Ali went]?	LF2: Ali didn't go, $\hat{a}re^{Agr}$ [Ali didn't go]?
	✓ Relational Attitude: high credence	✓ Relational Attitude: high credence
(167'')	Ali raft, na ? Ali went no	(168'') Ali na-raft, na ? Ali NEG-went no
	LF1: Ali went, na^{Neg} [Ali didn't go]?	LF1: Ali didn't go, na^{Neg} [Ali didn't go]?
	✓ Relational Attitude: low credence	✓ Relational Attitude: low credence
	LF2: Ali went, na^{DAgr} [Ali didn't go]?	LF2: Ali didn't go, na^{DAgr} [Ali went]?
	✓ Relational Attitude: low credence	✗ Relational Attitude: high credence

4.3.2.2 Alternative Questions

Alternative questions (AltQs) are unbiased questions that express equal interest from the speaker towards each of the disjunctive alternatives, e.g., *Do you want coffee or tea?* Here, I am examining alternative questions with polarity alternatives, known as *or-not* AltQs. These questions propose two propositions in opposite polarities, e.g.,

Do you want coffee or not? (Bolinger 1978, Biezma 2009, among othhers). In Farsi, PolPrts can create such alternatives using the *-yâ-na* clause, literally meaning *or-no*. While the particle *âre* is not acceptable in AltQs, as shown in (169) and (170), *na* can be used to form felicitous constructions, although the form starting with a negative clause, as in (172), is marginally acceptable.

- (169) # Ali raft *yâ âre?*
Ali went or yes

- (170) # Ali na-raft *yâ âre?*
Ali NEG-went or yes

- (171) Ali raft *yâ na?*
Ali went or no
'Did Ali go or not?'

- (172) % Ali na-raft *yâ na?*
Ali NEG-went or no
'Did Ali not go or did he?'

Example (172) has a marked (represented by %) reading compared to (171), however, compared to its minimal pair in (170), it becomes felicitous in a context where the speaker is being challenged as to whether Ali didn't go, and the speaker seeks clarification (see convention of orders in AltQs in Van Rooy and Šafářová 2003).³⁵ While both polarity and conformity readings of *na* in (171) with a positive antecedent generate the same proposition ($\neg p$), in (172) with a negative antecedent, the particle can generate two different propositions. However, similar to TQs, the question itself does not indicate any ambiguity.

In AltQs, there is no sense of bias (and consequently no Relational Attitude), since the speaker is symmetrically interested in both propositions. Therefore, we need to determine which reading correctly provides the alternative proposition with respect to the first clause in the question. Starting with the polarity reading, on one hand, *âre^{Pos}* in (169') correctly generates a logically ill-formed question of [*p* or *p?*], while in (170'), the reading incorrectly predicts a possible form of [$\neg p$ or *p?*]. On the other hand, *na^{Neg}* in (171') can generate the felicitous form, [*p* or $\neg p?$], however in (172') results in illogical form, [$\neg p$ or $\neg p?$], though the question is felicitous.

³⁵In example (172), Farsi speakers might find it helpful to read the predicate in the first clause with focal stress, NA-RAFT 'NEG-went', and also utter the predicate *raft* 'went' after the particle in the second clause, i.e. 'Ali NA-RAFT *yâ na* RAFT?'. This improves the (marginal) acceptability for AltQs with a negative clause. However, running the same process with *âre*-AltQs as in (170), i.e. 'Ali NA-RAFT *yâ âre* RAFT?', the question is still infelicitous.

- | | |
|--|---|
| (169') # Ali raft yâ âre?
Ali went or yes | (170') # Ali na-raft yâ âre?
Ali NEG-went or yes |
| LF: Ali went or $\hat{a}re^{Pos}$ [Ali went]? | LF: Ali didn't go or $\hat{a}re^{Pos}$ [Ali went]? |
| ✓ Illogical | ✗ Predicted Felicitous |
-
- | | |
|--|---|
| (171') Ali raft yâ na?
Ali went or no | (172') Ali na-raft yâ na?
Ali NEG-went or no |
| LF: Ali went or na^{Neg} [Ali didn't go]? | LF: Ali didn't go or na^{Neg} [Ali didn't go]? |
| ✓ Felicitous | ✗ Predicted Infelicitous |

In contrast, the conformity reading of both particles correctly predicts the felicitous forms and identifies the infelicitous ones. $\hat{a}re^{Agr}$ in both (169'') and (170'') correctly generates illogical forms, while na^{DAgr} in (171'') and (172'') returns proper readings.

- | | |
|--|--|
| (169'') # Ali raft yâ âre?
Ali went or yes | (170'') # Ali na-raft yâ âre?
Ali NEG-went or yes |
| LF: Ali went or $\hat{a}re^{Agr}$ [Ali went]? | LF: Ali didn't go or $\hat{a}re^{Agr}$ [Ali didn't go]? |
| ✓ Illogical | ✓ Illogical |
-
- | | |
|---|---|
| (171'') Ali raft yâ na?
Ali went or no | (172'') Ali na-raft yâ na?
Ali NEG-went or no |
| LF: Ali went or na^{DAgr} [Ali didn't go]? | LF: Ali didn't go or na^{DAgr} [Ali went]? |
| ✓ Felicitous | ✓ Felicitous |

4.3.3 What about *čerâ*?

As mentioned before, Farsi has another response particle, *čerâ*, which exclusively expresses a positive response (B1) to negative initiatives, as in (174). Similar to German *doch* and French *si*, *čerâ* is unacceptable in response to positive forms (173).

- | | |
|---|--|
| (173) A: danešjuhâ mehmuni raftand?
students party went
'Did the students go to the party?' | (174) A: danešjuhâ mehmuni na-raftand?
students party NEG-went
'Did the students not go to the party?' |
| B1: # <i>čerâ</i> raftand.
ČERÂ went | B1: <i>čerâ</i> (raftand).
ČERÂ went
'Yes/No, they DID.' |
| B2: # <i>čerâ</i> na-raftand.
ČERÂ NEG-went | B2: # <i>čerâ</i> na-raftand.
ČERÂ NEG-went |

Particle *čerâ* can be used in certain embedded positions (B3-B6). While the coordinated response (B3) with *čerâ* is fully acceptable, its usage in embedded positions (B4-B6) is marked without the predicates, so I bring them outside the parentheses. In comparison to the previous examples with *âre* and *na*, embedded *čerâ* more frequently requires the presence of the predicate. Additionally, *čerâ* cannot be employed in the antecedent clause of conditionals (B7).

- (174) B3: Ali *čerâ* (raft) vali Sara *na* (na-raft).
 Ali ČERÂ went but Sara no NEG-went
 'Ali did but Sara didn't.'
- B4: Ali goft *čerâ* raftand.
 Ali said ČERÂ went
 'Ali said that they did.'
- B5: ferk konam *čerâ* raftand.
 thought do ČERÂ went
 'I think so.'
- B6: age ostad unja bude, *čerâ* raftand.
 if professor there was ČERÂ went
 'If the professor was there, they did.'
- B7: # age *čerâ* raftand, ta alan bâyad bargašte bašand.
 if ČERÂ NEG-went, until now must return be

Notice *čerâ* literally means 'why' and is used as a question operator in Wh-questions, such as (175). While its exclusive responsive meaning and the limitations in the embedded positions could be related to its literal meaning,³⁶ I posit *čerâ* has a double life (cf. *ja* and *denn* in German, see Lindner 1991, Theiler 2021). There is much more to be studied and explained about *čerâ*, and I leave it for further investigation.

³⁶It would not come as a surprise to discover that the responsive meaning of *čerâ* is a consequence of its literal meaning, resembling something like a *why*-rhetorical question, exemplified in (i). This implies that, much like in rhetorical questions where the response is evident to the participants, the responsive use of *čerâ* serves as a rhetorical questioning, indicating the answer that is already known. Consequently, in response to (174), response (B) follows the structure seen in (i), explicitly suggesting *they did*. I leave the discussion to future studies.

(i) B: *čerâ* [na-ran?]
 why NEG-go
 'Why wouldn't they go?' ~ meaning that they went.

- (175) čerâ Ali ne-miyâd?
why ali NEG-come
'Why doesn't Ali come?'

The distribution of *čerâ* is different from *âre* and *na* for the following reasons: (i) *čerâ* is predominantly used in colloquial speech.³⁷ (ii) Unlike *âre* and *na*, *čerâ* is unacceptable in certain embedded positions and often requires explicit predicates. (iii) *čerâ* cannot be used in polar questions, whereas the other two particles can form interrogatives such as TQs and AltQs. These three issues may be attributed to the literal Wh-meaning of *čerâ*, and may result in different syntactic form.

I only mention this particle because it does influence the particle preference in response to negative initiatives. Many speakers, including my informants and participants in my experiments, find both *âre* and *na* degraded in positive answers to negative initiatives, arguing they prefer *čerâ* as the optimal response. However, they acknowledge that the particle is not suitable for non-colloquial styles. Considering its distinct distribution and style, I have excluded *čerâ* from the scope of this study.

4.3.4 Summary

This section presented examples illustrating both polarity and conformity readings of PolPrts in Farsi, used in declarative responses and foring interrogatives. The analysis of declarative responses reveals the following key findings: (i) PolPrts exhibit ambiguity in response to negative initiatives. (ii) The polarity reading consistently maintains high acceptability across different types of initiatives. (iii) The acceptability of the conformity reading is influenced by the bias of the initiative, with a higher acceptability observed for obligatorily biased initiatives. On the other hand, the examination of interrogatives yields the following results: (iv) PolPrts in questions are unambiguous. (v) Only the conformity reading accurately predicts the intended meaning in interrogatives, namely TQs and AltQs.

³⁷I acknowledge that *âre* and *na* are also informal compared to the more formal words *bale* 'yes' and *xeir* 'no'. However, I differentiate between colloquial and informal in that the latter is related to speech or writing that is not strictly formal or standard, while the former refers specifically to informal speech (and to a lesser extent, informal writing). In other words, in a scale of formality, we have formal (*bale* and *xeir*) > informal (*âre* and *na*) > colloquial (*čerâ*).

Therefore, our data challenges the assumption that PolPrts are always ambiguous (clearly with negative antecedent). This is evident in both the bias observation presented in (164) within declarative responses and the unambiguous nature of PolPrts in interrogatives. Consequently, a comprehensive account of PolPrts should be capable of capturing the unavailable reading in cases of unambiguity while accurately predicting the optimal reading based on the initiative. In the section, an analysis of PolPrts in Farsi will be presented, including resolutions to the aforementioned puzzles, as well as introducing our theoretical perspective in addition to the existing literature.

4.4 Data Analysis

In this section, I offer my analysis of PolPrts, beginning with the underlying structure puzzle in Section 4.4.1. To address the other two puzzles, the proposal in Section 4.4.2 will be presented in two steps. In Section 4.4.2.1, I define the semantic denotation of PolPrts, advancing the idea of lexical ambiguity. I extend the account within the dynamic discourse framework in Section 4.4.2.2, employing the Scoreboard model to capture distinct discourse referents (DRs) associated with each reading. Section 4.4.3 discusses how our account helps solve the source of ambiguity and determine the optimal particle. Section 4.4.3.1 advocates for the optimal reading rooted in the inherent bias of the initiative. Lastly, we apply the account to the data from TQs and AltQs in Section 4.4.3.2, capturing the unambiguous and appropriate reading of PolPrts in interrogatives.

4.4.1 The Underlying Structure

While semantic studies agree that PolPrts are anaphoric to an antecedent, there are different proposals regarding their underlying structures, including *mono-clausal* and *bi-clausal* structures.³⁸ In the mono-clausal form, PolPrts always involve a prejacent, even in bare form. In contrast, the bi-clausal structure treats the particle as a proform

³⁸Notice that the clausal structure is not a crucial aspect of these accounts, and they can be reformulated to accommodate the other structure (see footnote 19 in Roelofsen and Farkas 2015).

that is independent from the prejacent. It is worth to recall that in syntactic accounts, similar to bi-clausal models, the prejacent always exists due to the polarity-marking relation between PolPrts and the polarity projection of the prejacent.

In this section, I present examples that support the mono-clausal structure over the bi-clausal one. Furthermore, I address the argument that the complement prejacent is semantically identical to the antecedent, even in cases where the particle is followed by a different clause (Laka 1990), as shown in example (176). Here, the complement prejacent is fully elided, and the overt clause follows the identical proposition as represented in the logical form (LF).

(176) A: Did Ali go to the party?

B: *na, kâr dâšt.*
no work had
'No, he was busy.'

LF: no [_{TP} Ali didn't go to the party]. He was busy.

4.4.1.1 Intonational Boundary

The first argument in favor of the mono-clausal structure is based on the prosodic representation of PolPrts and the prejackets. Empirical evidence from English, observed by Pope (1976) and further examined by Goodhue (2018), supports this argument. Goodhue demonstrates that in example (177), taken from p. 168, the utterance (B1) can be easily pronounced with a single intonational boundary, whereas it is nearly impossible for (B2) to be uttered in the same way.³⁹ He suggests that two separated speech acts as in (B2) cannot be pronounced with a single intonational tune.

(177) Jane likes steak, right?

B1: No, she doesn't.

B2: She doesn't, she is vegetarian.

Goodhue argues for the prominence shift between constituents within a sentence, which he refers to as intrasententially. This shift is not possible between clauses, as

³⁹It is worth considering the role of punctuation (such as the comma) in both (B1) and (B2) of example (177). The influence of automatic pauses after commas or periods should be taken into account in intonational arguments.

illustrated in (B2) in (178), adopted from Goodhue (2018): p. 169. That means if PolPrts and the prejacent were not within the same sentence, we would expect (B1) mirrors the infelicity of (B2), where the verb *likes* similarly necessitates prominent prosody regarding its separated sentential boundary in (B3). In (B3), both *does* and *likes* are prominent, given their association with distinct intonational boundaries. Conversely, in (B1), operating within a singular intonational boundary, only *Yes* emerges as the prominent element in the sentence.

(178) Does Jean like coffee?

B1: YES, she likes coffee.

B2: # She DOES, she likes coffee.

B3: She DOES, she LIKES coffee.

Similar phonological arguments can be applied to Farsi, although more empirical data is required to determine the existence of intonational boundaries and the scope of prosodic shifts. Preliminary observations indicate that speakers do not typically pause between PolPrts and the remaining constituent in the prejacent, whereas a pause is more likely to occur between two separate clauses. For instance, in example (179), there is usually no pause after the particle *na* in (B1), but it is more likely to have a pause (represented by \curvearrowright) as in (B2),⁴⁰ similar to the pause that occurs after the verb in the prejacent and before the subsequent clause in (B3). I leave the phonological evidence for future studies.⁴¹

(179) Did Ali go to the party?

B1: *na* na-raft.
no NEG-went
'No, he didn't.'

B2: *na* \curvearrowright kâr dašt.
no work had
'No, he was busy.'

B3: *na* na-raft \curvearrowright kâr dašt.
no NEG-went work had
'No, he didn't. He was busy'

⁴⁰Note that the pause is too short that needs accurate phonological studies. However, a native speaker (or the reader) can try with an exaggerated pause, which is acceptable between clauses but not within a clause.

⁴¹Following the footnote 39 about the use of punctuation, it is not clear whether a comma should be placed after PolPrts in Farsi. From the data I have examined in various novels, the comma is not strictly used. I found instances similar to cases (B1) and (B2) both with and without a comma, although (B3) should be separated by a period. The role of punctuation warrants further investigation in a separate study.

4.4.1.2 Commitment Dependency

The distinction between bi-clausal and mono-clausal structures also appears to raise some issues regarding discourse commitments (DC). In general, each declarative sentence carries its own speech act assertion and introduces a new commitment for the speaker. Thus, the speaker's new DC remains consistent with her earlier commitments, unless she retracts or corrects her commitment, e.g, '*I want a cheeseburger. No wait! I don't want a cheeseburger*' (see Farkas and Bruce 2009). While the speech act of assertion in a declarative sentence implies speaker's full commitment to the proposition, various linguistic devices such as adverbs, modals, or attitude predicates allow the speaker to convey different degrees of commitment e.g, '*I'll have a cheeseburger. I mean, I probably have a cheeseburger*'. Therefore, it is worth exploring whether PolPrts and the prejacent generate separate commitments (in a bi-clausal structure) or if they interact within a single clause (in a mono-clausal structure).

In example (180), if we assume that the response particle is separated from the prejacent, the interpretation of the particle *na* in (B1) should be similar to (B3), where speaker B initially commits to the proposition *that Ali doesn't come*, but then reduces her commitment by stating *it is probable that he doesn't come*. However, what (B1) means is similar to (B2), where B believes *that probably Ali doesn't come*.

- (180) A: Does Ali come to the party?

B1: *na ehtemâlan ne-miyâd.*
no probably NEG-comes
'Probably not.'

B2: *ehtemâlan ne-miyâd.*
probably NEG-comes
'Probably not.'

B3: *ne-miyâd. ehtemâlan ne-miyâd*
NEG-comes probably NEG-come
'He doesn't. Probably he doesn't.'

Likewise, speakers can update their discourse commitments by correcting themselves. In example (181), the speaker in (B1) neither commits to the proposition *p* nor to its negation $\neg p$ in response to the question [*p?*], but rather expresses a hope that *p*

will occur. The commitment remains unchanged without the presence of any particle in (B2). However, in (B3), the speaker corrects her initial (full) commitment to p , represented by *Believe* in DC , by revising it to a weaker commitment with desire. While the members in DC should be consistent, the stronger commitment should be first removed from the commitment set.⁴² It is important to note that (B3) is characterized by two intonational boundaries, separated by a comma. Furthermore, the word *omidvâram* ‘hopeful’ in (B3) necessarily carries (corrective) focus, indicating the revision of the commitment (i.e. correcting *believe* to *hope*), however the focus is not necessary in (B1) and (B2).

- (181) A: Does Ali come to the party?

B1: <i>âre omidvâr-am beyâd.</i>	$DC_B = DC_B \cup \{\text{Hope}_B(\text{come}(\text{ali}))\}$
yes hopeful-am comes	
‘I hope he does.’	
B2: <i>omidvâr-am beyâd.</i>	$DC_B = DC_B \cup \{\text{Hope}_B(\text{come}(\text{ali}))\}$
hopeful-am comes	
‘I hope he does.’	
B3: <i>meyâd, [omidvâr-am]_F beyâd.</i>	$DC_B = DC_B \cup \{\text{Believe}_B(\text{come}(\text{ali}))\}$
comes hopeful-am comes	$DC_B = DC_B - \{\text{Believe}_B(\text{come}(\text{ali}))\}$
‘He does, (indeed) I hope he does.’	$DC_B = DC_B \cup \{\text{Hope}_B(\text{come}(\text{ali}))\}$

Taken together, the speaker in (B1) and (B2) does not commit to the proposition. That is, *âre* interacts with the prejacent and results in a mono-clause form with a proposition under the desire commitment. Thus, there is no commitment correction. However, in (B3), the speaker corrects her commitment, perceived by the focal stress.

⁴²Example (ii) with a weaker commitment under *think* mirrors that of full commitment in (i). In (i.a), the speaker cannot simultaneously commit to both p and $\neg p$ unless she corrects her speech, as illustrated in (i.b). Similarly, in (ii.a), the speaker cannot maintain full commitment (belief) in p while simultaneously thinking p is true unless she retracts her initial belief, as shown in (ii.b).

- (i) Full commitment (believing):
 - a. Ali went to the party yesterday. He was working all day, and # he didn’t go.
 - b. Ali went to the party yesterday. Oh wait! I’ve made a mistake. He was working all day, and he didn’t go.
- (ii) Commitment under *think*:
 - a. Ali went to the party yesterday. He was working all day, and # I think he didn’t go.
 - b. Ali went to the party yesterday. Oh wait! I’ve made a mistake. He was working all day, and I think he didn’t go.

4.4.1.3 Information Structure

Information structure/packaging is typically described as a variation of sentential structure that modifies the information conveyed by a sentence in relation to the context. In essence, a sentence can be packaged in different forms, all carry the same truth-value meaning, while each packaging form associates with different pragmatic phenomena such as focus-background, topicalization, old/new information, word order, and etc.

Given that, when an answer is packaged as a single proposition or two independent propositions, it may result in different information structures. Let's consider a plain vanilla example as in (182).⁴³ Needless to say answer (B1) is the canonical (unmarked) response accepting the question. While (B2) conveys the same truth-value proposition in (B1), it indicates extra information like emphasis (expressed by *definitely*). This emphasis can have different contextual meanings, for example, speaker B might be very enthusiastic or irritated by the question and repeated the answer to express her feeling. If such information does not associate with the context, answer (B2) is infelicitous and redundant (as it is tautology and against the principle of economy).

- (182) A: Will you come to the party?

B1: miām.
 come
 'I will.'

B2: miām. miām.
 come come
 'I will (definitely) come.'

Moving to responses with PolPrts, speakers commonly employ a partially elided prejacent in company with a particle.⁴⁴ Regarding the example (182), the bi-clausal structure should either express extra information akin to (B2) or it would be redundant. Responses (B3) and (B4) hold identical truth-value meaning as (B1) and (B2). In a comparable vein, both (B3) and (B4) impart the same informational content as (B1), thereby suggesting a mono-clausal information structure. In other words, (B4) lacks a sense of emphasis, assuming it consists of two propositions similar to (B2).

⁴³Note that Farsi is a null-subject language, and including the subject in responses may seem unusual in general.

⁴⁴Although I haven't conducted a corpus study on the distribution of PolPrts with and without a prejacent, my statement about their frequent use with a prejacent is based on personal observation as a native speaker.

B3: âre.
yes
'Yes, I will.'

B4: âre miâm.
yes come
'Yes, I will.'

One might object that uttering the referent right after a proform is not unexpected. For instance, in example (183), the speaker clarifies the referent right after the pronoun *she* by adding *my younger sister*, assuming that the referent of *she* might be confusing for the hearer when distinguishing between the older and younger sisters.

(183) A is talking about his family and says: '*She, my younger sister, has two girls.*'

While this example serves as a clarification by packaging the pronoun and the referent together, it is not the common form of using a pronoun. However, in example (182), (B3) and (B4) are equally unmarked compared to (B2). Hence, I reject the objection. Before closing this section, it is worth noting the fragment answers with PolPrts, introduced by Krifka (2013). He mentions in some languages, PolPrts can come with parameters from the question, referred to as *polarity fragment answers*. Krifka provides example (184) in Italian, suggesting that PolPrts can pick up the backgrounded information from the question, e.g., $\lambda x.[x \text{ has eaten}]$, and apply it to the topic *Gianni* (adopted from Krifka 2013: p.8).

(184) A: Who amongst you has eaten?
B: Gianni si.

While in Farsi, one cannot use such structure in response to constituent questions as in (185), we may find example (186) in the similar vein of backgrounding. In a context where we have {Sara, Ali} as the children, the proposition in the question would be true for Sara and false for Ali, as in (B1). The same process applies to any other arguments as in (B2) and (B3).⁴⁵

⁴⁵It is worth noting that responses to (186) do not require focus on the related constituent in the question (e.g., focus on *bachehâ* 'children' for B1) to be felicitous. In other words, A can ask the question in a general sense about *p*, but B knows that the answer is different for the subset of *p*.

(i) A: The children didn't give their books to the library.

B1: Sara *âre^{Pos}* dâd vali Ali *na^{Neg}* na-dâd.
Sara yes gave but Ali no NEG-gave
'Sara did but Ali didn't.'

- (185) A: ki ketabha-š ro be ketâbxune mide?
 who books-his/her ACC to library give
 'Who give his/her books to the library?'

B1: # Sara *âre*.
 Sara yes

- (186) A: bachehâ vasâyele-šun ro be ketâbxune midan?
 children stuffs-their ACC to library give
 'Do the children give their stuffs to the library?'

B1: Sara *âre* vali Ali *na*.
 Sara yes but Ali no
 'Sara does but Ali doesn't.'

B2: ketâbha-šun ro *âre* vali majalehâ-šun ro *na*.
 books-thier ACC yes but magazines-their ACC no
 'They give their books but not their magazines.'

B3: be ketâbxune *âre* vali be madrese *na*.
 to library yes but to school no
 'They give them to the library but not the school.'

Considering the topic movement, the backgrounded antecedent solution can adequately account for responses like (B1)–(B3) in (186), keeping the answers as monoclause with topic phrases. I wonder what is the analysis of (B4)–(B8)? They all have the same prejacent with different (multi) explicit remnants (written in black, while the gray texts represent the elided/silent parts).⁴⁶

-
- B2: Sara *âre^{Agr}* na-dâd vali Ali *na^{D^{Agr}}* dâd.
 Sara yes NEG-gave but Ali no gave
 meaning 'Sara didn't but Ali did.'
- B3:# Sara *âre^{Pos}* dâd vali Ali *âre^{Agr}* na-dâd.
 Sara yes gave but Ali yes NEG-gave
 meaning 'Sara did but Ali didn't.'

Lexicalist approaches argue that homophones can be used in cases like (*John is sitting by the river bank near the bank building*). However, I propose that the unacceptability of (B3) is pragmatic in nature. The addressee makes a decision about which reading system to use based on the bias in the question before providing the answer, and she maintains that reading throughout the sentence. Therefore, it would be odd to have the polarity reading in the first part of a conjunction, focusing on the polarity of the answer, and then switch to the conformity reading in the second part, assuming the question is biased (see Section 4.3.1.2 for the effect of bias). In other words, while the speaker may have expressed their bias for the entire question and not just a subset of it, the addressee also adheres to a single reading when using particles.

⁴⁶Note that responses to (186) do not require focus on the related constituent in the question

- (186) B4: *na bachehâ ketâbhâ-šun ro be ketâbxune ne-midan.*
 no children books-their ACC to library NEG-give
 'No, they don't give their books to the library.'

B5: *na bachehâ ketâbhâ-šun ro be ketâbxune ne-midan. They sale them.*

B6: *na bachehâ ketâbhâ-šun ro be ketâbxune ne-midan. I give mine.*

B7: *na bachehâ ketâbhâ-šun ro be ketâbxune ne-midan. They give their magazines.*

B8: *na bachehâ ketâbhâ-šun ro be ketâbxune ne-midan. They want to keep them.*

In cases where there are multiple remnant constituents, as those found in (B6)–(B8), the backgrounded model faces the challenge of either treating them as a multi-topic constituents (in a single clause), which does not seem to be the real case, or considering them as separate clauses. That is, the analysis would consider PolPrts in (B1)–(B3) as anaphoric to the backgrounded antecedent, leading to a mono-clausal structure, whereas (B4)–(B7) would exhibit a bi-clausal structure where the particle is independent of the prejacent.

Although these assumptions can account for the data, it remains unclear whether the speaker in (B4)–(B8), using a bi-clausal form, corrects her commitments. In (B7), for instance, the particle *na* refers to the negative proposition '*that the children don't give their stuff to the library*' as a full denial, and the second clause with the remnant constituents [*their books*] and [*NEG-Give*] indicates '*that the children don't give their books*' as a partial denial, which aligns with the continuation '*that they give their magazines*'. It is unclear why someone would state a full denial in the first proposition using *na*, when the answer is a partial denial as in the prejacent and the continuation of the conversation (unless she retracts or corrects herself).

To summarize, the data from Farsi lends support to the ellipsis account as the underlying structure for PolPrts, wherein the particle and the prejacent form a single clause. Although the bi-clausal structure can account for the core data by making certain assumptions, it lacks a unified model.

(e.g., focus on *bachehâ* 'children' for B1) to be felicitous. In other words, A can ask the question in a general sense about *p*, while B may know that the answer is different for the subset of *p*. The prosodic saliency in the answers is on the constituent remnants as the topic stress.

4.4.2 The Proposal

To solve the puzzles of the source of ambiguity and the optimal particles, this section will propose an account for PolPrts in Farsi (regarding the presented data). It is important to note that although there are limitations of PolPrts in interrogatives, where they are not used in both readings, their similarity to PolPrts in declarative responses, in terms of form and meaning, is fair enough to consider them as the same particles and analyze them under the same lexical entries (cf. different PolPrts in Servidio 2018 for Italian, more details in Section 4.4.3). This section aims to provide a unified account for PolPrts in both declarative responses and interrogatives.

The proposed account consists of two steps, drawing upon the analysis presented in Mohammadi and Romero (2024). First, in Section 4.4.2.1, the semantic denotation of each particle in the polarity and conformity readings will be defined in separated lexical entries as propositional anaphoras (following Pope 1976 and Roelofsen and Farkas 2015). Second, in Section 4.4.2.2, different discourse referents will be introduced for each reading by the means of the scoreboard model. The idea is that while PolPrts are lexically ambiguous, they are anaphoric to different discourse references. It will be argued that the limitations of PolPrts in interrogatives and the bias observation of reading preference in declarative responses are both due to the availability of discourse referents. Later in Section 4.4.3, this account will be applied to the data.

4.4.2.1 The Semantic Entries

Since I am going to define PolPrts as propositional anaphoras, we should first discuss their antecedents. Following the literature, PolPrts (similar to other anaphoric elements) refer to the most salient/highlighted proposition in the context as their discourse referent. The highlighting notion prevents the use of PolPrts in response to Wh-questions or AltQs, as well as using them out of the blue (and at the beginning of a conversation). Roelofsen and Farkas (2015)'s study extensively explores the highlighted proposition in various types of initiatives in Inquisitive Semantics.

It is worth noting a point, which was also mentioned in a footnote by Roelofsen and

Farkas (2015) (see their footnote 27, p. 400). They provide an example with *doch*⁴⁷ and mention that with sufficient contextual support, an antecedent can also be accommodated for PolPrts. Thus, it would not be surprising if we consider the concept of *familiarity*, proposed by Heim (1983), as an alternative approach. Heim defines familiarity as a matter of having an antecedent in the context or having a contextually salient referent, similar to deictic expressions. Therefore, using familiarity as a common factor between these two cases could contribute to the determination of the antecedent for PolPrts in examples (187) and (188).

- (187) **Context:** A and B want to go to a party. It's 7 pm and B is not ready yet. A looks at B and taps his watch with his finger, indicating it is getting late.

A: âre midunam dir šode. Give me a minute.
yes know late becomes
'I know it's late!'

- (188) **Context:** A and B are discussing a new position in their department. B believes the position is a great opportunity and highly demanded.

B: Who doesn't want this position? (meaning everyone wants it)

A1: âre hame mixâñ-eš.	A2: na man ne-mixâñ-eš.
yes everyone wants-it	no I NEG-want-it
'Yes, everyone wants it.'	'No, I don't want it.'

Therefore, as long as the interlocutors can correctly recognize the intended reference, the discourse referent of the particles can be successfully resolved. Thus, whether PolPrts are anaphoric to an explicit or implicit contextual antecedent, or they can be used deictically and pick up non-linguistic antecedents, the variable alignment in anaphoras can determine the referent. While this topic is interesting, it is not the focus of our account, and I leave the discussion for future studies. Here, I follow Roelofsen and Farkas (2015)'s account, and I will not further investigate the resolution of the discourse referent.

⁴⁷Roelofsen and Farkas (2015) adopted example (i) from Karagjosova (2006)

(i) A: Das war sehr freundlich von ihm.
'That was very friendly of him.'

B: Doch, das muss man schon sagen.
'Yes, that needs to be admitted.'

As discussed in Section 4.2.3, Roelofsen and Farkas (2015) build upon Pope (1976)'s work by proposing disjunctive features instead of conjunctive features. On one hand, Pope introduces four types of responses, *positive-agreement*, *positive-disagreement*, *negative-agreement*, and *negative-disagreement*, and explains that particles are dedicated to one of these readings. On the other hand, Roelofsen and Farkas propose that PolPrts realize individual features disjunctively. For example, *Yes* can mark an answer as a positive proposition or in agreement with the initiative, while *No* can mark an answer as a negative proposition or in disagreement with the initiative.

I follow the feature marker accounts for PolPrts in Farsi. However, I differ in a trivial point that is crucial for the subsequent step of my analysis in dynamic discourse, which can explain the data better. Mohammadi (2022) claims that each particle has two distinct entries, making them lexically ambiguous. It is worth noting that Roelofsen and Farkas also mention that in lexical terms, PolPrts are polysemous rather than arbitrarily ambiguous (2015: p. 387). However, they define the features in a disjunctive combination, apparently within a single entry (see the definitions (72)–(75) in Roelofsen and Farkas (2015), repeated in examples (152)–(154) in Section 4.2.3). I argue that the disjunctive feature marking allows both readings of each particle in all settings, predicting ambiguity in all cases with a negative antecedent. However, the data shows that there are certain settings with only one available reading.

The denotations are provided in (189)–(192). The particles function as identity functions with presuppositional feature marking tests. The proposition to saturate the λp -slot may be fully or partially elided.⁴⁸ The anaphoric link is encoded in $g(i)$, which refers to the propositional DR highlighted by the initiative (à la Roelofsen and Farkas 2015). The functions $+$ and $-$ take a proposition p and return a truth value: $+p = 1$ iff p has positive polarity and $-p = 1$ iff p has negative polarity.⁴⁹

⁴⁸Following Rasekhi (2018), I assume that PolPrts in Farsi sit in the left-periphery specifier of the polarity phrase (PolP), where they are attached to a fully or partially elided propositional prejacent. The discussion and examples are presented in Section 4.4.1.

⁴⁹See Roelofsen and Farkas (2015) p. 378 for a richer way to represent propositional polarity consisting of a pair $\langle [\phi]^+, [\phi]^-\rangle$ which hosts a proposition derived from a positive structure as the first member of the pair and a proposition derived from a negative structure as the second member. For example, the positive sentence *John arrived* will have the pair representation $\langle \lambda w. \text{arrive}_w(j), \emptyset \rangle$ while the negative sentence *John did not arrive* will be represented as $\langle \emptyset, \lambda w. \neg \text{arrive}_w(j) \rangle$.

- Lexical entries of PolPrts in Farsi:

[To be revised]

$$(189) \quad [\![\hat{a}re_i^{Pos}]\!]^{w,g} = \lambda p : (p = g(i) \vee p = \neg g(i)) \wedge +p \cdot p$$

$$(190) \quad [\![\hat{n}a_i^{Neg}]\!]^{w,g} = \lambda p : (p = g(i) \vee p = \neg g(i)) \wedge -p \cdot p$$

$$(191) \quad [\![\hat{a}re_i^{Agr}]\!]^{w,g} = \lambda p : p = g(i) \cdot p$$

$$(192) \quad [\![\hat{n}a_i^{DAgr}]\!]^{w,g} = \lambda p : p = \neg g(i) \cdot p$$

In the polarity-reading entries (189)–(190), both particles first verify that the prejacent p and the highlighted DR $g(i)$ are identical up to their polarity values (i.e., $(p = g(i) \vee p = \neg g(i))$). This is essential to prevent unrelated answers, as exemplified by ‘*A: Did John come? B: #Yes, I am.*’ (see examples (89) and (90) in Farkas and Roelofsen 2017), while still allowing for coupling a prejacent and a DR that align in propositional content except for their polarity, thus enabling responses like ‘*A: John did not come. B: Yes, he did*’. Subsequently, $\hat{a}re^{Pos}$ and $\hat{n}a^{Neg}$ require that their prejacent p exhibit positive and negative polarity, respectively. Hence, the lexical entries guarantee that the polarity of $\hat{a}re^{Pos}/\hat{n}a^{Neg}$ and of the prejacent p align, thereby preventing infelicitous answers such as ‘*A: Did John come? B: #Yes, he didn’t*’.

In the conformity reading entries (191)–(192), $\hat{a}re^{Agr}$ presupposes that the prejacent proposition p and the DR $g(i)$ are identical ($p = g(i)$), whereas $\hat{n}a^{DAgr}$ presupposes that they are complementary ($p = \neg g(i)$).

Table 4.2 summarizes the possible readings. The Initiative column indicates the highlighted proposition (q), referred to by $g(i)$, and the Prejacent column shows the corresponding (elided) proposition followed by the particle. The lexical entries of the particles are also provided. Cells marked with two crosses in a given column indicate the corresponding particle cannot be followed by the related prejacent.

Initiative	Prejacent	$\hat{a}re^{Pos}$	$\hat{a}re^{Agr}$	$\hat{n}a^{Neg}$	$\hat{n}a^{DAgr}$
Positive (q)	p	✓	✓	✗	✗
	$\neg p$	✗	✗	✓	✓
Negative ($\neg q$)	p	✓	✗	✗	✓
	$\neg p$	✗	✓	✓	✗

Table 4.2: Possible readings of PolPrts in response to positive and negative initiatives.

All together, *âre* can only precede a positive proposition in response to positive initiatives, whereas it can precede either a positive or negative prejacent after a negative initiative. Similarly, *na* can be used with a negative prejacent in response to positive initiatives, but both positive and negative prejackets are acceptable with *na* in response to negative initiatives. So far, the analysis is based on the current perspective following Roelofsen and Farkas (2015), which can be adapted to other accounts with minor modifications. An important addition to the current analysis is the incorporation of the second step in our account.

The necessity of lexical entries becomes evident in two aspects: (i) the differing acceptability of the readings based on the type of initiative, and (ii) unambiguous cases such as interrogatives. In the next section, I will address both issues within the context of dynamic discourse by positing different discourse referents for each reading. Building upon our proposal in Mohammadi and Romero (2024), we will demonstrate that particles in the polarity reading refer to the discourse referents under negotiation, whereas particles in the conformity reading are anaphoric to the referents in the speaker’s commitment.

4.4.2.2 The Discourse Referents

The second part of our account is defined in dynamic discourse, presented in the Scoreboard model (Farkas and Bruce 2009, Malamud and Stephenson 2015). This model distinguishes between propositional discourse referents on the ‘negotiation’ *Table* and in the Discourse Commitments of speaker A, both current (DC_A) or tentative (DC_A^*) ones. We claim that each reading refers to a different discourse referents (Mohammadi and Romero 2024). In short, the polarity entries refer to the proposition on the *Table*, while the conformity entries are anaphoric to the discourse commitment, regardless of the current or tentative forms.

Let’s first have a review of the required components from the Scoreboard model. Farkas and Bruce (2009) represent the uttered proposition (q) as the highlighted one by its syntactic category over the radical sentence on the *Table*. The *Table* for an assertion and a question will be filled as shown in (193) and (194), respectively.

The radical sentence ‘*Sam is home*’ in both examples is added as the highlighted proposition on the *Table*, marked by [D]eclarative and [I]nterrogative, in addition to $\{q\}$ and $\{q, \neg q\}$ as the meaning of the examples.

(193) Sam is home.

(194) Is Sam home?

Table = <‘Sam is home’[D]; $\{q\}$ >

Table = <‘Sam is home’[I]; $\{q, \neg q\}$ >

I represent a simplified version of the model (cf. Malamud and Stephenson 2015), in which I do not include the syntactic category, but I indicate the salient proposition in boldface q as in (194’). Highlighting a proposition in assertions is not necessary, while a singleton set, i.e. $\{q\}$, unambiguously indicates it as the salient proposition. For uniformity, I show it in boldface as well.

(193’) *Table* = < $\{\mathbf{q}\}$ >

(194’) *Table* = < $\{\mathbf{q}, \neg q\}$ >

The other two components, namely the Common Ground (*CG*) and the Projected Common Ground (*CG**) (adopted from Malamud and Stephenson 2015, cf. the *projected set* in Farkas and Bruce 2009) remain the same as introduced in the literature. In short, *CG* is the set of propositions publicly shared between the interlocutors, and *CG** is a set of all possible CGs, given the possible/default resolutions for the current issue on the *Table*. Farkas and Bruce claim that different types of sentences suggest different possibilities as the next projected discourse move. For instance, default assertions, $[\phi.]$, project the confirmation of ϕ , while (default) polar questions $[\phi?]$ project both accepting and rejecting ϕ as the projected future discourse.⁵⁰ Finally, Farkas and Bruce argue that the *DC* of the speaker is filled by the proposition in an assertion, while it remains intact in questions. Malamud and Stephenson (2015) extend the scoreboard model by introducing the notion of projected discourse commitment, *DC**, which includes speaker’s tentative commitments (for more details see Section 2.2.3.2). Both *DC* and *DC** play crucial roles in our account, and I will elaborate on their significance below. Now, we can represent different initiatives and

⁵⁰The general idea of the default vs non-default forms is that any assertion with a resolution different from “confirmation” and any polar question with resolutions different from “accepting” and “rejecting” are the non-default forms (for further discussion, see Farkas and Bruce 2009).

capture the required discourse referents for PolPrts. The goal of the dynamic discourse analysis of the initiatives is to figure out (I) the bias observation, in which the conformity reading was highly degraded in response to optionally biased initiatives compared to the constant high acceptability of the polarity reading, and (II) the unambiguity of PolPrts in interrogatives. Let's check each point.

Starting with (I). The bias observation in Section 4.3.1.2 was confirmed by the experimental data in Section 5.2 as well (Mohammadi to appear). While the positive initiatives do not reflect the ambiguity of PolPrts, I drew the scoreboard for different negative initiatives, including negative assertions, NPQs, and *dige*-NPQs. Assertions are considered the highest form of bias in terms of the speaker's commitment. I consider NPQs as optionally biased forms and *dige*-NPQs as obligatorily biased forms, both of which are biased towards $\neg p$.

Following the literature, an assertion $[\neg\phi.]$ adds $\{\neg\phi\}$ to both the *Table* and DC_A , as shown in Table 4.3, whereas questions, including NPQs $[\neg\phi?]$ and *dige*-NPQs $[\neg\phi \text{ } \textit{dige}?]$, put $\{\neg\phi, \phi\}$ on the *Table*, as shown in Table 4.4 and 4.5. Extending Malamud and Stephenson (2015)'s modeling of bias in TQs to bias in *dige*-NPQs, $[\neg\phi \text{ } \textit{dige}?]$ additionally signals that speaker A is tentatively committed to $\neg\phi$, as shown in Table 4.5.⁵¹ Note that CG and CG^* remain the same as proposed in Farkas and Bruce (2009).⁵²

A	Table	B
$DC_A = \cup\{\neg\phi\}$	$\{\neg\phi\}$	DC_B
DC_A^*		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{\neg\phi\}$	

Table 4.3: Assertions $[\neg\phi.]$

⁵¹Expressing a tentative/conditional commitment to the anchor is common, assuming that tag questions expect confirmation from the addressee (cf. conditional *DC* in Servidio 2014). Thus, such an extension is not unexpected since *dige*-questions, similar to TQs, seek confirmation.

⁵²The \cup in CG^* denotes the union with all the elements in the set (adopted from Roelofsen and Farkas 2015). When the set consists of one element as in the CG^* in assertions (Table 4.3), \cup is equivalent to \cup . However, when the set has more elements as in the CG^* in questions (Table 4.4), \cup represents a joint union with all the elements in the set. This notation is simply a shorthand for $CG^* = \{CG \cup \{\neg\phi\}, CG \cup \{\phi\}\}$.

A	Table	B
DC_A	$\{\neg\phi, \phi\}$	DC_B
DC_A^*		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{U} \{\neg\phi, \phi\}$	

Table 4.4: NPQs $[\neg\phi?]$

A	Table	B
DC_A	$\{\neg\phi, \phi\}$	DC_B
$DC_A^* = \cup \{\neg\phi\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{U} \{\neg\phi, \phi\}$	

Table 4.5: *dige*-NPQs $[\neg\phi \text{ } dige?]$

Following Mohammadi and Romero (2024), we claim that PolPrts in the polarity reading refer to the (highlighted) discourse referent on the *Table*, while PolPrts in the conformity reading refer to the *DC*. The idea is that one marks an answer as a positive or negative proposition with respect to the raised issue under negotiation, while intuitively they can agree or disagree with someone’s (tentative) belief/idea/commitment. Thus, while a question that is asked without any expectation does not indicate the speaker’s belief, responding with the conformity reading seems unrelated.

Given that, the constant acceptability of the polarity reading is due to the presence of the required propositional DR on the *Table* in all cases. However, the gradable acceptability of the conformity reading of PolPrts is due to the presence or absence of the antecedent in the $DC^{(*)}$. On one hand, optionally biased questions, i.e., NPQs, might (but not necessarily) imply bias. Thus, the acceptability of the conformity reading becomes shaky, as some bias-sensitive speakers may accept the conformity particles while bias-insensitive speakers reject them. On the other hand, inherently biased questions, i.e., *dige*-NPQs, obligatorily express bias by the discourse particle *dige*. Consequently, more speakers find the conformity particles acceptable.

To implement this idea, we enrich our basic lexical entries with an additional presuppositional condition. In the polarity readings (189) and (190), repeated below, PolPrts are anaphoric to a DR $-g(i)$ in the lexical entries— that is on the negotiation *Table* of the initiative, marked as purple ϕ in our Scoreboard representations above. That is, are_i^{Pos} and na_i^{Neg} presuppose that $g(i) \in \text{Table}$. In contrast, in the

conformity readings (191) and (192), PolPrts are anaphoric to a DR $g(\textcolor{brown}{i})$ that is in the (current/tentative) $DC_A^{(*)}$ of the initiative, marked as orange ϕ in our Scoreboard representations. In other words, $\text{are}_{\textcolor{brown}{i}}^{Agr}$ and $na_{\textcolor{brown}{i}}^{Dagr}$ presuppose that $g(\textcolor{brown}{i}) \in DC^{(*)}$:

- **Lexical entries of PolPrts in Farsi:** [Final version]

$$(189) \quad [\text{âre}_{\textcolor{violet}{i}}^{Pos}] = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge +p \cdot p$$

$$(190) \quad [\text{na}_{\textcolor{violet}{i}}^{Neg}] = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge -p \cdot p$$

$$(191) \quad [\text{âre}_{\textcolor{brown}{i}}^{Agr}] = \lambda p : p = g(\textcolor{brown}{i}) \wedge g(\textcolor{brown}{i}) \in DC^{(*)} \cdot p$$

$$(192) \quad [\text{na}_{\textcolor{brown}{i}}^{Dagr}] = \lambda p : p = \neg g(\textcolor{brown}{i}) \wedge g(\textcolor{brown}{i}) \in DC^{(*)} \cdot p$$

Therefore, the gradable acceptability of the conformity readings in response to different types of initiatives can be explained by their potential bias and its representation as a discourse reference in the speaker's (tentative) $DC^{(*)}$. Moreover, regarding issue (II), the unambiguity of PolPrts in interrogatives can also be explained by the lack of proper referent. To determine the potential referent for PolPrts in interrogatives, we utilize the scoreboard model, illustrated in 4.6 for TQs and in 4.7 for AltQs.

In TQs, $[\neg\phi, \text{PolPrt?}]$, I analyze the role of the anchor and the tag separately. As discussed in Section 3.4.2, we proposed the propositional anchor as the speaker's bias expectation (indicating a tentative commitment) and the proposition in the tag as different conditions of the contextual bias (CB). I also introduced the concept of Relational Attitude, calculating the bias attitude (and strength) of TQs based on the polarity relation between the anchor and the tag. The model aligns with speakers' judgments, where none of the tags express ambiguity, and *âre*-tags indicate speaker's high credence and certainty compared to *na*-tags, which convey lower credence (see Section 4.3.2.1). We propose that the anchor, $\{\neg\phi\}$, is first added to DC_A^* , Table 4.6, while the tag later pushes $\{\neg\phi, \phi\}$ to the *Table* (Mohammadi and Romero 2024).

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\neg\phi\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{\neg\phi\}$	

Table 4.6: TQs $[\neg\phi, \text{PolPrts}_{\textcolor{brown}{i}}?]$

With $\neg\phi$ in the (tentative) DC_A^* of the speaker, the particle in the tag, whether *âre* or *na*, only has the discourse referent available for its conformity reading. In other words, the polarity entries are not applicable in this setting as they lack an antecedent. However, the conformity entries refer to their antecedent in the speaker's $DC^{(*)}$, yielding the related proposition, which is fully elided. Therefore, there is no sense of ambiguity in TQs.

Lastly, we should consider PolPrts in AltQs. While the assertive anchor in TQs is added to DC_A^* as the speaker's tentative belief, one might object that including the first clause of AltQs, $[\phi \text{ or } \text{PolPrt?}]$ in DC_A^* introduces bias. While I acknowledge the critic, for the sake of analysis, I assume that in AltQs, adding both alternatives in DC_A^* results in a symmetric interest of the speaker. Regarding the propositional reading of PolPrts, by asking ' ϕ or $\neg\phi$?', the speaker indicates that she requires/demands either proposition. Therefore, including both ϕ and $\neg\phi$ in DC_A^* signals that the speaker is equally interested in both propositions. Although including both propositions in DC_A^* may seem non-vital, as it would yield the same result when none of the propositions are present in DC_A^* , it maintains the unity of our analysis, as presented in Table 4.7. Furthermore, it differentiates AltQs from PQs, in the sense that the proposed DC_A^* in AltQs could indicate speaker's symmetric interest on both answers, while PQs do not express such inference (therefore, no DC_A^* is required).

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\neg\phi\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{U} \{\neg\phi\}$	

Table 4.7: AltQs $[\neg\phi \text{ or } \text{PolPrts}_i?]$

Given that, only the conformity particles can capture their antecedent, eliminating ambiguity in AltQs. Once the particle identifies its antecedent, it adds the propositional prejacent to DC_A^* , and then the meaning of the question, i.e., $\{p, \neg p\}$, is added to the *Table*. In Section 4.4.3.2, we apply the proposed account to the data.

4.4.2.3 Summary

I proposed my account in two steps. First, I provided the semantic denotation of PolPrts through presuppositional feature marking tests. Addressing the first puzzle, PolPrts are identified as propositional anaphors that refer to the highlighted discourse referent in an antecedent. The crucial point that the account emphasizes is that the particles have lexical ambiguity with different entries (instead of relying on disjunctive feature marking as proposed in earlier studies).

This claim also partially solves the second puzzle concerning the source of ambiguity. While the lexical entries of the particles contribute to the ambiguity, they are selective in terms of their antecedents. In the second step of my proposal, we introduced different DRs on different parts of the conversational scoreboard based on the type of initiative. We argued that the polarity entries pertain to referents under negotiation on the *Table*, whereas the entries for conformity readings are selective for referents within the speaker's (current/tentative) discourse commitments *DC*^(*).

The final puzzle regarding the optimal particle is automatically resolved with the assistance of discourse referents. In short, the competition between the polarity and conformity readings can be viewed as a double-pathway in semantic-pragmatic accounts. In one path, the semantics of the initiatives consistently provide the required DR for the polarity entries, which only indicates the polarity of the responsive proposition. In the other path, each initiative exhibits a distinct pragmatic signature in terms of the location on the scoreboard where their DRs are situated. Building on that, the potential bias inherent in the initiative (as the speaker's tentative belief) leads the addressee to express agreement or disagreement with the speaker, accomplished through the use of PolPrts in the conformity reading (see Section 5.2.4).

4.4.3 The Source of Ambiguity

As noted earlier, syntactic views reject the possibility of a positive interpretation of bare particles in response to negative initiatives. However, data from Farsi and examples such as (196) demonstrate that such reading is possible. In example (195),

particle *yes* can only be interpreted with a positive (elided) prejacent, ‘*he came to the party*’. The positive interpretation behind *yes* conflicts with the continuation, ‘*he was on a trip*’ in (B1), while it is congruent with (B2). On the other hand, in example (196), (B1) is interpreted with a negative prejacent, ‘*he didn’t come to the party*’, as predicted by syntactic accounts. However, contrary to their prediction, (B2) can be read with a positive prejacent, ‘*he came to the party*’, without any explicit polarity phrase, which aligns with the continuation, ‘*he was the first one*’.

(195) A: Did John come to the party? (196) A: Did John not come to the party?

B1:# Yes. He was on a trip.

B2: Yes. He was the first one.

B1: Yes. He was on a trip.

B2: Yes. He was the first one.

Example (196) presents challenges for syntactic approaches, as they assert the feasibility of such interpretations only in the presence of an explicit prejacent, such as ‘*he didn’t*’ in (B1). Thus, I leave the syntactic accounts aside.

Semantic accounts allow for the ambiguity of bare PolPrts through the anaphoric relation of the particles with the antecedent. However, some authors attribute the ambiguity to the antecedent offering multiple referents, while others propose that it is the particles themselves that have dual functions and cause the ambiguity. Anyhow, they result in consistent ambiguity whenever the antecedent is negative. However, data from Farsi show that PolPrts are not always ambiguous. The lack of ambiguity becomes apparent in two cases: (i) the bias observation, where the conformity reading was highly degraded in optionally biased initiatives and (ii) interrogatives.

I adopted the intuitive feature marking account (established in Pope 1976 and extended by Roelofsen and Farkas 2015), arguing specifically for lexical ambiguity and distinct referents for different readings. However, one objection that could be raised pertains to the referents, suggesting the ambiguity of the particles arises from the presence of multiple referents (Krifka 2013), rather than lexicon. I acknowledge that the alternative analysis based on multiple referents is also plausible, and I do not have a knockdown counterargument. However, I would like to draw a parallel between PolPrts and a comparable situation involving pronouns.

In examples (197) and (198), *they* is a (feature marking) pronoun, properly selects an antecedent with [Plural] feature in (197), as well as a [Singular, NonBinaryGender] antecedent in (198). Each reading should agree in number with the verb and nouns in the rest of the sentence.

- (197) Some colleagues of A are sitting around a table in a restaurant. A and B enter.

A: Look! They are my colleagues.

- (198) A's colleague, who is gender-blind, sits by a table in a restaurant. A and B enter.

A: Look! They is my colleague.

Although the antecedents in the context serve to establish conventional referents, the recent multiple functionality of the lexicon entry `[[they]]` generates the ambiguity. Notice that the feature marking of *they* could be disjunctively joined in a single entry, if *they* is always ambiguous (cf. our proposal for the lexical distinction for PolPrts). This recalls the acceptability of PolPrts with the propositions in the matrix and embedded positions as in (199) (adapted from Goodhue and Wagner 2018: p. 11).

- (199) A: I know Mary believes John is home.

B1: No, he isn't.

B2: No, she doesn't.

B3: No, you don't.

Goodhue and Wagner present example (199) in support of the ambiguity in the discourse referents (à la Krifka 2013), thereby challenging the feature marking account (by Roelofsen and Farkas 2015). However, the possibility of both matrix and embedded propositions poses a challenge for both accounts, as they both assume the anaphoric nature of PolPrts with respect to the *salient/highlighted* proposition. Therefore, the question is whether the highlighting DR is constrained to the matrix or embedded propositions (for more discussion, see Section 4.2.2 and also Simons 2007, Syrett and Koev 2014, Koev 2018). Recalling the anaphoric and deictic interpretations of PolPrts, exemplified in (187) and (188), the resolution of PolPrts_i , $g(i)$, is free to choose the appropriate DR, starting with the QUD-salient proposition, though more referents might be available in the context. I leave the discussion of the various potential DRs to future investigations.

Before we proceed, it is worth mentioning again that I assume the same particles are used in both declarative responses and interrogatives. However, Servidio (2014) claims that interrogative PolPrts in Italian are different from responsive ones. He categorizes interrogative PolPrts into two groups: First, invariant tags (similar to TQs in my study), where the tag, including *si*, *no*, *vero?* ‘true?’, *giusto?* ‘right?’, *o sbaglio?* ‘or am I wrong?’, does not have different forms depending on the polarity of the anchor, except *si*-tag, which cannot combine with a negative anchor (unlike Farsi). Second, disjunctive tags (similar to Farsi AltQs), where the tags and the anchor are joined by *o* ‘or’ and should have reverse polarity.

Servidio provides two syntactic arguments for his claim about different PolPrts in declarative responses and interrogatives. First, he shows that in TQs, no material can be extracted from the (purported) elliptical sentence, while it is acceptable in responsive PolPrts. Second, he presents examples that require a c-command relation between the anchor and the tag, which fails in particle tags. He concludes the materials included in the anchor do not c-command the tags. Servidio introduces interrogative PolPrts as functional elements located in a structurally high discourse-related structure, which semantically take an assertive sentential argument (the anchor) and change it into a biased question. Following Farkas and Roelofsen (2012), he offers his analysis for *si* and *no* with respect to *conditional*, *actual*, *source* and *dependent* features in DC of the interlocutors (for details see Servidio 2014).⁵³

While his analysis of adding the propositional anchor in the *DC* of the speaker aligns with our account, I argue that the limitation regarding explicit remnants is related to the form of these questions and not PolPrts themselves. In other words, any excessive material left in TQs and AltQs is doomed to be infelicitous, regardless of PolPrts. As shown in Chapter 2, in Farsi, one can ask TQs with verbal or particle tags as well as verbal or particle AltQs (for more details, see Section 3.3.3). In all forms, whether

⁵³Servidio (2014) claims that by the means of the particle tags, the speaker expresses a conditional commitment to the anchor. That is, in *no*-tags (i), the speaker presents herself as a source for the commitment, and invites the addressee to express herself as a source. However, in *si*-tags (ii) the addressee is introduced as the source and the speaker presents herself as dependent on her.

(i) *no*: Add *p* to $DC_X^{c,d}$

(ii) *si*: Add *p* to $DC_X^{c,s}$

the tag part is a particle or a predicate, the limitations apply similarly. Therefore, in both examples of verbal forms of TQs (200) and AltQs (201), the questions are infelicitous when there is excessive material left from the elided site.

- (200) A: Ali ketâbhâ ro be Sara dâd, (# be Sara) na-dâd?
 Ali books ACC to Sara gave to Sara NEG-gave
 ‘Ali gave the books to Sara, didn’t he?’
- (201) A: Ali ketâbhâ ro be Sara dâd yâ (# be Sara) na-dâd?
 Ali books ACC to Sara gave or to Sara NEG-gave
 ‘Dis Ali give the books to Sara or not?’

The discussion about the c-commanding argument is beyond the scope of my study, and I didn’t find such limitations in Farsi. Based on my investigations, there was no reason to assume different particles for declarative responses and interrogatives. Therefore, I claim that the same particles are used in both types. In the next section, I will apply my account to the data from interrogatives, including TQs and AltQs.

4.4.3.1 The Reading Preference

In Section 4.3.1.2, we discussed the bias observation (164), in which the conformity reading was highly degraded in response to optionally biased initiatives, namely NPQs, compared to the constant high acceptability of the polarity reading. Later, in Section 4.4.2.2, we argued for different discourse representations for each reading and demonstrated that our account aligns with the observation. In this section, we provide a detailed analysis of the data using our account. It is worth noting that the primary observation is also experimentally confirmed in Chapter 5.

The observation demonstrates that in response to optionally biased NPQs as in (162'), PolPrts in the conformity reading were highly degraded in both rejecting (B1) and accepting (B2) answers. According to our account, illustrated in Table 4.8, PolPrts in the conformity reading fail to find the appropriate antecedent in the speaker’s (tentative) *DC*^(*). As a result, the particles were degraded by many speakers. Although, the possibility of the conformity reading arises from the potential bias reading in NPQs, as commonly acknowledged in the literature. That is, speakers who find *na^{DAgr}* in

(B1) and \hat{are}^{Agr} in (B2) acceptable perceive the negative question as a biased one. Consequently, they locate the required DR in the DC^* as the speaker's tentative commitment/bias (for the potential bias in PPQs and NPQs, see Section 3.3.1).

A	Table	B
DC_A	$\{\neg q, q\}$	DC_B
DC_A^*		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{\neg q, q\}$	

Table 4.8: NPQs: $[\neg q?]$

- (162') A: Ali mehmuni na-raft? (simple NPQs)
 Ali party NEG-went
 'Did Ali not go to the party?'

B1: $\hat{are}_i^{Pos} \succ na_i^{Dagr}$ raft.
 yes no went
 'Yes \succ No, he did.'

B2: $\hat{are}_i^{Agr} \prec na_i^{Neg}$, na-raft.
 yes no NEG-went
 'Yes \prec No, he didn't.'

Moving on to *dige*-NPQs and assertions as inherently biased antecedents, we observed an improvement in the conformity reading, as shown in (163') (a similar pattern was observed for assertions). Referring to the Tables in 4.9, PolPrts in the conformity reading easily find the required DR in the $DC^{(*)}$.

A	Table	B
$DC_A = \cup\{\neg q\}$	$\{\neg q\}$	DC_B
DC_A^*		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{\neg q\}$	

1. ASS $[\neg q.]$

A	Table	B
DC_A	$\{\neg q, q\}$	DC_B
$DC_A^* = \cup\{\neg q\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{\neg q, q\}$	

2. *dige*-NPQs: $[\neg q dige?]$

Table 4.9: Negative Assertion and *dige*-NPQs?

- (163') A: Ali mehmuni na-raft dige? (dige-NPQs)
 Ali party NEG-went DIGE
 'Did Ali not go to the party?' \rightsquigarrow The speaker expects that Ali didn't go.

B1: $\hat{are}_i^{Pos} \approx na_i^{Dagr}$ raft.
 yes no went
 'Yes \approx No, he did.'

B2: $\hat{are}_i^{Agr} \approx na_i^{Neg}$, na-raft.
 yes no NEG-went
 'Yes \approx No, he didn't.'

Finally, the constant acceptability of PolPrts in the polarity reading can be attributed to the appropriate discourse referent provided on the *Table* for all types of initiatives. The accessibility of DRs is more distinct in interrogatives (in next section). Taken together, the bias observation and the experimental data suggest that the type of antecedent plays a crucial role in reading preference. Other approaches should update their models by incorporating a new parameter, the antecedent, to evaluate the optimal particle. The discussion on optimal particles and a comparison with earlier accounts will be presented in Section 5.2.4.

4.4.3.2 The Unambiguity in Interrogatives

The data from the PolPrts in the interrogatives reveals two important findings. Firstly, the questions are not ambiguous. Secondly, TQs with each particle exhibit constant bias behaviour, regardless of whether the antecedent is a positive or a negative proposition. In Section 3.4.2, I conducted a full analysis of TQs and showed that the polarity relation between the propositions in the anchor and the tag, namely the *Relational Attitude*, leads to their bias implicature with different attitude/credence. In Section 4.3.2.1, we observed that only the conformity reading correctly predicts (i) the felicitous forms in interrogatives and, (ii) *âre*-tags have speaker's high credence and *na*-tags express lower credence. I will demonstrate how my proposal for different DRs can effectively explain our data.

Let's start with TQs. In all examples of TQs in (202)–(205), the proposition uttered in the assertive anchor is added to the (tentative) DC_A^* of the speaker. We can now determine which discourse referent is available for each reading. Tables 4.10 and 4.12 present the scoreboard models for asking a TQ with a positive (q) and negative ($\neg q$) anchor, respectively. It is important to note that these Tables represent the state of the discourse after asserting the anchor and before the tag question is uttered.

In (202.a)–(205.a), the polarity entries of both particles are undefined due to the presupposition failure. That is, the lexical denotation of $\llbracket \text{âre}_i^{\text{Pos}} \rrbracket$ and $\llbracket \text{na}_i^{\text{Neg}} \rrbracket$ are undefined since there is no referent on the *Table* to be aligned by $g(i)$. On the other hand, in (202.b)–(205.b), the conformity reading finds the proper reference for

the particles $\llbracket \text{âre}_{\textcolor{brown}{i}}^{Agr} \rrbracket$ and $\llbracket \text{na}_{\textcolor{brown}{i}}^{DAgr} \rrbracket$, correctly generating high credence and low credence tag forms, respectively.

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\textcolor{brown}{q}\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG$	

Table 4.10: TQs $[q, \dots?]$

(202) Ali raft, *âre?*

Ali went, yes

- a. $\llbracket \text{âre}_{\textcolor{violet}{i}}^{Pos} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge +p \cdot p$ ✗ No Referent
- b. $\llbracket \text{âre}_{\textcolor{brown}{i}}^{Agr} \rrbracket = \lambda p : p = g(\textcolor{brown}{i}) \wedge g(\textcolor{brown}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $=$ Ali went, did Ali go? ✓ High credence

(203) Ali raft, *na?*

Ali went or no

- a. $\llbracket \text{na}_{\textcolor{violet}{i}}^{Neg} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge -p \cdot p$ ✗ No Referent
- b. $\llbracket \text{na}_{\textcolor{brown}{i}}^{DAgr} \rrbracket = \lambda p : p = \neg g(\textcolor{brown}{i}) \wedge g(\textcolor{brown}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $=$ Ali went, did Ali not go? ✓ Low credence

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\textcolor{brown}{q}\}$	$\{\textcolor{violet}{p}, \neg p\}$	DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{\cup} \{p, \neg p\}$	

1. $[q, \text{âre}^{Agr}(p)?]$

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\textcolor{brown}{q}\}$	$\{p, \neg p\}$	DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{\cup} \{p, \neg p\}$	

2. $[q, \text{na}^{DAgr}(\neg p)?]$

Table 4.11: TQs $[q, \text{PolPrts}??]$

Table 4.11 displays the final state of the discourse after uttering TQs with a positive anchor. Both scoreboards are nearly the same, except that *âre*-tags have a highlighted positive prejacent $\textcolor{violet}{p}$ on the *Table*, while *na*-tags have a highlighted $\neg p$ (for more details about the highlighted proposition, see Section 3.4.2 and Section 4.4.2.2).

Table 4.12 represents the scoreboard for TQs with a negative anchor ($\neg q$). As mentioned earlier, the polarity entries have no referent, while the conformity entries find

the referents in DC_A^* . By considering the highlighted proposition in the tag and the anchor, as shown in Table 4.13, the Relational Attitudes return the related attitude.

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\neg q\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG$	

Table 4.12: TQs $[\neg q, \dots?]$

- (204) Ali na-raft, $\hat{a}re$?
 Ali NEG-went, yes

- a. $\llbracket \hat{a}re_{\textcolor{violet}{i}}^{Pos} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge +p \cdot p$ ✗ No Referent
 b. $\llbracket \hat{a}re_{\textcolor{orange}{i}}^{Agr} \rrbracket = \lambda p : p = g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $=$ Ali didn't go, did Ali not go? ✓ High credence

- (205) Ali na-raft, na ?
 Ali NEG-went no

- a. $\llbracket na_{\textcolor{violet}{i}}^{Neg} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge -p \cdot p$ ✗ No Referent
 b. $\llbracket na_{\textcolor{orange}{i}}^{DAGr} \rrbracket = \lambda p : p = \neg g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $=$ Ali didn't go, did Ali go? ✓ Low credence

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\neg q\}$	$\{p, \neg p\}$	DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{p, \neg p\}$	

1. $[\neg q, \hat{a}re^{Agr}(\neg p)?]$

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\neg q\}$	$\{p, \neg p\}$	DC_B^*
$CG = \{\dots\}$	$CG^* = CG \cup \{p, \neg p\}$	

2. $[\neg q, na^{DAGr}(p)?]$

Table 4.13: TQs $[\neg q, \text{PolPrts}^?]$

It is worth noting the following support for our claim about the conformity reading in interrogatives. In Chapter 2, I introduced particle *mage*, expressing the speaker's bias against the uttered proposition (for the data and analysis, see Section 3.3.2 and Section 3.4.2). In short, $[\text{mage } p?]$ indicates that the speaker has a prior belief for $\neg p$, and there is contextual evidence for p , while $[\text{mage } \neg p?]$ means that the speaker's prior belief is p and the contextual evidence is $\neg p$. Thus, in *mage* questions, OB and CB are in reverse polarity. Interestingly, *mage* can appear in tags but only with particle *na*, as in (208) and (209).

(206) # Ali went, mage âre?

(207) # Ali didn't go, mage âre?

(208) Ali went, mage na?

(209) Ali didn't go, mage na?

Let's draw the logical form of the TQs with the negative anchor, as in (207) and (209), which could cause ambiguity. While the assertive anchor represents the speaker's tentative belief (OB), the proposition in the tag refers to the contextual evidence (CB). Considering the reversal relation between OB and CB in *mage*-questions, with negative anchor TQs, i.e., OB($\neg p$), *mage* requires a positive proposition, CB(p). Thus, only tags with positive propositions are predicted to be felicitous. Regarding the felicity condition of *mage*, in our setting OB($\neg p$)+CB(p), in (207'), the polarity reading in (a) wrongly predicts a felicitous form for *mage*, while the conformity reading in (b) correctly predicts the unacceptability of *mage*. On the other hand, in (209'), the polarity reading in (a) fails the felicity condition of *mage*, while the conformity reading captures the felicitous setting. In other words, the proposed account can capture the unacceptability of *mage* in TQs, otherwise the polarity reading in (207'.a) was predicted felicitous.

(207') # Ali didn't go, mage âre?

- a. Ali didn't go, mage âre^{Pos} [Ali went]? ✗ Wrongly predicted felicitous
- b. Ali didn't go, mage âre^{Agr} [Ali didn't go]? ✓ The felicity conditions fail

(209') Ali didn't go, mage na?

- a. Ali didn't go, mage na^{Neg} [Ali didn't go]? ✓ The felicity conditions fail
- b. Ali didn't go, mage na^{DAgr} [Ali went]? ✓ Correctly predicted felicitous

Finally, AltQs propose a proposition and its complement as two possible alternatives. While the second clause is formed by an anaphoric particle, the first clause is taken as the antecedent. The data shows that AltQs are only felicitous with the particle *na* and more often with a positive antecedent in the first clause. In line with the claim that PolPrts in interrogatives are only used in their conformity reading, the account correctly predicts that *âre*^{Agr} would not generate well-formed AltQs since it returns the proposition in the same polarity as its antecedent, while *na*^{DAgr} seems to satisfy alternative questions by returning the complement of the first clause. These predictions are indeed borne out. Table 4.14 shows the scoreboards of AltQs with a positive (q) and a negative ($\neg q$) antecedent. For

now, assume that similar to TQs, the antecedent clause in AltQs is also added to DC^* . I will explain this assumption after we capture the felicitous and infelicitous forms.

I start with the unacceptability of *âre* in AltQs. By uttering the first clause, we only have the DRs in DC^* . Thus, the polarity readings of âre^{Pos} in (210.a) and (211.a) fail due to the lack of a proper referent on the *Table*. The conformity readings in (210.b) and (211.b) find their referents; however, the final structures create an illogical form of asking [ϕ or $\phi?$] question. Therefore, âre^{Agr} is logically out for AltQs, while the account predicts that âre^{Pos} is doomed to be infelicitous due to the lack of DR.

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\textcolor{orange}{q}\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{U} \{q, \neg q\}$	

1. AltQs $[q\text{-yâ...?}]$

A	Table	B
DC_A		DC_B
$DC_A^* = \cup\{\textcolor{orange}{\neg q}\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG \bar{U} \{\neg q\}$	

2. $[\neg q\text{ yâ ...?}]$

Table 4.14: AltQ $[\phi\text{ yâ ...?}]$

- (210) # Ali raft yâ *âre*?

Ali went or yes

- a. $\#\llbracket \text{âre}_{\textcolor{violet}{i}}^{Pos} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in \text{Table} \wedge +p \cdot p$ ✗ No Referent
- b. $\#\llbracket \text{âre}_{\textcolor{orange}{i}}^{Agr} \rrbracket = \lambda p : p = g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $= \text{Ali went} \text{--- or---} \text{Ali went?}$ ✗ illogical

- (211) # Ali na-raft yâ *âre*?

Ali NEG-went or yes

- a. $\#\llbracket \text{âre}_{\textcolor{violet}{i}}^{Pos} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in \text{Table} \wedge +p \cdot p$ ✗ No Referent
- b. $\#\llbracket \text{âre}_{\textcolor{orange}{i}}^{Agr} \rrbracket = \lambda p : p = g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} \cdot p$ ✓ Referent
 $= \text{Ali didn't go} \text{--- or---} \text{Ali didn't go?}$ ✗ illogical

The fate of the polarity reading is the same for the particle *na*, in which na^{Neg} in (212.a) and (213.a) fails to find the proper referent. However, na^{DAgr} in (212.b) and (213.b) happily finds its antecedent and results in felicitous questions.

- (212) Ali raft yâ *na*?

Ali went or no

- a. $\#\llbracket \text{na}_{\textcolor{violet}{i}}^{Neg} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in \text{Table} \wedge -p \cdot p$ ✗ No Referent

- b. $\llbracket \text{na}_{\textcolor{orange}{i}}^{D\text{Ag}r} \rrbracket = \lambda p : p = \neg g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} . p$ ✓ Referent
 = Ali went or Ali didn't go? ✓ Felicitous

- (213) Ali na-raft yâ na?
 Ali NEG-went or no

- a. $\#\llbracket \text{na}_{\textcolor{violet}{i}}^{Neg} \rrbracket = \lambda p : (p = g(\textcolor{violet}{i}) \vee p = \neg g(\textcolor{violet}{i})) \wedge g(\textcolor{violet}{i}) \in Table \wedge \neg p . p$ ✗ No Referent
 b. $\llbracket \text{na}_{\textcolor{orange}{i}}^{D\text{Ag}r} \rrbracket = \lambda p : p = \neg g(\textcolor{orange}{i}) \wedge g(\textcolor{orange}{i}) \in DC^{(*)} . p$ ✓ Referent
 = Ali didn't go or Ali went? ✓ Felicitous

Now, we can explain the assumption for the discourse referent in DC^* . The account in Section 3.4.2 claims that the assertive anchor in TQs is added to DC_A^* as the speaker's tentative belief (extending from Malamud and Stephenson 2015). Therefore, one might object that the presence of q in DC^* is against the unbiased reading of AltQs. However, it is important to recall the characteristics of AltQs, contributing an additional feeling of impatience or urgency (cf. cornering effect in Biezma 2009). Van Rooy and Šafářová (2003) present different contexts, in which AltQs cannot be used. The inherent sense of pushiness in AltQs makes them infelicitous in settings like discourse-initials, invitations, requests or drawing inferences (see Van Rooy and Šafářová 2003, and Biezma 2009). I stipulate that both alternatives are added to DC_A^* , indicating the necessarily requirement of an answer. Thus, by asking $[\phi \text{ or } \neg\phi?]$, the speaker highlights both propositions, resulting in unbiased questions. Additionally, adding both ϕ (after the first clause) and $\neg\phi$ (after the particle clause) in DC^* indicates that the speaker requires one of the options (pushing an answer). Our tentative proposal for the inclusion of propositions on DC^* in AltQs raises the question of what prevents us from inserting the uttered proposition in PPQs and NPQs. While AltQs signal that the speaker requires either of the possible answers, this reading is not signaled in PPQs and NPQs (see the difference of AltQs and PQs in Van Rooy and Šafářová 2003). In other words, both AltQs and PQs project $\{q, \neg q\}$ as the possible answers in CG^* . However, AltQs indicate speaker's pushiness for either of propositions, whereas PQs do not convey such an indication. Notably, our account can adequately explain this distinction as well.

The final discourse state of AltQs with the *na* particle has been presented in Table 4.14. Note that unlike TQs (and other types of polar questions), in AltQs both propositions on the *Table* (or DC^*) are highlighted.

A	Table	B
DC_A	$\{q, \neg q\}$	DC_B
$DC_A^* = \overline{\cup}\{q, \neg q\}$		DC_B^*
$CG = \{\dots\}$	$CG^* = CG\overline{\cup}\{q, \neg q\}$	
	1. $[q \text{ yâ na}_i^{Dagr} [\neg q] ?]$	
		2. $[\neg q \text{ yâ na}_i^{Dagr} [q] ?]$

Table 4.15: AltQ $[\phi \text{ yâ na?}]$

Taken together, the separated lexical entries and the ambiguity in the TQs were explained via their different discourse referents, while AltQs were shown to be felicitous only in their conformity readings. Moreover, the proposed analysis successfully accounted for the ungrammaticality of the particle *mag̤e* in TQs. The empirical and logical coverage of the analysis provides support for the proposed account of PolPrts in interrogatives.

4.5 Summary

This chapter delves into the intricate nuances of polar particles in Farsi, namely *âre* ‘Yes’ and *na* ‘No’, both of which exhibit polarity and conformity readings. We provide extensive data presenting PolPrts not only in declarative responses to polar questions and assertions but also in the formation of interrogatives such as TQs and AltQs. Two pivotal observations are underscored: Firstly, in response to negative initiatives, the polarity reading of PolPrts remains acceptable regardless of the type of initiative. However, the conformity reading exhibits a degradation in response to optionally biased questions, contrasting with its improved acceptability in response to inherently biased forms. Secondly, while the presence of a negative antecedent introduces ambiguity in bare PolPrts within declarative responses, this ambiguity does not extend to TQs and AltQs with PolPrts.

Our proposed account incorporates three key elements: Firstly, we delineate distinct lexical entries for each reading of PolPrts as feature markers (à la Roelofsen and Farkas 2015). Secondly, building on the insights of Malamud and Stephenson (2015), we argue that the bias in initiatives generates a discourse referent regarding the speaker’s tentative discourse commitments. Thirdly, we posit that different readings of PolPrts are anaphoric to distinct referents within the Scoreboard model (à la Farkas and Bruce 2009). This analysis operates within the dynamic discourse framework, elucidating different required DRs for each reading of PolPrts. The account provides predictive insights regarding the appropriate lexicon application within interrogatives and the diverse acceptability patterns in response forms.

Chapter 5

Bias and Response Particles

5.1 Introduction

The interchangeable use of PolPrts with both positive and negative propositions prompts discussions on their selection and interpretation. From a selection perspective, it is essential to understand how a speaker chooses a particle over the alternative option in response to an initiative. From an interpretation perspective, comprehending how the questioner (who subsequently becomes the addressee of the answer) determines the meaning of the bare particle is crucial. I introduce bias as the key factor influencing both decision-making processes. Within this chapter, I present experimental evidence regarding particle (reading) preferences. Additionally, in Chapter 6, I elaborate on the significance of prosodic data alongside bias in encoding and decoding the intended meaning.

Pope (1976) mentions the role of bias in the discussion of the polarity and conformity readings. She suggests that cross-linguistically, languages such as Japanese, in which polar questions obviously express the speaker's expected (biased) answer, tend to use the conformity reading system more frequently than languages where the expected answer is unclear, resulting in a stronger preference for the polarity reading system. Although she does not explicitly state what would be the optimal answer in languages where the same particles can be used in both readings, one can extend her account to bias sensitivity of the optimal reading/particle.

In Chapter 4, I presented the core data from Farsi and offered my analysis of the lexical ambiguity of PolPrts and different discourse referents for the polarity and conformity readings.

I also mentioned an observation regarding the bias effect on reading preference, wherein the conformity reading gains acceptability in response to inherently biased initiatives. In this chapter, I will first present experimental data that support the bias observation in (164)¹ from the previous chapter, and then address the third puzzle concerning the optimal answer. As we will see, an experiment was conducted to capture speakers' preferences when multiple response particles are plausible. Various types of initiatives were presented: plain NPQs were considered optionally biased forms, while *dige*-NPQs and (negative) assertions were categorized as obligatorily biased initiatives, due to the presence of the bias particle *dige* and the speaker's full commitment, respectively.²

The results reveal a significant impact of bias on the conformity reading. Specifically, the polarity reading consistently received high acceptability regardless of the type of initiative. However, the conformity reading in response to optionally biased initiatives was marginally accepted, whereas it gained greater acceptability when responding to obligatorily biased forms. The underlying concept behind this bias observation is that individuals can agree or disagree with someone's (tentative) belief. Thus, the dispreference for the conformity reading in response to NPQs can be attributed to the absence of bias implicature, resulting in the lack of the required discourse referent. In contrast, obligatorily biased forms inherently convey bias, thereby establishing the necessary referent and leading to a higher preference for the conformity reading (see Section 4.4.2.2 and Mohammadi and Romero 2024).

Given the aforementioned considerations, I posit that the decision for the optimal particle can be seen broadly as the optimal reading, and it involves a dual-pathway approach within semantic-pragmatic accounts. In the first pathway, the semantics of all initiatives discuss as to whether ϕ or $\neg\phi$ and provide the required discourse referent for the polarity reading. Thus, the speaker uses the particle in the polarity reading, indicating the polarity of the answer. In the second pathway, the speaker's bias inherent in the initiative also prompts

¹The bias observation, adopted from Section 4.3.1.2:

(164) The polarity reading of PolPrts consistently receives high acceptability in response to different initiatives. However, the conformity reading varies from degraded acceptability in response to optionally biased questions, which can but not necessarily convey bias, to high acceptability in response to obligatorily biased questions, which inherently convey bias.

²In my earlier works (Mohammadi 2022, 2023b), I used *weakly biased* (WB) instead of *optionally biased* questions, referring to questions that can (but not necessarily) implicate bias (depending on the context). Conversely, I used *strongly biased* (SB) questions instead of *obligatorily biased* forms, as they inherently convey bias (across all contexts). Therefore, readers of the earlier publications should associate WB with optionally biased and SB with obligatorily biased terms.

the addressee to express their agreement or disagreement with the speaker's bias through the conformity reading. Hence, the speaker can go either way of responding (for the full discussion, see Section 5.2.4).

This chapter is organized as follows. In the next section, the experiment will be presented, providing detailed information on the materials 5.2.1 and procedures 5.2.2. In Section 5.2.3, we will see the results of the experiment, confirming the effect of bias on the reading preference. I will discuss the results in Section 5.2.4, where I claim that the optimal particle is determined with respect to the presence and absence of bias in the initiative. Section 5.3 reviews prior accounts with our data from the experiment and demonstrates the need for revisions to align with the data. Finally, I will conclude the chapter in Section 5.4.

5.2 Experimental Data

As extensively discussed in Chapter 4, in response to negative initiatives PolPrts can generate both positive and negative responses, as in example (214). The literature has addressed the question of selecting the optimal particle for conveying a positive proposition p in (B1) and a negative proposition $\neg p$ in (B2), considering various constraints based on the particles (see the literature in Section 5.3).

(214) A: Did John not come to the party?

B1: Yes / No, he did.

B2: Yes / No, he didn't.

This experiment was conducted based on a primary observation that the bias inherent in the initiatives actually influences the choice of particle. While all polar questions semantically offer both propositions $\{\phi, \neg\phi\}$, certain types of questions convey bias, either optionally, allowing for cancellation, as in LNQs, or obligatorily, as in *really*-questions, TQs, and HNQs (for more details, see Chapter 2). Recall from the bias observation in (4.3.1.2), in response to optionally biased questions, speakers prefer the polarity reading, whereas in the obligatory forms the acceptability of the conformity reading is increased by speakers. This experiment seeks evidence to support this observation and help to identify the optimal particle. By conducting this experiment, we aim to shed light on the factors influencing the choice of particles.

Recalling from the bias observation, in response to NPQs like (215) as optionally biased questions, responses with $\hat{a}re^{Pos}$ in (B1) and na^{Neg} in (B2) are favored over the alternative choices. That is, the polarity reading is preferred over the conformity.

- (215) A: Ali mehmuni na-raft?
 Ali party NEG-went
 'Did Ali not go to the party?'

B1: $\hat{a}re^{Pos} \succ na^{DAgr}$ raft.	B2: $\hat{a}re^{Agr} \prec na^{Neg}$, na-raft.
yes no went	yes no NEG-went
'Yes \succ No, he did.'	'Yes \prec No, he didn't.'

On the other hand, in example (216) as obligatorily biased questions, where particle *dige* obligatorily expresses bias for the uttered proposition, the acceptability of na^{DAgr} in (B1) and $\hat{a}re^{Agr}$ (B2) is comparable to their counterparts in the polarity reading.

- (216) A: Ali mehmuni na-raft *dige*?
 Ali party NEG-went DIGE
 'Did Ali not go to the party?'
 \rightsquigarrow The speaker expects that Ali didn't go.

B1: $\hat{a}re^{Pos} \approx na^{DAgr}$ raft.	B2: $\hat{a}re^{Agr} \approx na^{Neg}$, na-raft.
yes no went	yes no NEG-went
'Yes \approx No, he did.'	'Yes \approx No, he didn't.'

The improvement in the acceptability can be attributed to the presence of bias in questions, which is inherently biased. In *dige*-NPQs, the use of the particle *dige* signifies that the speaker holds a (prior) belief/expectation towards the uttered proposition in the question, which paves the way for the addressee to express agreement or disagreement with the speaker, rather than simply indicating the polarity of the answer. However, simple NPQs do not necessarily trigger this implicature, resulting in the dispreference of such responses.

In order to empirically substantiate the impact of the initiative on particle preference, we conducted an experiment that provided different types of initiatives. This experiment was designed to address the following two research questions:

1. Does the bias in the initiative influence the reading preference of PolPrts?
2. Is the reading preference consistent across accepting and rejecting answers?

5.2.1 Materials

Since both readings of PolPrts in response to positive initiatives generate the same proposition (e.g., *Did John come? Yes^{Pos}/Yes^{Agr}, he did*), positive initiatives cannot help us distinguish the reading preference. Therefore, I presented all samples in negative form and included PPQs in the control group, where some combinations are unacceptable (e.g., *Did John come? #Yes, he didn't*).

The experiment is designed with two main factors. The first factor is the initiative type, which has three values: NPQs as optionally biased questions, where the bias is not necessarily present. Conversely, obligatorily biased questions are *dige*-NPQs, where the bias is inherently conveyed by *dige* (for more details, see Section 3.3.2). Lastly, negative Assertions (Neg-ASS) represent the extreme case of bias, indicating speaker's commitment. The second factor pertains to the reading type and includes PolPrts in the polarity and conformity readings. We have a 3x2 design as follow:

- **Initiative type:** NPQs, *dige*-NPQs, Negative Assertions
- **Reading type:** polarity, conformity

It is worth noticing that the studies of biased questions usually consider two types of bias, namely original bias (OB) as the speaker's prior belief and contextual bias (CB) as the contextual evidence in the current setting (see Section 2.3). To avoid any complexity, I excluded CB and offered examples with OB.

All stimuli are constructed using the same structure, including a short scene-setting that provides relevant information about the question and the answer at the end of the setting. The setting suggests the expected answer from the speaker side, as well as the true answer from the addressee's point of view, which may be a rejecting or an accepting response. For example, in the sample stimuli shown in Figure 5-1, Sara's expectation (OB) is a negative answer (as she thinks Leila wouldn't lend her book), but based on the context, the answer that Ali (the addressee) will provide is a rejecting response (that Leila lent her book).

The presented answers include four options: two of them feature the target particles *are* and *na* in (i) the polarity reading and (ii) the conformity reading, which are followed by a short answer, i.e. the predicate in the prejacent.³ The other two answers serve as the control

³Since the experiment aims to examine the effect of bias on reading preference, the ambiguous bare forms were excluded. The predicate in the short answer clearly indicates the meaning.

Context: *Ali wanted to borrow a book from Leila. Leila is quite protective of her books and often finds reasons to decline lending them. Sara thinks that Leila probably didn't lend the book as usual, although she actually did.*

Sara: *Leila ketâbesh ro behet qarz na-dâd dige?*
 'Did Leila not lend her book DIGE?'

Answer type

Ali: *âre dâd.*

(i) polarity: *âre^{Pos}*

Yes gave ('Yes, she did.')

Ali: *na dâd.*

(ii) conformity: *na^{DAgr}*

No gave ('No, she did.')

Ali: OK.

(iii) unrelated answer

Ali: She couldn't make any excuse.

(iv) indirect answer

Figure 5-1: Sample stimuli: *dige*-NPQs with a rejecting answer.

group by (iii) an unrelated answer, e.g., *xob/bâše* 'OK', which is unacceptable as a response to polar questions (cf. Krifka 2016); and (iv) an indirect answer that fulfills the question, e.g., by adhering to the Maxim of Relevance.

The final two responses, namely the unrelated and indirect answers, serve the dual purpose of functioning as attention checks to ensure participants' attentiveness during the test, as well as introducing distractors and reinforcing the idea that multiple answers could be considered felicitous. Notably, the indirect answers were intentionally designed to always remain felicitous, irrespective of the speaker's preferred reading of PolPrts. This enables participants to recognize that multiple answers are deemed acceptable to varying degrees, emphasizing the flexibility in interpreting PolPrts.

5.2.2 Method

There were 18 core questions, with 6 trials for each target initiative type, and 4 control stimuli of PPQs. The total of 22 stimuli were distributed across 4 lists in a Latin-square, pseudo-randomized design. Thus, participants encountered three tokens of each condition. All the examples were created using common (simple or compound) predicates in everyday speech, in simple past tense and for the second or third person singular. The two interlocutors

were always a female and a male characters with the same names in all contexts. However, they appeared in different arbitrary roles (e.g., sister-brother, wife-husband, mother-son, colleagues, etc.) in each context.

The experiment was conducted online on the www.testable.org platform. Participants were provided instructions on the first page regarding the overall design of the experiment and the number of trials. They were instructed to carefully read the scene-setting and then rate the naturalness of each individual answer in relation to the question using a scale of 1-7 (1=the least natural, 7=the most natural). Each trial was presented on one page, and there was a *Comment* box at the end of each page, prompting participants to share their thoughts on the responses. Few participants provided feedback related to the way they needed to read the particles to obtain the correct interpretation, such as pausing between the particle and the predicate or emphasizing/lengthening the particle (see Appendix A for a screenshot).

5.2.3 Result

Data were collected from 40 participants, consisting of 23 women and 17 men (AVG age = 36 years). They were randomly divided into six lists. All participants were native speakers of Farsi and had IP addresses limited to Iran. Six participants were excluded from the analysis because they failed more than five attention checks by rating unrelated responses higher than 4 on the 7-point scale. From the data shown in Figure 5-2, it is evident that indirect (though related) responses to all four types of initiatives were highly accepted (mean=6, median=7), compared to the complete unacceptability of unrelated responses (mean=1.6, median=1). Additionally, in response to PPQs, participants truly detect the unacceptability of $[âre, \neg p]$ in accepting and $[na, p]$ in rejecting answers, as in Figure 5-6, PPQs-plot.

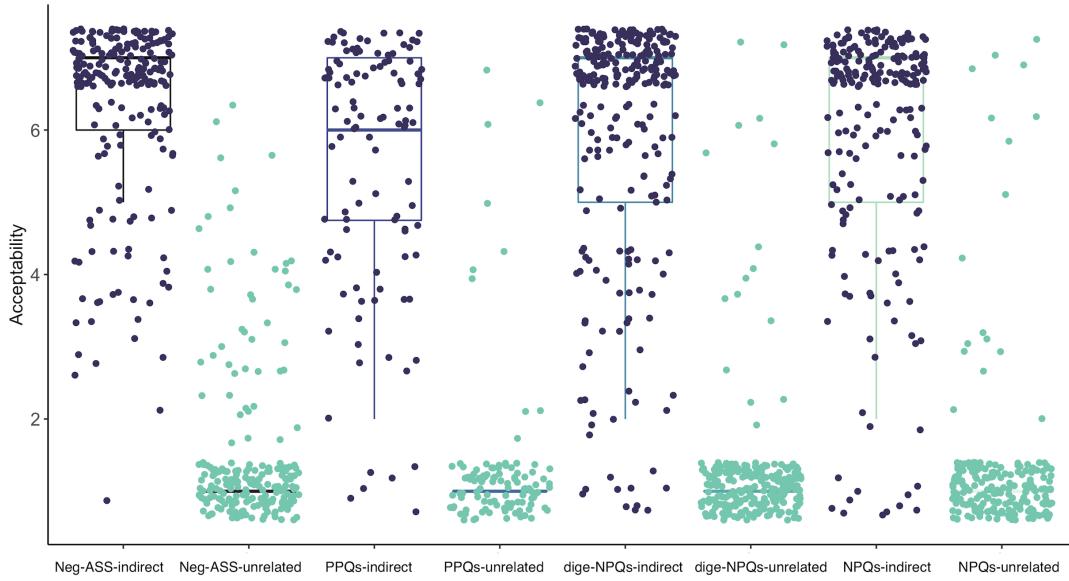


Figure 5-2: Acceptability judgement of control responses, including *indirect* and *unrelated* answers to different types of initiatives: Negative Assertions, PPQs, NPQs, *dige*-NPQs.

The data was analyzed using a mixed-effects ordinal regression model fitted with the Cumulative Link Mixed Model (clmm) package in R (version 4.1.2, 2021). The model in Figure 5-3 included the maximal random effects structure that allows for the convergence of the random by-participant intercepts, capturing participants' variability in responses. The results revealed a significant difference between the readings in response to NPQs ($\beta=2.73$, $SE=0.27$, $p<0.001$) and *dige*-NPQs ($\beta=0.67$, $SE=0.26$, $p<0$), and non-significant difference in Assertions ($\beta=-0.31$, $SE=0.19$, $p<0.05$)

Figure 5-4 illustrates the correlation between reading preference and the bias in the initiative. The acceptability of the conformity reading exhibits a gradual increase from optionally biased questions NPQs (mean = 3.3, median = 3), to obligatorily biased *dige*-NPQs (mean = 5.1, median = 6), and to assertions (mean = 5.8, median = 7). Conversely, the acceptability of the polarity reading remains almost consistent across different initiatives (mean = 5.6, median = 7). Statistical analysis reveals that the difference in acceptability for the polarity reading between different initiatives is not significant (mean = 5.81 \approx 5.34 \approx 5.99), whereas it is significant for the conformity reading in optionally biased forms as compared to obligatory biased questions and Assertions (mean = 3.31 $<$ 5.11 \approx 5.80).

Taking a closer look at the results, Figure 5-5 highlights two points. First, the polarity reading of both *are*^{Pos} and *na*^{Neg} particles consistently receives high acceptability in response to

```

Cumulative Link Mixed Model fitted with the Laplace approximation

formula: ResponseValue ~ Bias * Reading + (1 | ParticipantID)
data:    clm_tbl

Random effects:
Groups      Name      Variance Std.Dev.
ParticipantID (Intercept) 0.6989  0.836
Number of groups: ParticipantID 36

Coefficients:
Estimate Std. Error z value Pr(>|z|)
Biasdige-NPQs -0.6824  0.1846 -3.696 0.000219 ***
BiasNPQs      -2.2963  0.1888 -12.165 < 2e-16 ***
ReadingPolarity -0.3185  0.1853 -1.719 0.085605 .
Biasdige-NPQs:ReadingPolarity 0.6737  0.2580  2.611 0.009029 **
BiasNPQs:ReadingPolarity  2.7359  0.2691 10.167 < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Threshold coefficients:
Estimate Std. Error z value
112 -3.0397  0.2157 -14.089
213 -2.6001  0.2105 -12.349
314 -2.0025  0.2050 -9.768
415 -1.5310  0.2018 -7.588
516 -1.0375  0.1993 -5.206
617 -0.4636  0.1976 -2.347

```

Figure 5-3: Cumulative link mixed model for naturalness ratings with participants random effect.

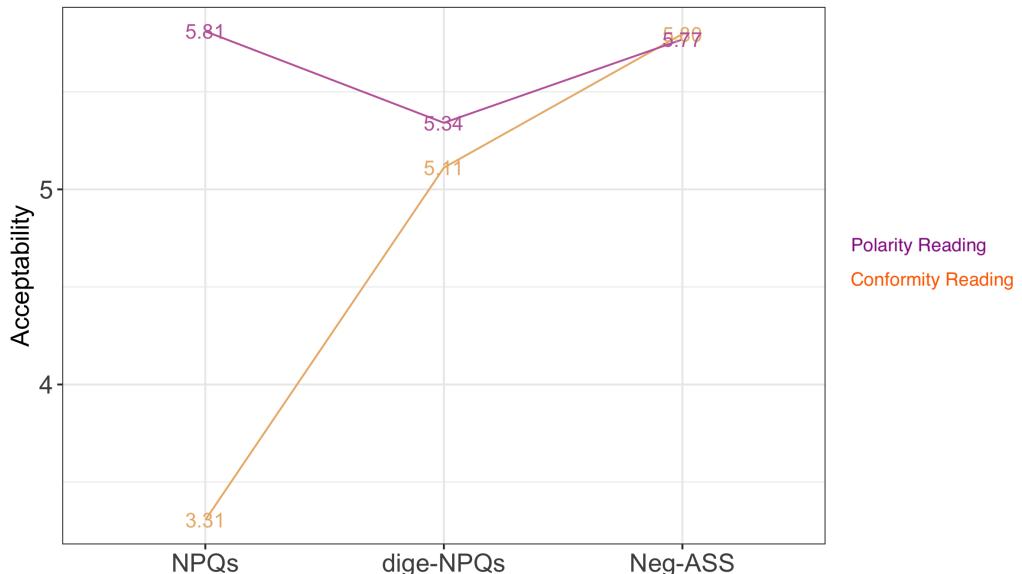


Figure 5-4: Mean acceptability rating of different readings of PolPrts in response to NPQs, *dige-NPQs* and *Neg(ative) ASS(ertions)*.

various types of initiatives (you can see that the data points of na^{Neg} and \hat{are}^{Pos} gathered in close rating levels). Statistically, na^{Neg} in the accepting answers has mean|median values of 6.6|7, and \hat{are}^{Pos} in the rejecting answers has values of 4.7|6. This indicates that the acceptability of the polarity reading of \hat{are}^{Pos} and na^{Neg} remains almost the same, regardless of the type of initiative. Second, the acceptability of both particles in the conformity reading increases with respect to the type of initiative in the following order: NPQs < *dige*-NPQs < ASS. \hat{are}^{Agr} in the accepting answers has mean|median values of 3.5|3 < 4.7|5 < 5.6|7, while na^{DAgr} in the rejecting answers has 3.1|3 < 5.4|5 < 5.9|7. Therefore, the plot highlights that the readings exhibit similar behavior in both particles.

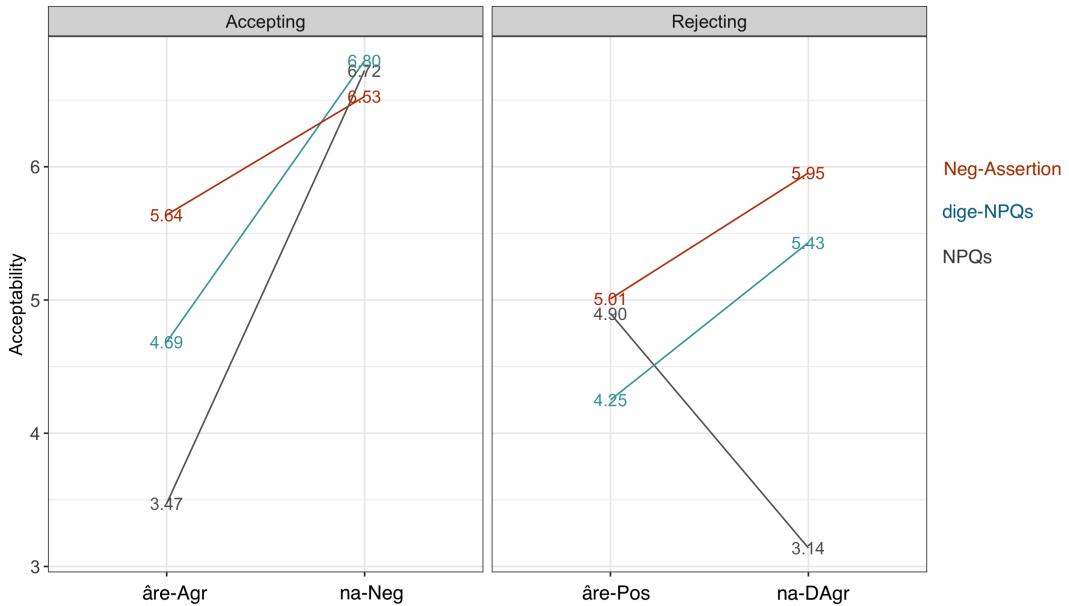


Figure 5-5: Mean acceptability rating of both readings of are and na particles to NPQs, *dige*-NPQs and Neg(ative) ASS(ertions) for accepting and rejecting answers.

Statistical data also shows that the overall acceptability of na is higher than \hat{are} (mean = 5.7 > 4.6, median = 7 > 5). This can be perceived from Figure 5-5, where in both accepting and rejecting answers na is preferred over \hat{are} . This holds true in all cases except in rejecting to NPQs. In other words, while participants prefer na in accepting and rejecting to both *dige*-NPQs and assertions, they prefer \hat{are}^{Pos} over na^{DAgr} in rejecting answers to NPQs. Furthermore, the plot demonstrates that while the acceptability of the conformity reading in both accepting and rejecting answers are almost the same level, the polarity reading in the rejecting answers (\hat{are}^{Pos}) gains lower rating as compared to the accepting answers (na^{Neg}).

An interesting observation emerging from the data is the distribution of judgments shown in Figure 5-6. In response to PPQs⁴ and assertions, participants show a considerable level of convergence. In PPQs, they consistently accept and reject responses based on the related follow-up prejacent. Building on our earlier findings, on one hand, we observe a close competition between both readings in response to assertions, resulting in little variation between the polarity and conformity readings.

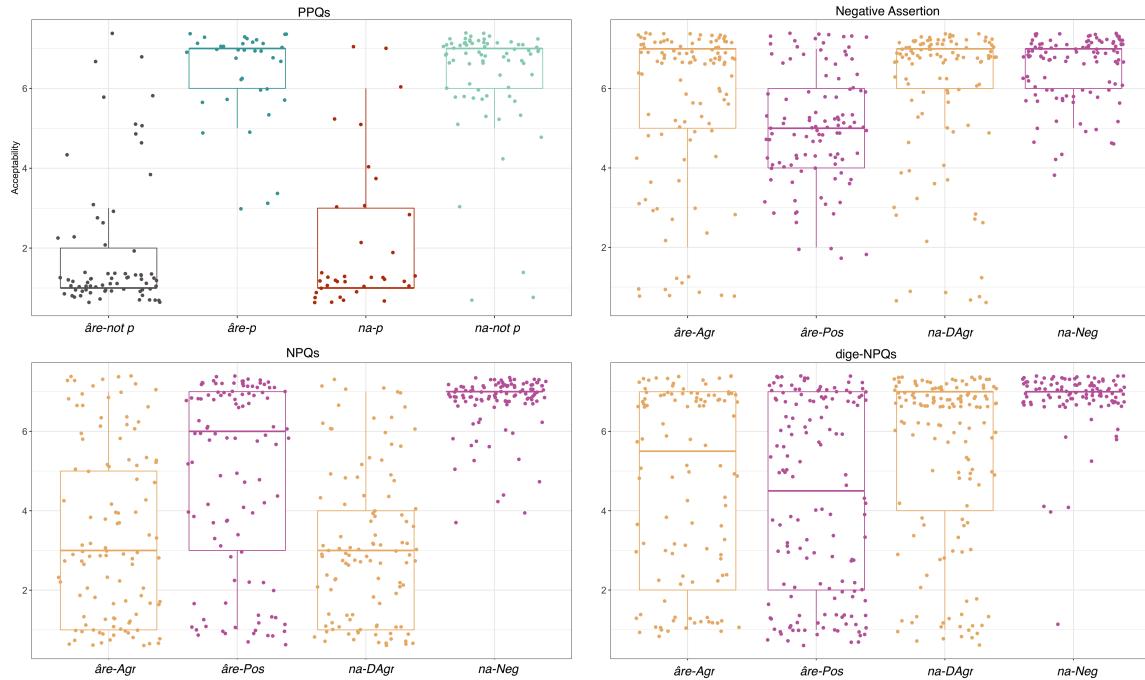


Figure 5-6: Distribution plots of both readings of *âre* and *na* particles in response to PPQs, negative Assertions, NPQs, *dige*-NPQs.

On the other hand, the distribution in NPQs and *dige*-NPQs plots is not as monotonic as in the earlier types. In NPQs, there is a great tendency towards the polarity reading compared to the divergence in the conformity reading (which tends towards unacceptability). In the *dige*-NPQs plot, however, we can observe a gradual shift of judgments towards the pattern seen in assertions. Notably, *na^{Neg}* exhibits a steady behavior across the figures, being not only the preferred particle in general but also showing less variation among participants as compared to *âre*.

⁴It is worth to remind that I did not take PPQs as a factor of the least bias form, but as a control group, since in such questions PolPrts in either of the readings generate the same proposition and we cannot see which reading is intended by participants. That is also the reason that the x-axis in Figure 5-6 is not annotated with any superscription.

Lastly, Figure 5-7 presents the acceptability of different readings within and between participants. Overall, there is a notable disparity between the conformity reading and the polarity reading across the different plots. In the NPQs plot, the acceptability of the conformity reading significantly deviates from that of the polarity reading. However, in the *dige*-NPQs plot, the conformity reading exhibits a slight improvement, and in the ASS(ertion) plot, it reaches a higher level. This pattern indicates that speakers generally display a clear preference for the polarity reading in optionally biased forms, but as the bias arises inherently in the initiatives, their dispreference for the conformity reading gradually diminishes. Importantly, this behavior is evident not only between participants but also within individual participants.

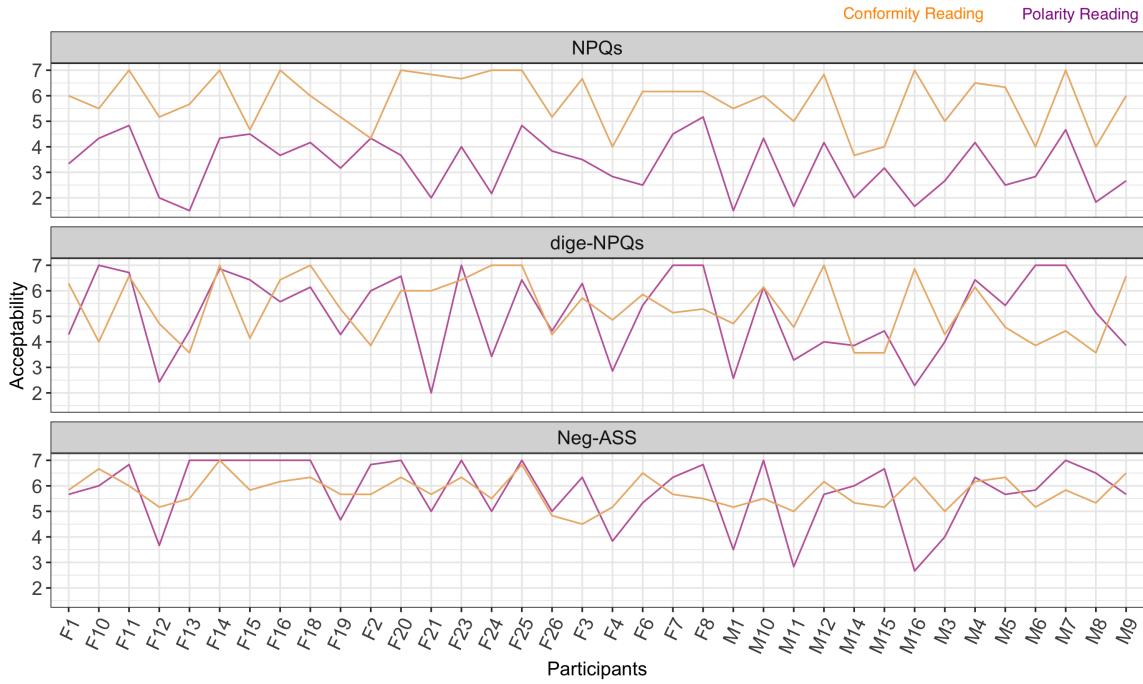


Figure 5-7: The acceptability judgement of the polarity and conformity readings in NPQs, *dige*-NPQs and negative ASS(ertions) per participant.

To conclude, the results of the experiment support the claim that bias affects the reading preference. The data reveals that (i) the polarity reading maintains a consistently high level of acceptability across different initiatives, (ii) the acceptability of the conformity reading improves with respect to the bias in the initiative, (iii) reading variation occurs between and within speakers, and (iv) particle *na* is generally preferred over *are* in both readings, except for its conformity reading in NPQs.

5.2.4 Discussion

Previous studies have focused on determining the optimal particle to express the positive and negative answers, without considering the broader aspect of the optimal reading regarding the type of initiative. In other words, they were looking to figure out that in response to negative initiatives $[\neg p?]$ which particle is the best to say p , and which particle is the best to say $\neg p$. Conversely, my investigation aimed to address both questions simultaneously, in which I considered the type of initiative as a variable that could potentially influence particle preference regarding its reading. This approach draws inspiration from the work of Pope (1976), who emphasized the influence of bias on reading systems in different languages.

Starting with the research questions, the experiment aimed to address two main questions: (1) Does the bias in the initiative influence the reading preference of PolPrts? (2) Is the reading preference consistent across accepting and rejecting answers? The answer to both questions is yes. (1) The acceptability of the conformity reading improves in obligatorily biased initiatives compared to the optionally biased forms. In contrast, the polarity reading consistently receives high acceptability in response to different initiatives. (2) The analysis indicates that the reading preference remains consistent for both accepting and rejecting responses. In other words, the consistent acceptability of the polarity reading is observed in both accepting and rejecting answers, alongside an enhanced acceptability of the conformity reading across both types of responses.

The data shows no meaningful correlation between the acceptability of the polarity and conformity readings. The increased acceptability of the conformity reading does not affect the acceptability rate of the polarity reading. On one hand, the polarity reading consistently demonstrates high acceptability across different types of initiatives. The conformity reading, on the other hand, improves regarding the bias in the initiatives, ranging from marginal acceptability⁵ in NPQs to high acceptability in *dige*-NPQs and assertions.

The result is suggestive for a double-pathway in choosing the response particle. I argue that the decision for the optimal particle is related to its reading and involves a semantic-pragmatic competition.⁶ In the first pathway, the semantics of the initiatives discuss about

⁵Regarding the feedback received from the participants and considering my own intuition as a native speaker, I personally find the conformity reading in response to NPQs to be unacceptable. However, from a statistical perspective, its mean value is 3.3 out of 7. Moreover, when compared to the unacceptability of the control group, which has a mean value of 1.6, I would classify it as marginally acceptable.

⁶The distinction between semantics and pragmatics is a widely debated topic in the literature,

whether or not ϕ and always provide the required discourse referent for the polarity reading. Consequently, the polarity reading, which only indicates the polarity of the answer, maintains a constant high acceptability, as it fulfils the discussion.

In the second pathway, the speaker's bias inherent in the initiative, functioning as their tentative belief, prompts the addressee to express agreement or disagreement with the speaker's bias through the conformity reading. In other words, while the speaker can respond to different initiatives using PolPrts in the polarity reading, the presence of bias opens up a second pathway for the addressee to respond to the bias expressed in the initiative. Thus, the addressee's inclination to agree or disagree with the bias implicature, rather than only marking the polarity of the question, influences the preference for the conformity reading. Furthermore, it is evident that speakers exhibit a consistent particle preference, with *na* being predominantly preferred in both accepting and rejecting answers, which results in the lower rating of the polarity reading in the rejecting answers. The only significant deviation occurs in rejecting responses to optionally biased NPQs, where $\hat{a}re^{Pos}$ is preferred over na^{DAgr} . This finding aligns with the predicted effect of bias, where the conformity reading has low acceptability in NPQs. Consequently, in optionally biased initiatives, the conformity reading is suboptimal for both accepting and rejecting responses, leading to a loss of exclusive preference for particle *na* in rejecting (for more discussions see Section 5.3).

Finally, the overall lower rating of the polarity reading by $\hat{a}re^{Pos}$ in the rejecting answers, as compared to the na^{Neg} in the accepting answers (see Figure 5-5), may be somewhat attributed to the principle proposed by Farkas and Bruce (2009), which suggests that rejecting a proposition is more costly than accepting it (cf. the notion of semantic difficulty in studies such as Pope 1976 and Roelofsen and Farkas 2015). However, this raises the question of why this difficulty didn't have a similar impact on the other rejecting answer involving na^{DAgr} . I will leave this question for further investigation.

The results also demonstrate reading variation both within and between speakers, which can also be attributed to bias. These variations can be ascribed to the influence of bias. The within-speaker variation in responses to different initiatives can be elucidated by considering the bias presence in these initiatives, as discussed previously. Furthermore, when considering

but I will not delve into it here. When I refer to a semantic-pragmatic competition, I am basing it on the (general) assumption that bias functions as an implicature, which is conventionally added to the semantic entailment of the utterance. The calculation and interpretation of bias, however, are beyond the scope of this chapter.

inter-speaker variation in responses to a certain type of initiative, this can be attributed to the differing levels of bias sensitivity among individuals. In other words, speakers exhibit distinct degrees of personal bias sensitivity, which leads to situations where one speaker finds the conformity reading as felicitous, while another, who has a lower sensitivity to bias, deems it as infelicitous or unnecessary. The observed patterns provides support for our claim.

5.3 Previous Accounts

The interchangeable use of PolPrts, conveying both positive and negative propositions in response to negative initiatives, gives rise to two issues: **(I)** The first issue pertains to decision-making among available options during generation. That is, when the addressee of the question intends to respond with either p (as a rejecting answer) or $\neg p$ (as an accepting answer), which particle would be the most suitable choice? **(II)** The second issue concerns the interpretation of bare particle, resulting in ambiguity during comprehension. When receiving a bare particle in response to a negative initiative, which answer, p or $\neg p$, would be understood? Our experiment primarily addresses the generation issue, where speakers exhibit varying levels of acceptability in response to optionally and obligatorily biased initiatives. This section presents an analysis of our experimental data in light of the predictions derived from existing theoretical frameworks.

In the preceding discussion in Chapter 4, it was elucidated that according to syntactic accounts, bare particles are associated with conveying negative responses, thereby obviating the necessity to address the comprehension issue of bare forms (for details, see Section 4.2.1). Additionally, these accounts did not furnish specific predictions concerning the optimal particle selection, even in the presence of an explicit prejacent. Although in an experimental investigation, Kramer and Rawlins (2012) noted that for some (minority of) speakers, bare particles could be interpreted ambiguously. In these cases, both *Yes* and *No* responses were frequently construed as conveying a negative answer, $\neg p$. The inclination toward the $\neg p$ interpretation among the majority of speakers has been posited as evidence substantiating the unambiguous nature of bare PolPrts.⁷ This prevailing preference can be generalized as a resolution to the comprehension issue. In essence, regarding syntactic view, when listeners encounter bare *Yes* and *No*, they tend to comprehend these particles as signifying $\neg p$. I will

⁷Notice Kramer and Rawlins (2012) also observed that bare particles in response to NPQs are rated less favorably in comparison to PPQs. This disparity in ratings suggests potential ambiguity in response to negative initiatives, indicating that speakers may rate them lower due to the ambiguity.

refrain from further investigation into the syntactic accounts.

Semantic frameworks, including the salient discourse referents model introduced by Krifka (2013) and the feature marker model proposed by Roelofsen and Farkas (2015), provide predictions for both generation and comprehension issues. In the forthcoming sections, we will examine these theoretical models and evaluate their applicability to our data. We will see that with certain adjustments, both frameworks can account for the data from our experiment. Before exploring the frameworks, let's have an overview of our findings.

Our experimental results are summarized in Table 5.1. We saw that in response to NPQs forms in (a)–(b), the particles in the polarity reading were preferred over the alternatives in the conformity reading. Furthermore, in response to *dige*-NPQs in (c)–(d), both readings consistently received high acceptability ratings (for further details, see Section 5.2.4).

Account	Row	Answer	Preference	Reason
Our Account	(a)	p	$\hat{a}re^{Pos} \succ na^{DAgr}$	to NPQs: No need to agree
	(b)	$\neg p$	$\hat{a}re^{Agr} \prec na^{Neg}$	to NPQs: No need to disagree
	(c)	p	$\hat{a}re^{Pos} \approx na^{DAgr}$	to <i>dige</i> -NPQs: Double-path
	(d)	$\neg p$	$\hat{a}re^{Agr} \approx na^{Neg}$	to <i>dige</i> -NPQs: Double-path

Table 5.1: The generation predictions for optimal particles in Farsi.

Although our experiment did not involve bare PolPrts, the bias effect can be employed to predict the interpretation when the particles stand alone, as demonstrated in Table 5.2. Considering the lower acceptability of the conformity reading in response to NPQs, we can anticipate that in these instances in (a)–(b), the bare particles would be interpreted with their polarity reading. Thus, $\hat{a}re$ would be understood as p , while na would convey the $\neg p$ meaning. Additionally, in the case of *dige*-NPQs where both readings received equal acceptability, it is anticipated that in instances such as (c)–(d), both particles result in ambiguity between the p and $\neg p$ interpretations. Decoding the intended meaning might be facilitated by prosody, an aspect that will be thoroughly discussed in Chapter 6.

Account	Row	Particle	Meaning	Reason
Our Account	(a)	$\hat{a}re$	$p \succ \neg p$	to NPQs: No need to agree
	(b)	na	$p \prec \neg p$	to NPQs: No need to disagree
	(c)	$\hat{a}re$	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)
	(d)	na	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)

Table 5.2: The comprehension predictions for bare particles in Farsi.

5.3.1 Salient Discourse Referent

In the salient discourse referent account, Krifka (2013) introduces two constraints: **Non-Salient* and **DisAgreement*. The former constraint penalizes the selection of a discourse referent (DR) that is not salient, and the latter penalizes disagreement with the other speaker. The author acknowledges the nuanced role of initiative on PolPrts and posits two key assumptions. Firstly, it is proposed that in "typical cases" of negative initiatives, denoted as $\neg q$, a positive proposition functions as the salient/highlighted DR, represented by q^h . However, special cases may occur wherein the negative proposition, $\neg q^h$, is the salient DR (although there is limited elaboration on what constitutes "typical", see Section 4.2.2 for more discussions, particularly footnote 19 for a non-typical example). In this account the distinct highlighting in these instances is not contingent on the type of initiative; rather, it is influenced by the context (which we will explore shortly in the generation predictions).

Secondly, Krifka notes that NPQs likely convey a bias, albeit in a weaker form compared to assertions. He posits that the constraints carry varying weights depending on the type of initiatives. In brief, he suggests that in response to NPQs, the constraint **DisAgr* is ranked lower than the **NonSal* constraint, whereas the ranking is reversed in response to assertions (for detailed information, see Section 4.2.2). As we will see in the following sections, these assumptions are crucial in the generation and comprehension processes, respectively (although they are generally considered).

(I) Generation Predictions: Applying this account to potential answers yields distinct predictions for negative initiatives with highlighted q^h and $\neg q^h$. In typical cases, where q^h is salient, selecting particle *Yes* for providing a rejecting answer (p) is predicted to be favored over *No*. This preference arises because *Yes* incurs a penalty for violating the **DisAgr* constraint, while *No* is penalized for violating both the **NonSal* and **DisAgr* constraints. Conversely, for giving an accepting answer ($\neg p$), particle *No* should be preferred over *Yes*. In this case, *Yes* violates **NonSal*, whereas *No* does not violate any constraints. Special instances, where $\neg q^h$ is salient, lead to opposite particle preferences due to the inverse violations of the constraints.

An overview of the predictions based on the salient discourse referent account is presented in Table 5.3. Notably, p and $\neg p$ denote the intended (prejacent) answer conveyed by the particle in the responses, while q^h and $\neg q^h$ indicate the highlighted DR in the initiative.

Additionally, particle selection adheres to the principle wherein a lower penalty $<_{penalty}$ results in a higher preference \succ . For instance, in (a), to say the p answer, particle *Yes* is preferred \succ over *No* in response to initiatives with the salient positive proposition, q^h , due to the lower $<$ penalty.

Account	Row	Answer	Preference	Reason
Salient DRs	(a)	p	Yes \succ No	$q^h: *DisAgr <_{penalty} *DisAgr + *NonSal$
	(b)	$\neg p$	Yes \prec No	$q^h: *NonSal >_{penalty} \text{No penalty}$
	(c)	p	Yes \prec No	$\neg q^h: *NonSal + *DisAgr >_{penalty} *DisAgr$
	(d)	$\neg p$	Yes \succ No	$\neg q^h: \text{No penalty} <_{penalty} *NonSal$
Our Account	(e)	p	$\hat{are} \succ na$	to NPQs: No need to agree
	(f)	$\neg p$	$\hat{are} \prec na$	to NPQs: No need to disagree
	(g)	p	$\hat{are} \approx na$	to <i>dige</i> -NPQs: Double-path
	(h)	$\neg p$	$\hat{are} \approx na$	to <i>dige</i> -NPQs: Double-path

Table 5.3: The generation predictions for optimal particles by the salient DR account.

As presented in Table 5.3, it becomes apparent that the predictions do not fully align with our experimental findings outlined in Table 5.1, repeated here in (e)–(h). Thus, we need some modifications.⁸ In general, the predictions made by Krifka (2013) for initiatives with q^h in (a)–(b) are in accordance with our results for NPQs forms in (e)–(f). Additionally, although the predictions involving the $\neg q^h$ in (c)–(d) seem different from our data, they still align with our finding in the sense that they reflect the acceptability of the particles in the conformity reading. In other words, in cases of $\neg q^h$, in the rejecting answer (c), No^{DAgr} is preferred over Yes^{Pos} , while in the accepting answer (d), Yes^{DAgr} is preferred over No^{Neg} . This preference for the conformity readings aligns with our findings in *dige*-NPQs, where the acceptability of the conformity reading was enhanced. It is worth noting that while Krifka’s example for $\neg q^h$ was an assertion initiative, he didn’t specify the type of initiative as a distinctive factor for highlighting different DRs but underscores the role of context.⁹ However, Claus et al. (2017) did not observe the influence of context on particle preference in their experimental study.

⁸It is worth to clarify that I am not suggesting an exact parallel between the bias implicatures in English NPQs and Farsi NPQs. However, it can be assumed that NPQs generally exhibit a weaker bias compared to assertions, a pattern observed across languages. Therefore, I posit that there exists a certain degree of overlap in the forms and bias of NPQs in different languages.

⁹Krifka briefly mentions the context dependency of the salient DR as follows (Krifka 2013:p. 12):

"The preference for the non-negated discourse referent was motivated by the fact that negated initiative clauses typically occur in contexts in which the non-negated proposition is salient. In contexts in which this condition is not satisfied, we should expect the answer patterns to be different."

To reconcile our data (for the parity in obligatorily biased forms) within this account, three modifications are necessary to be considered. Firstly, I uphold the positive proposition as the salient DR, q^h , in all negative initiatives. Secondly, I expand the concept of distinct salient DRs across various contexts, positing that the presence of bias for $\neg q$ in the initiative makes $\neg q$ DR as salient as q DR. As a result, the $*NonSal$ constraint in *dige*-NPQs are trivial. Thirdly, the $*DisAgr$ constraint appears unnecessary and can be safely disregarded without affecting the predictions in our data. Notice that while disagreeing with the speaker is a more costly (complex) move in discourse compared to agreeing, this constraint is not crucial for our particle predictions, neither in generation nor in comprehension (we see shortly). This discourse effect is evident in Figure 5-5, where rejecting answers receive lower ratings compared to accepting answers (see Section 5.2.4).

With these adjustments, the account can be applied to our findings. As previously mentioned, our data concerning NPQs align with the predictions in this account. However, regarding our adjustments, we only need to dismiss the $*DisAgr$ penalty, as illustrated in (e')–(f') in Table 5.4. By removing the $*DisAgr$ constraint, we still achieve accurate predictions in (e'). Here, $\hat{a}re$ is preferred over na , since $\hat{a}re$ does not violate any constraints, whereas na violates the selection of $*NonSal$ DR.

Account	Row	Answer	Preference	Reason
Farsi Data in modified Salient DR	(e')	p	$\hat{a}re \succ na$	NPQs: No penalty $<_{penalty} *NonSal$
	(f')	$\neg p$	$\hat{a}re \prec na$	NPQs: $*NonSal >_{penalty}$ No penalty
	(g')	p	$\hat{a}re \approx na$	<i>dige</i> -NPQs: No penalty = No penalty
	(h')	$\neg p$	$\hat{a}re \approx na$	<i>dige</i> -NPQs: No penalty = No penalty

Table 5.4: Applying the modified salient DR account to Farsi data (in generation).

Finally, we proposed that the $*NonSal$ constraint in *dige*-NPQs are trivial, since the $\neg q$ is as salient as the q . Thus, in both rejecting and accepting answers in (g')–(h'), neither $\hat{a}re$ nor na violates any constraints. Therefore, both particles in both answers are anticipated to be equally acceptable, aligning with our experimental data.

(II) Comprehension Predictions: Shifting to the comprehension issue, Krifka (2013) posits that the interpretation of bare particles hinges on the bias, leading to varying constraint weights based on the type of initiative. He contends that in NPQs, which exhibit weaker bias, the $*NonSal$ constraint incurs a greater penalty than the $*DisAgr$ constraint. Conversely, in assertions with stronger bias, he posits that the $*DisAgr$ constraint imposes

a higher penalty than the $*NonSal$ constraint. Hence, Krifka predicts in NPQs, $[Yes, p]$ is preferred as it violates the lesser penalty of the $*DisAgr$ constraint, compared to $[Yes, \neg p]$, which violates the $*NonSal$. While $[No, p]$ violates both constraints, $[No, \neg p]$ only incurs a penalty for the $*DisAgr$ constraint. In the case of assertions, both particles are predicted to be interpreted as $\neg p$ rather than p . $[Yes, p]$ violates the $*DisAgr$, incurring a higher penalty than $[Yes, \neg p]$, which violates the $*NonSal$ constraint. Similarly, $[No, p]$ violates both the $*DisAgr$ and $*NonSal$ constraints, whereas $[No, \neg p]$ incurs no violation.¹⁰

Table 5.5 summarized the predictions, demonstrating that our data partially aligns with the predictions of the salient DR account, in which (a)–(b) are similar to (e)–(f). However, the account can effectively explain the data when we incorporate our adjustments. As previously discussed, we dismissed the $*DisAgr$ constraint and also considered the $*NonSal$ trivial in *dige*-NPQs, given that obligatorily biased initiatives highlight $\neg q$ DR as the p DR.

Account	Row	Particle	Meaning	Reason
Salient DR	(a)	Yes	$p \succ \neg p$	to NPQs: $*DisAgr <_{penalty} *NonSal$
	(b)	No	$p \prec \neg p$	to NPQs: $*DisAgr + *NonSal >_{penalty} *DisAgr$
	(c)	Yes	$p \prec \neg p$	to Assertion: $*DisAgr >_{penalty} *NonSal$
	(d)	No	$p \prec \neg p$	to Assertion: $*DisAgr + *NonSal >_{penalty} \text{None}$
Our Account	(e)	<i>âre</i>	$p \succ \neg p$	to NPQs: No need to agree
	(f)	<i>na</i>	$p \prec \neg p$	to NPQs: No need to disagree
	(g)	<i>âre</i>	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)
	(h)	<i>na</i>	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)

Table 5.5: The comprehension predictions for bare particles by the salient DR account.

As illustrated in Table 5.6, concerning NPQs initiatives, our projections in (e')–(f') are in line with the related predictions, regarding the violation of the $*NonSal$ constraint. Furthermore, our predictions about the ambiguity between p and $\neg p$ in *dige*-NPQs (g')–(h') can be deduced, assuming that the trivial role of $*NonSal$ does not incur any penalty.

Account	Row	Particle	Meaning	Reason
Farsi Data in modified Salient DR	(e')	<i>âre</i>	$p \succ \neg p$	to NPQs: No penalty $<_{penalty} *NonSal$
	(f')	<i>na</i>	$p \prec \neg p$	to NPQs: $*NonSal >_{penalty} \text{No penalty}$
	(g')	<i>âre</i>	$p/\neg p$	to <i>dige</i> -NPQs: No penalty = No penalty
	(h')	<i>na</i>	$p/\neg p$	to <i>dige</i> -NPQs: No penalty = No penalty

Table 5.6: Applying the modified salient DR account to Farsi data (in comprehension).

¹⁰Note that these predictions are grounded in the salient positive DR q^h , as outlined in Krifka (2013). Since I have assumed the q^h in all instances, I did not explore the other case.

It is worth to emphasize the role of prosody in the comprehension of bare PolPrts, a point acknowledged by Krifka (2013). He highlights that expressing a *p*-meaning (in all cases) necessitates either an explicit prejacent or a specific rejecting accent to establish a contrast between the answer and the question. However, our experimental findings in Chapter 6 indicate the presence of prosodic saliency in response to obligatorily biased forms, but its absence in optionally biased questions. Hence, the current account needs to elucidate the absence of the "rejecting accent" in NPQs (for our discussion about the prosodic saliency, see Section 6.4).

Overall, Krifka (2013)'s framework, with some adjustments, can be applied to our experimental findings. Nonetheless, the assumption that in negative initiatives the positive DR is highlighted seems counterintuitive. This approach treats PPQs and NPQs as if they highlight the same proposition despite expressing distinct propositions. Although both PPQs and NPQs are semantically identical, the uttered/highlighted proposition influences the meaning, which is overlooked in this account.

5.3.2 Feature Marker

In this framework, Roelofsen and Farkas (2015) introduce two polarity features: the *Absolute* feature with $[+, -]$ values, and the *Relative* feature with $[\text{Agree}, \text{Reverse}]$ values. Alongside these features, the authors propose two fundamental rules: *Markedness* and *Realization*. The *Markedness* consideration reflects the markedness of feature values in terms of semantic complexity, thereby establishing the following markedness scale. The *Realization* constraint, on the other hand, asserts that the more marked a feature is, the stronger the pressure to overtly realize it (see Section 4.2.3).

- **Overall markedness scale:** $[\text{Agree}, +] < [\text{Reverse}, -] < [\text{Agree}, -] < [\text{Reverse}, +]$

(I) Generation Predictions: Concerning the optimal particle choice, Roelofsen and Farkas (2015) posit that in ambiguous scenarios, there exists a preference for realizing the marked feature over the unmarked one.¹¹ Therefore, for accepting answers $\neg p$, characterized by the features $[\text{Agree}, -]$, *No* is preferred as it realizes the marked feature $[-]$, while *Yes* conveys the unmarked feature $[\text{Agree}]$. Similarly, for rejecting answers p , denoted by the

¹¹I extend their predictions for ambiguous cases to general predictions for the particle preference.

features [Reverse, $+$], *No* is favored since it realizes the marked feature [Reverse], while *Yes* manifests the unmarked feature $[+]$. Table 5.7 provides a summary of these predictions, where a higher degree of markedness $>$ corresponds to a higher preference \succ .

Account	Row	Preference	Answer	Reason
Feature Marker	(a)	<i>Yes</i> \prec <i>No</i>	p	$[+]$ $<_{marked}$ [Reverse]
	(b)	<i>Yes</i> \prec <i>No</i>	$\neg p$	[Agree] $<_{marked}$ $[-]$
Our Account	(c)	$\hat{a}re \succ na$	p	to NPQs: No need to agree
	(d)	$\hat{a}re \prec na$	$\neg p$	to NPQs: No need to disagree
	(e)	$\hat{a}re \approx na$	p	to <i>dige</i> -NPQs: Double-path
	(f)	$\hat{a}re \approx na$	$\neg p$	to <i>dige</i> -NPQs: Double-path

Table 5.7: The generation predictions for optimal particles in the feature marker account.

Let's see if their predictions can be applied to our findings from Table 5.1, repeated here in (c)–(f). In their thorough study, Roelofsen and Farkas (2015) provide examples including both NPQs and negative assertions. However, they did not take the type of initiative into account as an influencing factor. Their prediction, advocating for the exclusive preference of particle *No* in (a)–(b), regardless of the initiative type, mirrors our experimental findings, in which *na* generally receives higher acceptability. However, two notable points arise: first, the account needs to elucidate why in response to NPQs in (c), *are* with the unmarked feature $[+]$ is favored over the *na* with marked [Reverse] feature. Second, we need to explain why both particles are acceptable in response to *dige*-NPQs forms in (e)–(f).

Roelofsen and Farkas (2019) expanded their model by introducing additional constraints and incorporating Optimality Theory (OT) to account for the particle variations observed in an experimental study conducted by Claus et al. (2017) (and also to address the phenomena in cross-linguistic studies). Claus et al. (2017) revealed diverse particle preferences among German speakers in response to negative assertions.¹² Building upon that, Roelofsen and Farkas (2019) introduced a novel constraint known as *Maximize Marked*, allowing speakers to assign different (markedness) weights for the realization of relative and absolute features. This suggests that different speakers, in accordance with their individual grammar, either maximize the absolute feature or the relative feature. Following OT, speakers tend to favor the realization of the particle with a higher weight, elucidating the observed particle variations (for a comprehensive discussion, interested readers are encouraged to read Roelofsen

¹²In short, Claus et al. (2017) observed substantial inter individual variation in accepting answers, with some speakers favoring *ja* over *nein*, while others exhibited the opposite preference.

and Farkas 2019 and also Claus et al. 2017).

To tailor the feature marker account to our data, we need two adjustments. First, we propose the inclusion of the *Maximize Absolute* constraint as defined below. This constraint indicates that speakers give higher priority to expressing absolute features, prioritizing the expression of $[+]/[-]$ over the relative features [Agree] and [Reverse]. Second, we posit that this constraint is applicable in response to optionally biased forms, and it is relaxed in the obligatory forms. This is inline with our argument, where in NPQs, there is no need to agree or disagree, thus the realization of absolute features are maximized. However, the bias in obligatorily biased forms enhances the realization of relative features, resulting in an equal pressure for the realization of absolute and relative features (the double-path decision).

- **Maximize Absolute:** Maximize the realization of absolute polarity features.

By incorporating the newly proposed constraint, we now apply the feature marker account to our data as represented in Table 5.8. On one hand, when responding to NPQs, both *âre* in (c') and *na* in (d') are preferred over alternative particles due to the prioritization of absolute polarity features, $[+]$ and $[-]$, over relative polarity features, [Reverse] and [Agree]. In *dige*-NPQs, on the other hand, the *Maximize Absolute* constraint is relaxed, allowing the acceptability of both *âre* and *na* in (e') and (f'). Thus, the bias in *dige*-NPQs makes the realization of relative features to the same degree as absolute features, which leads to the ambiguity in our data.

Account	Row	Preference	Answer	Reason
Farsi Data in modified Feature Marker	(c')	$\hat{a}re \succ na$	p	to NPQs: $[+] > [\text{Agree}]$
	(d')	$\hat{a}re \prec na$	$\neg p$	to NPQs: $[-] > [\text{Reverse}]$
	(e')	$\hat{a}re \approx na$	p	to <i>dige</i> -NPQs: No markedness constraint
	(f')	$\hat{a}re \approx na$	$\neg p$	to <i>dige</i> -NPQs: No markedness constraint

Table 5.8: Applying the modified feature marker account to Farsi data (in generation).

(II) Comprehension Predictions: Roelofsen and Farkas (2015) posit that both bare *Yes* and *No* would be understood as $\neg p$ meaning. According to their model, the p -reading necessitates explicit verum focus on the prejacent, a requirement independent of the need for disambiguation. They argue that $[+, \text{Reverse}]$, as the most marked feature combination, demands verum focus to articulate the contrastive polarity between the positive prejacent and the negative initiative. A summary of these predictions is presented in Table 5.9.

Account	Row	Particle	Meaning	Reason
Feature Marker	(a)	Yes	$p \prec \neg p$	p requires verum focus
	(b)	No	$p \prec \neg p$	p requires verum focus
Our Account	(c)	<i>âre</i>	$p \succ \neg p$	to NPQs: No need to agree
	(d)	<i>na</i>	$p \prec \neg p$	to NPQs: No need to disagree
	(e)	<i>âre</i>	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)
	(f)	<i>na</i>	$p/\neg p$	to <i>dige</i> -NPQs: Double-path (prosody helps)

Table 5.9: The comprehension predictions for bare particles the feature marker account.

As we can see in Table 5.9, the predictions in (a)–(b) do not align with our predictions in (c)–(f). Although, their concern about the role of prosody is inline with our predictions concerning the influence of prosody in *dige*-NPQs forms (e)–(f). However, the framework falls short in explaining the lack of prosodic saliency in responses to NPQs. The absence of prosodic saliency in these instances is substantiated by the experimental data from our study, as detailed in Chapter 6, and also corroborated by findings from Goodhue and Wagner (2018). I refrain from exploring further adjustments within this account, as the only criterion for the comprehension in this context is prosodic saliency, verum accent (for our discussion about the presence and absence of prosodic saliency, see Section 6.4)

5.4 Summary

In this chapter, we conducted an experiment to explore the impact of bias on the acceptability of PolPrts in response to negative initiatives. The data substantiated our initial observations: speakers demonstrated a preference for the polarity reading of PolPrts when responding to optionally biased initiatives, whereas both polarity and conformity readings were nearly equally acceptable in response to obligatorily biased forms. This trend held true for both *âre* ‘Yes’ and *na* ‘No’ particles, and in accepting and rejecting answers

Based on our findings, we proposed that the optimal particle choice involves a dual-pathway approach within semantic-pragmatic accounts. The first pathway aligns with responses in the polarity reading, where particles indicate the answer’s polarity based on the question’s semantics. The second pathway becomes active in the presence of bias, particularly in *dige*-NPQs and assertions. Here, the addressee can agree or disagree with the speaker’s expectation using PolPrts in the conformity reading. Thus, while PolPrts in the polarity reading allow speakers to consistently respond to different initiatives, the introduction of

bias opens a secondary pathway for the addressee to address the expressed bias, leading to enhanced acceptability.

We argued that previous theoretical frameworks, specifically the salient discourse referent proposed by Krifka (2013) and the feature marker introduced by Roelofsen and Farkas (2015), can elucidate our experimental findings with slight adjustments, by incorporating the type of initiative within the framework of Optimality Theory. While gradable OT reasoning has been developed for contexts involving variations (Keller 2000), our proposed dual-path account offers a simple and coherent explanation, seamlessly aligning with the observed data. This approach avoids the complexity associated with assigning intricate weights to numerous parameters, such as interindividual preferences and the type of initiative.

Chapter 6

Prosody and Polar Particles

6.1 Introduction

An overview of the literature reveals the significant role of prosodical saliency (represented by SMALL CAPS), particularly in positive answers to negative initiatives as in (217). Pope (1976) identifies a special tune known as the *rise-fall-rise* (RFR) in rejecting answers to both positive and negative assertions. Kramer and Rawlins (2009) further emphasize that *reverse-No* is only considered acceptable when accompanied by an *intonational peak* on the auxiliary. Krifka (2013) and Roelofsen and Farkas (2015) refer to the prosodic prominence observed in rejecting answers to negative initiatives as the *rejecting accent* and *verum focus*, respectively. Finally, Goodhue and Wagner (2018), through a series of generation and perception experiments in English, report the presence of particular rising tune, referred to as *contradiction contour* (following Liberman and Sag 1974), exclusively in positive responses.

- (217) A: Did John not come to the party?

B1: Yes, he DID.

B3: No, he DID.

B2: Yes, he didn't.

B4: No, he didn't.

Despite the varied terminology employed by these authors, their discussions converge on a common observation regarding the prosodical saliency presents in rejecting answers. Henceforth, I refer to this phenomenon as *focal stress*.¹ However, two key issues necessitate further

¹Remember that *focal stress* is employed in a broad sense, including various terms found in the literature, referring to prosodical saliency. Consequently, it should not be conflated with the specific

consideration. Firstly, previous studies have addressed focal stress, but the use of diverse terminology by different authors introduces distinctions in terms of features and functions. For example, in languages like English, verum focus and contrastive focus exhibit prosodic similarities as homophones, yet they have distinct semantic interpretations (Rooth 1992, Romero and Han 2004, Gutzmann et al. 2020, Bill and Koev 2021b). Therefore, it is crucial to determine which of these types aligns most appropriately with the observed data.

Secondly, while the literature agrees on the presence of focal stress in rejecting answers (rather than in accepting ones), two distinct viewpoints exist regarding the polarity of the initiative. The first perspective suggests that focal stress appears in rejecting answers to both positive and negative initiatives, contrasting the polarity of the answer with that of the initiative. This perspective aligns with the principles of contrastive focus (à la Rooth 1992) and is supported by the observation of the RFR pattern in Pope (1976). The second perspective predicts focal stress exclusively in rejecting answers to negative initiatives. Roelofsen and Farkas (2015) propose the notion of verum focus, which is grounded in the markedness distinction between [+*Reverse*] features in negative initiatives and [-*Reverse*] features in positive initiatives (cf. Kramer and Rawlins 2009 and Krifka 2013).² The experimental findings of Goodhue and Wagner (2018) also support the predictions of the second perspective, demonstrating the absence of focal stress in rejecting answers to PPQs.

In order to reach any conclusions regarding either of these perspectives and determining the type of focal stress they have introduced, it is essential to investigate some crucial points raised by these studies. (i) These perspectives are not consistent with the type of initiative, particularly in terms of their bias (see Section 4.3.1.2). For instance, Goodhue and Wagner tested positive and negative polar questions, as well as negative rising declaratives (NRDecs), whereas Pope's observations included positive and negative assertions. (ii) Goodhue and Wagner reported a higher frequency of focal stress in rejecting answers to NRDecs compared to NPQs. Based on the intuitively plausible assumption that NRDecs tend to convey stronger bias compared to NPQs, the authors suggest that bias (strength) may play a role in determining the presence of focal stress. However, their study only provided con-

concepts of *focus* or *stress* as defined within semantic, pragmatic, or phonological frameworks.

²Krifka did not explain about "rejecting accent", and he did not address this concept in response to positive initiatives. If we interpret it as contrastive focus, as I think the author intended, it would provide support for the first viewpoint. However, considering that he only exemplified the "rejecting accent" in rejecting answers to negative forms, one would align his work with the second viewpoint.

texts with evidence for a negative proposition, $\neg p$, and they speculated that if a context provided evidence for p , rejecting answers might also exhibit focal stress, aligning with the first viewpoint. (iii) The literature suggests that in response to negative initiatives, where bare PolPrts are ambiguous, the interpretation of $\neg p$ is often preferred over p (see the predictions in Section 5.3, and for empirical data, see Kramer and Rawlins 2012). Moreover, Goodhue and Wagner noted that participants more frequently preferred rejecting answers p when bare PolPrts bore focal stress. This observation is significant for understanding the role and function of focal stress.

We conduct two auditory experiments to investigate focal stress on PolPrts, aiming to determine the type and function of stress with respect to its presence and absence. Experiment 1 focused on controlling the prosody in accepting and rejecting answers to positive and negative polar questions. The goal was to collect experimental evidence that substantiates the aforementioned viewpoints. The results aligned with previous empirical studies and the second view, revealing focal stress exclusively in rejecting answers to NPQs. Experiment 2 served as a follow-up investigation, aiming to account for the impact of bias on focal stress. PPQs and NPQs with particle *dige*, which obligatorily expresses speaker's expectation for the uttered proposition, were presented. Interestingly, focal stress was observed in rejecting answers to both *dige*-PPQs and *dige*-NPQs, providing support for the first view.

I propose the existence of two distinct types of focal stress: contrastive focus and verum focus, each serving different functions.³ I posit the focal stress in rejecting answers to NPQs (Experiment 1) represents contrastive focus, while the focal stress observed in rejecting to both *dige*-PPQs and *dige*-NPQs (Experiment 2) is verum focus. The argument is based on the idea that in optionally biased initiatives, i.e., PPQs and NPQs, contrastive focus is required to disambiguate the PolPrts readings through the alternative set. This accounts for its presence in response to NPQs, where PolPrts exhibit ambiguity, and its absence in response to PPQs, where PolPrts are unambiguous. Moreover, in obligatorily biased forms, i.e., *dige*-PPQs and *dige*-NPQs, verum focus signals the conflict between speaker's expected answer and addressee's (real) answer, regardless of the polarity of the initiative.

Before delving into the experimental details, it is worth emphasizing that the following experiments do not make any inherent *phonological* claims regarding the prosodic specification

³Although this analysis is based on Farsi data, I believe it can be potentially extended to other languages with minor modifications based on language-specific properties.

of polar particles per se (as the particle segmentation). The focus here lies only on capturing any prosodic saliency, referred to as focal stress, which specifically entails an increase in pitch range and/or duration (see Mohammadi 2023b). Any additional inherent phonological claims remain subject to further studies.

This chapter is structured as follows: Section 6.2 introduces Experiment 1, outlining the materials and methodology employed. The results are presented in Section 6.2.3, followed by a discussion of the findings in Section 6.2.4. Experiment 2 in Section 6.3 expands on the study by considering the impact of bias on prosody. While the method remains consistent with the previous experiment, the materials are presented in Section 6.3.1. The results and discussion are provided in Sections 6.3.2 and 6.3.3, respectively. In Section 6.4, I propose distinct types of focal stress based on the types of the initiative. Section 6.5 offers a comparison of my proposal with the prior empirical accounts. Finally, Section 6.6 concludes the chapter.

6.2 Experiment 1: Focal Stress

This section presents an experimental investigation into the focal stress on PolPrts in Farsi. The study focuses on positive (218) and negative (219) polar questions as experimental stimuli. We aim to identify prosodical saliency on the particles in rejecting answers (218.B2) and (219.B1) as compared to accepting answers (218.B1) and (219.B2).

- | | |
|---|---|
| (218) A: Ali mehmuni raft?
Ali party went
'Did Ali go to the party?' | (219) A: Ali mehmuni na-raft?
Ali party NEG-went
'Did Ali not go to the party?' |
| B1: $\hat{a}re^{Pos}$ / $\hat{a}re^{Agr}$ raft.
yes yes went
'Yes, he did.' | B1: $\hat{a}re^{Pos}$ / na^{DAgr} raft.
yes yes went
'Yes/No, he did.' |
| B2: na^{Neg} / na^{DAgr} na-raft.
no no NEG-went
'No, he didn't.' | B2: $\hat{a}re^{Agr}$ / na^{Neg} na-raft.
no no NEG-went
'Yes/No, he didn't.' |

To address the following research questions, we will manipulate focal stress in terms of both particles, *âre* vs. *na*, and the type of answers, rejecting vs. accepting.

1. Do speakers employ focal stress on specific answers?
2. Does the polarity of the question influence the occurrence of focal stress?

6.2.1 Materials

The experiment employs a 2x2x2 design, incorporating the following factors. Note that due to semantic incompatibility two conditions, i.e., PPQs-Accepting-[*na, p*] and PPQs-Rejecting-[*âre, ¬p*], are excluded, resulting in six conditions.

- **Question type:** PPQs, NPQs
- **Response type:** Accepting, Rejecting
- **Response particles:** *âre, na*

The experimental stimuli consist of scene-settings followed by brief conversations, as depicted in Figure (6-1). The target stimuli were generated from 18 core sentences, and contexts were set up for accepting and rejecting answers. Each dialogue includes three question-answer pairs, with one pair designated as the target and the remaining pairs serving as distractors in the form of Wh-Questions or assertions. Each particle is presented once in each condition, employing a Latin-square design. Consequently, six lists were created, wherein the stimuli were pseudo-randomized, and participants encountered three tokens of each condition. Participants were evenly divided, with an equal number of male and female in each group. They were instructed to read the scene carefully and record the dialogue in a natural manner.

Context: *Sara thinks Ali didn't go to the party last night, but she's not sure. She is talking to Leila, who was at the party. Leila knows that Ali was there.*

Sara: How was the party?

Leila: Awesome! You missed it.

Sara: I know. Did Ali not come?

Leila: *na umad.* I saw him.
no came. 'No, he did.'

Sara: When did you see him?

Leila: Just before the dinner.

Figure 6-1: Sample stimuli: NPQs with a rejecting answer by particle *na*.

Due to the COVID-19 pandemic, data collection in a laboratory setting was not feasible, as the labs remained closed for an extended period. Online recording was also avoided to

prevent potential issues such as noise or low audio quality. Data collection took place in person, in a dedicated recording room equipped with a MacBook Pro 2019 and by PRAAT (version 6.1.53). The recordings were conducted at a monotone sampling rate of 44100Hz. Given the pandemic-related restrictions, participants were scheduled individually for the recording sessions.⁴ They received an individual introduction on how to use PRAAT for recording purposes. The initial recording served as a test, and participants had the option to re-record if they were dissatisfied with their performance. It is worth noting that the dialogues commenced with a control question, which served as a warm-up and helped participants become comfortable with their own voices.

6.2.2 Method

Earlier studies have commonly employed the ToBI (To(nes), B(reak), I(ndices)) labeling conventions (Pierrehumbert 1980, Beaver and Clark 2008) to model intonational tunes. These tunes are characterized by strings of tones that shape the fundamental frequency (f0). The ToBI model includes three types of tones: (i) pitch accents, which align with stressed syllables and are represented by L*, H*; (ii) phrase accents, represented by L-, H-; and (iii) boundary tunes, represented by L%, H%.

Transcribing data in ToBI system is a time-consuming process that requires extensive training and relies on individual judgment. This task posed particular challenges in my study, as the prosodic saliency targeted monosyllabic particles occurring at the clause beginning. Furthermore, the phonological specification of responses in ToBI framework is beyond the scope of my investigation and should be explored in future studies. The goal of this study is to find potential prosodic differences among different responses, accomplished by analyzing the dynamic properties of speech.⁵

There is growing interest in employing dynamic analysis in phonetics and related fields, not only to reduce data complexity but also to discover underlying patterns in speech contours using well-established statistical approaches (Wood 2017, Wieling 2018, Sóskuthy 2021).

⁴I am sincerely grateful to all the participants who took part in the experiments, demonstrating patience and dedication. Despite the challenges posed by the ongoing COVID-19 pandemic, they generously devoted their time and agreed to be present in the recording room. I extend my deepest appreciation to each and every one of the 36 participants for their valuable contribution.

⁵I express my sincere gratitude to Tamara Rathcke, who introduced me to GAMMs. Her insightful comments during the study were immensely valuable. Additionally, I am grateful to Massimiliano Canzi, who generously provided the materials necessary for mastering GAMMs.

Such analyses offer a range of measurements with temporal/spatial structure, facilitating the detection and examination of intricate patterns without relying only on individual judgment. Additionally, contour patterns can be grouped into various units such as phones, morphemes, words, and utterances, establishing complex dependencies among individual measurements. Generalized additive mixed models (GAMMs) are nonlinear regression models that capture time-varying speech data by accounting for variation not only in trajectory height but also in shape. These models also incorporate smoothing of shapes, fitting separate curves for each (group) variable while accommodating random effects that account for dependencies among grouped data points. In both experiments, I employed various model simulations to explore the suitability of different GAMM setups with my dataset.

I began with a simple model and progressively developed it into more complex ones, ultimately arriving at the optimal model. The f0 trajectory difference for each condition employed *Maximum Likelihood* estimation, essential for comparing models with different fixed effects. For the smoothing process, I employed *Thin Plate* regression splines for each level of our factor parameters (results were consistent with *Cubic Regression*). Finally, the optimal model utilized a *knit* parameter value of 5 for the basis dimension size (for technical details see Wieling 2018, Sóskuthy 2017).

The data preparation process was the same for both experiments. Response utterances were extracted from the recordings, and particle boundaries were annotated by the author. Subsequently, 15 data points of f0 trajectory were automatically collected from each particle using a script in PRAAT. The final GAMM model estimates the f0 trajectory difference for each condition, incorporating a random effect for participants. The final results from the optimal model will be presented. For creating GAMM illustrations, I utilized *mgcv* and *itsadug* packages in R (version 4.1.2, 2021).

6.2.3 Result

Data were collected from a total of 36 participants, including 22 women and 14 men, with an average age of 34 years. All participants were native speakers of Farsi residing in Tehran, Iran, and were above 18 years old. Six participants were excluded due to a lack of natural intonation. The exclusion process involved checking for rising intonation on questions and non-monotonic intonation related to surprise expressions, such as *râst mig!* ‘Really!’, *če*

bahâl! ‘Awesome!’, *hurâ!* ‘hurrah!’, and others. During the recording sessions, participants had two 5-minute breaks between recording 18 stimuli. The overall duration of the sessions was approximately 40 minutes.

The dataset consists of 8370 measurement points obtained from 15 (f0) time-slap data points out of a total of 558 trials. The average duration of *âre* and *na* was approximately 0.311 and 0.294 seconds, respectively. As depicted in Figure 6-2, there is a significant difference between Accepting and Rejecting answers ($\beta = 4.49$, $CI = 95\%$, $p < .001$). The optimal random effect structure includes by-participant intercepts, and the model exhibits substantial explanatory power ($R^2 = 0.75$).

```

Family: gaussian
Link function: identity

Formula:
F0 ~ ResponseType + s(MeasurementNo, by = ResponseType, bs = "tp",
k = 5) + s(ParticipantID, bs = "re")

Parametric coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) 190.3968 8.2476 23.085 < 2e-16 ***
ResponseTypeRejecting 4.4882 0.5946 7.548 4.91e-14 ***
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Approximate significance of smooth terms:
edf Ref.df F p-value
s(MeasurementNo):ResponseTypeAccepting 3.167 3.635 19.57 <2e-16 ***
s(MeasurementNo):ResponseTypeRejecting 3.673 3.936 138.67 <2e-16 ***
s(ParticipantID) 28.962 29.000 793.71 <2e-16 ***
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-sq.(adj) = 0.745 Deviance explained = 74.6%
-ML = 38225 Scale est. = 716.02 n = 8100

```

Figure 6-2: Summary of GAMM analysis of different responses.

I will present the non-linear *smooth plot* and *difference plot* of the data, illustrating the shape and height differences in the f0 trajectory for each condition. In all of the smooth plots (on the left), shaded bands representing pointwise 95% confidence intervals are used to depict the trajectory tracks. Additionally, the difference plots (on the right) show the significant difference areas of the pitch tracks, indicated by a red line on the x-axis and separated by vertical dotted lines. Notice that the absence of a red line in a diff-plot indicates the lack of significant difference.

Figure 6-3 presents the general smooth plot and diff-plot of the prosodic patterns on both *âre* and *na* in rejecting and accepting answers to polar questions (PQs), including PPQs

and NPOs. The accepting f0 (the blue track) exhibits a lesser degree of rising compared to the rejecting answer f0 (the purple track), which shows an enhanced pitch rise. Statistically, the magnitude excursion of f0 in accepting is 9 Hz (184-193 Hz), while in rejecting answers, it is 26 Hz (179-205 Hz). The patterns suggest H* (in accepting) and L+H* (in rejecting) interpretations in ToBI (cf. CC tune in Goodhue and Wagner 2018). I leave the phonological claims for future studies.

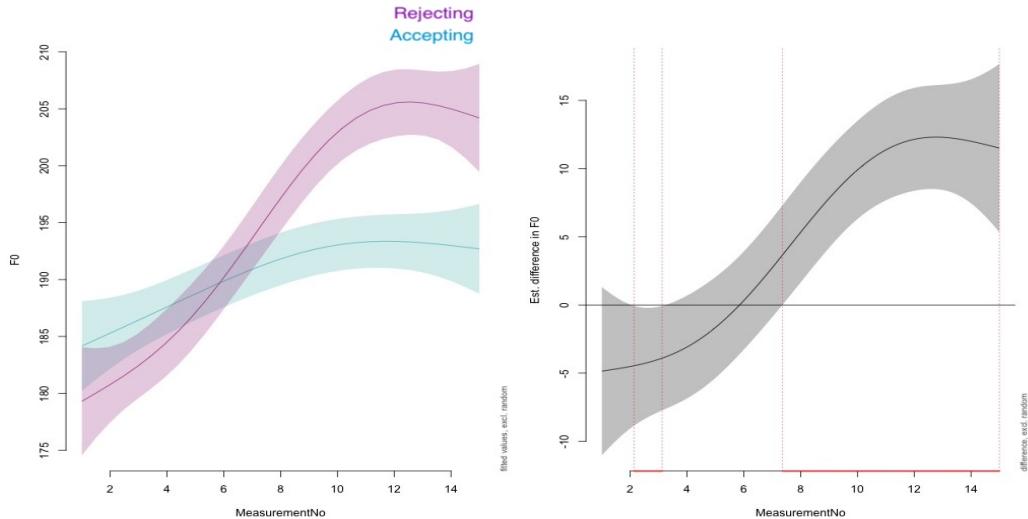


Figure 6-3: Non-linear smooth and difference plots of Accepting and Rejecting answers to PQs.

Moreover, it is important to note that not only the height but also the shape of the patterns exhibit differences. The presence of vertical red dotted lines on the x-axis in the diff-plot reveals slight variations in trajectories at the initial measurements (time slaps 2-3), and significant differences from the middle to the end of the measurements (time slaps 7-15). This observation suggests that the response type significantly differs not only in terms of height but also in terms of shape.

In order to ensure that the morpho-phonological⁶ characteristics of the particles did not influence the observed results, the f0 trajectory of *âre* and *na* are separately illustrated in Figures 6-4 and 6-5, respectively. Although the investigation of the phonological properties of PolPrts falls beyond the scope of this study, the individual plots of each particle demonstrate

⁶The particles *âre* and *na* exhibit distinct phonological patterns, with *âre* following a CVCV pattern and starting with a glottal stop consonant, while *na* has a CV pattern and begins with a nasal sound. These phonological differences may impact the overall shape and duration of the particles as well as the starting and ending points of articulation. However, the individual plots of each particles, Figures 6-4 and 6-5, demonstrate the same pattern in the plot of both particles in Figure 6-3. The potential influence of phonological properties is left for future studies to explore.

a similar pattern to the combined plot of both particles (Figure 6-3), where the accepting and rejecting answers of PolPrts display differences in both shape and height. Therefore, the finding in our data, where the accepting answers exhibits a smaller pitch rise compared to the rejecting ones, is consistent in both particles.

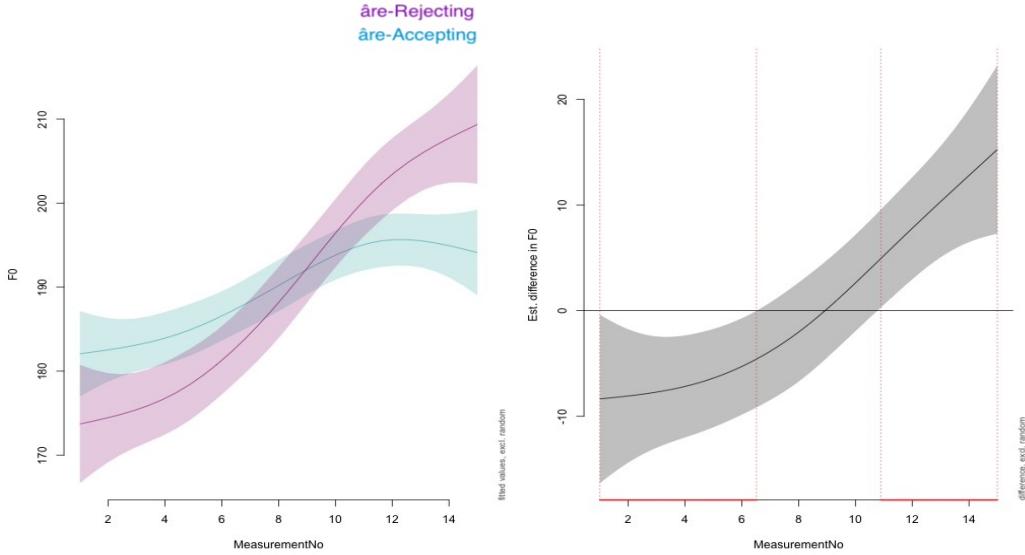


Figure 6-4: Non-linear smooth and diff. plots of *åre* in Accepting and Rejecting answers to PQs.

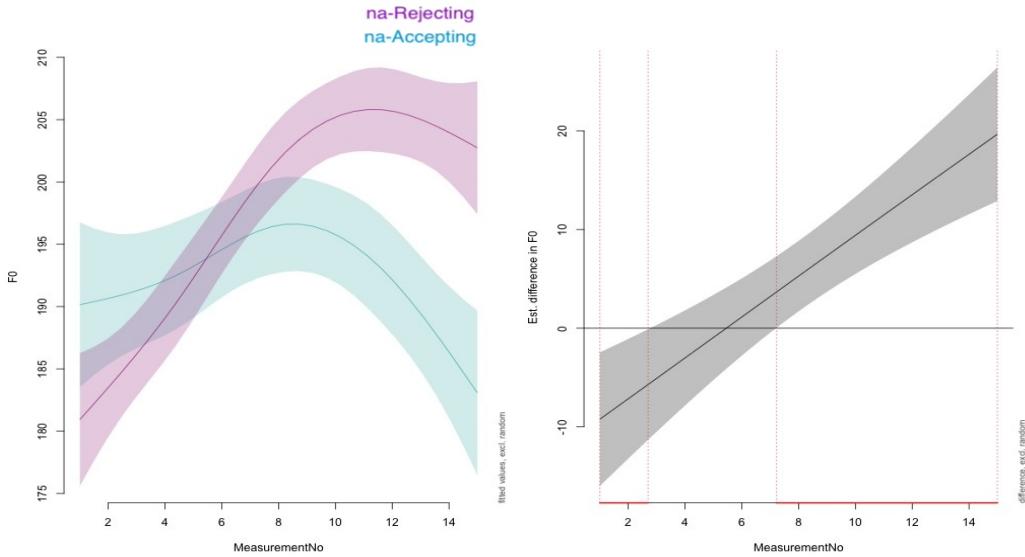


Figure 6-5: Non-linear smooth and diff. plots of *na* in Accepting and Rejecting answers to PQs.

To address the second research question, investigating whether the polarity of the initiative affects prosody, we examine the responses to PPQs and NPQs separately, as depicted in Figure 6-6. Unsurprisingly, in the *åre*-plot on the left, the rejecting answers with *åre* in

NPQs (the green track) exhibits a higher pitch rise compared to the two accepting answers in PPQs and NPQs (the purple and orange tracks, respectively). However, in the *na*-plot on the right, the rejecting answers with *na* in PPQs (the purple track) bears a closer prosody to the accepting answer (the orange track) rather than the rejecting (the green track) in NPQs. In other words, the rejecting answer in PPQs starts from a higher position (similar to the accepting answers in NPQs) and does not raise significantly, thus, it does not exhibit significant prosodic saliency compared to the rejecting in NPQs, which starts in a lower position and raise significantly.⁷

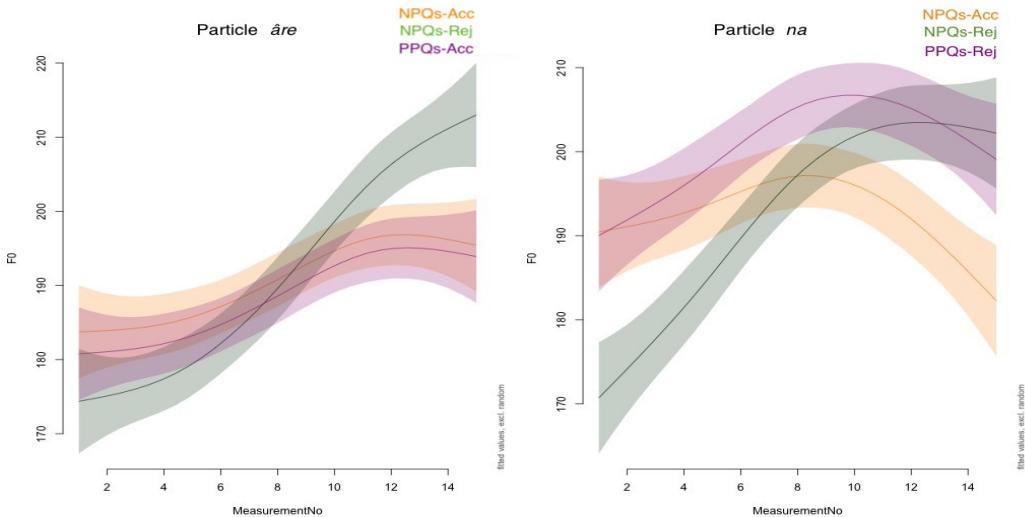


Figure 6-6: Non-linear plots of *are* and *na* in Acceptings and Rejectings to PPQs and NPQs.

It is important to note that the accepting answers did not display significant saliency, regardless of the question's polarity. In the *are*-plot, the accepting answers to both PPQs and NPQs (the purple and orange tracks) demonstrate similar patterns. Besides, given that *are* cannot semantically be used in rejecting answers to PPQs, our analysis primarily centers on examining the impact of question polarity by particle *na*, which is used in rejecting answers to both PPQs and NPQs, as in Figure 6-7. The results indicate that the effect of question polarity is statistically significant ($\beta = 6.33$, $CI = 95\%$, $p = 0.002$). The magnitude excursion difference between PPQs (190-210 Hz) and NPQs (170-210 Hz) is approximately 20 Hz. As depicted in the diff-plot, the trajectories exhibit significant differences at the initial segments of the tracks (represented by the red line in time slaps 1-9).

⁷In the *na*-plot in Figure 6-6, the patterns in the orange and purple tracks bear resemblance to the H^* contour in ToBI system, while the green track demonstrates similarities with the $L+H^*$

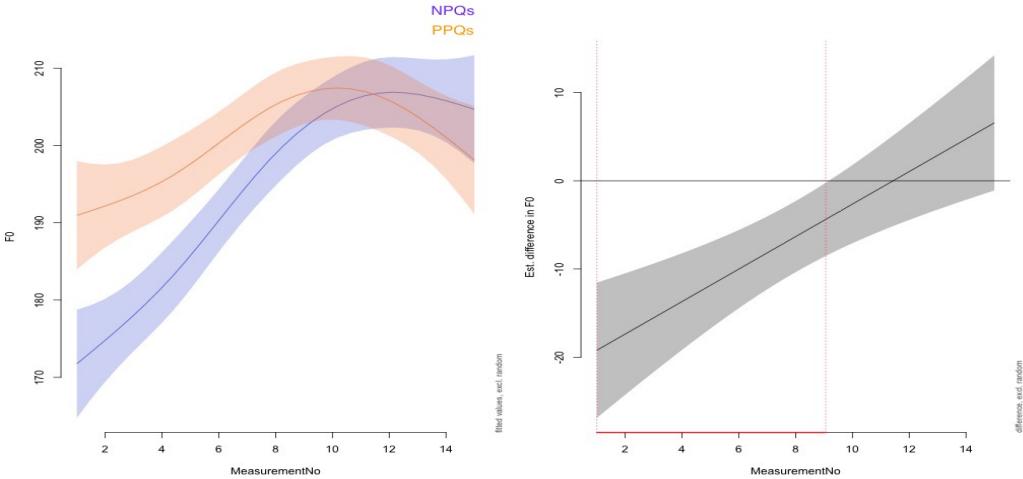


Figure 6-7: Non-linear smooth and difference plots of *na* in Rejecting answers to NPQs and PPQs.

6.2.4 Discussion

The rejecting answers to polar questions are pragmatically expected to exhibit contrastive focus, while previous studies on PolPrts have often associated rejecting answers to negative initiatives with the presence of focal stress. This experiment aimed to examine prosodic saliency in responses to both PPQs and NPQs, employing Farsi as the object language. Two research questions were posed: (1) Do speakers employ focal stress on specific answers? (2) Does the polarity of the question influence the occurrence of focal stress? While I will provide answers to these questions, the full discussion will be presented in Section 6.4, as it necessitates additional data from the follow-up experiment.

The data obtained from Experiment 1 support the perspective that there is indeed prosodic saliency in rejecting answers to negative initiatives. Consequently, the answer to both research questions is yes: Focal stress was observed on both particles, *âre* and *na*, but only in rejecting answers to NPQs. In other words, the presence of focal stress is not sensitive to the specific particle (cf. intonational peak on *No* in Kramer and Rawlins 2009) but rather to the polarity of the response and the initiative.

Despite the prediction and observation of our results in previous studies, the precise type and nature of the focal stress in PolPrts remain uncertain (see Section 6.1 for various terminologies). There are two main challenges for our findings. Firstly, regarding the semantics of questions, $\{p, \neg p\}$, one might anticipate observing focal stress on both accepting and reject-

contour (I leave the phonological claims for further studies).

ing responses. This expectation aligns with the theoretical prediction of focus congruency in question-answer pairs, a phenomenon extensively discussed in the literature (cf. Rooth 1992, Krifka 2007).⁸ However, when we consider the role of the highlighted proposition in questions, a more nuanced perspective emerges. In this view, dismissing the accepting responses becomes justifiable, given that they represent the same proposition as the one highlighted within the questions (Krifka 2013, Roelofsen and Farkas 2015). Thus, I attribute the absence of focal stress in accepting answers to their alignment with the highlighted concept.

Secondly, if focal stress indicates a polarity contrast (à la Rooth 1992) between the question and answer, i.e., $[\phi? \neg\phi.]$, then why is it observed in rejecting answers to NPQs, $[\neg p? p.]$, but not to PPQs, $[p? \neg p.]$? On the other hand, if focal stress signifies the presence of contextual evidence for $\neg p$ (à la Goodhue and Wagner 2018), one would expect to observe it in contexts biased towards p as well. This missing data will be addressed and controlled in the follow-up experiment. Remember that the stimuli used by Goodhue and Wagner (2018) consisted of contexts with evidence for $\neg p$ for both positive and negative initiatives, and while they reported a higher frequency of CC contour in response to NRDecs than NPQs, they did not provide positive rising declaratives (for more details, see Section 6.5).

Therefore, it is crucial to examine rejecting answers to both PPQs and NPQs, considering the bias towards positive and negative propositions, respectively. Experiment 1 focused exclusively on PPQs and NPQs without explicitly highlighting the bias. In the forthcoming experiment, we will investigate whether bias influences the presence and absence of focal stress. Further elaboration will be provided in Section 6.4.

6.3 Experiment 2: Bias Effect on Focal Stress

The upcoming experiment aims to investigate the influence of bias on prosodic saliency in PolPrts. Prior research conducted by Goodhue and Wagner (2018) indicated a higher

⁸The studies on questions show the necessity of aligning the focus in answers with the corresponding elements in the questions, as illustrated in (i). Consequently, all responses should place stress on the pertinent constituents, ensuring congruence with the question (for a comprehensive discussion, see Rooth 1992 and Krifka 2007).

- (i) A: Who did Mary see?
 B: Mary saw [John]_F.
 B': # [Mary]_F saw John.

frequency of CC contour on PolPrts in response to negative rising declaratives compared to NPQs, suggesting that (the strength of) bias might be a contributing factor in this phenomenon. Nevertheless, the scenario where the context of a positive initiative is biased towards the positive proposition has not been explored.

In Experiment 2, I will present both positive and negative polar questions, with and without the biased particle *dige*, which obligatorily carries bias towards the proposition expressed in the question (for further details on particle *dige*, see Section 3.3). While rejecting answers to plain PPQs in Experiment 1 did not exhibit focal stress, I hypothesize that the introduction of bias through the inclusion of *dige* may influence the outcome. Thus, it is expected that we will observe focal stress in rejecting answers to *dige*-PPQs and *dige*-NPQs. The experiment addresses the following question:

1. Does bias affect the occurrence of focal stress? Do speakers employ focal stress more frequently or with greater intensity when the initiative is biased?

6.3.1 Materials

While in Experiment 1, focal stress was exclusively observed in rejecting answers, Experiment 2 focused only on rejecting answers and excluded accepting answers. In order to introduce bias, particle *dige* was utilized, which conveys the speaker’s expectation towards the uttered proposition in the question. To categorize the questions based on bias, they were divided into optionally biased and obligatorily biased conditions. The experiment followed a 2x2x2 design, incorporating the following factors:

- **Bias type:** Optionally Biased (OpB), Obligatorily biased (ObB) (via *dige*)
- **Question type:** PPQs, NPQs
- **Response particles:** *âre*, *na*

Two conditions of rejecting PPQs by *âre*, namely PPQs-*âre*($\neg p$) and *dige*-PPQs-*âre*($\neg p$), are semantically ruled out, resulting in a total of six conditions. The methodology and materials employed in this experiment were largely similar to those utilized in Experiment 1 (see Section 6.2.1). The scene-settings were adjusted to align with optionally or obligatorily biased questions. Participants were instructed to carefully read the scenes and subsequently record the dialogues in the most natural manner.

6.3.2 Result

The data were collected from the same participants who took part in Experiment 1, but in separate sessions to avoid potential intervention effects. The participants were divided into two groups, and the order of recording Experiment 1 and Experiment 2 was reversed between the groups. A total of 36 participants (22 women, 14 men, AVG = 34 years) were randomly assigned to six lists. Five participants were excluded due to exhibiting unnatural intonation (see the criteria in Section 6.2.3). During the recording sessions, participants had two 5-minute breaks between recording 18 stimuli. The overall duration of the sessions was ca. 40 minutes.

The dataset comprises 8100 measurement points obtained from 15 (f_0) time-slap data points out of 540 trials. The average duration of *âre* and *na* was 0.306 and 0.274 seconds, respectively. To analyze the f_0 trajectory of rejecting responses to optionally and obligatorily biased questions, a non-linear regression model was fitted. The results indicated a statistically significant difference ($\beta = -1.63$, $CI = 95\%$, $p = 0.005$), and the model exhibited substantial explanatory power ($R^2 = 0.79$).

```

Family: gaussian
Link function: identity

Formula:
F0 ~ BiasType + QType + s(MeasurementNo, by = BiasType, bs = "tp",
                             k = 5) + s(ParticipantID, bs = "re")

Parametric coefficients:
              Estimate Std. Error t value Pr(>|t|)    
(Intercept) 192.4550    9.0524  21.260 < 2e-16 ***
BiasType0pB -1.6296    0.5754  -2.832  0.00464 ** 
QTypePPQ     8.0918    0.6103  13.259 < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Approximate significance of smooth terms:
                               edf Ref.df      F p-value    
s(MeasurementNo):BiasType0pB 3.524  3.869  150.22 <2e-16 ***
s(MeasurementNo):BiasType0pB 3.436  3.821   50.42 <2e-16 ***
s(ParticipantID)            28.971 29.000 1021.31 <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

R-sq.(adj) =  0.791  Deviance explained = 79.2%
-ML =  37962  Scale est. = 670.44  n = 8100

```

Figure 6-8: GAMM summary of rejecting answers to optionally and obligatorily biased questions.

Figure 6-9 demonstrates a slight difference between NPQs and *dige*-NPQs, with an f0 magnitude excursion of (optionally biased) NPQs=21Hz (180-201Hz) and (obligatorily biased) *dige*-NPQs =30Hz (175-205Hz).⁹ Notice that the diff-plot also does not exhibit significant differences in the shape of the trajectories.

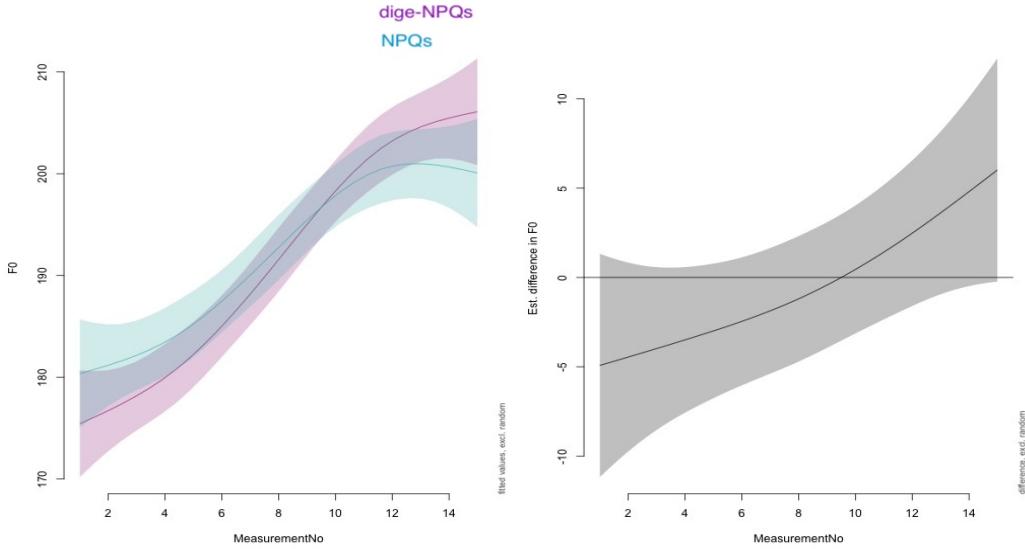


Figure 6-9: Non-linear smooth and diff. plots of Rejectings (with *are* and *na*) to negative questions

Interestingly, Figure 6-10 illustrates a significant difference between PPQs and *dige*-PPQs, with an f0 magnitude excursion of (optionally biased) PPQs=7Hz (193-200Hz) and (obligatorily biased) *dige*-PPQs=22Hz (187-209Hz). The difference at the end of the tracks visually demonstrated in the diff-plot (time slaps 7-15). These findings suggest that rejecting responses to PPQs, similar to the results of Experiment 1, do not exhibit prosodic saliency, whereas their counterparts in *dige*-PPQs shows saliency.

⁹I represent the distinction of prosodic saliency between optionally and obligatorily biased NPQs by employing the * mark in the summary Table 6.1. While both patterns exhibit a rising excursion, the saliency* in NPQs is marginally lower than that in the *dige*-NPQs form.

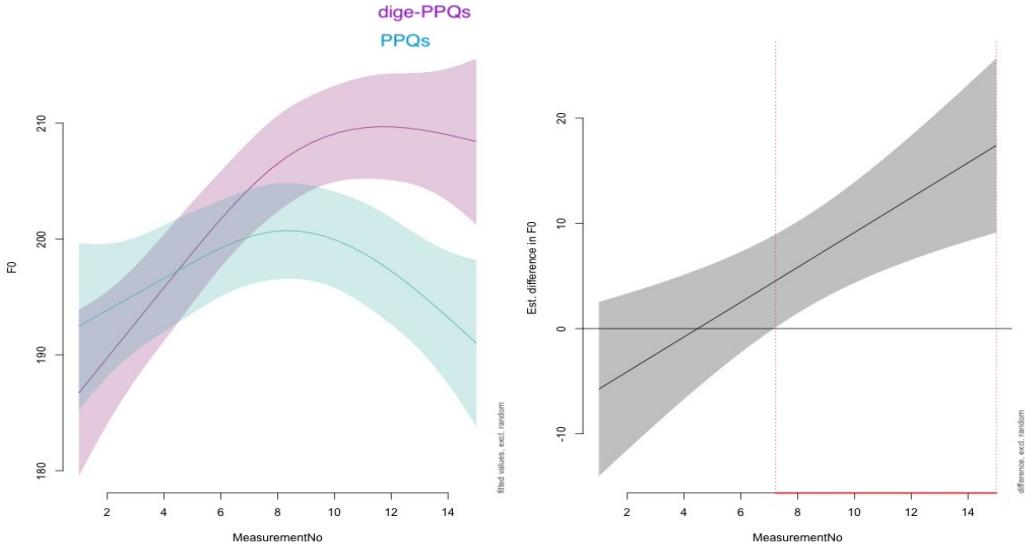


Figure 6-10: Non-linear smooth and diff. plots of Rejectings (with *na*) to positive questions.

6.3.3 Discussion

Experiment 2 served as the second phase of the production study, which aimed to investigate the interplay between PolPrts and prosodic saliency. This phase specifically focused on the role of bias as a factor that could provide insights into the nature and function of focal stress on PolPrts. The results confirmed previous findings, demonstrating the presence of focal stress on rejecting answers in NPQs and its absent in rejecting to PPQs. Additionally, the new findings revealed the occurrence of focal stress on rejecting answers to both *dige*-PPQs and *dige*-NPQs when these questions inherently favored the the uttered proposition in the question.

Drawing upon the combined findings from both experiments, we can now draw conclusions regarding the discussion initiated in Section 6.2.4 and shedding light on the types and functions of focal stress on PolPrts. A thorough analysis of these results will be presented in the subsequent section, offering a more in-depth exploration of the subject matter. However, before delving into the detailed analysis, it is necessary to address a critical matter concerning the default interpretation of bias in NPQs as compared to the neutral interpretation in PPQs, which has been widely discussed within the literature and warrants consideration.

In our study, we classify plain positive and negative polar questions as optionally biased questions, while those with particle *dige* are considered obligatorily biased ones. It is a common assumption in the literature that PPQs serve as the default form and are used in

neutral contexts, while the presence of negation in NPQs indicates bias (refer to Section 2.2 for a review of the literature). One might raise the objection to our assumption, arguing that PPQs are not inherently biased, unlike NPQs.

As I explained in Section 3.3.1, both positive and negative polar questions in Farsi can be employed in proper neutral contexts where the speaker does not intend to convey bias as well as in contexts where the speaker can cancel any potential bias, though NPQs are more often used in bias settings. In this experiment, I controlled these different possibilities through the contextual cues. In all of our trials for both PPQs and NPQs, the context demonstrated a bias of lower credence (cancelable) as compared to their counterparts involving *dige*. This suggests that the context of both PPQs and NPQs contributed to a biased inference, though to a lesser extent. Consequently, we can confidently dismiss the concern that PPQs lack bias entirely.¹⁰

6.4 Which Focal Stress?

Regarding our experimental findings, I propose that the observed prosodic saliency on PolPrts in response to optionally and obligatorily biased questions represents two distinct types of focal stress, each serving a different functional role. On one hand, when responding to (optionally biased) NPQs, the presence of contrastive focus prompts a set of alternatives, enabling the addressee to disambiguate the intended interpretation of the particle. On the other hand, in the case of obligatorily biased initiatives, the focal stress signifies verum focus, indicating a conflict between speaker’s expected answer and addressee’s belief (as the true answer).

The findings from both experiments, as well as the proposed types of focal stress, are summarized in Table 6.1 (Mohammadi 2023b). The *QType* column consists of positive and negative questions, with and without *dige*. The *Bias* column employs the symbols \diamond and \square to indicate the possibility and necessity of bias implicature in optionally and obligatorily biased questions, respectively. In the *Response* column, different potential PolPrts in rejecting answers are presented, while the *Prosody* column denotes the presence and absence of prosodic saliency regarding the data from Experiments 1 and 2. The $*$ symbol is used to represent

¹⁰Note that the context in this setting differed from the experiment in Chapter 5. In that experiment, the contexts did not offer any clues for the optionally biased trials, thereby precluding the obligatory emergence of bias implications.

a smaller pitch rise in optionally biased initiatives compared to their obligatorily ones (see footnote 9). The *Focal Stress* column outlines the type of stress within our proposal, while the *Requirement* column specifies the motivation for the proposed type, including proper alternative sets for contrastive focus (CF) and conflicting evidence for verum focus.

QType	Bias	Response	Prosody	F.Stress	Requirement
PPQs	◊	$na^{Neg}(\neg p)$	no saliency	-	$\{na^{Neg}, na^{DAgr}\} = \{\neg p\}$
	◊	$na^{DAgr}(\neg p)$	no saliency	-	$\{na^{Neg}, na^{DAgr}\} = \{\neg p\}$
NPQs	◊	$\hat{are}^{Pos}(p)$	salient*	CF	$\{\hat{are}^{Pos}, \hat{are}^{Agr}\} = \{p, \neg p\}$
	◊	$na^{DAgr}(p)$	salient*	CF	$\{na^{Neg}, na^{DAgr}\} = \{p, \neg p\}$
dige-PPQs	□	$na^{Neg}(\neg p)$	salient	verum	conflicting evidence for p
	□	$na^{DAgr}(\neg p)$	salient	verum	conflicting evidence for p
dige-NPQs	□	$\hat{are}^{Pos}(p)$	salient	verum	conflicting evidence for $\neg p$
	□	$na^{DAgr}(p)$	salient	verum	conflicting evidence for $\neg p$

Table 6.1: The summary of Experiments 1 and 2, and the proposal for the type of focal stress.

Drawing from Rooth (1992)'s analysis of question-answer focus congruency (see footnote 8), one might expect the prosodic saliency on both accepting and rejecting responses concerning the semantics of questions $\{p, \neg p\}$. However, this anticipation did not align with the outcomes of our experiment (similarly noted in Goodhue and Wagner 2018). Consequently, we challenge the conventional notion of question-answer focus congruency in polar questions. Instead, we advocate for a more nuanced perspective that emphasizes the role of the highlighted proposition within polar questions (Krifka 2013, Roelofsen and Farkas 2015). In this light, justifying the absence of focal stress on accepting responses becomes feasible, given that they inherently represent the same proposition highlighted within the questions.

Let's begin by exploring the prosodic saliency in rejecting responses to optionally biased initiatives. We will examine not only the presence of focal stress in rejecting responses to NPQs but also its absence in rejecting answers to PPQs. Our analysis hinges on two components: firstly, we embrace the concept of contrastive focus as outlined in Rooth (1992), and secondly, we propose an alternative set of different readings (feature values) of the same particles, arguing that it aligns more closely with the empirical observations.

Drawing upon Rooth (1992), the set of alternatives for contrastive focus comprises various possible replacements within the same domain as the focused expression.¹¹ The CF list includes the focused constituent and its contrasting elements, resulting in the existence of at least two members. The alternative set plays a crucial role in elucidating the observed data.

¹¹The contextual restrictions could be applied later at the level of pragmatics.

Building upon the claim for the lexical ambiguity of PolPrts in Section 4.4.3, we propose that the alternative set of CF in PolPrts consists of different readings of the focused particle. In other words, CF on PolPrts triggers a (presuppositional) feature-marking set for the same particle, i.e., $\{na^{Neg}, na^{DAgr}\}$ for focused $[na]_F$ and $\{\hat{are}^{Pos}, \hat{are}^{Agr}\}$ for $[\hat{are}]_F$, as shown in Table 6.1. The suggested set helps to disambiguate the related meaning of the particles. It is worth noting that the use of CF on a constituent can result in different sets depending on the context. For example, CF on the verb $[eat]_F$ may lead to sets such as $\{eat, ate\}$ in terms of tense, $\{eat, has eaten\}$ in terms of aspect, $\{eat, not eat\}$ in terms of polarity, or $\{eat, eats\}$ in terms of person. The proposal of the feature marking set is not a new concept, as illustrated by the case of focused pronouns. In (220), CF indicates alternatives with different gender features for $\{unknown, male\}$, while in (221), CF indicates a set with different person features, $\{singular, plural\}$.

- | | |
|----------------------------------|--|
| (220) A: Matin comes for dinner. | (221) A: Matin and Sara come for dinner. |
| B: Is he your colleague? | B: Is he your colleague? |
| A: $[They]_F$ is my colleague. | A: $[They]_F$ are my colleagues. |

The presence and absence of prosodic saliency in rejecting answers to NPQs and PPQs, respectively, can be elucidated by considering the role of CF in disambiguating the meaning within the related set. When the initiative is a negative proposition, PolPrts in different readings generate two propositions, $\{p, \neg p\}$, resulting in the ambiguity of PolPrts. Consequently, CF helps disambiguating by indicating the contrast between the two potential meanings of the same particle (as outlined in the derivation in (223)). On the other hand, when the initiative is a positive proposition, different readings of PolPrts yield the same proposition, generating a singleton set $\{\neg p\}$ with nothing to contrast. Thus, the prosodic saliency of CF is observed in response to NPQs, but not to PPQs (see Table 6.1).

Earlier studies have emphasized the crucial role of prosody in meaning determination. Scholars have noted that speakers tend to interpret focused bare PolPrts as rejecting answers rather than accepting answers (Kramer and Rawlins 2012, Krifka 2013 and Roelofsen and Farkas 2015, Claus et al. 2017, Goodhue and Wagner 2018). Such a preference can be attributed to semantic factors. I illustrate the focus semantics of the particle \hat{are} in (222) (a similar process applies to the particle na).

- (222) Focus semantics of particle \hat{are} :

(a) Polarity reading:

$$\begin{aligned}\llbracket [\hat{\text{are}}^{Pos}]_F \rrbracket^o &= \{\llbracket \hat{\text{are}}^{Pos} \rrbracket\} \\ \llbracket [\hat{\text{are}}^{Pos}]_F \rrbracket^f &= \{\hat{\text{are}}^{Pos}, \hat{\text{are}}^{Agr}\}\end{aligned}$$

(b) Conformity reading:

$$\begin{aligned}\llbracket [\hat{\text{are}}^{Agr}]_F \rrbracket^o &= \{\llbracket \hat{\text{are}}^{Agr} \rrbracket\} \\ \llbracket [\hat{\text{are}}^{Agr}]_F \rrbracket^f &= \{\hat{\text{are}}^{Agr}, \hat{\text{are}}^{Pos}\}\end{aligned}$$

The derivation for focused $[\hat{\text{are}}]_F$ in response to a negative proposition, as shown in example (223), felicitously yields a rejecting answer, while it fails to occur in the other reading in (223.b), which generates an accepting answer (for the semantics of PolPrts, please see Section 4.4.2.1). The \sim squiggle operator relates the focus domain ϕ to the contrasting initiative C (Rooth 1992), which is in congruent with the highlighted proposition in the initiative question.

(223) A: Did Ali not come?

B: $[\hat{\text{are}}]_F$

LF: $[_{PolP} [\hat{\text{are}}]_F [_{TP} \cdot]]_\phi \sim C$

$Q = \{\lambda w. \text{come}_w(a), \lambda w. \neg \text{come}_w(a)\}$, where $\lambda w. \neg \text{come}_w(a)$ is highlighted

$C = \lambda w. \neg \text{come}_w(a)$

(a) $\llbracket \phi \rrbracket = \llbracket [\hat{\text{are}}^{Pos}]_F \rrbracket$

(b) $\llbracket \phi \rrbracket = \llbracket [\hat{\text{are}}^{Agr}]_F \rrbracket$

$$\begin{aligned}\llbracket \phi \rrbracket^o &= \lambda w. \text{come}_w(a) \\ \llbracket \phi \rrbracket^f &= \left\{ \begin{array}{l} \text{are}^{Pos}, \\ \text{are}^{Agr} \end{array} \right\} \\ &= \left\{ \begin{array}{l} \lambda w. \text{come}_w(a), \\ \lambda w. \neg \text{come}_w(a) \end{array} \right\} \\ \hline &\end{aligned}$$

$C \in \llbracket \phi \rrbracket^f \quad \checkmark$

$C \neq \llbracket \phi \rrbracket^o \quad \checkmark$

$$\begin{aligned}\llbracket \phi \rrbracket^o &= \lambda w. \neg \text{come}_w(a) \\ \llbracket \phi \rrbracket^f &= \left\{ \begin{array}{l} \text{are}^{Agr}, \\ \text{are}^{Pos} \end{array} \right\} \\ &= \left\{ \begin{array}{l} \lambda w. \neg \text{come}_w(a), \\ \lambda w. \text{come}_w(a) \end{array} \right\} \\ \hline &\end{aligned}$$

$C \in \llbracket \phi \rrbracket^f \quad \checkmark$

$C \neq \llbracket \phi \rrbracket^o \quad \times$

The compositional semantics of CF ensures focus operates exclusively within rejecting answers. Descriptively, the addressee engages in the process of disambiguating and determining

the rejecting answer of the focused particle, e.g., $[\hat{a}re]_F$ in (223), as follows:

- i. Contrastive focus on $[\hat{a}re]_F$ is acceptable when the prejacent stands in rejecting answers to the initiative (as derived through CF in (223.a)).
- ii. We encounter an NPQ with a salient negative proposition.
- iii. Consequently, the speaker intends $\hat{a}re^{Pos}$, conveying the meaning *he did*.

On the other hand, when PolPrts are unfocused, they can be disambiguated as the accepting meaning with the help of the Maxim of Quantity (and CF derivation). Quantity implicatures arise when the speaker opts for a less informative form when a more informative alternative is available. I posit informativity as follows: if p_1 and p_2 represent two ways of conveying the same content, p_1 is considered more informative than p_2 if $p_1 \subset p_2$. Based on this premise, I contend that focused particles, e.g., $[\hat{a}re]_F$, are more informative than their unfocused counterparts, i.e., $\hat{a}re$. The compositional derivation of CF on $[\hat{a}re]_F$ in (223) leads to a single interpretation of the particle $\hat{a}re^{Pos}$ with a singular propositional meaning. In contrast, the unfocused $\hat{a}re$ can yield either reading, $\hat{a}re^{Pos}$ and $\hat{a}re^{Agr}$, resulting in two distinct propositions. Thus, the focused particle $[\hat{a}re]_F$ is more informative, as its meaning constitutes a subset of the unfocused particle $\hat{a}re$ (that is $\{\hat{a}re^{Pos}\} \subset \{\hat{a}re^{Pos}, \hat{a}re^{Agr}\}$).¹² Therefore, the addressee can deduce that the speaker has authority over the topic and is as cooperative as possible. When the speaker chooses not to employ the more informative form, the addressee is justified in inferring that the speaker does not consider that information to be true, thereby giving rise to a non-scalar Quantity implicature.¹³ Assuming that the

¹²Notice that the notion of Maxim of Manner shares many similarities with Maxim of Quantity. Manner implicatures generally arise when the speaker selects a more complex form while an equally informative but less complex alternative exists. In contrast, Quantity implicatures occur when the complexity of the alternative form remains constant, but it provides additional information. We argued that the focused particle provides more information, whereas the unfocused form is less informative, presenting two potential readings. As a result, even though both focused/unfocused particles adhere to the Maxim of Manner by being concise, the plain form is ambiguous (contrary to the Maxim), and the speaker must articulate the prejacent to disambiguate. Thus, the Maxim of Manner necessitates the use of the longer form, while the Maxim of Quantity can account for the deployment of the shorter form.

¹³Scalar Quantity implicatures generally emerge from a set of alternatives that exhibit a canonical scale of informativeness, whereas non-scalar Quantity implicatures pertain to forms lacking an explicit scale, yet the hearer is still able to infer that the chosen form is less informative than what could have been used. Example (i) serves as a non-scalar Quantity implicature sample from Grice (1975), implying that John didn't meet his mother/wife/girlfriend at the bar last night.

- (i) John met a woman at the bar last night.

speaker maximizes cooperation, the addressee can interpret unfocused PolPrts, such as *âre* in (223), as follows:

- i. The unfocused *âre* can generate p and $\neg p$ (with $\hat{a}re^{Pos}$ and $\hat{a}re^{Agr}$, respectively). However, the focused $[\hat{a}re]_F$ only yields p (as derived through CF in (223.a)).
- ii. Hence, the plain *âre* is less informative than the focused $[\hat{a}re]_F$.
- iii. By choosing not to assert the more informative form $[\hat{a}re]_F$, generating p , when the speaker had the option to do so, it can be inferred that the speaker does not believe it to be true (non-scalar Quantity implicature).
- iv. By eliminating p from the set of alternatives, we are left with $\neg p$.
- v. Therefore, the speaker intends $\hat{a}re^{Agr}$, conveying the meaning *he didn't*.

Overall, the disambiguation of focused PolPrts can be semantically derived, whereas the ambiguity of unfocused particles arises due to a failure to consider the pragmatic reasoning associated with the Maxim of Quantity. While the addressee may correctly deduce the semantics of focused particles (as observed in experimental data by Goodhue and Wagner 2018), they may overlook the implicature described in step (iii). Consequently, the addressee cannot determine that the bare unfocused particle indicates an accepting answer and reports the ambiguity.

Before proceeding to our proposal for obligatorily biased forms, it is worth addressing two potential objections to my proposal. Firstly, it has been argued that the more intuitive alternative set would be different particles within the same reading. That is, focused particles in the polarity reading would give rise to the set $\{\hat{a}re^{Pos}, \hat{na}^{Neg}\}$, while focused particles in the conformity reading would indicate $\{\hat{a}re^{Agr}, \hat{na}^{DAgr}\}$, both resulting in $\{p, \neg p\}$. Assuming these sets, we would expect CF to occur in rejecting answers to PPQs as well, given the sets are identical for both NPQs and PPQs. However, the data reveals the absence of focal stress in rejecting answers to PPQs. I dismiss the objection, asserting that the suggested set of features is consistent with the observed data.

The second criticism is that the inference process based on the Maxim of Quantity is unnecessary if we consider the *Avoid F* constraint proposed by Schwarzschild (1999):

- **Avoid F:** F(ocus)-mark as little as possible, without violating givenness.

- **Givenness:** If a constituent is not F-marked, it must be given.

The suggestion of the *AvoidF* constraint offers an explanation for the absence of focal stress on accepting answers. This proposal posits that addressees tend to avoid F-marking accepting answers since the proposition conveyed by the answer is already provided by the highlighted proposition in the preceding discourse, regardless of whether the initiative is positive or negative. However, it should be noted that this constraint fails to explain why speakers also avoid F-marking rejecting answers to PPQs, where the answer is no longer given in the discourse.

Since our proposal includes two components, namely, the CF type of bias and the feature marking set of alternatives, one could potentially apply the Avoid F constraint in conjunction with the proposed alternative set to elucidate the data. I defer a more detailed exploration of this avenue to future studies. Nevertheless, I contend that our proposal effectively accommodates the observed data. It not only predicts the presence of CF in rejecting answers to NPQs but also accounts for its absence in rejecting to PPQs as well as in accepting answers. Moving on to the analysis of *dige* questions, I posit that the focal stress observed on rejecting answers to both positive and negative questions represents verum focus, which serves as the overt realization of the VERUM operator (Romero and Han 2004; Gutzmann et al. 2020). According to Bill and Koev (2021b), the VERUM operator, as defined in (224), presupposes the existence of conflicting evidence in the given context:

$$(224) \quad \llbracket \text{VERUM} \rrbracket_c(p) = p,$$

provided that there is conflicting evidence about prejacent p in context c .

This definition is consistent with the data and provides support for the hypothesis of verum focus in obligatorily biased questions. On one hand, the bias implicature, expressed by particle *dige*, necessarily presents in both positive and negative questions (as denoted by \square in Table 6.1). This implicature establishes the uttered proposition as the expected answer. However, when an rejecting answer is given, it implies that the reverse polarity is the true answer. As a result, the bias implicature fulfills the conflicting presupposition requirement of VERUM and triggers verum focus. On the other hand, in optionally biased forms, the bias implicature is expressed in a lower credence. That is regarding the context, the speaker may or may not derive the bias optionally (represented by \diamond), while the potential bias inference

in the question can be canceled (for further discussion, see Section 3.4.2). Consequently, the presupposition of VERUM becomes uncertain in plain polar questions.

The potential presence of bias implicature in NPQs as well as the felicitous alternative sets in *dige*-NPQs raises the possibility that the focal stress in rejecting answers to optionally and obligatorily biased NPQs may be ambiguous between verum focus and contrastive focus. However, regarding the results from Experiment 2, the f0 excursion patterns in rejecting to NPQs and *dige*-NPQs exhibit slight pitch differences, suggesting the presence of two distinct pitch tracks. The smaller pitch rise, indicated by * in Table 6.1, corresponds to CF, while the enhanced pitch rise corresponds to verum focus.¹⁴ Given that the difference is not statistically significant, I refrain from making any phonological claims and recommend future studies to explore this aspect. It is worth mentioning that the findings of Goodhue and Wagner (2018) also show a higher frequency of rising tune in response to negative rising declaratives (NRDecls) when compared to NPQs. This higher frequency in response to their stronger bias initiatives (NRDecls) is in line with the higher pitch rise in our data in response to *dige*-NPQs, in contrast to the reduced frequency and lower pitch rise in NPQs.

One shortcoming of our study is the absence of accepting answers in the context of *dige* questions. Many scholars have noted the presence of verum focus in accepting responses, e.g., A: ‘*John is Canadian.*’ B: ‘*He IS.*’ (see Höhle 1992; Gutzmann et al. 2020; Bill and Koev 2021b). Following that, it is expected that verum focus would have been observed in accepting answers to obligatorily biased questions, *dige*-PPQs and *dige*-NPQs.¹⁵ However, we did not include accepting answers in our second experiment due to the absence of prosodic saliency in our first study. Regrettably, we overlooked the potential presence of verum focus in accepting answers.¹⁶ Nevertheless, it is important to emphasize that the prediction of verum focus in affirmation context does not pose any challenges to our proposal. Our analysis only concerns the presence of focal stress, as verum focus, in both positive and negative *dige* questions. In fact, the presence of verum focus in affirmations could potentially bolster our claim concerning the subsequent argument.

An alternative argument for the presence of focal stress in responses to *dige*-questions could

¹⁴The presence of two pitch tracks supports the existing literature’s suggestion that verum focus is distinct from contrastive polarity focus. I am grateful to Todor Koev for pointing this out.

¹⁵It is worth to note that Bill and Koev (2021b) state affirmations (accepting) with verum focus also represent a contradiction within a gradable scale (for further details, see Bill and Koev 2021b).

¹⁶I would like to express my gratitude to a participant at SemDial 2022 conference for bringing this point to my attention, although I forgot his name.

be the use of *corrective focus*, as presented by Krifka (2008), rather than verum focus. This argument suggests that when faced with obligatorily biased forms, the addressee employs corrective focus to signify the opposing answer as a correction to the speaker's expectation. Currently, I do not have a counterargument to challenge this suggestion. However, if future studies reveal the presence of focal stress in accepting responses to biased forms, we can relax our doubts and dismiss the alternative explanation of corrective focus. Nonetheless, verum focus has the advantage of accounting for both accepting and rejecting in biased questions, while corrective focus cannot provide the same level of explanatory power. Further investigations are necessary to determine the validity of either argument.

6.5 Previous Accounts

This section has a look at the experimental findings presented in Goodhue and Wagner (2018). Notice that Goodhue and Wagner used ToBI system to annotate the data and made distinctions between different pitch patterns, such as contradictory contour (%H L* L-H%), rise-fall (L*+H L-H%), and declarative-fall (H* L-L%). In contrast, I used GAMMs to analyze the presence/absence of prosodic saliency based on pitch range. I do not claim a direct phonological similarity between what I refer to as contrastive focus or verum focus and any specific ToBI patterns that they have. However, the pitch tracks in my data are suggestive for H* (with small pitch rise) on the accepting answers, and L-H* (with enhanced pitch rise) on the rejecting answers.

Goodhue and Wagner (2018) claim what Pope (1976) observed as rise-fall-rise (RFR) tune is contradictory contour CC. They distinguish between "actual" RFR and CC, arguing that RFR necessarily involves implications about focus alternatives, while CC necessarily involves a sense of contradiction. They also suggest the possibility of verum focus and rise-fall tune for emphasizing the truth of an assertion, regardless of whether it has the same or opposite polarity as the question.

The authors work on PPQs, NPQs, and negative rising declaratives (NRDecls) as their initiative types. Moreover, they provide contextual evidence supporting $\neg p$ in all of their trials, whether the questions were positive or negative.¹⁷ They explain the presence and

¹⁷Goodhue and Wagner (2018) present conflicting evidence within the context of all their trials. Both in PPQs and NPQs, the context provides evidence for $\neg p$. While PPQs are unacceptable in such context (Büring and Gunlogson 2000, Trinh 2014), the authors mentioned that their positive question

absence of CC in their data by arguing that CC requires contextual evidence supporting the negative proposition. Here are some of their findings:

- i. Positive (accepting) answers with *No* to PPQs exhibited CC.
- ii. Negative (rejecting) answers to PPQs did not show CC.
- iii. CC was observed in positive (rejecting) answers to negative initiatives.
- iv. The rate of CC in response to NRDecs was higher compared to NPQs.

There are two noteworthy points regarding finding (i). Firstly, positive answers with *No* to PPQs, e.g., '*Did John come? #No, he did*', are semantically infelicitous, regardless of the presence or absence of CC. While the authors acknowledged this unacceptability in their first experiment, they reported the presence of CC for such answers in their production experiments (see footnote 17). Therefore, in their explanation, the response *No, p* to PPQs contradicts the contextual evidence for $\neg p$. Given that, if CC is available on *No* to PPQs (considering the contradicting evidence), one would expect to see CC also on *Yes*, as CC was observed on both particles in response to NPQs. However, there was no CC observed for *Yes* in PPQs. In addition, if the contradicting evidence allows [*No, p*] to PPQs, one would expect [*Yes, $\neg p$*] to be felicitous as well, although their data clearly shows its unacceptability. While our data indicate the unacceptability in such cases, the discussion on this topic is left for future explorations.

We can reevaluate the data from Goodhue and Wagner (2018) in light of our proposal and provide an alternative interpretation for their findings. It can be argued that what they identify as CC corresponds to verum focus in our account, whereas their verum or rise-fall patterns align more closely with CF. While the authors attribute their findings (i)-(iii) to CC's sensitivity to contextual evidence supporting $\neg p$, I propose that the absence of focal stress in (ii) is due to the lack of ambiguity and the singleton set of alternatives in contrastive focus. Furthermore, according to my proposal, the presence of focal stress in rejecting answers to NPQs in (iii) signifies CF, as NPQs fall under optionally biased forms. Conversely, in obligatorily biased NRDecs, the stress can be interpreted as representing verum focus (for details, see Section 6.4).

examples in their experiments were felicitous with contextual evidence for $\neg p$ (see footnote 31 in Goodhue and Wagner 2018: p. 22).

Finally, the higher rate of CC observed in NRDecs, as outlined in finding (iv), corresponds with the heightened pitch rise observed in my data from Experiment 2, which presents in both *dige*-PPQs and *dige*-NPQs. Notably, Goodhue and Wagner did not explore positive rising declaratives. Their findings imply a potential gradient correlation between the likelihood of producing CC on p and the strength of contextual evidence supporting $\neg p$. In other words, the stronger the evidence for $\neg p$, the more likely it becomes to produce CC as a prosodic marker of disagreement. Consequently, it is reasonable to infer that NRDecs carry stronger evidence for $\neg p$ when compared to NPQs. This explanation may align with our proposition, as the stronger the potential of bias, as in NRDecs and *dige* questions, the more likely it is for carrying prosodic saliency, such as verum focus, to indicate the presence of conflict.

6.6 Summary

This chapter conducted two audio experiments with the aim of investigating the roles of prosody and bias on PolPrts. The first experiment focused on analyzing the prosodic patterns of PolPrts in both accepting and rejecting answers to positive and negative polar questions. The data revealed that only rejecting answers to negative polar questions exhibited focal stress. The subsequent experiment delved into the prosodic aspects of rejecting answers to both optionally and obligatorily biased questions involving particle *dige* (with both PPQs and NPQs). The results reveal focal stress in the rejecting answers to both *dige*-PPQs and *dige*-NPQs.

I proposed the existence of two distinct types of focal stress: contrastive focus and verum focus, each serving different functions. The focal stress observed in rejecting responses to NPQs during Experiment 1 indicated contrastive focus, aiming to disambiguate various readings of the same particle within the alternative set. This clarifies the presence of focal stress in responses to NPQs, where PolPrts display ambiguity, and its absence in responses to PPQs, where PolPrts are unambiguous. In the second experiment with obligatorily biased initiatives, including both *dige*-PPQs and *dige*-NPQs, the observed focal stress indicates verum focus. This underscores the interaction between the speaker's expected answer and the addressee's actual response, irrespective of the polarity of the original initiative.

Chapter 7

Conclusion

7.1 Main Findings

Polar questions and answers are frequently used in everyday conversations. While they seem preliminary and easy tools to gain information in conversations, they could be complex and confusing when we consider the variation of asking a polar question, as well as answering with response particles in different ways. That is, one can ask a polar question (whether or not ϕ) in different forms, each of which conveys different information about the likelihood/preference of an answer over the alternative one. While bias can be observed in various questions, it also influences on the way speakers formulate their answers with different response particles.

This dissertation has investigated the role of bias on polar questions and answers in Farsi. In the first part, we explored polar questions which exhibit bias either lexically by discourse particles *ke*, *dige*, *mage*, or structurally as in different types of tag questions. We showed that questions may indicate the same expected answer under the same felicity conditions, but they differ mainly in terms of speaker's attitude towards that answer. We explored different accounts in the literature and argued that while they can explain the core data, they overlooked the potential of different attitudes in different types of questions.

We proposed that biased questions vary across three components: (i) the projected answer as the next conversational move, (ii) the felicity conditions with respect to the speaker's original bias (OB) and contextual evidence (CB), (iii) the attitude of the speaker towards the projected answer. We defined the attitude as a conventional implicature for each type

of biased questions. We argued that the projected answer and the felicity conditions can be derived from the attitude facet. Therefore, the attitude feature provides a fine-grained tool, with which we not only distinct between different types of questions with the same projected answer in similar felicity conditions, but also keep the semantic coherence of the same question in different settings.

The second part of the study has investigated the role of bias on response particles, namely *âre* ‘Yes’ and *na* ‘No’. We showed these particles can be used in two different reading systems: the polarity reading, by marking the answer as being positive or negative, and the conformity reading, by conveying agreement or disagreement with an initiative. The potential of two readings leads to the possibility of generating both positive and negative answers with *âre* and *na* interchangeably in different readings. The exploration showed the effect of bias in the initiative on the acceptability of PolPrts in different readings. Our experimental data revealed the conformity reading of PolPrts was degraded in response to optionally biased initiatives as compared to their enhanced improvement in obligatorily biased forms. However, the polarity reading was consistently acceptable, regardless of the bias in the initiatives.

Furthermore, we showed that PolPrts in Farsi can be used in forming interrogatives, as in tag questions and alternative questions. In this function, however, they didn’t raise any ambiguity, and each particle exhibited similar behaviour preceding a positive or negative clause. We have illustrated the possible readings of each particle in different types of interrogatives and claimed that PolPrts are used only in their conformity reading in interrogatives. Building on our data, we proposed a unified account for PolPrts in both declarative responses and interrogatives. First, we defined different lexical entries of each particle in different readings, as feature marking components (à la Roelofsen and Farkas 2015). Second, we assumed different discourse referents (DRs) for the question under discussion and the bias in the initiatives (à la Malamud and Stephenson 2015). Finally, we claimed that different readings of PolPrts are anaphoric to different DRs in different parts of the scoreboard model of discourse (à la Farkas and Bruce 2009).

The discourse distinction of different reading of PolPrts is based on the concept that one would agree or disagree with one’s opinion/belief. In questions that bias is not grounded, namely optionally biased forms, the addressee has no reason to use the conformity reading of the particles, thus, they use the polarity reading exhaustively. Whereas in obligatorily biased

questions, the addressee may react to the speaker’s bias/expectation by the conformity reading of the particles, or they may respond the question by using the polarity reading of the particles. The account fully covered the unambiguity of PolPrts in interrogatives, regarding the only possible referents for the conformity reading.

7.2 Further Directions

The dissertation commenced with a central research question: What are the manifestations of bias in polar questions in Farsi? Given the function of *are* and *na* particles in common tag questions as one types of biased questions, the scope of the study naturally expanded to include the underlying semantics of response particles too. As a result, the examination of bias in polar questions broadened to include the influence of bias on both polar questions and their corresponding responses. It is important to note that this exploration, while significant, does not claim to address all potential related issues in this complex domain. Many challenges remain unexplored, as the study necessarily had to narrow its focus.

One of these challenges pertains to the felicity conditions of questions in relation to their attitudes. While we controlled for required types of bias, including OB and CB in epistemic forms, a comprehensive study incorporating non-epistemic scenarios would yield a deeper understanding of the interplay between attitude implicatures and felicity conditions. Besides, due to the context dependency of bias in simple PPQs and NPQs, we excluded them from our study. Future research should investigate their felicity conditions and potential attitudes. Furthermore, further examinations of biased questions’ attitudes in other languages can provide valuable insights into the subtle distinctions between various question types.

In our study on PolPrts, incorporating alternative questions in the analysis required certain assumptions. We posited that the first clause resides in the speaker’s tentative discourse commitments, and the particle *na* in the conformity reading refers to this DR, generating the related alternative proposition and adding it to the *DC** as well. Consequently, both clauses in AltQs are tentatively proposed as potential answers, signaling the speaker’s symmetric interest in either response. While this assumption aligns with the data and has been incorporated into the model, some may consider it an unnecessary step. An objection might be raised that AltQs are unbiased, and filling the *DC** position may not be a logical move. This challenge remains open for discussion and resolution in future studies.

In our experimental study, our attention was dedicated the role of bias on prosody exclusively in the context of rejecting answers to biased PPQs and NPQs. Our proposal for the type of focal stress suggests the presence of verum focus. Since verum can also appear in accepting answers, it leads to the prediction that a follow-up study on the presence of focal stress (verum) to biased questions may find the prosody on both accepting and rejecting answers. This prediction stands as a valuable avenue for future research exploration.

Finally, our investigation into the acceptability of PolPrts in polarity and conformity readings highlights the influence of bias on adult participants. Our pilot study involving children did not reveal any functional use of the conformity reading among the target groups. Pope (1976) also mentioned that the conformity reading is apparently acquired at a later stage of development, likely due to its semantic complexity. According to our account, this reading might be acquired later as the relevant particles refer to the discourse referents generated by bias in the initiatives. While bias as a conventional implicature operates at the pragmatic level, children may learn the function of the conformity reading after they have mastered the derivation of (bias) implicatures. Future studies on the acquisition of the polarity and conformity readings of PolPrts can provide novel data for the analysis of PolPrts and bias implicatures.

Appendix A

Appendix

2- علی قرار بود برای امتحانش به کتاب از لیلا قرض بگیره ولی سارا می دونه که لیلا روی کتاب هاش به کم حساس و خدش میزنه بهونه آورده، که اینه درست هم فکر می که.
سارا: لیلا کتاب شو بیهوده قرض نداد؟

علی: آره نداد.



علی: نه نداد.



علی: می دونی که کتاب هاش به جونش بندن.

کاملاً طبیعی



علی: خب.



توضیحات

بعدی

Figure A-1: A snapshot of a sample token used in the acceptability experiment from Chapter 5.

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