# A unified analysis of polar particles in Farsi

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**Abstract.** Polar Response Particles (PRPs) have been widely studied in the literature, discussing the essence of their ambiguity in polarity and (dis)agreement reading systems (Pope 1976) and what affects the reading preference. In languages like English and Farsi, in which the same particles satisfy both readings, PRPs are ambiguous in response to negative initiatives (including questions and assertions). In Farsi, on the other hand, PRPs are not only used in assertive responses to polar initiatives, but they also appear in interrogatives like tag questions and alternative questions. In this paper, I propose a unified analysis of PRPs in Farsi in both forms. My analysis is based on the feature marking account (Roelofsen & Farkas 2015), and I propose a lexical ambiguity that can benefit the account for interrogative forms too. Moreover, I claim that bias in the initiatives affect the reading variation in ambiguous cases, in the sense that the stronger the bias in the antecedent the higher preference for the (dis)agreement reading over the comparison to polarity reading.

**Keywords.** polar response particles; questions; ambiguity; bias; ellipsis

**1. Introduction.** The basic, though challenging, puzzle about polar response particles (PRPs) is rooted in the work of Pope (1976). Pope points out that polar particles may fulfill two distinct purposes: they may mark a response as being either positive or negative (aka polarity reading), or they may express agreement or disagreement with an antecedent (aka (dis)agreement reading).

In some languages, like English, the same particles can have both readings. In other words, *Yes* can indicate a positive response or agreement with an initiative and *No* can express a negative response or disagreement with an initiative, where an initiative can be an assertion or a polar question. Thus, PRPs in either of the reading systems end up expressing the same proposition in response to positive questions like (1), while they generate different propositions in response to negative questions, as in (2).[1] Therefore, bare PRPs could result in ambiguity in response to negative initiatives.

(1)   A: Did John come to the party?
   a.   B1: Yes, he did.              polarity/(dis)agreement reading
   b.   B2: No, he didn't.            polarity/(dis)agreement reading

(2)   A: Did John not come to the party?
   a.   B1: Ye, he DID.              polarity reading
   b.   B2: Yes, he didn't.          (dis)agreement reading
   c.   B3: No, he DID.              (dis)agreement reading
   d.   B4: No, he didn't.           polarity reading

[1] Note that speakers have different (acceptability) judgments about responses to negative initiatives, where prosodic stress might be helpful (if not necessary) for positive answers to negative questions like B1 and B3 in example (2).

Following Hamblin's (1973) idea that polar questions introduce both positive and negative propositions, some accounts assume that one of these propositions is more salient and build their account around the relation between PRPs and the salient antecedent. While Krifka (2013) explains the ambiguity of bare PRPs based on multiple discourse referents in negative initiatives, Roelofsen & Farkas (2015) propose double feature marking of PRPs. I will propose a version of Roelofsen & Farkas's account, in which PRPs are propositional operators with potentially elided prejacents and the presuppositional features are separated out in two different lexical entries.

On the other hand, the possibility of two readings raises the issue of particle choice when both of the readings are available for a specific answer. In other words, which particle speakers choose when answering a negative polar question needs to be explained. Recent experimental studies about German (Claus et al. 2017, Repp et al. 2019) show variation amongst subjects preferring different particles. In previous studies (see Krifka 2013, Roelofsen & Farkas 2015 amongst others), the reading variation between the speakers is explained by individual grammar and Optimality Theory (OT). I present novel data from Farsi that reveals reading variation also within speakers.

Questions can imply bias (by means such as negation, a particle, word order, prosodic stress, etc.), where the expectation of one answer is stronger than the other one. I argue that the reading preference is bias sensitive, in the sense that when the antecedent is weakly biased, like in (3) by the presence of negation, both readings are almost equally acceptable, with different preferences between the speakers. Compare this to the strongly biased question in (4), where the particle *dige* expresses speaker's expectation towards the uttered proposition in the question. Here, the acceptability of the (dis)agreement reading is increased, not only between speakers but also within speakers with respect to the bias strength in the initiative.

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

  a.  B1: $âre^{Pos} \approx na^{DAgr}$raft.
         yes      no      went
      'Yes ≈ No, he did.'

  b.  B2: $âre^{Agr} \approx na^{Neg}$,na-raft.
         yes      no      NEG-went
      'Yes ≈ No, he didn't.'

(4)  A: Ali mehmuni na-raft    dige?
       Ali party    NEG-went DIGE
     'Did Ali not go to the party?'
     The speaker expects that Ali didn't go.

  a.  B1: $âre^{Pos} \prec na^{DAgr}$raft.
         yes      no      went
      'Yes ≺ No, he did.'

  b.  B2: $âre^{Agr} \succ na^{Neg}$,na-raft.
         yes      no      NEG-went
      'Yes ≻ No, he didn't.'

I will argue that the urgency of reaction to the bias plays an important role in reading variation. This can explain not only the (dis)agreement reading preference over the polarity one in response to strongly biased questions but also the reading variation among speakers in response to weakly or non-biased questions, in the sense that speakers have different bias sensitivity.

Finally, polar particles are mostly studied in their capacity as response particles in assertive responses. However, in Farsi, they can also be used in interrogatives, such as alternative questions (5) and tag questions (6). It is interesting that there is no ambiguity in interrogatives like (6), where the antecedent (the anchor) is negative and it can provide two different readings of the particle in the tag.

(5) Ali mehmuni umad ya *na*?
    Ali party   came or no
    'Did Ali come to the party or not?'

(6) Ali mehmuni na-yumad, *âre*?
    Ali party   NEG-came yes
    'Ali didn't come to the party, did he?'

I propose a lexical ambiguity account of polar particles, which facilitates a unified analysis of both declarative and interrogative forms of PRPs. I will stipulate that, in interrogatives, PRPs are used only in their (dis)agreement reading, which results in unambiguity of PRPs in questions. I also suggest a bias effect on reading preference of PRPs in ambiguous cases, in the sense that the stronger the bias for a given alternative the more obligation the addressee feels to react to the bias by choosing a (dis)agreement reading, as compared to just indicating the polarity of the prejacent.

   The paper is organized as follows. In Section 2, I present the core data of polar particles from Farsi in both responses and questions, I then present my account in Section 3 and show how it captures the core data from the previous section. Section 4 reviews two much cited studies of PRPs. Section 5 is the conclusion of the whole study.

**2. The core data from Farsi.** Farsi has two polar response particles,[2] namely *âre* 'yes' and *na* 'no', which can have both polarity and (dis)agreement readings in matrix or embedded positions. To distinguish a given reading, I indicate polarity and (dis)agreement readings by superscripts on PRPs. In polarity readings, $âre^{Pos}$ and $na^{Neg}$ mark the answer as being positive or negative respectively, while in (dis)agreement, $âre^{Agr}$ and $na^{DAgr}$ express agreement and disagreement readings respectively. Moreover, since both particles in Farsi can be used in responsive declaration and interrogatives, I call them polarity particles (PolPrts).

2.1. RESPONSIVE ASSERTIONS. PolPrts in (7) and (8) form reactive assertions to positive and negative questions respectively. They could stand alone or have the prejacent fully/partially. In case of negative questions like (8), PolPrts could result in different propositions.[3]

(7) A: Ali mehmuni raft?
       Ali party   went
    'Did Ali go to the party?'

   a.  B1: $âre^{Pos/Agr}$(raft).
           yes      went
       'Yes, he did.'

   b.  B2: # $âre^{Pos/Agr}$(na-raft).
           yes        NEG-went

   c.  B3: # $na^{Neg/DAgr}$(raft).
           no          went

   d.  B4: $na^{Neg/DAgr}$(na-raft).
           no          NEG-went
       'No, he didn't.'

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

   a.  B1: $âre^{Pos}$(raft).
           yes   went
       'Yes, he did.'

   b.  B2: $âre^{Agr}$(na-raft).
           yes   NEG-went
       'Yes, he didn't.'

   c.  B3: $na^{DAgr}$(raft).
           no     went
       'No, he did.'

   d.  B4: $na^{Neg}$(na-raft).
           no    NEG-went
       'No, he didn't.'

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[2] Particle *čerâ* 'why' in responsive assertions is also used to exclusively mark a positive answer to negative initiatives, similar to German *doch*. However, this particle is used in colloquial speech and I exclude it from this study.

[3] Speakers' judgement is more diverse in positive responses to negative questions, where some speakers highly prefer *čerâ*. Though, they accept the other particles in more formal contexts. Thus, in this paper, I ignore this interference.

PolPrts can also appear in different positions: in coordinations (B1, B2), in antecedent and consequent clauses of conditionals (B3, B4), and in the embedded complement clause of predicates like *think* (B5). This behavior demonstrates their anaphoric potential. Note that the ambiguity of PolPrts remains the same in embedded position (For brevity, I omit the relevant data).

(9)  A: danešjuha mehmuni raftan?
        students  party    went
     'Did the students go to the party?'

    a.   B1: Ali $âre^{Pos/Agr}$ vali baqi ro   ne-midunam.
           Ali yes      but rest ACC NEG-know
           'Ali did, but I don't know about the rest.'

    b.   B2: Ali $âre^{Pos/Agr}$ vali Sara $na^{Neg/DAgr}$.
           Ali yes      but Sara no
           'Ali did, but Sara didn't.'

    c.   B3: age $na^{Neg/DAgr}$, hatman ostad    unja bude.
           if  no      sure    professor there was
           'If they didn't, the professor should have been there.'

    d.   B4: age ostad    unja bude, $âre^{Pos/Agr}$.
           if  professor there was  yes
           'If the professor was there, they did.'

    e.   B5: fekr    konam $âre^{Pos/Agr}$.
           thought do    yes
           'I think so.'

Before talking about reading preference in case both particles are available, it is worth mentioning that most of the studies on PolPrts emphasize the important role of intonation on reading distinction. Krifka (2013) claims that in response to negative initiatives, PolPrts in opposition answers (where the answer has opposite polarity of the question) have a "rejecting accent", though he does not describe what it is exactly. Similarly, Roelofsen & Farkas (2015) indicate that such answers bear verum focus on the auxiliary in the prejacent (in English). I assume that both studies describe the same kind of prosodic prominence, namely contrastive focus.

Although focus is assumed to be optional, many speakers find opposition answers unacceptable without focus. In a series of experiments in English, Goodhue & Wagner (2018) show that a contrastive contour steers the reading towards opposition answers in response to negative initiatives. While in Farsi, focus sits on the particle, bare PolPrts can be disambiguated with the help of prosody.[4] Thus, although both readings of PolPrts in reaction to negative assertions (10) are available, focus makes the affirmation answers in (B1, B2) unacceptable/degraded, while opposition answers (B3, B4) are unacceptable/degraded without focus.

(10)  A: Ali mehmuni na-raft.
         Ali party    NEG-went
      'Ali didn't go to the party'

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[4] More prosodic studies are required to argue for the semantic role of prosody.

a. B1: $âre^{Agr}$/ #[$âre^{Agr}$]$_F$,na-raft.
       yes    yes      NEG-went
   'Yes, he didn't.'

b. B2: $na^{Neg}$/ #[$na^{Neg}$]$_F$,na-raft.
       no    no      NEG-went
   'No, he didn't.'

c. B3: # $âre^{Pos}$/ [$âre^{Pos}$]$_F$,raft.
       yes    yes     went
   'Yes, he DID.'

d. B4: # $na^{DAgr}$/ [$na^{DAgr}$]$_F$,raft.
       no    no     went
   'No, he DID.'

Thus, contrastive focus can prevent the reading that is in line with the bias of the speaker and forces an opposition answer. In other words, prosodic stress helps the speaker and the addressee to code and decode the proper reading and prevents further ambiguity. Since focus is either present or absent on both particles in oppositions and affirmations respectively, speakers show different preferences for choosing *âre* or *na* when both particles are available. The question is what affects particle choice.

2.1.1. BIAS EFFECT ON READING PREFERENCE. While polar questions semantically offer both propositions $\{p, \bar{p}\}$, some of them imply bias. The bias can be weak and can be canceled like in low negation questions (*Did John not go to the party?*), or strong like *really*-questions (*Did John really go to the party?*), tag questions (*John didn't go to the party, did he?*) and high negation questions (*Didn't John go to the party?*). While Farsi doesn't have distinct low and high negation questions,[5] canonical negative questions can carry weak bias, although this bias can be strengthened with the help of bias particles like *dige* or *mage*.

Besides, in canonical questions both responses would be equally expected, while in biased questions the expectation of one answer is stronger than the other one (Krifka 2013, Roelofsen & Farkas 2015). The issue is whether bias affects reading system preference. I argue that the stronger the bias in the question the more obligation the addressee feels to react to the bias by (dis)agreement reading, as compared to indicating the polarity of the prejacent.

Examples (11) and (12) are a minimal pair of negative questions in Farsi, where (12) implies a stronger bias by using the particle *dige*. In a context where Ali didn't go to the party, the addressee might answer (11) with either particle (with different readings). But in (12) $âre^{Agr}$ is preferred, since the addressee wants to react to speaker's bias (expressing her agreement). On the other hand, if Ali went to the party, the addressee again would choose either *âre* or *na* to (11), but it is more likely to say $na^{DAgr}$ to (12) to indicate her disagreement to the speaker in comparison to $âre^{Pos}$ that just indicates a positive proposition[6].

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[5] There is a discussion in the literature as to whether negation in Farsi is low or high (for more detail see Taleghani 2008, Kahnemuyipour 2017). Talking about the type of negation is beyond the scope of this paper.
[6] As previously said, PolPrts in opposition answers bear focus. Thus, in examples (11) and (12), both particles in (B2s) are equally expected to bear focus. For simplicity, I ignore marking focus.

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

 a.  B1: $âre^{Agr} \approx na^{Neg}$,na-raft.
   yes  no  NEG-went
  'Yes $\approx$ No, he didn't.'

 b.  B2: $âre^{Pos} \approx na^{DAgr}$raft.
   yes  no  went
  'Yes $\approx$ No, he did.'

 • PolPrts$^{Pos/Neg} \approx$ PolPrts$^{D/Agr}$

(12)  A: Ali mehmuni na-raft dige?
      Ali party    NEG-went DIGE
      'Did Ali not go to the party?'
      The speaker expects that Ali didn't go.

 a.  B1: $âre^{Agr} \succ na^{Neg}$,na-raft.
   yes  no  NEG-went
  'Yes $\succ$ No, he didn't.'

 b.  B2: $âre^{Pos} \prec na^{DAgr}$raft.
   yes  no  went
  'Yes $\prec$ No, he did.'

 • PolPrts$^{D/Agr} \succ$ PolPrts$^{Pos/Neg}$

It is worth mentioning that this generalization is borne out by Claus et al.'s (2017) experimental study. In this study, the authors found out that in responses to negative assertions (as the extreme case of bias in the form of full commitment of the speaker), participants rated *nein*$^{DAgr}$ higher than *ja*$^{Pos}$ for rejecting the initiative and also rated *ja*$^{Agr}$ higher than *nein*$^{Neg}$ in affirmation responses.

2.2. INTERROGATIVES. PolPrts are widely studied in responses to polar initiatives, but they can also play a role in asking polar questions. We will see two types of interrogatives, alternative questions and tag questions, that use PolPrts in their structures.

2.2.1. ALTERNATIVE QUESTIONS. Alternative questions (AltQs) are unbiased questions that express symmetric interest of both the positive and the negative answers. While *âre* is not acceptable in AltQs (13) and (14), *na* builds felicitous forms, although it is marginally acceptable after a negative clause (16).

(13)  #Ali mehmuni raft   ya *âre*?
      Ali party    went or yes

(14)  #Ali mehmuni na-raft      ya *âre*?
      Ali party    NEG-went or yes

(15)  Ali mehmuni raft   ya *na*?
      Ali party    went or no
      'Did Ali go to the party or not?'

(16)  %Ali mehmuni na-raft      ya *na*?
      Ali party    NEG-went or no
      'Didn't Ali go to the party or did he?'

Example (16) receives a marked reading in comparison to (15), but contrary to its minimal-pair (14), it is felicitous in a context where the speaker is challenged as to whether Ali didn't go to the party or did, and the speaker asks for a clarification (with stress on the predicate *na-raft*). Note that (16) with a negative antecedent is assumed to provide both readings of *na*, but since the polarity reading generates the same proposition in the first clause, that reading is not used and we have only *na*$^{DAgr}$. We will see that the same observation in tag questions can present single pattern of possible PolPrts in interrogatives (for more detail see Section 3.2).

2.2.2. TAG QUESTIONS. PolPrts could be also used in tag questions (TQs), consisting of a declarative anchor with (often) falling intonation and a bare particle *âre* or *na* tag with rising intonation.

(17)  Ali mehmuni raft,  *âre*?
      Ali party      went yes
      'Ali went to the party, didn't he?'

(18)  Ali mehmuni na-raft,    *âre*?
      Ali party      NEG-went yes
      'Ali didn't go to the party, did he?'

(19)  Ali mehmuni raft,  *na*?
      Ali party      went no
      'Ali went to the party, didn't he?'

(20)  Ali mehmuni na-raft,    *na*?
      Ali party      NEG-went no
      'Ali didn't go to the party, did he?'

Both particles are used in TQs with different polarity in the antecedent. Taking the anchor as the highlighted antecedent, PolPrts in (18) and (20) are expected to generate different propositions in the tag and cause ambiguity. However, speakers only get the (dis)agreement reading of the particles. Besides, the intuitive difference between *âre* and *na* tags is that in (18) where the tag is *âre*, the speaker is more confident about her belief in the anchor and looks for confirmation from the addressee, while in (20) where the tag is *na* the speaker doubts and she is less certain.

**3. Proposal for a unified analysis of PolPrts.** To offer a unified analysis, I assume that Pol-Prts in responsive assertions and interrogatives are the same lexical items. I follow the ellipsis approach to PolPrts (see Kramer & Rawlins 2011, Holmberg 2013, Roelofsen & Farkas 2015 among others). According to this approach, PolPrts sit in the head position of Polarity Phrase (PolP) and an prejacent, identical to the antecedent, is always in the complement position, even when PolPrts are followed by a different clause as in (21). In such cases, it is assumed that the prejacent is fully elided (represented in gray).

(21)  A: Did Ali go to the party?
      B: *na*, kar dašt.
         no work had
      'No, he was busy.'
      LF: No [$_{TP}$ ali didn't go to the party.], he was busy.

3.1. ACCOUNT. I propose that PolPrts are lexically ambiguous between a polarity and a (dis)agreement reading, and that they impose a presupposition on their prejacent proposition. Thus, the polarity variants (22) and (23) just check the ($-$ and $+$) polarity of the prejacent $p$, while the (dis)agreement variants (24) and (25) check the relation between the antecedent $q$ and the prejacent $p$. I remain silent about how we determine the polarity of a proposition as a set of possible worlds. I simply assume $+/-$ as black box functions that take a proposition $p$ and return a truth value if $p$ is positive or negative respectively.

(22)  $[\![\hat{a}re^{Pos}]\!] = \lambda p : +p \, . \, p$

(23) $[\![na^{Neg}]\!] = \lambda p : -p \, . \, p$

(24)  $[\![\hat{a}re_q^{Agr}]\!] = \lambda p : p = q \, . \, p$

(25) $[\![na_q^{DAgr}]\!] = \lambda p : p = \neg q \, . \, p$

In spite of this lexical ambiguity, I claim that PolPrts in interrogatives are unambiguous and I stipulate that only (dis)agreement entries are used in questions. While, on the other hand, in declaratives both entries are available that make the responses ambiguous. Moreover, I argue that the reading variation (in ambiguous cases) is bias sensitive, in the sense that the stronger the bias in the antecedent, the higher the preference for a (dis)agreement reading over a polarity reading.

This generalization predicts that the preference of (dis)agreement readings in response to assertions, as the extreme case of bias in the form of full commitment of the speaker, should be higher than the same response in questions. The prediction matches the intuition and it is born out by the judgement of the informants as well as the author.

3.2. BACK TO THE DATA. In this section, I review the data from Section 2 and show how my account can predict felicitous readings and prevent ill-formed occurrence of PolPrts in both assertions and questions. In short, the data showed that both particles can appear in responsive assertions and they are ambiguous in response to negative initiatives, where contrastive focus helps disambiguating. Moreover, reading preference is bias sensitive and the (dis)agreement reading gets higher preference in responses to strongly biased initiatives. On the other hand, in interrogatives, there is no sense of ambiguity, and PolPrts in some question forms are infelicitous. Thus, we need an account that can explain the infelicitous forms. I start with possible underlying structure in interrogatives.

Examples (26)-(31) are the simplified representation of (13)-(16). We can explain the unacceptability of (26), (28) and (30) by their illogical meaning, in which the reading behind these examples repeats the same proposition in the first clause (which is nonsense for AltQs that are symmetrically interested in both possible propositions). On the other hand, one would expect the acceptability of (27), (29) and (31), offering positive and negative clauses.

(26)  #Ali went or $\hat{a}re^{Pos/Agr}$ [he went]?

(27)  #Ali didn't go or $\hat{a}re^{Pos}$ [he went]?

(28)  #Ali didn't go or $\hat{a}re^{Agr}$ [he didn't go]?

(29)   Ali went or $na^{Neg/DAgr}$ [he didn't go]?

(30)  #Ali didn't go or $na^{Neg}$ [he didn't go]?

(31) %Ali didn't go or $na^{DAgr}$ [he went]?

Regarding the acceptable forms, I stipulate that only the (dis)agreement reading of PolPrts are used in interrogatives, which can correctly predict the unacceptability of (27). Besides, the marginal reading of (31) might be explained by unbiased characteristic of AltQs in general. In other words, starting an alternative question with a negative clause, that is marked in comparison to a positive clause, might indicate bias of the speaker, even if just weakly.

On the other hand, tag questions have a complex structure that consists of an assertion (aka anchor) and a question (tag). The combination mechanism and the bias effect of different type of TQs (matching vs. reverse and nuclear vs. postnuclear) has been widely discussed in the literature (Ladd 1981, van Rooij & Safarova 2003, Reese & Asher 2007, Malamud & Stephenson 2015, Krifka 2015). I follow the general complex speech act approach of *Assertion • Question* (for more detail see Reese & Asher 2007, Krifka 2015). I assume the bias comes from the proposition in the anchor, in the sense that it is either the speaker's belief or a piece of evidence in the context, which raises the bias in the question, i.e. the speaker tends to commit to the proposition in the anchor, while she looks for the addressee's idea (by asking the tag) in order to fully commit to the anchor.[7]

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[7] TQs in Farsi are biased questions that can be triggered either by speaker's belief/expectation or by evidence in the discourse (original and contextual bias respectively). Neither of the biases is obligatory but having one is necessary.

While *âre* and *na* can have two different readings (and be matched by prejacents of different polarities), tags are expected to be ambiguous after a negative anchor (generating (33) and (34), for instance, at the same time). However, I argue that similar to AltQs, PolPrts are only used in (dis)agreement reading in TQs, where the former generates a stronger bias.

(32) Ali went, $\hat{a}re^{Pos/Agr}$ [he went]?

(33) #Ali didn't go, $\hat{a}re^{Pos}$ [he went]?

(34) Ali didn't go, $\hat{a}re^{Agr}$ [he didn't go]?

(35) Ali went, $na^{Neg/DAgr}$ [he didn't go]?

(36) #Ali didn't go, $na^{Neg}$ [he didn't go]?

(37) Ali didn't go, $na^{DAgr}$ [he went]?

As said previously, the difference between the examples above is that *âre*-tag is more biased than *na*-tag, and we can explain it in Table model of Farkas & Bruce (2010). While Malamud & Stephenson (2015) take the anchor to contribute to the *projected discourse commitments* ($DC^*$) of the speaker to be added to the Common Ground, I add the elided prejacent in the tag as the second $DC^*$. In other words, first, the assertion in the anchor is added to the projected $DC^*$, then the tag question not only puts both $\{p, \neg p\}$ on the Table, but also adds the elided prejacent of the tag to the $DC^*$. Thus, $\hat{a}re^{Agr}$-tag is more biased than $na^{DAgr}$-tag, because in the former the (elided proposition in the) question is of the same polarity (bias) as the speaker's potential belief in the anchor, while in the latter the speaker doubts and asks in the reverse polarity of what she tends to believe, thus indicating her uncertainty.

I conclude that the interchangeable use of polar tags is the result of pragmatic competition, where the *âre*-tag coveys certainty, while the *na*-tag is weaker and shows doubt. In other words, knowing whether the speaker is more certain about her belief and asks for a confirmation from the addressee or she doubts about her belief and looks for an answer, helps the speaker to choose *âre* or *na* tags respectively.

Finally, I presented data with reading variation between the speakers in response to weakly biased negative questions as well as increase of (dis)agreement over polarity reading within the speakers in strongly biased questions. I propose that reading variation is bias sensitive, in which the change of reading preference is due to the need of bias in the question to be answered as compared to the lack of such a requirement in weakly biased questions. In other words, in weakly biased questions the individual sensitivity to the bias cause reading variation between the speakers (so that both readings are almost equally acceptable), while strongly biased questions make the implication of the bias more salient, in the sense that the addressee feels more obligation to react to the bias in the antecedent (to agree or to disagree) rather than just indicating the polarity of the prejacent. Thus, even speakers who prefer polarity reading in response to weakly biased questions tend to prefer (dis)agreement readings when responding to strongly biased questions. That is the pragmatic reaction (due to the bias in the question) is required rather than the semantic reaction.

**4. Previous accounts.** A large and growing body of literature has investigated PolPrts (Pope 1976, Kramer & Rawlins 2011, Holmberg 2013, Krifka 2013, Roelofsen & Farkas 2015 among others) with different perspectives. In this paper, I choose two of the most discussed studies,

namely Krifka (2013) and Roelofsen & Farkas (2015), that are distinct from each other in almost all aspects and share many parts with other studies.

Krifka (2013) suggests that PolPrts are propositional proforms that have their own separated clause from prejacents. In other words, PolPrts and prejacents are two parallel propositions. Krifka assumes three types of discourse referents (DRs): speech acts referent (ActP), propositional referent (TP), where negatives are separated propositions and there is a positive proposition inside the negative forms, and event referent (vP) (38).

(38)   John didn't come.

$[_{ActP}$ [ASS] $[_{NegP}$ John$_1$ didn't$_2$ $[_{TP}$ $t_1$ $t_2$ $[_{vP}$ come ]]]]
$[_{ActP}$ dRef1 $[_{NegP}$ dRef2      $[_{TP}$ dRef3 $[_{vP}$ dRef4 ]]]]

He claims that proform PolPrts pick up a propositional discourse referent ($p$), *yes* is an identical function expressing the referent and *no* returns its complement. In this analysis for English (but not necessarily for other languages), assertion is already part of the meaning of PolPrts:

(39)   $[\![ [_{ActP} \quad yes] ]\!]$ = ASSERT(p)          (40)   $[\![ [_{ActP} \quad no] ]\!]$ = ASSERT($\neg$p)

The illustration of the following responses in this account is as bellow:

(41)   A: Did John come?
       B1: Yes.          $[_{ActP}$ Yes] = ASSERT(dRef3) = $[_{ActP}$ [ASS] $[_{TP}$ John did $[_{vP}$ come]]]
       B2: He did.       $[_{ActP}$ [ASS] $[_{TP}$ he did $[_{vP}$ dRef4 ]]] = $[_{ActP}$ [ASS] $[_{TP}$ he did $[_{vP}$ come ]]]

Krifka also claims that the ambiguity of PolPrts is due to the multiple discourse references in the antecedent. In other words, negative antecedents cause ambiguity in PolPrts since they include a positive (propositional) discourse referent as well as a negative discourse referent, which is not the case in positive initiatives. Thus, PolPrts are ambiguous because they are free to choose either of the discourse referents.

Krifka's (2013) syntactic account is limited to the DRs that are introduced by the initiative clause[8]. However, Snider (2019) explores different structures that syntactically either cannot introduce any DRs, like adverbs or small clauses[9](because they don't involve TP) or they should always introduce DRs because they have TP like in Rising and Control structures, but such DRs are not always available. While syntactic account cannot explain all (im)possible DRs, *Discoursive* approaches like DRT (see Snider 2017, 2019 for more information) might be a better solution to

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[8] Krifka (2013) presents TP and NegP as well as some negative quantifiers that introduce non-negated proposition. He claims that the discourse references depend on the presence of a syntactic category expressing negation.

[9] Small clause constructions involve a noun and a predicate, which together compose the small clause, following a verb, e.g. *The rabbi considered them married.* Note that PolPrts can still accompany the small clause, without rejecting the main clause in (i).

(i)   A: Ali una ro    zan o   shohar  dar-nazar-gereft-e.
         Ali they ACC wife and husband consider-3SG
      'Ali considers them as husband and wife.'
      B: *na* zan o    shohar   ni-stan.
         no wife and husband NEG-are
      'No, they are not husband and wife.'

propose multiple DRs for the ambiguity of PolPrts[10]. However, such accounts might be too broad to catch felicitous DRs, and they need to explain the unavailability of some potential DRs for PolPrts.

As for the reading preference, Krifka offers two constraints to penalize selecting *NonSalient* and *DisAgreement* DRs, which lead the speakers to choose the response with less penalty. He believes that negative antecedent clauses typically occur in contexts, in which the non-negated proposition is salient, although there would be contexts where this condition is not satisfied. Therefore, he expects the answer patterns to be different with respect to context. The context sensitivity feature has been rejected by experimental studies (Claus et al. 2017, Goodhue & Wagner 2018). Claus et al. (2017) suggest that the reading variation in Krifka's account could be explained by assuming inter-individual grammar in Optimality Theory (OT), where speakers assign different weight to the constraints. This ends a complex model of weight on constraints, without considering the antecedent type, which I show plays an important role on reading variation.

On the other hand, Roelofsen & Farkas (2015) offer their account in inquisitive semantics, and show that the uttered proposition in the question is the highlighted (salient) antecedent for PolPrts. They assume (like Kramer & Rawlins 2011) that the anaphoric link to the antecedent clause is provided by the fully/partially elided prejacent clause. In this account, PolPrts sit in the head/specifier position of PolP with a TP (prejacent) complement. They propose that PolPrts are feature markers that do double duty in both polarity and (dis)agreement systems. They suggest two features with two values: namely *Absolute feature* [+/-] and *Relative feature* [same/reverse], and shows that PolPrts have the disjunctive combination of them, in which *Yes* can realize [+] or [same] features and *No* can realize [-] or [reverse] features.

Moreover, Roelofsen & Farkas suggest two rules, *markedness* and *realization*, in order to predict the reading preference, where it is calculated by the feature markedness scale, in the sense that the more marked a feature is, the stronger the pressure for it to be overtly realized. Roelofsen & Farkas (2019) revise their model by Linear OT to explain the reading variation between the speakers that was found in Claus et al. (2017).

Although my proposal is based on Roelofsen & Farkas's account, it offers distinct entries for either of reading systems, since the disjunctive feature marking over-generates reading. In other words, it predicts the ambiguity in all settings where the initiative is negative. However, we saw that PolPrts are not ambiguous in interrogatives. Besides, since the type of the initiatives (regarding the bias strength) affects the reading preference, their OT model should be updated and consider question type as another parameter (apart from inter-individual preference) in calculating the weight, that results in an unnecessarily complex model.

**5. Conclusion.** In this study, I offered a unified analysis of PolPrts in Farsi, which can be used in declarative responses and interrogatives, including alternative questions and tag questions. The account argues for a lexical ambiguity such that presuppositional features mark the reading. I argued that PolPrts are unambiguous in interrogatives, since they are only used in their (dis)agreement reading. Moreover, I presented data that shows bias sensitivity of PolPrts, in the sense that the stronger the bias for a given alternative the more likely the speaker to choose a (dis)agreement reading, as compared to just indicating the polarity of the prejacent. Thus, reading preference and variation of PolPrts can be predicted by the bias in the initiative.

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[10] Thanks to Daniel Goodhue for reminding me about the possibility of an account for PolPrts with ellipsis structure and multiple DRs ambiguity (for more detail see Goodhue & Wagner (2018)).

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