Anti-agreement with bound variables

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1 Introduction

- In many languages, φ-agreement with a DP becomes invariant when that DP is involved in an Ā-dependency. Since Ouahilla (1993), this phenomenon has been known as anti-agreement.

(1) Berber
  a. t-za tamghart Mohand
     3SG.F-see.PFV woman Mohand
     ‘The woman saw Mohand’
     (Ouahilla 1993)
  b. man tamghart, ay yzrin/t-za Mohand
     which woman C see.AA/3SG.F-see.PFV Mohand
     ‘Which woman saw Mohand?’
     (Ouahilla 1993)

(2) Abaza
  a. pro pro, f’aa1 l-bat
     3SG.F 2PL 2PL-3SG.F-see
     ‘She saw you!’
     (O’Herin 2002)
  b. dazda, s-ax’1 a1 za-qa1
     who 1SG.POSS-money ERG.AA-steal
     ‘Who stole my money?’
     (O’Herin 2002)

- In Berber, (1), the verb appears in an invariant form.
- In Abaza, (2), the verb exhibits a specialized form of agreement to index extracted arguments.

- We argue that these data lend strong support to Baier’s (2016) featural theory of anti-agreement in which anti-agreement is the result of a ϕ-probe agreeing with an Ā-operator bearing what we call [WH].
  - When the ϕ-probe agrees with a goal bearing a WH-feature, the resulting feature bundle on the probe includes both ϕ-features and a WH-feature.
  - When ϕ-features coccur with a WH-feature in the same feature bundle, partial or total impoverishment of ϕ-features may take place—yielding anti-agreement.

- We also argue that bound anti-agreement is analytically parallel to fake indexicals (e.g. Kratzer 2009), thus unifying these two phenomena.


→ Bound anti-agreement supports an analysis of fake indexicals in which a variable is ‘born’ underspecified but acquires its features from its antecedent in the course of the derivation.
→ The features of the variable may be realized on the variable itself or as agreement with the variable.
- Bound anti-agreement arises when [ϕ,WH] is transmitted to a variable from its binder.

2 A featural approach to anti-agreement

- Reduced ϕ-agreement with Ā-operators is often discussed in terms of two different phenomena.

(5) Anti-agreement → default/invariant form
  a. Disruption of agreement in the syntax
  b. Often thought to result from a restriction on Ā-movement of certain arguments (Ouahilla 1993; Richards 1997; Schneider-Zioga 2007; Diercks 2010; Henderson 2013, a.o.)

(6) Wh-agreement → special agreement exponent for Ā-operators
  a. ‘Normal’ agreement process
  b. The special exponent is the form a probe takes when it has agreed with an Ā-operator (Chung 1994, 1998; Chung and Georgopoulos 1988; Georgopoulos 1991; Watanabe 1996, a.o.)

- We argue, following Baier (2016), that both ‘anti-agreement’ and ‘wh-agreement’ arise from the configuration in (7), where a ϕ-probe finds a DP with both ϕ- and WH-features.1

(7) Configuration for anti-agreement

[... P[ϕ] [... DP[ϕ, ω] ... ]]

- Reduced agreement in this configuration arises because of impoverishment (Bonet 1991; Noyer 1992, 1997; Halle and Marantz 1993) of the φ-features in the morphology.

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2The term ‘wh-agreement’ has also been used to discuss other patterns that do not necessarily involve alternation in φ-agreement morphology. We leave these aside here, but see Haik (1996), Watanabe (1996), and Chung (1998) for discussion and references.
The difference between ‘anti-agreement’ and ‘wh-agreement’ reduces to variation in the morphology.

- In a language like Berber, (1), impoverishment results in the appearance of default agreement.
- In a language like Abaza, (2), impoverishment allows for the insertion of a morpheme expressing the remaining WH-feature.

This analysis centers the explanation in the featural make up of the DP targeted for agreement.

- Anti-agreement is not the result of syntactic constraints on \( \bar{A} \)-movement (Ouhalla 1993; Richards 1997; Schneider-Zioga 2007; Diercks 2010; Henderson 2013, a.o.) or Agree (Georgi 2014).

3 Anti-agreement with bound variables

**Prediction of the featural account:**
It should in principle be possible for an XP to trigger anti-agreement even when that XP has not undergone \( \bar{A} \)-movement itself, as long as that XP bears a WH-feature.

Abaza confirms this prediction. The core data comes from possessor agreement.

- In addition to argument-verb agreement, Abaza has possessor agreement.

(9) **Possessor agreement**

a. apa\(\hat{\text{a}}\), 1-qas'a
woman 3SG.F.POSS-man
‘the woman’s husband’

b. (\text{war);} w$_{\bar{\text{a}}}$-nap’\(\bar{\text{a}}\)
2SG.M 2SG.M.POSS-man
‘your hand’

Possessor agreement also participates in the anti-agreement system.

- When a possessor serves as the head of a relative clause, the agreement prefix that cross-references that possessor on the possessed noun must be the anti-agreement prefix \( z \).

(10) [\text{cp }] [\text{cp } OP, z\text{-zdo}] [\text{pro }] y$_{2G}\text{-w-a}$fiz \(\rightarrow\) a-qac’\(\hat{\text{a}}\)
[ [ [ POSS.AA-house ] 2SG.M ABS.AA-2SG.M-buy.PST ] DEF-man ‘the man whose house you bought’

We follow O’Herin (2002) and assume that relativization in Abaza involves null operator movement to Spec-CP.

- When a relative operator serves as a possessor, it pied-pipes the DP that contains it to Spec-CP.
- Possessor anti-agreement arises from agreement with the null operator, as shown in (11).
- The possessor \( \bar{\phi} \)-probe copies both [\( \bar{\phi} \)] and [\( \text{WH} \)], and impoverishment occurs.

There are two important observations here:

1. Anti-agreement is triggered by an element which is not an operator.
2. Anti-agreement is triggered by an element which does not move.

Conversely, the theory defended here provides a way of explaining how these variables trigger anti-agreement.

(13) The bound variable bears a WH-feature, triggering anti-agreement on the possessive probe.

4 Deriving bound anti-agreement

4.1 Unification with fake indexicals

- The bound anti-agreement effect shown in (12) displays strong parallels with fake indexicals, suggesting a unified analysis of these two phenomena.

- Proposal: Like fake indexicals, bound anti-agreement involves Feature Transmission between an antecedent and a bound variable.

→ Thus, in both cases, the features on the bound variable are not inherent to the variable; rather, the variable acquires these features in the course of the derivation.

4 We assume that possessor agreement originates as a \( \bar{\phi} \)-probe on a possessor D, which agrees a with the possessor in its specifier.
Fake indexicals are bound variables that are morphologically realized as pronouns, despite lacking the referential semantics of pronouns (Rullmann 2003; Kratzer 2009; Wurmbrand 2015):

(14) Only you did your homework.
   a. Referential paraphrase:
      Nobody else did your homework.
      \( \rightarrow \) You are the only one such that x did x’s homework.
   b. Bound variable paraphrase:
      Nobody else did their homework.

Kratzer (2009) argues that bound variables are minimal pronouns which enter the structure without features and acquire the \( \psi \)-features of their antecedents post-syntactically.

Specifically, the minimal pronoun receives its features from an intermediate \( \lambda \)-introducing head (e.g. \( \nu \), C; henceforth ‘binder’),\(^5\) which interacts with both the antecedent and the minimal pronoun in turn, in two steps:

(15) \textbf{Predication (Spec-Head Agreement under Binding)} \quad \text{(Kratzer 2009)}

When a DP occupies the specifier position of a head that carries a \( \lambda \)-operator, their \( \psi \)-feature sets unify.

(16) \textbf{Feature Transmission Under Binding} \quad \text{(Kratzer 2009)}

The \( \psi \)-feature set of a bound DP unifies with the \( \psi \)-feature set of its binder.

An illustration in (17):

(17) a. Only you did your homework.
   b. Feature sharing relations

\[ \begin{array}{c}
\text{Transmission} \\
[ \text{only}] \{ \nu \ \text{you} \} \downarrow \{ \text{6’s homework} \} \] \quad \text{(Adapted from Kratzer 2009)}
\]

We extend this analysis to bound anti-agreement: Variables bound by wh-extracted elements receive both \( \psi \)- and \( \psi \)-features under Feature Transmission.

(18) Derivation of bound anti-agreement in Abaza

a. \([\text{DP pro, } z, q'k"marga}] \ \text{ayfa ac'addi} \ \text{dzada,} \ y\nu-q\alpha-z-chwaxaz\]
   POSS-AA-toy table under who 3SG-PV-ERG_AA-hide
   ‘Who, hid his, toy under the table?’
   \( \text{(O’Herin 2002:272)} \)
   \( ^{\text{aKratzer (2009) argues that evidence for the intermediate binder comes from the observation that fake indexical readings in relative clauses (in which the relative pronoun is by default 3rd person) are only available if the features of the embedded verb match with the bound variable, as in cases of syncronymy. This generalization is borne-out in both standard and non-standard varieties of German, as well as in Dutch. In contrast, Wurmbrand (2015) argues that the minimal pronoun receives its features directly from the antecedent through Upward Agree, thus eliminating the need for an intermediary. The data presented in this talk are in principle compatible with both approaches; however, we believe that Wurmbrand’s system faces certain challenges in accounting for optional feature transmission, as exhibited in Abo (Burns 2011).}} \)

b. \([\text{DP, C} \ldots] \ [\phi \ \text{pro, wu}] \ \text{v}\nu,_{\text{wu}} \ldots \ [\phi \ \text{pro, wu}] \ \text{AGR}_{\phi, \text{wu}}]_{\text{N}} \]

4.2 Extensions of our system

Below, we consider a wider range of Abaza data and their implications for the morphosyntactic properties of variable binding.

1. In the absence of bound anti-agreement (i.e. with 3rd person possessive agreement), \textbf{only the referential reading is available} (O’Herin 2002); the bound variable reading is blocked, (19).

   – From this, we conclude that Feature Transmission is a obligatory operation: A minimal pronoun may not be defaultly spelled out as 3rd person, but must receive all the features of its binder.\(^6\)

   \[ \{ \text{pro, y\nu-q\alpha-z-marga}] \ \text{ayfa ac'addi} \ \text{dzada,} \ y\nu-q\alpha-z-chwaxaz \]
   3SG-M-toy table under who 3SG-PV-ERG_AA-hide
   ‘Who, hid his, toy under the table?’

2. Bound anti-agreement is only possible in the c-command domain of the binder, suggesting that Feature Transmission is sensitive to c-command.

   – In (20), anti-agreement is triggered by the possessive pronoun in the relative clause (\( \nu \)-‘his son’), though not by the bound possessive pronoun in the matrix clause (\( y\nu \)-‘his wife’).

   – While the head of the relative clause c-commands the matrix possessive pronoun, this is irrelevant to the availability of anti-agreement.\(^7\)

(20) \textbf{Bound anti-agreement in relative clauses}

\[ \{ \text{DP, } x, \text{pa} \} \ \text{bzyaw d}a\text{-}z\alpha-bawa \]
   POS-S-AA-son good 3SG-ERG_AA-see_PRS
   DEF-man 3SG.M*/ERG_AA-wife
   d\( \text{-}y\nu\)-daw
   3SG-PVF-3SG.M-GET_DYN
   ‘The man, who, loves his, son picked up his, wife.’

3. Finally, Abaza displays \textbf{bound anti-agreement with controlled PRO}, when the controller is a wh-element, (21).

   – This is expected if both \( v \) and \( C \) are binders and PRO is bound by embedded C, as proposed by Chierchia (1989) and Kratzer (2009).

\(^{5}\text{Recall that fake indexical constructions are ambiguous between bound and referential readings, though this ambiguity does not seem to be possible in Abaza, as the presence of anti-agreement only allows a bound variable reading. We suggest that this difference stems from the inability of pronouns to be inherently specified for \{\text{wh}\}. A pronoun that bears \{\text{wh}\} must therefore have acquired it from a higher binder via Feature Transmission.}

\(^{6}\text{While we chose to represent the structure of Abaza relative clauses as head-external, our analysis is compatible with a head-internal analysis as well.} \)
5 Extension: Anti-agreement on complementizers

Finally, we extend our analysis to cover anti-agreement on subject-oriented complementizers—a phenomenon that is expected under our system.

Subject-oriented complementizers involve an indirect Agree relation: Complementizer agreement (C-agreement) with a higher subject is mediated by an embedded anaphor/operator in Spec-CP (Diercks 2013; Torrence and Duncan 2017).

An illustration with Ibibio, which exhibits C-agreement on a subset of its complementizers:

Ibibio
M-má ǹ-kóp (ǹ-bó) kê Kókó ì-dép ìnìt ìnìt
1SG-PST 1SG-bear 1SG-C Koko 3SG-PST 3SG-buy book
‘I heard that Koko bought a book.’

Ibibio also exhibits an anti-agreement effect (Baker 2008; Baker and Willie 2010). Wh-subjects require the subject agreement prefix í instead of the normal 3rd person singular prefix a-:

Ibibio
a. ǹ-nwón ǹ-ì-ánh’í ìnìɨ ǹ-ì-ánh’í ìnìɨ
who 1SG-PST-eat porridge
‘Who ate porridge?’

Baker 2008:616

b. *ǹ-nwón ǹ-ì-ánh’í ìnìɨ ǹ-ì-ánh’í ìnìɨ
who 1SG-PST-eat porridge
Intended: ‘Who ate porridge?’

Baker 2008:616

Strikingly, when an agreeing complementizer agrees with a matrix wh-subject, the complementizer must bear the anti-agreement prefix:

5 Conclusion

This talk investigated anti-agreement with bound variables, a subtype of anti-agreement that sheds light on the nature of anti-agreement as a whole.

While anti-agreement is often argued to reflect constraints on subject movement (Ouhalla 1993; Richards 1997; Schneider-Zioga 2007; Diercks 2010; Henderson 2013, a.o.), the existence of bound anti-agreement is predicted only under a featural approach (Baier 2016).

→ Anti-agreement may cross-reference bound variables, which crucially do not undergo A-movement.

Following Baier (2016), anti-agreement is simply agreement with a goal bearing both [φ,WH], followed by postspatitic impoverishment.

Bound anti-agreement constitutes novel empirical support for this featural approach to anti-agreement, based on (i) the absence of movement in such cases, (ii) the parallels with fake indexical phenomena cross-linguistically, and (iii) extensions to subject-oriented complementizer agreement.

Finally, the fake indexical literature has largely focused on the form of overt pronouns. The analysis here provides further evidence for Feature Transmission to minimal pronouns by examining the form of bound agreement.

References


Appendix: Consequences for Agree

- The analysis we have argued for here has consequences for the architecture of Agree.
- Because Feature Transmission is a postsyntactic operation, our analysis presupposes that Agree is (at least) partially postsyntactic as well.

- **Agree → Feature Transmission**
  - Bound pronouns should not be able to value probes in their local domain.
  - At the time of Agree, the bound pronoun will have no features to value the probe, (27a).

  $$\text{Feature Transmission}$$

  (27) a. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

  b. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

- **Agree-Link**
  - A dependency is established between the probe and goal in the syntactic component, (28a).

  $$\text{Agree-Link}$$

  (28) a. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

  b. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

- **Agree-Copy**
  - The goal’s features are copied onto the probe in the postsyntactic component, (28b).

  $$\text{Agree-Copy}$$

  (28) a. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

  b. $[\text{Binder}([\varphi]),[\ldots,\text{Probe}[,\ldots]],[\text{PROBE}[\ldots,\text{PROBE}[\ldots]]]]$

- **In our approach, the interaction of Agree and Feature Transmission is such that Feature Transmission must take place between these two Agree sub-processes, as shown in (29).**

  (29) $\text{Agree-Link} \rightarrow \text{Feature Transmission} \rightarrow \text{Agree-Copy}$