

Binding

Binding Theory determines the interpretation and distribution of pronouns and anaphors. It is formulated in terms of three principles, Condition A, which applies to anaphors, Condition B, which applies to pronouns, and Condition C, which applies to name and other referential expressions (R-expressions).

We have already discussed Condition C.

- (1) Condition C: a pronoun cannot refer to an R-expression that it c-commands.

We now focus on Conditions A and B of the binding theory.

1 Condition A

Condition A governs the distribution and interpretation of anaphors. Anaphors are dependent nominal elements, which must have a sentence-internal antecedent. Unlike pronouns, they cannot (generally) refer to a sentence-external contextual element.

Most languages have two kinds of anaphoric elements.

- (2) a. reflexives: *himself, herself, themselves, myself, ourselves, yourself*
b. reciprocals: *each other*

The discussion here will focus largely on reflexives. Most of what we will propose for reflexives will also apply to reciprocals, but reciprocals introduce additional complexity which we will not get into here.

1.1 Properties of Anaphors

- Anaphors, unlike pronouns, must have an antecedent within the sentence.

- (3) a. *Himself arrived.
b. He arrived.

The ungrammaticality of (3a) can be plausibly attributed to an inability of *himself* to appear in a nominative position. (4) does not run into this problem.

- (4) a. *[For himself to leave now] would be good.
b. [For him to leave now] would be good.

- Anaphors must have feature-compatible antecedents.

- (5) a. Stephin_i likes himself_i.
b. *Claudia_i likes himself_i
(6) a. *Susan_i believes [himself_i to be a genius].

- b. Susan believes [him to be a genius].

Pronouns do not require a sentence-internal antecedent. However, if they do have a sentence-internal antecedent, then it must be feature-compatible with the pronoun.

- (7) a. Vladislav_i thinks that he_{i/j} is a genius.
b. Vladislav_i thinks that she_{j/*i} is a genius.

- The antecedent of the anaphor must c-command the anaphor.

- (8) a. *Stephin's_i mother likes himself_i.
b. Stephin's_i mother likes him_i.
c. *[That Stephin_i is always ignored] irritates himself_i.
d. [That Stephin_i is always ignored] irritates him_i.

Pronouns do not have a c-command requirement. The antecedents of the pronouns in (8b, d) do not c-command them.

- The antecedent of the anaphor cannot be 'too far' from the anaphor.

- (9) a. *Stephin_i thinks that Claudia likes himself_i.
b. Claudia thinks that Stephin_i likes himself_i.

The antecedent of a pronoun cannot be 'too close' to the anaphor.

- (10) a. Stephin_i thinks that Claudia likes him_i.
b. *Claudia thinks that Stephin_i likes him_i.

1.2 Binding Domains

The intuition is that anaphors must have a binder that is 'close enough,' while pronouns may not have a binder that is 'too close.'

- (11) NP₁ **binds** another NP₂ iff NP₁ c-commands NP₂ and NP₁ and NP₂ are co-indexed.
(An NP is bound iff there is an NP' s.t. NP' binds NP)
- (12) a. Condition A: An anaphor must be locally bound.
b. Condition B: A pronoun must not be locally bound.
c. Condition C: An R-expression can not be bound.

What does *locally bound* mean? In particular, what constitutes *local*?

local in the context of the binding theory = **binding domain**

Thus the binding conditions can be restated as:

- (13) a. Condition A: An anaphor must be bound in its binding domain.
b. Condition B: A pronoun must not be bound in its binding domain.
c. Condition C: An R-expression can not be bound.
- (14) Binding Domain (Attempt 1): the binding domain of an NP is the smallest TP that contains it.

1.3 Problems with 14

(14) goes quite far in capturing the examples we have seen so far. In fact, it explains every single example discussed in this handout up until this point.

It can also explain cases of ambiguity like the following.

- (15) They pointed the guns at each other.

Despite this, it is ultimately inadequate.

ECM provides one environment where (14) makes incorrect predictions.

- (16) a. Vladislav_i believes [_{TP}himself_i to be a genius].
b. *Vladislav_i believes [_{TP}him_i to be a genius].

By (14), the binding domain of the subject of the embedded TP is the embedded TP. Therefore, we incorrectly predict that (16a) should be ungrammatical and that (16b) should be grammatical.

One might think (17) to also be a counterexample.

- (17) a. John_i tried [_{TP} to kill himself_i].
b. *John_i tried [_{TP} to kill him_i].

Given our assumptions, it isn't a counterexample. Why?

We might have the intuition that what is going wrong in (16) is that we are dealing with a non-finite TP and that therefore we should reformulate (14) as follows:

- (18) Binding Domain (Attempt 2): the binding domain of an NP is the smallest **finite** TP that contains it.

However, ECM proves to be a problem once again.

- (19) a. *Risto_i considers [Liina to be fond of himself_i].
b. Risto_i considers [Liina to be fond of him_i].

By (18), the binding domain of *himself/him* in (19) is the entire sentence – the entire sentence is the minimal finite clause that contains the anaphor/pronoun. Hence (19a) is incorrectly predicted to be good and (19b) to be bad.

- Reverse engineering points out that we need to distinguish between the subject of an ECM infinitive and the object of an ECM infinitive. The binding domain of the subject of the ECM infinitive seems to be larger than that of the object of the ECM infinitive.

1.4 Reformulating Binding Domains

- Binding domain of the subject of the ECM infinitive includes the clause of the ECM verb.
- Binding domain of the object of the ECM infinitive includes only the ECM infinitive.

- (20) Binding Domain (Attempt 3): the binding domain of an NP is the smallest clause that contains (i) the NP, (ii) its case-marker, and (iii) a 'higher' subject.

2 The Role of Subjects

(20), our last definition of binding domain, makes reference to the notion ‘subject.’ By ‘subject,’ we mean an NP in the [Spec,TP].

The new definition allows us to handle properly the examples in (21) and (22).

(21) Subjects

- a. Sebastien_i considers [_{TP} himself_i to be intelligent].
- b. *Sebastien_i considers [_{TP} him_i to be intelligent].
- c. *Sebastien_i believes that [_{TP} himself_i is intelligent].
- d. Sebastien_i believes that [_{TP} he_i is intelligent].

(22) Objects

- a. *Sebastien_i considers [_{TP} Miguel to be fond of himself_i].
- b. Sebastien considers [_{TP} Miguel_i to be fond of himself_i].
- c. *Sebastien_i believes that [_{TP} Miguel is fond of himself_i].
- d. Sebastien believes that [_{TP} Miguel_i is fond of himself_i].

2.1 Subjects Across Categories

Above we defined ‘subject’ as an NP in [Spec,TP]. This assumption requires revision.

We already assume that subjects do not originate in [Spec,TP]. They are merged in lower θ -positions from where they raise to [Spec,TP] to get case.

- (23)
- a. Roland might [_{VP} Roland visit Klaus].
 - b. Roland might be [_{AP} Roland nice].
 - c. Roland might be [_{PP} Roland in Amsterdam].
 - d. Roland might be [_{NP} Roland a star].

If we supply case to the various θ -positions, then overt subjects can appear there.

- (24)
- a. I watched [_{VP} Roland visit Klaus].
 - b. I find/consider [_{AP} Roland nice].
 - c. I want [_{PP} Roland in Amsterdam].
 - d. I consider [_{NP} Roland a star].

So we will extend ‘subject’ to mean an NP that occupies the [Spec,XP] position of any XP.

2.2 Binding Domains don’t have to be TPs

The notion of binding domain made reference to ‘the smallest clause that contains the pronoun/anaphor.’ Now that we are talking about subjects across categories, we will need to replace ‘smallest clause’ by ‘smallest XP.’

The evidence:

- (25) VP
- a. Ken_i watched [_{VP} Roland_j hit himself_{j/*i}].
 - b. Ken_i watched [_{VP} Roland_j hit him_{i/*j}].
- (26) AP
- a. Ken_i considers [_{AP} Roland_j fond of himself_{j/*i}].
 - b. Ken_i considers [_{AP} Roland_j fond of him_{i/*j}].
- (27) Binding Domain (Attempt 4): the binding domain of an NP is the smallest XP that contains (i) the NP, (ii) its case-marker, and (iii) a subject.

2.3 Optional Subjects

NPs allow for optionality with respect to subjects i.e. some NPs, but not all, have subjects. So NPs constitute a binding domain or not depending upon the presence or absence of a subject.

Our theory makes correct predictions with regard to the cases in (28).

- (28)
- a. Marc_i will believe [any positive description of himself_i].
 - b. *Marc_i will believe [Annie's description of himself_i].
 - c. Marc_i will believe [Annie's description of him_{i/j}].
 - d. Annie will believe [Marc's_i description of himself_{i/*j}].
 - e. Annie will believe [Marc's_i description of him_{j/*i}].

What are the judgements about:

- (29) Marc_i will believe [any positive description of him_i].

Our theory so far correctly predicts that (28a) is grammatical. For the same reason, it should also predict that (29) is ungrammatical. This is indeed the judgement reported in the literature. However, there seems to be a dialect split here. For some speakers, (29) is ungrammatical, while for others it is ok.

Other examples are also found of environments where there is no complementarity between pronouns and anaphors. These are for the most part cases where the anaphor/pronoun appears inside an NP.

- (30)
- a. Artemis_i lost [a beautiful picture of herself_i (that I had given her)].
 - b. Artemis_i lost [a beautiful picture of her_i (that I had given her)].
- (31)
- a. They_i heard [stories about each other_i/themselves_i].
 - b. They_i heard [stories about them_i].

Complementarity is not lost with all NPs.

- (32)
- a. Jacob_i took [a picture of himself_i/*him_i].
 - b. Jacob_i saw [a picture of himself_i/(*)him_i].

Speakers pretty consistently find complementarity in *take a picture* environments, but there seems to be optionality for at least some speakers otherwise. The generalization seems to be that complementarity holds in semi-idiomatic environments like *take a picture* or *tell a story*, but not generally.¹ In (30-32), the relevant NP is in object position. Non-complementary distribution also emerges when the NP is in subject position.

- (33) a. Jonah_i thinks that [_{TP} [a beautiful picture of himself_i] is hanging on the outside wall of the gym].
 b. Jonah_i thinks that [_{TP} [a beautiful picture of him_i] is hanging on the outside wall of the gym].

Various scholars have taken cases where the complementarity between anaphors and pronouns breaks down to be instantiating a different module of grammar. They propose that anaphors that appear in these environments are *logophors*, which they argue have distinct properties (see Reinhart and Reuland (1993)).

Classical binding theory (see Chomsky (1981), Chomsky (1986)) does not make distinctions between anaphors in NPs and anaphors elsewhere. The following extensions were proposed to handle the special issues raised by anaphors in NPs.

3 Binding Theory Extensions

3.1 Accessible Subjects

Contrast (33), which is repeated here as (34), with (35).

- (34) a. Jonah_i thinks that [_{TP} [a beautiful picture of himself_i] is hanging on the outside wall of the gym].
 b. Jonah_i thinks that [_{TP} [a beautiful picture of him_i] is hanging on the outside wall of the gym].
 (35) a. *Jonah_i thinks that [_{TP} himself_i is intelligent].
 b. Jonah_i thinks that [_{TP} he_i is intelligent].

We will focus on the contrast between (34a) and (35a).

- (36) Binding Domain (Attempt 4): the binding domain of an NP is the smallest XP that contains (i) the NP, (ii) its case-marker, and (iii) a subject. (= 20)

The binding domain for *himself* in both (34a) and (35a) is the embedded TP. Hence we predict that both should be ungrammatical. This is correct for both (35a) but incorrect for (34a).

Now consider how the binding domain for *himself* is determined for (34a) and (35a).

- (37) a. For *himself* in (34a):
 case-marker of *himself* = *of*
 subject = *a beautiful picture of himself*

¹Implicit Arguments have been argued to play a role here. See Williams (1985).

- b. For *himself* in (35a):
 case-marker of *himself* = I^0
 subject = *himself*

The problem intuitively is that the anaphor is either contained in the subject or *is* the subject. Such a subject is not ‘accessible’ to the anaphor. This suggests the following revision of the binding theory:

- (38) Binding Domain (Attempt 5): the binding domain of an NP is the smallest XP that contains
 (i) the NP, (ii) its case-marker, and (iii) an **accessible** subject.

But don’t we predict that (35a) should be good? We do. But this is not a problem given that we have another way of ruling out (35a): *himself* is accusative but appears in a nominative position. To properly test the predictions made by (38), we would need a language which has nominative anaphors.

- *himself* in accusative subject positions does fine, but this is not surprising.

- (39) a. Matt_i would like for himself_i to win.
 b. Matt_i considers [himself_i to be competent].

- We also need to say that *each other* cannot appear in nominative positions.

- (40) a. *[Elena and Artemis]_i know that [each other_i is/are wonderful].
 b. [Elena and Artemis]_i know that [they_i are wonderful].

The binding domain of *each other* in (40a) is the entire clause and so it has to be blocked by something other than binding theory.

3.2 Binding Theory Compatibility

We are still left with the breakdown of complementarity between the distribution of anaphors and pronouns.

The problem of complementarity also arises with possessive pronouns.

- (41) a. Maya_i likes her_i husband.
 b. Maya_i thinks that Idan dislikes her_i husband.
 c. [Idan and Dorit]_i like each other’s_i books.²

her as a possessive pronoun can be bound locally and also non-locally.

By the definition of binding domain sketched so far, in (41a), the binding domain of the pronoun should be the whole TP. This incorrectly predicts that (41a) should be ungrammatical due to a violation of Cond. C.

One possibility is to just say that the possessive *her* is systematically ambiguous between a pronoun *her* and an anaphor *her own*. Thus (41a) would involve the anaphor and (41b) would involve the pronoun. This line of reasoning receives some support from the fact that English doesn’t seem to have a simplex possessive reflexive pronoun.

- (42) a. Thomas_i saw his sister.

²What are the judgements concerning: [Idan and Dorit]_i think that Maya likes each other’s_i books.

- b. *Thomas saw himself's_i sister.
- c. *Thomas saw self's_i sister.

Other languages do not have this lexical gap and there we find what our binding theory predicts.

(43) Hindi

- a. Thomas-ne apnii behin-ko dekh-aa
Thomas-Erg self.f's sister-Acc see-Pfv
'Thomas_i saw his_i/*_j sister.
- b. Thomas-ne us-kii behin-ko dekh-aa
Thomas-Erg he-Gen.f sister-Acc see-Pfv
'Thomas_i saw his_j/*_i sister.

This line of reasoning may be correct but it does not account for the lack of complementarity in anaphor/pronoun distribution that we found with anaphors/pronouns inside NPs. These were cases where both a pronoun and an anaphor can felicitously appear.

- (44) a. Bruce thinks that [_{TP} [a beautiful picture of himself/him_i] is hanging on the outside wall of the gym].
- b. They_i heard stories about them/themselves_i.

If we reverse engineer from (44) and the basic binding conditions as we know them, we are forced to the conclusion that contrary to our assumption, anaphors and pronouns are not required to have the same binding domain. In both (44a, b), the binding domain of the anaphor would include the matrix subject, but the binding domain of the pronoun would not i.e. the binding domain of the anaphor would be bigger than the binding domain of the pronoun.

Why would anaphors and pronouns have different binding domains? Further why would the binding domain of the anaphor be larger than the binding domain of the pronoun?

The following answer suggests itself: anaphors **need** to be locally bound, while pronouns **need** to be locally free.

- So we want to give the anaphor a binding domain where it *in principle* has a chance to get bound i.e. there is an accessible subject.
- The binding domain for the pronoun can be more conservatively defined - any subject like element, accessible or not, will do.

Expletive subjects satisfy the *in principle*.

- (45) a. *Miguel_i said that it seemed to himself_i that we were trying to speak Dutch.
- b. Miguel_i said that it seemed to him_i that we were trying to speak Dutch.

(46) Binding Domain (Final Attempt for now):

- a. For Anaphors: the binding domain of an NP is the smallest XP that contains (i) the NP, (ii) its case-marker, and (iii) an **accessible** subject.
- b. For Pronouns: the binding domain of an NP is the smallest XP that contains (i) the NP, (ii) its case-marker, and (iii) a subject.

It was mentioned earlier that there is speaker variation concerning the acceptability of *John_i saw [a picture of him_i]*. It is possible that this variation can be related to what counts as a subject in (46). The speakers who permit coreference would be analyzing the determiner as a subject, while those who do not allow for coreference will not allow it to satisfy the subject requirement.

4 Digression: Garden Path Sentences

- (47) a. The daughter of the king's son likes himself. (Christina Willis p.c.)
b. The horse raced past the barn fell.
c. I drove my aunt from Peoria's car.

References

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