Binding in Turkish Nominal Phrases and Phase-Sliding[1]

Murat Özgen

ORCID ID: 0000-0001-7960-6627

Dokuz Eylül Üniversitesi Edebiyat Fakültesi Dilbilim Bölümü, İzmir

murat.ozgen@deu.edu.tr

ABSTRACT: There are studies within literature which claim that nominal phrases such as DPs also constitute phases in addition to v*Ps and CPs (Chomsky, 2006; Hiraiwa, 2005; Marantz, 2007; Ott, 2008 and Svenious, 2004 among others). Every phase is subject to a strict locality condition, i.e. Phase Impenetrability Condition (Chomsky, 2001), which forms an opaque domain for external probes. As one of the phenomenon subject to this strict locality, anaphor binding is allowed only within a given phase, since each phase is a local domain for the binding to occur. However, binding in Turkish CPs and DPs behave differently from each other. While the former allows only local reflexive binding, the latter allows distant reflexive binding as well. If DPs are also assumed to be phases, then they must not allow distant reflexive binding. I claim that this problem is an extension of an operation referred to as phase-sliding. It is an operation that extends the phase boundary by pushing up the borders of a spell-out domain (Gallego, 2010). It occurs when a phase head H^0 is raised to another head X^0 to form a complex $[H^0+X^0]$. This study aims to show that this operation accounts for the asymmetry between the binding behaviors of the two phases, i.e. DPs and CPs.

Keywords: phase-sliding, phasehood, binding, DP, nominal phrases

Türkçe Adcıl Öbeklerde Bağlama ve Evre-Kaydırma

ÖZ: Standart biçimde evre olarak benimsenen eÖ (küçük eylem öbeği) ve TÖ'lerin (tümleyici öbeği) yanısıra, BelÖ başta olmak üzere adcıl öbeklerin de sözdizimsel bir döngü oluşturduğunu savlayan bir alanyazın bulunmaktadır (*bknz.* Chomsky, 2006; Hiraiwa, 2005; Marantz, 2007; Ott, 2008 ve Svenious,

2004). Sözdizimsel döngü oluşturan bu evrelerin *Evre Girimsizliği Koşulu* (*ing.* Phase Impenetrability Condition) (Chomsky, 2001) gereği dış *sonda*ların (*ing.* probe) işlemlerine karşı geçirimsiz bir alan oluşturmaları beklenir. Sözgelimi, göndergelerin yerel bir öncül tarafından bağlanması bu sözdizimsel döngülerde gerçekleşir, çünkü her evre aslında bir yerel alandır. Ancak BelÖ ve TÖ'lerin bağlama davranışlarına göz atıldığında BelÖ'lerdeki geçirimsizliğin ortadan kalktığı görülür. Yani, BelÖ'ler göndergelerin uzaktan bağlanmasına da izin verirken, TÖ'ler ise yalnızca yerel bağlamaya izin verir. Eğer adcıl öbekler alanyazında varsayıldığı biçimiyle birer evre olarak benimsenirse, gönderge bağlamanın her iki tümcede de aynı yerellik etkisini göstermesi beklenir. Bu bakışımsızlığın evrelerde gerçekleşen evre kaydırımı işleminin bir sonucu olduğunu düşünmekteyiz. Evre-kaydırımı dağıtım alanı sınırlarını genişleten bir işlemdir (Gallego, 2010). Bu durum, H^0 gibi bir evre başının bir diğer baş X^0'ye eklenip $[H^0+X^0]$ karmaşığını oluşturmasıyla gerçekleşir. Bu çalışma da BelÖ ve TÖ'lerde bağlama açısından ortaya çıkan bu dağılımsal farklılığı evre kaydırımı ile açıklamayı hedeflemektedir.
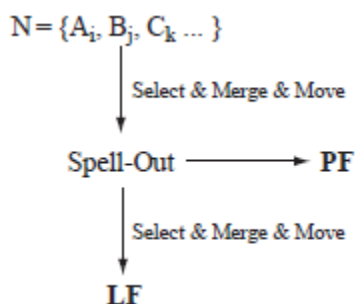
Anahtar sözcükler: Evre-kaydırma, evrelik, tanılar, eşsüremsiz dağıtım, BelÖ

1 Introduction

As put by Chomsky (1995 and subsequent studies), The Minimalist Program maintains that the derivations and representations constituting linguistic competence conform to an 'economy' criterion. Therefore, language is the most optimal solution to the computational system, which formalists call *grammar*, and to the constraints imposed by two interfaces. These interfaces are the articulatory-perceptual system and the conceptual-intentional system. Articulatory-perceptual system is known briefly as PF, while conceptual-intentional system is known as LF.[2]

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[2] Recent studies in Phase Theory (Chomsky 2000, 2001, 2008) uses the terms <PHON> and <SEM> to denote these two interfaces. For the ease of understanding throughout the study, I will employ the common abbreviations PF and LF to refer to these two interfaces respectively.

Figure 1. The Single Spell-Out Architecture of Grammar

$$N = \{A_i, B_j, C_k \dots \}$$

$$\downarrow \text{Select \& Merge \& Move}$$

$$\text{Spell-Out} \longrightarrow \textbf{PF}$$

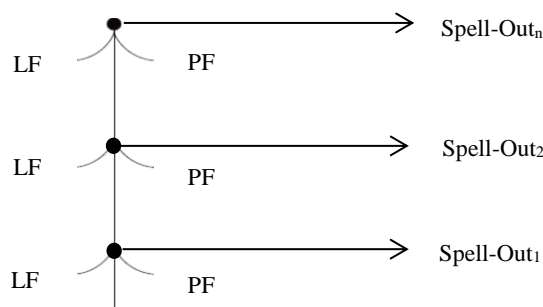$$\downarrow \text{Select \& Merge \& Move}$$

$$\textbf{LF}$$

(Hornstein, Nunes & Grohmann, 2005, p. 73)

Chomsky (1995) suggests that such a starting point is a numeration, understood to be a set of pairs (LI, i), where LI is a lexical item and i indicates the number of instances of that lexical item that are available for the computation. Given a numeration N, the computational system accesses the lexical items of N through the operation Select and builds syntactic structures through the operations Merge and Move. At some point in the derivation, the system employs the operation Spell-Out, which splits the computation in two parts, leading to PF and LF. The mapping that leads to LF is referred to as the covert component and the one that leads to PF as the phonetic/phonological component; the computation that precedes Spell-Out is referred to as overt syntax (Hornstein, Nunes & Grohmann, 2005, p. 73).

In more recent studies, the idea of Multiple Spell-Out is forwarded, which suggests that a derivation is composed of incremental computations called *phases*. A derivation is a syntactic computation that operates with syntactic objects (lexical items and phrases built from them) and yields a phonological, and a semantic object. The phonological object is a PF object, and the semantic object is a LF object. If both objects comply with Full Interpretation (i.e. all [–interpretable] features have been appropriately checked), the derivation is said to converge at PF and LF (Hornstein, Nunes & Grohmann, 2005, p. 331) The key point here is that a phase must be legible at both interfaces, which suggests the idea that phases can be isolated at <PF, LF>.

Figure 2. The Multiple Spell-Out Architecture of Grammar

$$\text{LF} \qquad \text{PF} \longrightarrow \text{Spell-Out}_n$$

$$\text{LF} \qquad \text{PF} \longrightarrow \text{Spell-Out}_2$$

$$\text{LF} \qquad \text{PF} \longrightarrow \text{Spell-Out}_1$$

What is different in Figure 2 from Figure 1 is that at certain points of the derivation, the syntactic information is shipped to the interfaces <PF, LF>. Those certain points are the spell-out points so the parts of the derivation are sent to interfaces more than one time (i.e. multiple times).

The derivation chunk between two spell-out points is called a phase, and each phase is built on a separate lexical subarray. Chomksy (2008) claims that each phase is a propositional unit/ *v**Ps and CPs are phases because he argues that the former indicates an argument complex where roles are marked and the predication is built, while the latter is the propositional complex. Chomsky (2008, p. 143) also claims that DPs are also propositional as well as CPs, thus they might as well be phases. This reasoning has been widely discussed in the literature (*see* Mathushansky, 2005; Svenious, 2004; Marantz, 2007; Ott, 2008 and Hiraiwa, 2005), studies in this regard tend to conclude that DPs are also phases.

Each phase has a phase head which has an edge and a spell-out property. While edge property of a phase functions as an escape hatch, the spell-out property of each phase head enables strong locality:

(1)
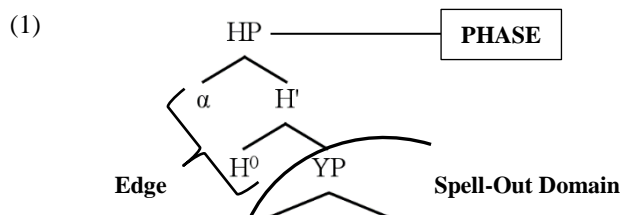
(Adapted from Citko, 2014, p. 32)

HP is the phase in the tree in (1), and the phase head is H^0. The edge of the phase are α, and H^0. The spell-out is triggered by the phase head H^0, and it contains YP. The spell-out domain is interpreted at <PF, LF>. Following spell-out, the domain shipped to interfaces becomes opaque to external probes. This is formulated by *Phase Impenetrability Condition* (PIC):

(2) *Phase Impenetrability Condition (PIC)*
     The domain of H is not accessible to operations at ZP; only H and its edge
     are accessible to such operations.

                                                    (Chomsky, 2001, pp. 13-14)

This definition of PIC allows probing inside the spell-out domain until the next phase head is merged. Assume another non-phase head X^0 merged with the phase

HP. This head, as a non-phase head, can agree with YP since YP is not spelled out until another phase head (say Z^0) is merged:

(3)
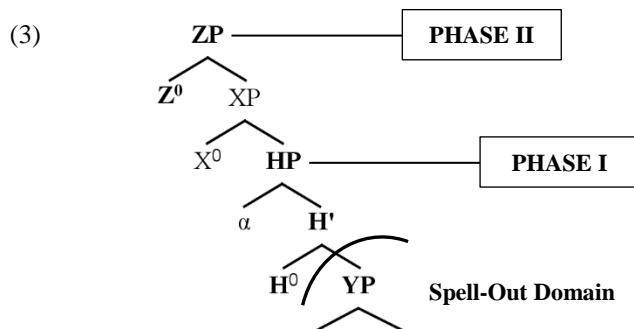
The definition of PIC given in (2) is the weak version of PIC. Under this definition of PIC, X^0 in (3) can agree with YP since YP is not spelled out until Z^0 is merged as shown in (3).

Since PIC renders the spell-out domain opaque to further operations, it can predict the binding properties of anaphors. Anaphors are subject to strict locality. That is, each phasal domain is a local domain and anaphor binding occurs at each phasal domain:

(4) Polis$_j$ [$_{CP}$ hırsız$_i$ kendi$_{i/*j}$-ni yarala-dı   diye]   bil-iyor
     cop   burglar self-ACC   wound-PAST COMP   know-PROG
     'The cop$_j$ knows that the burglar$_i$ wounded himself$_{i/*j}$'

The anaphor *kendi* in (4) can only be indexed with the phasemate antecedent *hırsız* 'burglar'. Otherwise, it is ungrammatical as shown with *j* indexation.

A similar effect would be expected at DP phasal domain if we follow Chomsky (2006) and Hiraiwa (2005) and assume that DPs are phases just like CPs:

(5) Polis$_j$ [$_{DP}$ hırsız$_i$-ın   kendi$_{i/j}$-ni yarala-dığ-ın]-ı   bil-iyor
     cop   burglar-GEN self-ACC   wound-VNOM-POSS-ACC know-PROG
     '(*int.*) The cop$_i$ knows that the burglar wounded him$_i$'

(5) is different from (4) in that it allows interphasal[3] binding. The anaphor *kendi* within the DP can be indexed with a local antecedent *hırsız* as well as with a distant antecedent *polis*, which is out of its phasal domain. Therefore, we can say that the opaqueness of the phasal domain is distorted. The asymmetry between

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[3] By interphasal, I mean that the binding occurs between two different spell-out domains. The term is first proposed by Richards (2007a).

(4) and (5) is the problem of this study. If we assume that DPs are phases following Chomsky (2006) and Hiraiwa (2005), (5) should have blocked interphasal binding. This problem needs clarifying. The aim of the study is to explain the different behaviors of these two domains within the light of an operation referred to as *Phase Sliding* (Gallego, 2010). I will show that the asymmetry between these two domains stems from this phase sliding that occurs at each phasal domain whenever head-movement is triggered. To this end, Section 2 presents a short summary about binding within the framework of phases. Section 3 discusses DPs in Turkish. Section 4 introduces the phase sliding mechanism and analyzes the problem within the framework of phase sliding. Section 5 concludes the study.

2   Binding, Phases and Binding in Turkish

Binding relations are discussed under the government category in Government and Binding Theory. Principle A refers to anaphors while Principle B refers to pronominals:

(6)   *Principle A*
       An anaphor must be bound in its governing category.
       Principle B
       A pronominal must be free in its governing category.

                                               (Haegemann, 1994, p. 228)

Binding Theory includes indexation operation that satisfies the binding principles. As Minimalism progresses, this indexation process transforms into an interpretive operation. Nominal phrases enter the derivation with anaphoric features and they are indexed with the phrases that bear matching features. Chomsky (1995, p. 43) mentions these two interpretation conditions regarding Principle A and B:

(7)   *Binding Conditions*
       a. if ɑ is an anaphor, interpret this anaphor co-indexed with a c-commanding
          phrase in D(omain).
       b. if ɑ is a pronominal, interpret this anaphor independent from each c-
          commanding phrase in D(omain).

As we mentioned above, on phasal grounds, the sister of a phase head is shipped to interfaces, and this area becomes an opaque domain for further syntactic operations due to PIC. Binding is an operation that configures the distribution of nominals in certain c-command relations. Since it includes a co-reference relationship between two nominals, it is accepted as an LF-correlate (*cf.* Gallego,

2009; Quicoli, 2008; Lee-Schoenfeld, 2004). Lee-Schoenfeld (2004, p. 147) defines Principle A and Principle B within the framework of phases:
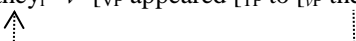
(8)   *Principle A*
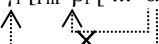   An anaphor is bound within its accessible phase.
      Principle B
      A pronominal must be free within its accessible phase.

Quicoli (2008, p. 304) presents the following two examples to elaborate the above-mentioned principles:

(9)   a. [$_{vP}$ they$_i$ v^0 [$_{VP}$ respect each other$_i$]]
      b. [$_{vP}$ they$_i$ v^0 [$_{VP}$ appeared [$_{TP}$ to [$_{vP}$ ~~they~~$_i$ v^0 [$_{VP}$ respect each other$_i$]]]]]

In (9a), Principle A operates before the movement occurs within the first phasal domain, and indexes the anaphor *each other* with the antecedent *they*. Therefore, the term accessible phase refers to the whole phasal domain. Take, for instance, PhP as a phase. If α is an anaphor, then it should find its antecedent β within PhP, not outside of it:

(10)   [$_{XP}$ γ$_i$ [$_{PhP}$ β$_i$ [... α$_i$ ...]]]

The representation in (10) predicts that in a CP phase an anaphor is co-indexed with another nominal within the same phrase:

(11)   a. John$_j$ said that [$_{CP}$ Peter$_i$ wounded himself$_{i/*j}$]
       b. Ali$_j$ [Murat$_i$ kendi$_{i/*j}$-ni yarala-dı   diye]   bil-iyor
          Ali Murat self-ACC   wound-PAST   that   suppose-PROG
          'Ali knows that Murat wounded himself'

(11a-b) clearly bear out the prediction given in (10). The anaphors *himself* and *kendi* in (11a) and (11b) are co-indexed with the embedded antecedent *Peter* and *Murat* respectively, whereas the co-indexation is impossible out of this domain.
    The point so far is that binding operates on phasal grounds at each phase. To show this, Quicoli (2008, p. 313) uses the following examples:

(12)   John$_j$ wonders which pictures of himself$_{i/j}$ Bill$_i$ saw.

(12) is ambiguous in the sense that the anaphor *himself* is bound with both the matrix subject *John* and the embedded subject *Bill*. Huang (1993, p. 104) claims

that this ambiguity stems from wh-movement. If wh-movement had not taken place, the anaphor binding would have occurred in the embedded clause only:

(13) John$_j$ said that [Bill$_i$ saw [a picture of himself$_{i/*j}$]]

<div align="right">(Quicoli, 2008, p. 313)</div>

Due to PIC, moving wh-phrases interphasally requires that phrases be moved through the edges of phases:

(14) [$_{vP}$ [$_{NP}$ which pictures of himself] [Bill$_i$ [saw [$_{NP}$ ~~WHICH PICTURES OF HIMSELF$_i$~~]]]]

Quicoli (2008, p. 316) argues that the NP 'which pictures of himself' is moved to Spec, CP through the edge of *v*P. PIC requirement on the moved NP enables the embedded subject *Bill* to bind the unpronounced copy of the anaphor. Another copy of this phrase is at the edge of the *v*P phase as seen in (14), which makes it visible for other antecedents in an upper phase:

(15) [$_{vP}$ John$_j$ wonders [$_{CP}$ [which picture of himself$_{i/j}$] [$_{TP}$ Bill$_i$ [$_{vP}$ [$_{NP}$ ~~WHICH PICTURES OF HIMSELF$_i$~~] [Bill$_i$ [saw [$_{NP}$ ~~WHICH PICTURES OF HIMSELF$_i$~~]]]]

(15) explains the ambiguity through PIC, i.e. the anaphor *himself* has been bound by both the matrix subject *John* and the embedded subject *Bill*. The point here is that binding occurs phase by phase in a cyclic fashion (*cf.* Uriagereka 1999).

    Given that anaphor binding occurs in a given phase, we can use the same reasoning to show that DPs are also subject to these principles since they are assumed to be phases following Chomsky (2006) and Hiraiwa (2005). In this sense, Svenious (2004) claims that DPs also behave like CPs in terms of anaphor binding:

(16) *John$_i$ saw [$_{DP}$ Casey's pictures of himself$_i$]

The fact that the co-indexation between the anaphor *himself* and the matrix subject *John* is not possible out of the DP in (16) suggests that DP is a phase. If we apply this diagnostic to Turkish nominal phrases, i.e. DPs, we can see that the opacity of such phrases disappears. Note that we need a two-place predicate to test this hypothesis. However, before we move on to identify the difference between the two domains, we will distinguish between the DP-types that are under analysis here.

3   DPs in Turkish

There have been many studies regarding the question as to whether DPs exist in Turkish or not. Studies in this regard within the literature can be divided in two.

On the one side, some studies claim that DPs do exist in Turkish (Erk-Emeksiz, 2003; Keskin, 2009, Tuğcu, 2009). On the other side of the discussion stand studies which claim there is no DP construction in Turkish (Bošković & Şener, 2012; Bošković, 2010). On the other side of the discussion stand studies which claim there is no DP construction in Turkish (Bošković & Şener, 2012; Bošković, 2010; Öztürk, 2005). I follow Hiraiwa (2005) and Svenious (2004) as well as Erk-Emeksiz (2003), Keskin (2009) and Tuğcu (2009) and assume that there are DP constructions in Turkish.

On a descriptive level, there are four types of DPs in Turkish. The first one is bare DP, which only bears possessive marking as in (17):

(17) [DP [NP Kapı kol-u]]⁴
          door knob-3SG.POSS
      'Door knob'

The second type of DP in Turkish is Agreeing DPs, which bear genitive-possessive agreement as in (18):

(18) [DP Ali-nin [NP kitab-ı]]
          Ali-GEN   book-3SG.POSS
      'Ali's book'

The third type of DPs in Turkish bears genitive-possessive agreement as well as an acc-marked object (*see* Keskin 2009), which I will call a complex DP:

(19) [DP Doktor-un [PredP hasta-yı   muayene-si]]
          Doctor-GEN   patient-ACC examination-3SG.POSS
      'Doctor's examination of the patient'

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⁴ An anonymous reviewer has asked me to provide an argument to support the assumption that the expression in (17) is a DP rather than a NP. Since such constructions can support pronominalization, they can be regarded as DPs:

(1) A: Enginar pişir-me-yi bil-mi-yor-um.
         artichoke cook-VN-ACC know-NEG-PROG-1SG

        'I don't know how to cook artichoke'

     B: Masa-da [yemek kitab-ı]ᵢ var. [Oᵢ-na] bak.
         table-LOC   cook book-POSS exist it-DAT   look

        'There is a cookbook on the table. Have a look at it.'

There are further aspects that should be considered. However, for the sake of the purposes of the study, I leave this issue for future studies, since the DP/NP distinction here does not influence the analysis of the paper.

The last type of DPs is sentential DPs in Turkish. They bear genitive-possessive agreement along with a verb carrying a verbal nominalizer:

(20) [DP Ali-nin [CP   kereviz-i   ye-diğ-i]
        Ali-GEN   celery-ACC eat-VNOM-3SG.POSS
     'Ali's eating of the celery'

DPs are deemed as phases, since they present a propositional complex in the same way as CPs and *v**Ps (*see* Hiraiwa, 2005; Svenious, 2004). Take, for instance, (21a). The agreeing DP in (21a) indicates an existential relationship between *Ali* and *kitap* (book). The proposition here leads us to the conclusion that *Ali has a book*. Therefore, the conceptual side of the DP resembles to that of the full finite clause 'Ali has a book', which is an observation attained in Hiraiwa (2005) among others. Besides, following Matushansky (2005, p. 159), if we take propositional complexity argument to display that there might be some limit on the number of projections in the workspace, then DPs in Turkish must contain phases since they exhaust the memory resources available:

(21) a. Ali-nin   kitab-ı
        Ali-GEN   book-3SG.POSS
        'Ali's book'
     b. Ali-nin   kardeş-i-nin   arkadaş-ı-nın   hala-sı-nın ...
        Ali-GEN   sister-3SG.POSS-GEN friend-3SG.POSS-GEN aunt-3SG.POSS.GEN
         kitab-ı
         book-3SG.POSS
         'Ali's sister's friend's aunt's ... book'

The fact that the DP in (21b) is iterated in terms of a noun rather a modifier indicates that computational complexity is right in stating that there might be a limit on the number of maximal projections (*see* Mathushanksy, 2005). Therefore, on conceptual grounds, DPs seem to constitute phases.

   Since binding is an operation that allows local coreference between an anaphor and an antecedent, we need a two-place predicate within the DP in order to place the anaphor as an internal argument. This will place the anaphor within the spell-out domain so that it will not be able to escape the PIC effect. Before analyzing the problem in detail, I will assume that complex DPs and sentential DPs display the following hierarchy. Note that the shaded areas are presumably spelled-out domains after partial phase sliding, and that GenP stands for a genitive marked NP for the ease of understanding:

(22) a. *Complex DP*
     [DP [GenP …] [D' [PredP [NP …] Pred^0] D$^0_{u[\varphi:]}$]

b. *Sentential DP*
[$_{DP}$ [$_{GenP}$ …] [$_{D'}$ [$_{CP}$ [$_{TP}$ [$_{vP}$ [$_{NP}$ …] v^0] T^0] C$^0_{[DEF]}$] D$^0_{u[\varphi:]}$]

Following Keskin (2009), (22a) is a complex DP in which the genitive and accusative marking are realized by D^0. Keskin compares inherently case-marked (i.e. ablative, dative etc.) internal arguments of DPs with structurally case-marked (i.e. accusative) internal arguments of DPs:

(23) a. Ali-nin   oyuncu-lar-a   hediye-si
     Ali-GEN   player-PL-DAT   present-3SG.POSS
   'Ali's present to the players'
    b. Ali-nin   hasta-yı   muayene-si
     Ali-GEN   patient-ACC   examination-3SG.POSS
   'Ali's examination of the patient'

Keskin follows Sezer (1991) and claims that cases such as dative, ablative etc. are inherent cases, and licensing of such cases are directly related to their θ-marking. He also claims that cases such as accusative as seen in (23b) are structural; therefore, they are licensed by D^0 head, which dominates a verbal noun construction projected as PredP. In addition, Keskin follows Pesetsky and Torrego's (2001) system of multiple agree and argues that D^0 also licenses the genitive marking in Spec, DP:

(24)
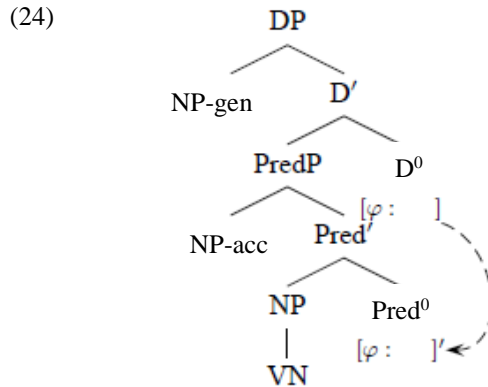
Pred^0 inherits the unvalued φ-features on D^0. In this way, Pred^0 can license accusative case at Spec, PredP. Similarly, following multiple agree, D^0 can license the genitive marking at Spec, DP as well.

   (22b) is a sentential projection of a nominal phrase, which bears genitive possessive agreement. As has been given in (22b), this DP includes a CP whose head has defective features; thus it is selected by a functional nominal head,

namely n^0. This analysis belongs to Ulutaş (2008), who claims that the nominal nature of such clauses stems from the fact that n^0 (in our case it is D^0 to maintain the consistency) bears uninterpretable φ-features, and that it can transfer these features to T^0 since C^0 is defective. Ulutaş (2008, p. 7) gives a tree representation for this construction:

(25)
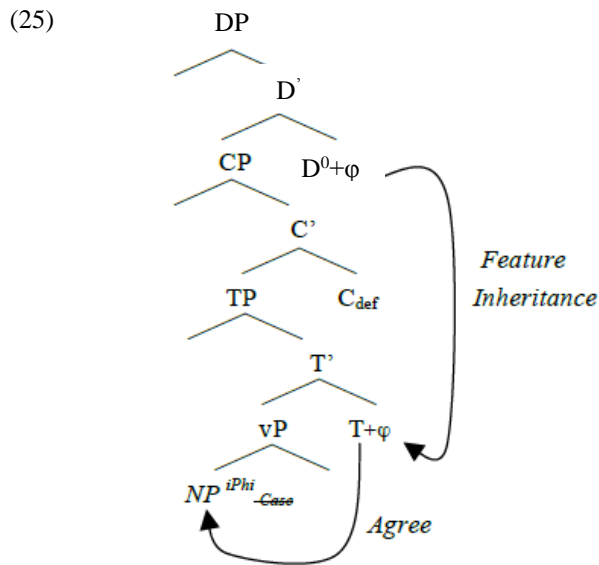
For (25), he claims that when the C^0 head merges with the T^0 head, T^0 cannot inherit any φ-probe from the C^0 head because of its defective nature[5]. If we assume this construction, we can make the claim that the CP within sentential DPs in our analysis does not constitute a phase since its head is defective.

To sum, I will follow Keskin's (2009) argument for complex DPs given in (22a), and Ulutaş's (2009) claim for sentential DPs given in (22b).

4   Analysis: Phase Sliding Mechanism

This section analyzes the opacity problem of DPs in terms of binding relations.

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[5] The system attested in Ulutaş (2008, p.7) is problematic in one way, as pointed out by an anonymous reviewer. C^0-T^0 feature inheritance occurs independently of the defectiveness of C^0, otherwise deletion of valued features would result in automatic crash as put forward by Richards (2007b), Danon (2011), and Inokuma (2013) among others. However, the system here would still work for the analysis proposed in the text no matter which approach I would assume. That is, the GEN-case of the subject of the nominal clause would still be licensed within Spec, *v*P under AGREE.

To do so, I will first elaborate the problem in terms of complex and sentential DPs, and show that the opacity also fails at complex DPs when it comes to binding. Then, I will summarize the basic points of phase sliding mechanism and I will go on to analyze this opacity problem within the framework of phase sliding.

4.1 The elaboration of the problem

So far, I have attempted to show that the CPs and DPs have different distributions of binding. On the basis of what I have argued in the previous section, let us compare the binding behaviors of complex and sentential DPs to full CPs:

(26) a. *Complex DPs*
      Yaşlı adam_i [DP çocuk-lar-ın   kendi_i-ni ziyaret-i]-nden
      old   man   child-PLUR-GEN self-ACC visit-3SG.POSS-ABL
      mutlu ol-du
      happy become-PAST
      'The old man became happy with the children's visit to him'
   b. *Sentential DPs*
      Ali_i [DP benim kendi_i-nden kork-tuğ-um]-u   san-ıyor.
      Ali   my   self-ABL   be.afraid-VNOM-1SG.POSS suppose-PROG
      'Ali thinks that I am afraid of him.'

(26a) includes a complex DP in which the anaphor *kendi* (self) can be co-indexed with an external antecedent. (26b) involves the same strategy. DP-external antecedent *Ali* can be co-indexed with the phase internal anaphor *kendi*. Data in (26a-b) suggest that DPs fail at the opacity condition on binding. This situation becomes clearer when we turn this DP into a finite CP:

(27) *Ali_i [CP ben kendi_i-nden kork-tu-m   diye] bil-iyor.
       Ali   I   self-ABL   be.afraid-PAST-1SG   that know-PROG
      'Ali know that I was afraid of him.'

Since full CPs are assumed to be phases, the anaphor cannot find its antecedent out of this phasal domain. The ungrammaticality of (27) indicates that only local binding, which is restricted to the given spell-out domain, is allowed. Before we move on to analyze this asymmetry between two presumably phasal domains, let us discuss the basic reasoning behind phase sliding mechanism.

4.2 Phase Sliding

The literature has agreed upon two types of movement. On one hand, there is phrasal movement which is feature-driven. This type of movement is targeted at

Specs. On the other hand, there is head movement, which, according to Vicente (2007, p. 17), is triggered to create a larger morphological unit. This type of movement is targeted at heads. Gallego (2010, p. 107) claims that a type of head movement, v*-T-(C) movement, is a type of feature driven movement. Therefore, whenever such movement occurs, he assumes that the label of the complex is hybrid (adapted from Gallego, 2010, p. 107):

(28) a. [$_{CP}$ C$_{[TENSE]}$ [$_{TP}$ v*-T$_{[TENSE]}$ [$_{v*P}$ EA t$_{v*}$...]]]   Label $\rightarrow$ v*-T
      b. [$_{CP}$ T-C$_{[TENSE]}$ [$_{TP}$ t$_T$ [$_{v*P}$ EA v*$_{[TENSE]}$...]]]   Label $\rightarrow$ T$_S$-C

The label is a label which is hybrid as seen in (28a-b). This eliminates the antilocality worries in the sense of Abels (2003). The labels v*-T and T$_S$-C are labels which are hybrid as seen in (28a-b). This eliminates the antilocality worries in the sense of Abels (2003). Abels states that movement out of a phase must pass through the specifier position of that phase. The idea of the account is that every step of movement must establish a relation between the moved item and some other element in the phrase marker which is in a well-defined sense closer than the relation they were in prior to movement. Movement from complement to specifier position within the same phrase never achieves this. Therefore, since the operation in (28a-b) creates a new label, it is not vacuous.

Gallego (2010) claims that v*-T movement is directly based on the notion of phases. Such movement extends the feature checking domain, which is an abandoned idea in generative tradition. Chomsky (1986) presented arguments in favor of removal of VP's barrierhood whenever a head movement such as v*-T movement (at the time, V-INFL) occurs. This is due to the fact that this head movement results in an amalgamated form of heads.[6]

According to Gallego, if the process in (28a) occurs within narrow syntax, v*, as a strong phase head, can be the center of the resulting structure. Therefore, if any head movement of v*-T takes place, it pushes the phase upstairs. This operation is a kind of an upstairs inheritance. Gallego (Gallego, 2010, p. 108) refers to this operation as *Phase Sliding*:

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[6] Tsai (2008) proposes a similar mechanism with a different approach. Tsai argues that the object specificity follows from a dynamic mechanism of syntax-semantics mapping encoded in the Extended Mapping Hypothesis, and should be treated on a par with Chinese subject specificity. However, the system in Tsai's work is limited in the sense that it only deals with specificity effects and it is based on V-to-I movement and concomitant extension of Nuclear Scope.

(29) *Phase Sliding*
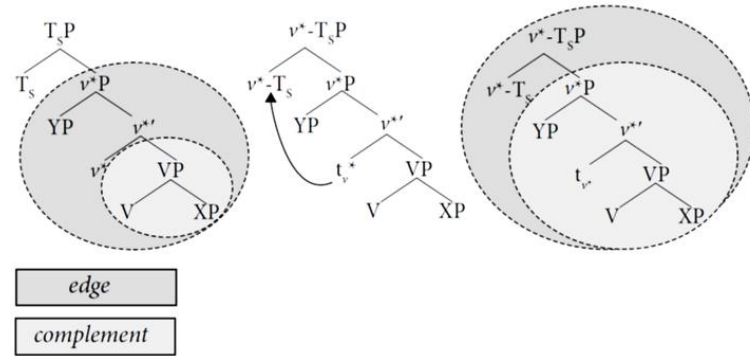
The resulting structure is the *v**-T complex which behaves as a phase head. It indirectly suggests that phases can vary from one language to another. For instance, in a language including this type of movement such as Turkish the phase head is a complex of *v**-T, whereas in languages where no such movement occurs the phase head is *v** itself. In a nutshell, the idea I will employ in the analysis here is based on the notion that the phasal domain pushes further up if the relevant phase head moves to adjoin another head.

4.3 Binding in DPs and phase sliding

The data from binding in (26) have suggested that DPs fail at constituting an opaque domain, since they allow so-called interphasal co-indexation of an anaphor embedded within themselves. Since binding of anaphors is realized within the same phase, such a situation calls for an account.

   Let us take the case in (26a) for instance. To clearly see the analysis in detail, I will present the derivation on a tree below in (30b). There, the dotted area refers to the spell-out domain. The fact that the spell-out domain is a big chunk including the first presumed spell-out domain (i.e. NP-vn) is due to the phase-sliding analysis put forth here: Pred^0 raises to adjoin D^0, which means that it pushes up the spell-out domain:

(30) a. Yaşlı adam$_i$ [$_{DP}$ çocuk-lar-ın   kendi$_i$-ni ziyaret-i]-nden
          old   man   child-PLUR-GEN self-ACC visit-3SG.POSS-ABL
          mutlu ol-du
          happy become-PAST

      b.
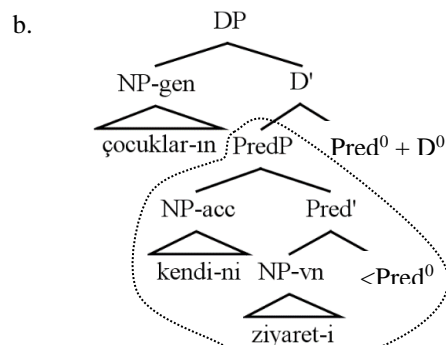
(30b) has the following consequence. The first spell-out domain is assumed to be NP-vn, following Keskin (2009). After $Pred^0$ is raised to adjoin to D^0, the spell-out domain is extended, which makes the anaphor *kendi* within NP-acc open to higher probes. The rest of the derivation includes merging of another phase head v^0:

(31)
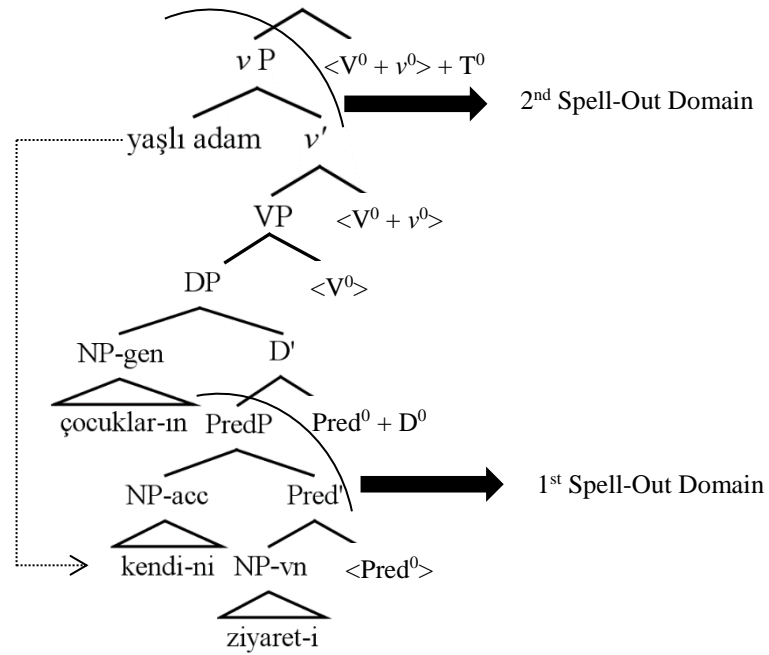
Before moving onto the analysis of the structure in (31), I need to show that subjects can remain within *v*P without raising to Spec, TP. If it is assumed that negation as a grammatical category is introduced right above the theta domain, then negation can take scope over all the constituents it c-commands following a long tradition starting with Klima (1964). Öztürk (2005) follows the same idea and shows that the negation can also take scope over the subjects in Turkish. Take, for instance, the sentence given in (32) cited from Öztürk (2005, p.131), which is modified slightly for the purposes of the study:

(32) [NegP [*v*P Bütün   çocuklar   o   test-e   gir]-me]-di.
              all   children   that   test-DAT take-not-PAST
   'All children did not take the test.' (*all>not; not>all)

The Turkish example given in (32) shows that the negation takes scope over the arguments of the verbs as seen in the scope relation 'not>all'. Based on the scope

relations, it is safe to say that both the subject and the object can remain in situ in the example above.

Now, let us return to the example (31). According to PIC (Chomsky, 2001), spell-out of a phase is triggered by the insertion of the next strong head, therefore the content of the spell-out domain still remains accessible to the next strong phase after the completion of the phase it belongs to. As a result, until the next phase head is merged and raised to phase-slide, the contents of this DP remain open to probes. Therefore, the antecedent within the matrix clause *yaşlı adam* can bind the anaphor within the complex DP *kendi*.

We can observe the same effect in sentential DPs as well. According to the analysis put forth here, phase-sliding can account for the interphasal binding: V^0 raises to adjoin to v^0 and ends up in D^0, which means that it pushes up the spell-out domain:

(33) a. Ali$_i$ [$_{DP}$ benim kendi$_i$-nden kork-tuğ-um]-u   san-ıyor.
          Ali   my   self-ABL   be.afraid-VNOM-1SG.POSS suppose-PROG
          'Ali thinks that I am afraid of him.'

b.
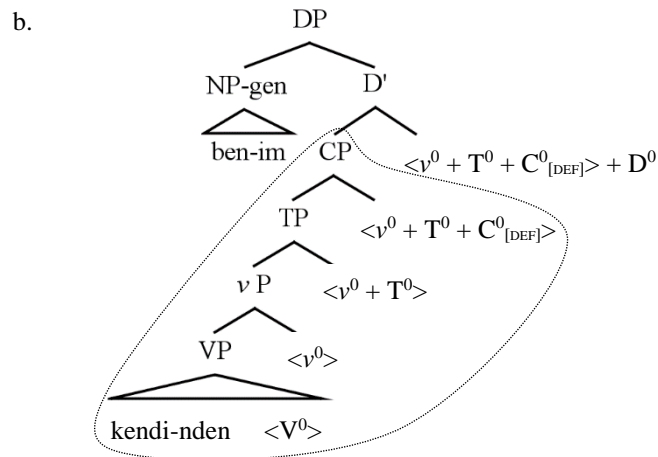
Similar to what has been seen in (31), this delay and extension of phasal domain has one consequence. According to PIC (Chomsky 2001), the spell-out of a phase is triggered by the insertion of the next strong head, therefore the content of the spell-out domain still remains accessible to the next strong phase after the completion of the phase it belongs to. As a result, until the next phase head is merged and raised to phase-slide, the contents of this DP remain open to probes:

(34)
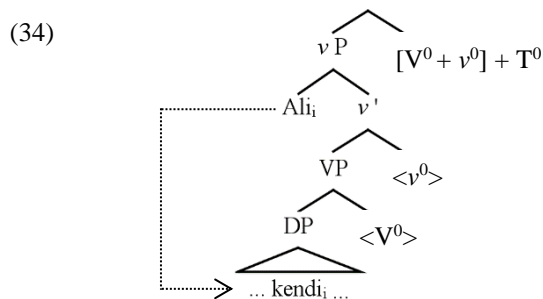
When the matrix V^0 is merged and then raised to T^0, the phasal domain extends including vP, which in turn enables the matrix subject *Ali* to bind the embedded anaphor *kendi*. Then, spell-out occurs and the derivation continues computing. The delay in the spell-out of the first phase is deu to the PIC and phase-sliding interaction. Since the spell-out of a phase is triggered by the insertion of the next strong head, the content of the spell-out domain still remains accessible to the next strong phase after the completion of the phase it belongs to. Therefore, when V^0 raises to adjoin to T^0, the phasal domain extends, which in turn extends the transparent domain where *Ali* can bind the anaphor *kendi* in (34).

The analysis might bring out the question as to how full CPs, as phases, do not allow binding if phase-sliding occurs. To answer this question, let us inspect the simplified tree version of the sentence below. Note that the anaphor *kendi* cannot be bound by the matrix subject in (35a):

(35) a. *Ali$_i$ [$_{CP}$ ben kendi$_i$-nden kork-tu-m   diye] bil-iyor.
      Ali   I   self-ABL   be.afraid-PAST-1SG that   know-PROG
      'Ali knows that I was afraid of him.'

b.
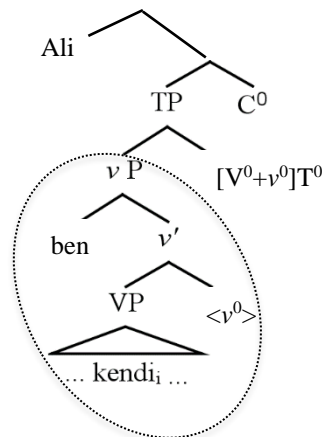
The CP domain in (35a) does not allow binding of the anaphor *kendi* with the matrix subject *Ali* due to two reasons. First, v^0 raises to adjoin to T^0, which triggers a phase-sliding in the embedded CP. The spell-out domain becomes vP and co-indexation cannot occur between the embedded subject *Ali* and the anaphor *kendi*, since they are not in the same phasal domain. Second, due to PIC reasons, the dotted spell-out domain is shipped to interfaces since the other phase head, C^0, is merged and there is no further phase sliding since there is no other head-raising to C^0. In a nutshell, phase sliding makes correct predictions as to the binding transparency of DPs.

One might simply ask the question as to why full finite embedded clauses such as a CP in (35a) does not allow anaphor binding out of CP while an ECM-

clause such as the one given in (36b) below allows such a binding relation between an embedded anaphor and a distant antecedent. Consider the following asymmetry:

(36) a. *Ali$_i$ [$_{CP}$ ben kendi$_i$-nden korku-yor-um   diye] bil-iyor.
           Ali   I   self-ABL   be.afraid-PROG-1SG that   know-PROG
     b. Ali$_i$ [$_{CP}$ ben-i   kendi$_i$-nden korkuyor(-um)   diye] bil-iyor.
         Ali   I -ACC self-ABL   be.afraid-PROG(-1SG) that   know-PROG
       'Ali knows that I am afraid of him'

Rosenbaum (1967) was the first to question whether there is a kind of raising from the subject position of the complement clauses of *believe*-type verbs to the matrix clauses. His seminal study on the English complement system (Rosenbaum, 1967) started a discussion over this issue, and different analyses have been proposed so far in spite of the fact that the core concern has remained the same. What was meant by raising to object, aka ECM, by Rosenbaum is such sentences below:

(37) I believe [him to be an idiot]

As for Turkish ECM clauses, Özgen & Aydın (2016) follow Şener (2008), and assume that ECM constructions and Finite Complement Clauses are structurally identical. Overt-Finite Complement Clauses are unambiguously CPs being headed by an overt complementizer (i.e, *diye*), and null-Finite Complement Clauses also project a CP, but the C^0 head of their CP is not morphologically realized. ECM clauses with no agreement on the embedded verb are assumed to be defective clauses (Özgen & Aydın, 2016; Şener, 2008). Defectivity is not only limited to C^0 head, but it can also be attributed to the Case and Tense features following Pesetsky & Torrego (2007). The defectivity of such domains makes it possible for an embedded anaphor to be bound by a matrix clause antecedent as in (36b).

(36a) is a full overt-finite complement clause headed by the complementizer *diye*. (36b), on the other hand, is an ECM construction, in which the embedded subject has exceptionally been marked with accusative case, and there is no subject agreement on the embedded verb. Within the framework of phase-sliding, the structure of these types of ECM clauses resemble those of sentential DPs in that the defective C^0 cannot spell out the embedded the extended TP domain due to phase-sliding. Therefore, it leaves the derivation transparent to any outside syntactic operation:

(38) a. Ali$_i$ [$_{CP}$ ben-i kendi$_i$-nden kork-uyor(-um)   diye] bil-iyor.
          Ali   I -ACC self-ABL   be.afraid-PROG(-1SG)   that know-PROG

b.
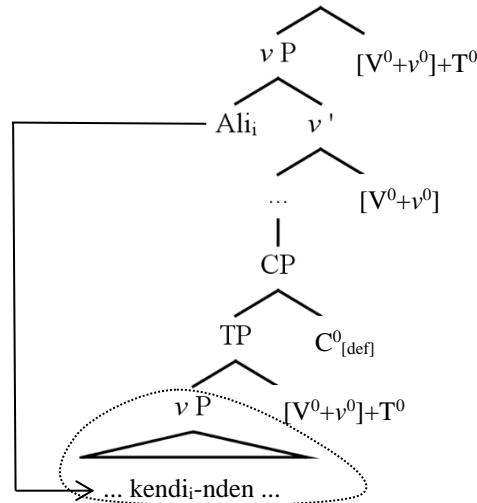
Assuming that the bordered area is the spell-out domain after phase-sliding, it waits for the other phase head to be merged into the derivation to get shipped off to interfaces. However, since C^0 is defective in (38a), the spell-out is delayed until the next phase-sliding (i.e. head-movement to T^0) in matrix clause. This enables the antecedent *Ali* to see the anaphor *kendi-nden* and bind it. In (36a), however, the circled domain will be the spell-out domain again with a slight difference. Since, this time, C^0 is not φ-defective, it will ship the bordered domain to LF, which makes it impossible for the antecedent *Ali* to bind the anaphor *kendi-nden*.

    On the other side of the Binding Principles stands Principle B, so the system should also explain the behavior of the pronominals. Consider the following data:

(39) Ali [ben-i o-ndan   kork-uyor(-um)   diye] bil-iyor.
      Ali I -ACC him-ABL   be.afraid-PROG(-1SG)   that know-PROG
      'Ali knows that I'm afraid of him.'

If phase sliding pushes the domain upwards, the pronominal *ondan* in (39) should not be indexed with Ali in violation of Principle B, but is. Here, I assume that phase-sliding still works, but the binder matrix clause subject raises to Spec, TP following Jimenez-Fernandez and İşsever (2012). They assume a movement analysis of topic fronting following Rizzi (1997), and argue that in discourse-prominent languages, topics are preposed to Spec, TP once discourse features are inherited by T^0. As Spec, TP is traditionally described as an A-position (Lasnik

2003), this is predicted to give rise to A-effects, such as binding improvement. Let us have a look at the examples taken from Jimenez-Fernandez and İşsever (2012, p. 9):

(40) a. *Kendi$_i$ komşu-su   Işık-ı$_i$ gör-dü.
         self   neighbor-3SG.POSS Işık-ACC see-PAST
      b. [Işık-ı$_i$]$_j$ kendi$_i$ komşusu t_j gördü.
         'Işık was seen by her neighbor.'

(40b) shows that Spec, TP is a slot which allows topic movement. Miyagawa (2003) also puts forward the same idea for Japanese. Therefore, if we assume for our case that the subject of the matrix clause checks topic feature inherited by T^0 from C^0 and raises to Spec, TP, then the subject will remain out of the binding domain, thus Principle B is satisfied:

(41)
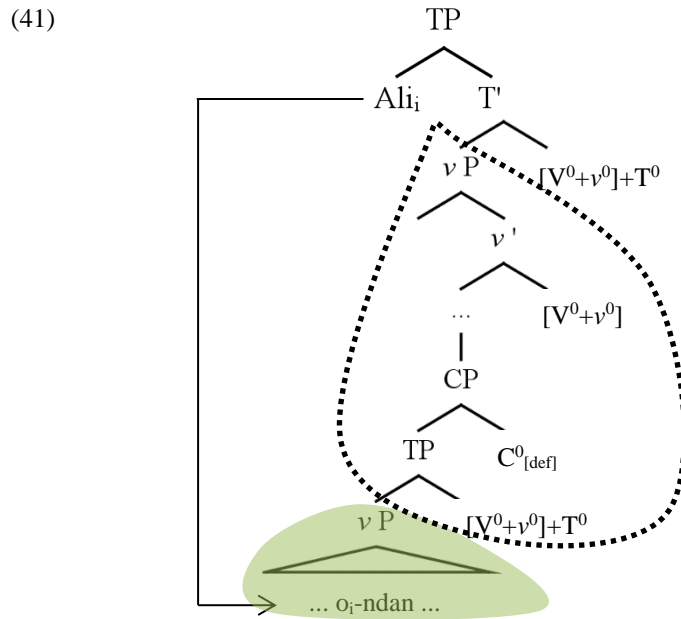
The shaded area in (41) clearly is the spell-out domain. We can clearly see that the domain in which the matrix clause subject *Ali* exists is different from that of the bindee pronominal *ondan*. Since the matrix clause subject *Ali* raises to Spec, TP to check topic feature inherited by T^0 from C^0, it escapes the domain where it can see the pronominal. Therefore, even if the phase-sliding occurs and the domain extends, Principle B as well as Principle A is satisfied in the system I have presented here.

5   Conclusion and Further Theoretical Consequences

In this paper, I attempted to show the opacity difference between the two so-called phasal domains, i.e. DPs and CPs. The claim that nominal phrases such as DPs also constitute phases in addition to *v**Ps and CPs (Chomsky, 2006; Hiraiwa, 2005; Marantz, 2007; Ott, 2008 and Svenious, 2004 among others) brings out the question as to whether DPs also form an opaque domain for higher probes. With this in mind, I employed binding data to show that DPs of Turkish behave in a different manner than CPs in that the former allows distant anaphor binding.

If DPs are assumed to be phases following Chomsky (2006) and Hiraiwa (2005), then they must not allow distant anaphor binding. I claimed that this problem is an extension of an operation referred to as phase-sliding. According to Gallego (2010), it is an operation that extends the phase boundary by pushing up the borders of a spell-out domain. It occurs when a phase head H^0 is raised to another head X^0 to form a complex $[H^0+X^0]$. This study showed that this operation accounts for the asymmetry between the binding behaviors of the two phases, i.e. DPs and CPs. According to the analysis, the first spell-out domain is extended within DPs since non-phase heads are moved to adjoin phase heads. This allows binding of an anaphor outside of its phasal domain.

Phase-sliding operation can account for the asymmetry between the opacity difference of the two phasal domains, i.e. DPs and CPs. However, further problems may arise here if the analysis discussed here holds. Since the spell-out domains extends after head-movement, then the domain of other licensing conditions may also be able to extend. Take, for instance negative polarity item licensing. A negative polarity item (NPI, hereafter) is an expression appearing in negative contexts and requires a licenser varying from overt negation to questions or conditionals (*see* Benmamoun, 1997; Kelepir, 2001; Kumar, 2006; Laka, 2013; Mahajan, 1990). These restrictions on where NPIs can or cannot appear imply that they need to be in a licensing environment:

(42) a. John doesn't have **any** potatoes.
       b. *John has **any** potatoes.

The asymmetry between (42a-b) stems from the fact that the NPI *any* cannot be licensed within a negative licensing environment in (42b). Licensing environment includes licensor and a licensee. Former accounts with a syntactic perspective tend to agree upon the necessity of a c-command relation between the NPI (as a licensee) and its licenser (Benmamoun, 1997; Kelepir, 2001; Kumar, 2006; Kural, 1997; Laka, 2013; Mahajan, 1990; Vasishth, 1999).

Following Kural (1997) and Kayabaşı & Özgen (2018), NPI licensing occurs in a context where the c-command search domain is restricted to the same phase.

Therefore, the licensor and the licensee should be phasemates[7], as is the case in CPs in Turkish:

(43) a. *Ali [CP Ayşe **kimse**-yi   gör-dü diye] bil-**mi**-yor
        Ali   Ayşe **noone**-ACC see-PAST that know-**NEG**-PROG

    b. Ali [CP Ayşe **kimse**-yi   gör-**me**-di   diye] bil-iyor
       Ali   Ayşe **noone**-ACC see-**NEG**-PAST that know-PROG

The asymmetry between (43a) and (43b) stems from the fact that the NPI *kimse* cannot be licensed, although the licensor negation suffix {-mA} (in *bil-mi-yor*) c-commands the NPI. The reason why it cannot be licensed despite the c-command relation is that they are not within the same phase, thus the NPI will have already been shipped to interfaces by the time the negation suffix is merged to the structure. If DPs were phases as suggested by Chomsky (2006) and Hiraiwa (2005), then licensing of a NPI within a DP by a licensor out of this DP would be banned, which is not the case in complex and sentential DPs:

(44) a. *Complex DPs*
    [DP Doktor-un [PredP kimse-yi   muayene-si]]
        Doctor-GEN   nobody-ACC examination-3SG.POSS
    kısa   sür-me-di.
    short   last-NEG-PAST
    'Doctor's examination of nobody lasted long.'
    b. *Sentential DPs*
    [DP Ali-nin [TP kimse-yi   yarala-dığ-ı]]   doğru değil.
        Ali-GEN   nobody-ACC wound-VNOM-3SG.POSS true   not
    'It is not true that Ali wounded someone.'

Assuming the shaded areas in (44a-b) as spell-out domains, one would expect that the NPI trapped within these domains could not be licensed, which would render the sentences ungrammatical. This data suggests that NPI-licensing can also be analyzed within the framework of phase-sliding mechanism. I leave this problem and analysis for future studies.

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[7] *Phasemateness* is used to refer to a situation where two units are within the same phase, and they have a licensor-licensee relation.

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