A compositional approach to conjunct agreement in Turkish

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Abstract. This article presents novel empirical evidence on verbal agreement patterns observed in conjunction phrases (CPs) in Turkish. To account for the discrepancies observed in native speaker preferences in agreement paradigms in CPs, two experimental tasks were carried out: namely an acceptability judgment task and a forced choice task. Based on the results, it is proposed that there is compositional conjunct agreement in Turkish that takes place in two stages. The agreement relationship is first established between the Agreement head and the coordinated phrase in the syntax. Then, the PF spells out the features of either the coordinated phrase, or the features of the linearly closest conjunct inside the coordinated phrase. I argue that Full Agreement (FA) results from the Spec-head agreement with the CP, whereby the features of both conjuncts are resolved and inherited to the CP (Johannessen 1996). In Closest Conjunct Agreement (CCA), on the other hand, the agreeing head has asymmetric access to one of the prominent conjuncts or its features (Bošković 2009; Johannessen 1998; Munn 1993, 1999; Benmamoun 1992). Thus, in CCA in Turkish, the agreement is with the linearly closest conjunct and the features of that conjunct appear on the verb.

Keywords. conjunct agreement; conjunction phrases; coordination; Turkish

1. Introduction. Turkish displays the following agreement patterns in CPs. Items (1) – (3) have identical meanings.

(1)   sen   ve   o   git-ti-niz
        you   and   s/he   go-PAST-2PL

(2)   sen   ve   o   git-ti
        you   and   s/he   go-PAST.3SG

(3)   ?sen   ve   o   git-ti-n
        you   and   s/he   go-PAST-2SG
        'You and s/he went.'

(1) exhibits Full Agreement (FA); (2) exhibits Closest Conjunct Agreement (CCA), since the verb agrees with the conjunct that is linearly more proximate; and (3) exhibits Distant Conjunct Agreement (DCA)[1]. While (1) is completely acceptable to most native speakers of Turkish, (2) is

[1] In the conjunct agreement literature, one can find two terms I avoid using in this paper. These are (a) First Conjunct Agreement (FCA); and (b) Last Conjunct Agreement (LCA). Since the concepts of first and last can mean both the closest and the distant conjunct depending on whether the verb precedes or follows the CP, I use the terms Closest Conjunct Agreement (CCA) and Distant Conjunct Agreement (DCA) in addition to Full Agreement (FA) to better disambiguate the structural position of the conjuncts in relation to the verb.

relatively less acceptable and (3) is somewhat unacceptable.

The questions I address in this article are whether empirical evidence provide support for the intuitions of native speakers of Turkish in terms of which verbal agreement patterns are acceptable in CPs and what accounts for the (un)acceptability of different agreement patterns in CPs in Turkish. My proposal is that the conjunction agreement patterns in Turkish can be explained by a compositional account that takes place in two stages. According to this compositional account, the agreement relationship is first established between the Agreement head and the CP in the syntactic component. Following this, the PF spells out the person and number features of either the CP as a whole, or the features of the linearly closest conjunct inside the CP (similar accounts can be found in Bhatia 2011; Franck, Vigliocco, and Nicol 2002; Ackema and Neeleman 2004; Haskell and MacDonald 2005; Benmamoun and Lorimor 2006).

2. Background and previous proposals on conjunct agreement. A conjunction phrase (CP)[2] is a syntactic constituent consisting of two or more units called conjuncts. The element linking the conjuncts is called a coordinator. Early attempts proposed a flat, multiple branching structure for CPs (Gazdar et al. 1985; Sag et al. 1985; Pullum and Zwicky 1986; Ingria 1990; Pollard and Sag 1994). Recent work, however, treats conjunctions/coordinators as heads of a phrase in a binary-branching structure, typically the conjunction phrase. This is due to the impossibility of stranding of external conjuncts, existence of interactions between coordinators and internal conjuncts, as well as possibility of extraction from either internal or external conjuncts (Zhang 2009).

Zhang (2009) argues that the external and the internal conjunct are in a Spec-Complement relationship with the head realized by the coordinator as shown below (similar accounts in Munn 1987; Larson 1990; Johannessen 1998; and Zoerner 1995).

(4)   The complementation structure of CPs in head initial and head final languages
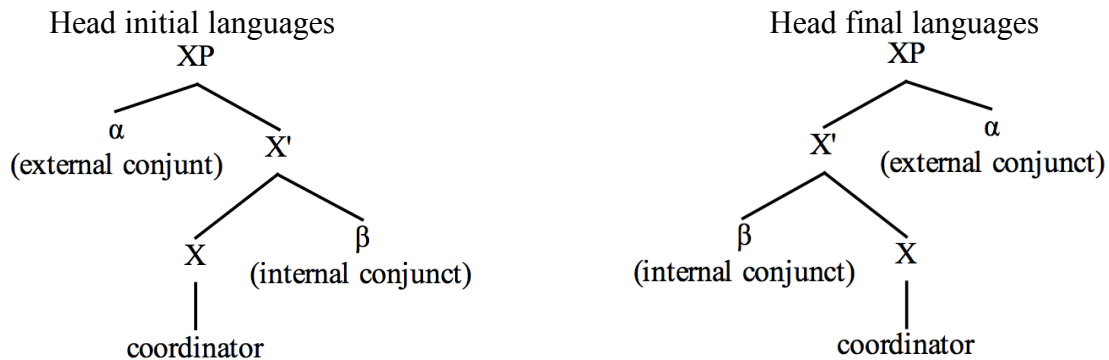
2.1. TWO APPROACHES ON THE NATURE OF COORDINATION
2.1.1. CLAUSAL COORDINATION. According to this approach, all conjuncts are clausal, and non clausal conjuncts are the result of reduction (Hudson 1970; George 1980; Goodall 1987;

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[2]Zhang (2009) argues against a CP claiming that coordinators do not have intrinsic categorial features, and it is the conjuncts that provide the categorial features to them since the category of a CP is identical to that of at least one of the conjuncts. Zhang (2009) maintains that the notion *coordination* is not primitive in syntactic computation and thus there is no special category in coordination.

Hoekstra 1994; Johannessen 1998; Aoun et al. 1994; Aoun and Benmamoun 1999; Camacho 2003). Consider the examples below which show how grammatical sentences are derived from underlying forms under a clausal coordination account. The (d) sentences represent the underlying forms while the (a) sentences are the surface representations.

(5)   a. Emily and Amy study linguistics.
       b. *Emily and Amy studies linguistics.
       c. *Emily ~~studies linguistics~~ and Amy studies linguistics.
       d. Emily studies linguistics and Amy studies linguistics.

(6)   a. Max and Ashley are a cute couple.
       b. *Max and Ashley is a cute couple.
       c. *Max ~~is a cute couple~~ and Ashley is a cute couple.
       d. *Max is a cute couple and Ashley is a cute couple.

As illustrated in (5) and (6), a clausal coordination analysis requires two operations: deletion and regrouping. Nevertheless, such a clausal account makes the syntactic derivation more complicated, as it requires both ungrammatical underlying forms and a rule to make them grammatical (Zhang 2009).

2.2.   PHRASAL COORDINATION. According to a phrasal analysis of coordination adopted by a number of linguists (Bošković 2009; Johannessen 1996, 1998; Munn 1993, 1999; Zhang 2009), what is being coordinated is NP/DPs. Person, number, and gender features are established via Agree (Chomsky 2000). In a phrasal analysis of coordination, Full Agreement (FA) results from the Spec-head agreement configuration while Closest Conjunct Agreement (CCA) results from the asymmetry of coordination whereby the agreeing head has asymmetric access to one of the prominent conjuncts or its features.

In conjunct agreement, languages can display a number of agreement paradigms based on the position of the verb and the conjunction phrase. Full Agreement (FA) is established when the predicate exhibits agreement features of the conjunction phrase as a whole. Closest Conjunct Agreement (CCA) is observed when the agreement morphology manifests itself on the linearly closer or more prominent conjunct. Finally, Distant Conjunct Agreement (DCA) is when the agreement marking is on the conjunct that is further away from the predicate. These three agreement paradigms are illustrated in Table 1 below. The first column represents the agreement patterns in clauses where the verb follows the conjunction phrase. The second column illustrates the same agreement patterns in clauses where the verb precedes the conjunction phrase. The shaded areas in each cell indicate the features of which conjuncts appear on the verb.

	C_1C_2V	VC_1C_2
FA	C_1C_2V	VC_1C_2
CCA	C_1C_2V	VC_1C_2
DCA	C_1C_2V	VC_1C_2

Table 1: Agreement patterns based on the structural position of the verb

As illustrated in Table 1, FA can appear both pre-verbally and post-verbally. (7) below shows an instance of FA when the verb follows the conjunction phrase, while (8) illustrates another occurrence of FA when the verb precedes the conjunction phrase.

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(7)   Turkish
      ben   ve   o   yürü-dü-k
      I   and   s/he   walk-PAST-1PL
      'I and s/he walked.'

(8)   Moroccan Arabic (Benmamoun, Bhatia, & Polinsky 2009)
      žaw   ʕomar   w   Kariim
      came.3PL   ʕomar   and   Karim
      'Omar and Karim came.'

Similarly, CCA can be observed both when the verb follows the CP as in (9); or when it precedes the CP (10).

(9)   Serbo-Croatian (Bošković 2009)
      sva   sela   i   sve   varošice   su uništene
      all   villages.NEUT   and   all   towns.FEM   are destroyed.PL.FEM
      'All the villages and towns were destroyed.'

(10) Arabic (Progovac 1998)
      gatalen   el-banaat   we-l-walad   el-bisse
      killed.PL.FEM   the-girls   and-the-boy   the-cat
      'The girls and the boy killed the cat.'

3. Turkish agreement paradigms. Turkish is an Altaic, head-final language. It is agglutinative, and the canonical word order is SOV, although it is flexible as long as the verb agrees with the subject. The table below illustrates the agreement paradigms in Turkish.

	Paradigm 1		Paradigm 2	
	SINGULAR	PLURAL	SINGULAR	PLURAL
1ST	-m	-k	-(y)Im	-(y)Iz
2ND	-n	-nIz	-sIn	-sInIz
3RD	-Ø	-Ø / -lAr	-Ø	-Ø / -lAr

Table 2: Agreement paradigms in Turkish

The first paradigm is used with verbal predicates ending with either the simple past suffix –*(y)DI*, or the conditional suffix –*(y)sE*. The second paradigm, on the other hand, can be considered as the elsewhere condition since it applies to all other verbal/non-verbal predicates.

4. Experimental evidence for FA and CCA in Turkish

4.1. EXPERIMENT I – ACCEPTABILITY JUDGMENT TASK. An acceptability judgment task was administered on Qualtrics[3] to investigate Turkish native speakers' conjunct agreement preferences. 34 native speakers of Turkish with a mean age of 29.55 participated in Experiment I. The participants were asked to judge 144 sentences on a 5-point Likert scale from completely natural to completely unnatural.

There were four pronoun combinations that made up the conjunction phrases; *ben ve o* (I

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[3] Qualtrics is a software that allows users to share surveys, and questionnaires to collect and analyze data online.

and s/he); *o ve ben* (s/he and I); *sen ve o* (you and s/he); *o ve sen* (s/he and you). The conjunction phrases either preceded or followed the verb (C_1C_2V or VC_1C_2). These constructions were tested in 3 agreement paradigms, namely with FA, CCA, and DCA. Four activity verbs (Vendler, 1957) used were *gitmek* (go); *gelmek* (come); *yürümek* (walk); and *koşmak* (run). Based on those variables, there were 96 experimental items. In addition, 48 distractors testing the proper use of the question particle *–mI* were used to mask the aim of the experiment. The figure below illustrates the agreement preferences of Turkish native speakers in CPs preceding the verb.
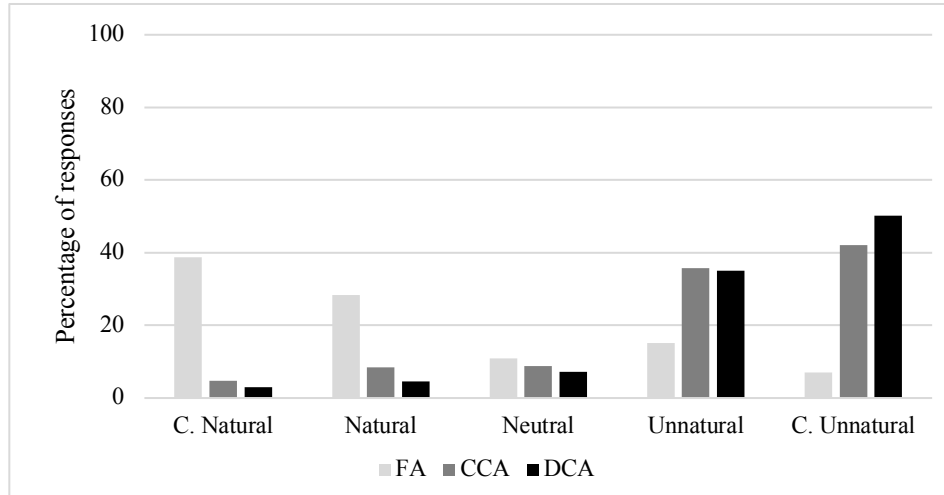

Figure 1. Agreement preferences in CPs preceding the verb (C_1C_2V)

The next figure demonstrates the agreement preferences of Turkish native speakers in conjunction phrases following the verb.
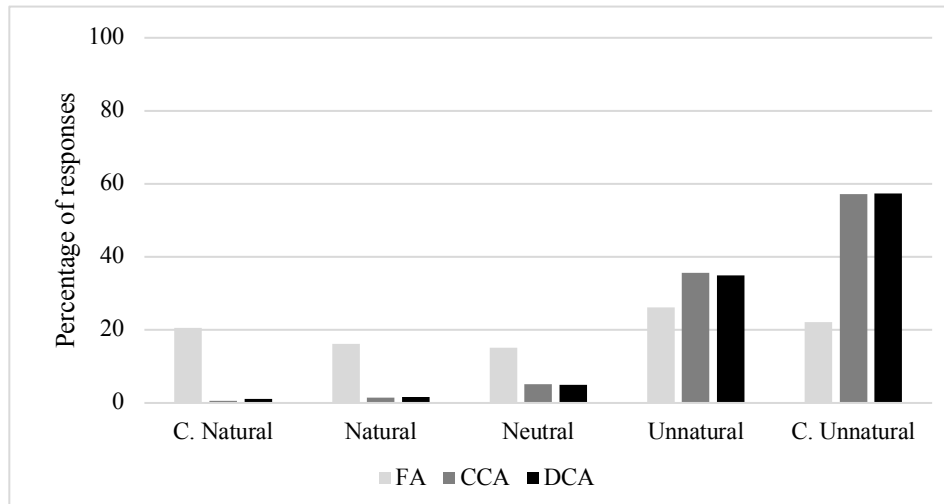
Figure 2. Agreement preferences in CPs following the verb (VC_1C_2)

The results of the first experiment indicate that native speakers of Turkish show a clear preference for FA in CPs while consistently finding CCA and DCA unnatural, with the latter being more dispreferred. Interestingly, the acceptability judgments for the three agreement patterns decrease when the CP follows the verb, which may be attributed to the fact that Turkish is a canonically SOV language.

4.2.   EXPERIMENT II – FORCED CHOICE TASK. The second experiment, also administered on Qualtrics, investigated if the participants favored either CCA or DCA when they were forced to choose between them and when FA was not available. 20 native speakers of Turkish with a mean age of 28.21 participated in Experiment II. For each item, the participants were presented with two sentences, minimally differing in their agreement morphology, and they were asked to choose the sentence that sounded more natural to them. One sentence exhibited CCA and the other had DCA. Similar to the first experiment, there were four pronoun combinations that made up the conjunction phrases; *ben ve o* (I and s/he); *o ve ben* (s/he and I); *sen ve o* (you and s/he); *o ve sen* (s/he and you). The conjunction phrases either preceded or followed the verb (C_1C_2V or VC_1C_2). Four activity verbs (Vendler, 1957) used were *gitmek* (go); *gelmek* (come); *yürümek* (walk); and *koşmak* (run). There were 32 experimental items. In addition, 16 distractors testing the proper use of the question particle *–mI* were used to mask the aim of the experiment. In total, there were 48 sentences. The figure below illustrates the results of the second experiment.
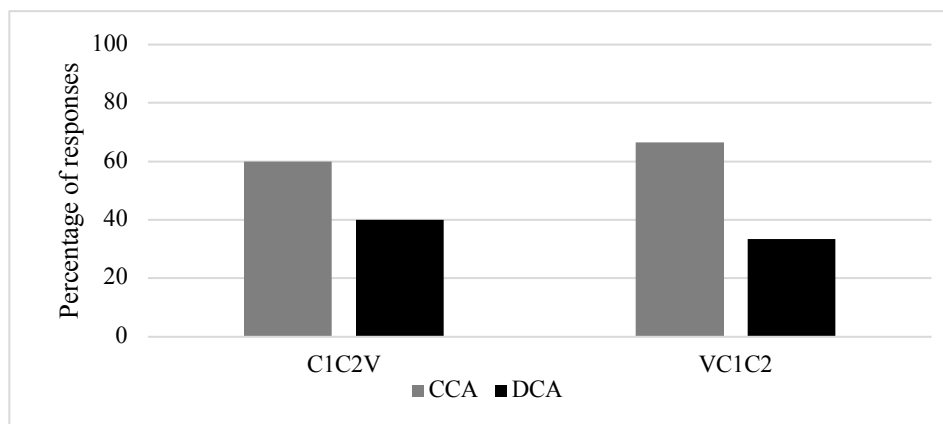

Figure 3. Agreement preferences for CCA and DCA in pre-verbal and post-verbal CPs in a forced choice task

The results of Experiment II indicate that the participants clearly prefer CCA over DCA in both pre-verbal and post-verbal CPs. A separate chi-square analysis for each word order revealed that native speakers of Turkish preferred CCA more often than would be predicted if all the participants were randomly picking either CCA or DCA ($p=.048$ for C_1C_2V and $p=.001$ for VC_1C_2).

5. A compositional view of agreement. I believe that the preference for FA in Experiment I and preference of CCA over DCA in Experiment II provides evidence that conjunct agreement in Turkish takes place in two stages. The first operation that needs to be appealed to is *Agree* (Chomsky 2000), stated below.

(11)   α can Agree with β iff:
    a.   α carries at least one unvalued and uninterpretable feature and β carries a matching interpretable and valued feature.
    b.   α c-commands β.
    c.   β is the closest goal to α.
    d.   β bears an unvalued uninterpretable feature.

Building on Chomsky (2000), Marušič, Nevins, and Badecker (2010) maintain that there are

three strategies to access the features from the search space determined by the relation Agree. First, agreement features can be accessed maximal-projectionally, where the agreeing head targets the whole coordinated phrase at PF. In such agreement, the resolved features of the whole coordinated phrase are chosen on the predicate. Second, agreement features can be accessed hierarchically. In this pattern, the agreeing head targets the highest conjunct, and hence the features of the highest conjunct are chosen. Finally, features can be accessed linearly. In a linear agreement pattern, the agreeing head targets the linearly closest conjunct, whereby the features of the linearly closest conjunct are chosen on the predicate (Marušič et al., 2010).

In a similar vein, some linguists attribute the different patterns in conjunct agreement to the special status of the PF. To give an example, Ackema and Neeleman (2004) argue that if linear adjacency is involved in CCA, the phenomenon is likely to belong in the PF component. Therefore, even though agreement may take place in the syntax, the way the features are spelled-out may not be faithful to the syntactic component. To be more specific, some features may get altered (Noyer 1992), or a feature may be completely absent (Benmamoun 2000).

5.1. FULL AGREEMENT IN TURKISH. Building on Chomsky (2000) and Marušič et al. (2010), I think the results of Experiment I and II can be accounted for. I argue that FA results from the spec-head agreement with the CP and the features of both conjuncts are resolved and inherited to the CP (Johannessen 1996). The following example and the corresponding tree diagram show how FA is established in Turkish.

(12) a. ben   ve   o   git-ti-k
        I   and   s/he   go-PAST-1PL
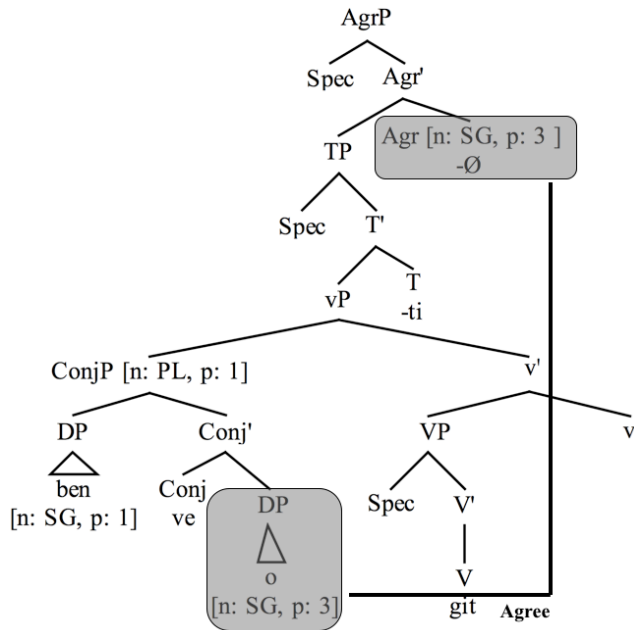   'I and s/he went.'

    b.
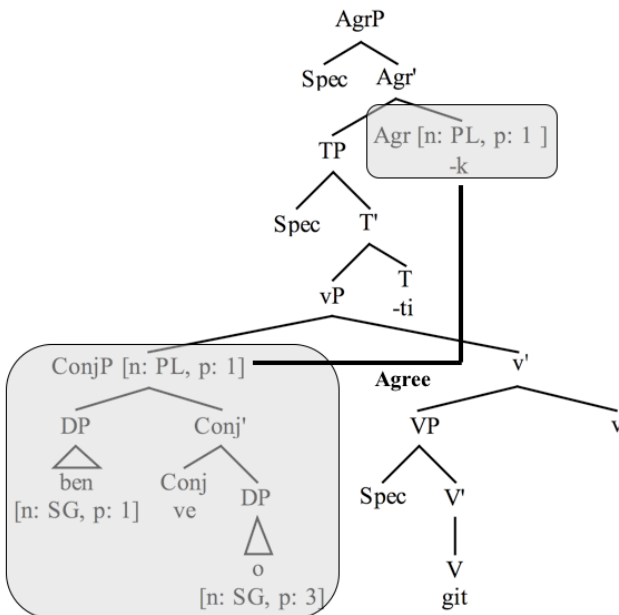
5.2. CLOSEST CONJUNCT AGREEMENT IN TURKISH. In CCA, on the other hand, the agreeing head has asymmetric access to one of the prominent conjuncts or its features (Bošković 2009; Johannessen 1998; Munn 1993, 1999; Benmamoun 1992). It is observed that in another preferred agreement pattern in Turkish, the agreement is with the linearly closest conjunct and the features

of that conjunct appear on the verb. The examples (13) and (14) below, and the corresponding tree diagrams show how CCA is established in Turkish.
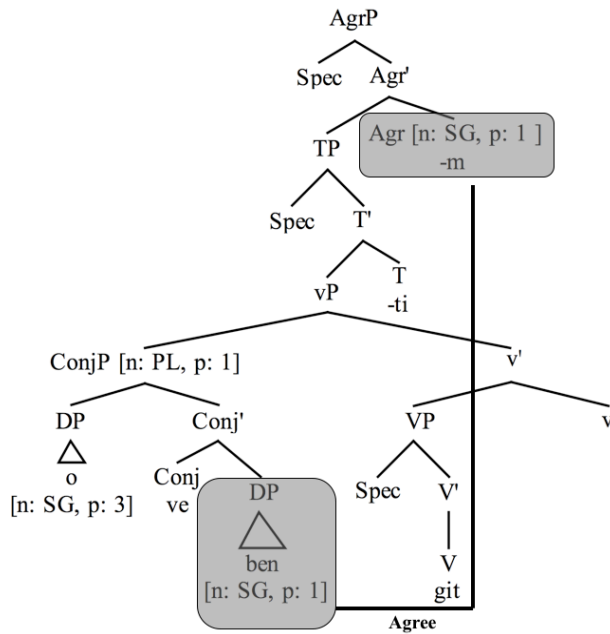
(13) a. ben   ve   o   git-ti- Ø
         I   and   s/he   go-PAST-3SG
         'I and s/he went.'

b.

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                        AgrP
                       /    \
                    Spec    Agr'
                           /    \
                        TP    ┌─────────────────┐
                       /  \   │ Agr [n: SG, p: 3 ]│
                   Spec   T'  │       -Ø          │
                         / \  └─────────────────┘
                       vP   T
                      /      -ti
         _____/_____
        /                             \
  ConjP [n: PL, p: 1]                  v'
       /        \              _____/_____
     DP         Conj'         /               \
     /\        /    \        VP                v
   ben      Conj  ┌────┐    /  \
 [n: SG, p: 1] ve │ DP │  Spec  V'
                  │ /\ │        |
                  │ o  │        V
                  │[n: SG, p: 3]│ git  Agree
                  └────┘
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(14) a. o   ve   ben   git-ti-m
         s/he and   I   go-PAST-1SG
         'I and s/he went.'

b.

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                        AgrP
                       /    \
                    Spec    Agr'
                           /    \
                        TP    ┌─────────────────┐
                       /  \   │ Agr [n: SG, p: 1 ]│
                   Spec   T'  │       -m          │
                         / \  └─────────────────┘
                       vP   T
                      /      -ti
         _____/_____
        /                             \
  ConjP [n: PL, p: 1]                  v'
       /        \              _____/_____
     DP         Conj'         /               \
     /\        /    \        VP                v
    o        Conj  ┌────┐   /  \
 [n: SG, p: 3] ve  │ DP │ Spec  V'
                   │ /\ │       |
                   │ben │       V
                   │[n: SG, p: 1]│ git
                   └────┘
                    Agree
```

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6. Conclusion and future directions. In this article, I presented novel experimental evidence suggesting that conjunct agreement in Turkish is a result of two components. The syntactic component is responsible for the agreement between the probe and the goal in the case of FA while the PF component is responsible for the spelling out of the person and number features of the linearly more proximate conjunct in the case of CCA irrespective of whether the CP precedes or follows the verb (similar accounts can be found in Bhatia 2011; Franck et al. 2002; Ackema and Neeleman 2004; Haskell and MacDonald 2005; Benmamoun and Lorimor 2006; Zhang 2009).

A future direction could be to further investigate the exact nature of FA in Turkish. Consider the minimal pair below, where the 1st person plural agreement is grammatical (15a), while the 3rd person plural agreement renders the construction ungrammatical.

(15) a. ben   ve   o   git-ti-k
         I   and   s/he go-PAST-1PL
       'I and s/he went.'

    b. ben   ve   o   git-ti-ler
         I   and   s/he go-PAST-3PL
       '*I and s/he went.'

If FA means that the features of both conjuncts are resolved and inherited to the CP, it is curious why only the 1st person plural agreement is grammatical in (15) since the conjuncts making up the CP are a first person and a third person pronoun. A possible explanation may be that there are multiple Agree operations, where the agreeing head first selects the resolved number features of the CP as a whole, subsequently initiating another probe that results in the person agreement features of only one of the conjuncts. That is, future research could look into the exact contribution of phi-features in agreement paradigms in CPs in Turkish.

Future studies could also investigate the proposed analysis in other head final languages, as well as the status of DCA in those languages. Such research has the potential to uncover cross-linguistic differences in the interaction between linear adjacency and agreement paradigms.

Appendix: Tables from Experiment I and Experiment II

Experiment I

	C. Natural	Natural	Neutral	Unnatural	C. Unnatural
FA	38.78	28.3	10.84	15.07	6.98
CCA	4.77	8.45	8.82	35.84	42.09
DCA	2.94	4.59	7.16	35.11	50.18

Table 3: Agreement preferences in CPs preceding the verb (C_1C_2V)

	C. Natural	Natural	Neutral	Unnatural	C. Unnatural
FA	20.58	16.17	15.07	26.1	22.05
CCA	0.55	1.47	5.14	35.66	57.16
DCA	1.1	1.65	4.96	34.92	57.35

Table 4: Agreement preferences in CPs following the verb (VC_1C_2)

Experiment II

	CCA	DCA
C_1C_2V	59.86	40.13
VC_1C_2	66.44	33.55

Table 5: Agreement preferences for CCA and DCA in pre-verbal and post-verbal CPs in a forced choice task

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