Description and analyses of nominal concord (Pt I)

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Abstract

This paper discusses the current understanding of what has been called NOMINAL CON-
CORD, whereby modifiers of a noun match certain features of the noun (e.g., gender, num-
ber, or case features). Part I discusses existing understanding of concord, remaining as
descriptive as possible. Concord has been argued to involve gender, number, case, and
definiteness, and nearly every word class that can be present inside nominal phrases is ca-
pable of showing concord. I consider some questions concerning the typology of concord,
which is largely uncharted territory. Part II focuses on existing formal analyses of concord.
Analyses of ϕ-feature concord are rather varied, but analyses of case concord more or less
converge on the same mechanism. Finally, I consider the insight offered by analyses of
cases of mixed concord, where modifiers do not all match each other or the head noun in
features or feature values.

1 Introduction: What is nominal concord

This article is concerned with analyses of a common form of agreement that I will call (NOM-
INAL) CONCORD. In the canonical case, various modifiers of nouns (e.g., demonstratives or
adjectives) inflect for the same features of the head noun. This is demonstrated for French
below.

(1) l-a plante vert-e
the-F.SG plant(F).SG green-F.SG
'the green plant'

(2) l-e bâtiment vert
the-M.SG building(M).SG green.M.SG
'the green building'

In (1), the determiner *la* 'the' and adjective *verte* 'green' match the gender (feminine) and
number (singular) of the noun *plante* 'plant'. The same is true for masculine gender in (2),
and, though not shown here, plural number. Because the head noun and modifiers all express
the same features and feature values, concord has been characterized as "agreement with the
head noun." Of course, the formalization need not directly reflect the description of concord
as agreement with the head noun. Furthermore, though this characterization is suitable for a
good many instances of concord, it does not apply for all of them, as I discuss at many points in

the present article. Nevertheless, I use the phrases "show(s) concord with the head noun" and "agree(s) with the head noun" at times in this article; for any skeptics, those wordings should be interpreted to mean "participates in concord."

Though the existence of concord is well-known and has even formed the basis of some influential syntactic arguments (see, e.g., Legate (2014)), it has not attracted much attention in the generative theoretical literature. Many existing approaches aim to assimilate concord to existing mechanisms of agreement—especially subject-verb agreement—as I discuss at length in Part II. This article attempts to synthesize and critique the analyses that have been presented thus far. In addition, I identify a number of questions about the nature of concord—even in terms of its description—that still lack satisfactory answers.

In the remainder of this section, I outline the basic properties of concord, covering the feature types that concord manipulates as well as the word types that show concord. In section , I discuss aspects of the typology of concord, which is largely uncharted territory. In section , I discuss the distinction between uniform concord, where all elements agree, and mixed concord, where they do not. That concludes Part I. Part II discusses formal analyses of concord.

1.1 The features involved in concord

The canonical example of concord involves concord for gender and number, as in the French examples in (1) and (2). Additional examples from Swahili are given below.

(3)   kitabu   ki-zuri   sana
         book(7)   7-good   very
         'a very good book'   (Carstens, 2016:7)

(4)   mzigo   m-zito   mno
         load(3)   3-heavy   too
         'too heavy a load'   (Carstens, 2016:7)

The prefixes glossed '7' and '3' are tradtionally called noun classes, and they express a combination of gender and number in Swahili. Since gender and number are among the features typically called ϕ-features, I dub this type of concord ϕ-feature concord.

In addition to ϕ-feature concord, some languages with case-marking exhibit case concord, where the modifiers bear case-marking in addition to the head noun. This is demonstrated for Estonian below.

(5)   kõigi-s   nei-s   raske-te-s   küsimus-te-s
         all.PL-INE   these.PL-INE   hard-PL-INE   question-PL-INE
         'in all these hard questions'

(6)   selle-ks   vahepealse-ks   perioodi-ks
         this-TRL   in.betweeen-TRL   period-TRL
         'for this interim period.'

In (5), each element reflects both plural number and inessive case. In (6), the same is true for singular number and translative case. In these examples, every element that shows case concord also shows ϕ-feature concord. It is possible to have case concord without ϕ-feature concord, and the reverse—ϕ-feature concord without case concord—is arguably true as well, as I discuss in section 2.

In some languages, modifiers in definite DPs look different than modifiers in indefinite DPs, a phenomenon that is sometimes termed definiteness concord or definiteness agreement. Some examples from Amharic are shown below.

(7) tɨllɨk'-u t'ɨk'ur(-u)   bet
     big-DEF black(-DEF) house
     'the big black house'   (Kramer, 2010:229)

(8) tɨnnɨʃ-wa   k'äyy(-wa) mäkina
     small-DEF.F red(-DEF.F) car
     'the small red car'   (Kramer, 2010:230)

Kramer (2010) argues that the first suffix in both (7) and (8) is in fact the syntactic determiner in Amharic; the suffix on the second adjective (which is optional) is definiteness agreement. Definiteness concord or agreement has been documented and extensively studied in Semitic languages (on Hebrew: Wintner (2000); Shlonsky (2004); Pereltsvaig (2006), on Arabic: Fassi Fehri (1999)), and Germanic (see Roehrs (2015) and references there). In Germanic, the relationship between the so-called weak inflection and definiteness is not clear in several languages (Roehrs, 2015; Harbert, 2007).[1] It has also been noted in some languages of Africa (e.g., Noon (Baier, 2015)). I regret that I do not have space to discuss definiteness agreement/concord in detail, and I set it aside for the remainder of this article.

It is worth pointing out a discrepancy in my use of the term ϕ-feature concord. The class of ϕ-features canonically includes person, but person features are almost entirely absent from nominal concord, and thus I have taken ϕ-feature concord to mean concord in only gender and number. This could be because concord typically involves common nouns, which are always third person. However, there are examples of quantifiers with person agreement in Bantu languages, illustrated below for Swahili.[2]

(9) sisi s-ote;   ninyi ny-ote
     we 1PL-all;   you   2PL-all
     'we all';   'you all'
     (Swahili, Ashton 1944)

This pattern is impressionistically rare, and I do not discuss it in detail— see Baker (2008:114-115, 185-186) for the most explicit formal account.[3]

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[1] In the analysis of Ingason & Sigurðsson (2017), the weak inflection is treated formally as agreement with a definiteness feature [+DEF]. To handle the circumstances when the definite article is present but the adjective nevertheless bears strong inflection, they propose a structure where the [+DEF] feature is not inaccessible to the adjective.

[2] Baker (2008:185) also lists Kinande and Zulu as languages with documented concord for person on a small number of words.

[3] Summarizing briefly, in Baker's account, person concord is not exceptional on its own— it is expected just in case the conditions are right. Namely, it is expected in languages (i) where functional heads agree upwards with their targets and (ii) that have D-like heads that can host DPs in their specifier. In contrast, Wechsler & Zlatić (2003) mention such cases (p. 15) and treat them as exceptional.

1.2 Concord and word classes

As seen in the initial French examples (1) and (2), adjectives show concord in many languages. In fact, both Anderson (1992:106) and Corbett (2006:40) take this to be the canonical example of concord. Across languages, nearly every kind of nominal-internal modifier is capable of showing concord. The only exceptions I am aware of are PPs and CPs, whether in adjunct or complement position. However, just as the features that participate in concord can vary from language to language, the word classes involved in concord also vary in this way. In this section, I provide examples of each category showing concord, taking a largely descriptive approach to syntactic categories.

Demonstratives show concord in many languages. The same is often true for articles in languages that have them. Demonstratives are arguably the only categories that show concord in English.

(10)   this book(*-s) / these book*(-s)

(11)   that bagel(*-s) / those bagel*(-s)

As shown in (10)-(11) the demonstratives *this/that* must match the number of the head noun, whether singular or plural. Another class of determiner-like elements that show concord in many languages are quantifiers, illustrated below for French *tout* 'all'.

(12)   tout-e-s l-es   plante-s
        all-F-PL the-PL plant(F)-PL
        'all the plants'

(13)   tou-s   l-es   batiment-s
        all-M.PL the-PL building(M)-PL
        'all the buildings'

Much like adjectives, feminine gender is marked on *tout* with *-e*, and plural is marked by *-s*. It is worth pointing out that some languages also have non-agreeing quantifiers, and this has featured prominently in research on concord in Bantu (see, e.g., Collins (2004); Baker (2008)).

Possessors show concord in a number of languages. This is perhaps most common for pronominal possessors (as in the Romance languages, see, e.g., Dobrovie-Sorin & Giurgea (2011)), but possessors other than pronouns can show the same agreement properties, demonstrated below for Bulgarian *vujčov* 'uncle's' and *Ivanov* 'Ivan's' (Harizanov, to appear).[4]

(14)   vujčovi-ja   / Ivanovi-ja   čajnik
        uncle's.MASC-DEF / Ivan's.MASC-DEF teapot
        'my uncle's teapot' / 'Ivan's teapot'   (Boris Harizanov, p.c.)

(15)   vujčova-ta   / Ivanova-ta   staja
        uncle's.FEM-DEF / Ivan's.FEM-DEF room
        'my uncle's room' / 'Ivan's room'   (Boris Harizanov, p.c.)

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[4]It is worth pointing out that the cut is not always so neatly made between pronominal possessors and non-pronominal possessors. In Icelandic, first-person singular *minn*, second-person singular *þinn*, and third-person reflexive *sinn* all show concord, but other pronominal possessors are invariant genitive pronouns.

Due to the fact that they show concord, these kinds of words are often called *possessive adjectives*, but as Dobrovie-Sorin & Giurgea (2011); Harizanov (to appear) show, they retain a number of important nominal properties, which suggests that the label *adjective* may be an oversimplification.

Numerals show concord in many languages. In Icelandic, numerals 1-4 show concord for gender, number, and case.[5]

(16) um fjór-a   snigl-a
      about four-ACC.M.PL snail-ACC.M.PL
      'about four snails'

In (16), the numeral *fjóra* 'four' matches the case, gender, and number of the noun *snigla* 'snails'. It is impressionistically common for 'one' to show concord, but other numerals are less common. For example, in French, only 'one' shows concord.

Finally, there are elements which den Dikken and Singhapreecha 2004 dub LINKERS that show concord in some (not all) languages, illustrated here with Kurdish.

(17) kur-ê   mezin
      boy-LINKER:M.SG big
      'the big boy'   (den Dikken and Singhapreecha, 2004:44)

(18) keç-a   baş
      girl-LINKER:F.SG nice
      'the nice girl'   (den Dikken and Singhapreecha, 2004:44)

In (17), the linker *-ê* is conditioned by the presence of the adjective, but it agrees in gender and number with the head noun *kur* 'boy'. The same is true in (18). The analysis of the Bantu linker has featured prominently in many formal approaches to concord.

This covers essentially every word class that can appear in a noun phrase, and thus, it is worth considering whether there are any categories that never show concord. This may be the case for adpositions, as I know of no cases where they show concord (e.g., gender, number, or case concord) whether they are complements to nouns, adjuncts to noun phrases, or when they take noun phrases as complements. Baker (2008:112-114) discusses cases of adpositions agreeing with their complements, but in all these cases, the adpositions manifest person and number features, and the agreement looks similar to possessor agreement (see section 2.4). Thus, whether these examples count as showing concord depends on whether a particular theory of agreement in DPs draws a meaningful line between possessor agreement and concord.

2   The typology of concord

The cross-linguistic typology of concord systems is also an area where attention is critically needed. Though the existence of concord is widely known, especially in Western languages,

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[5]Claiming that numerals show concord for number is controversial, because numerals typically require a certain number value on the nouns they combine with, so it is not possible to see an alternation in number. However, in Icelandic, the numeral *einn* 'one' clearly declines like a singular element, and *tveir* 'two', *þrír* 'three', and *fjórir* 'four' all decline like plural elements. If these elements do not show concord in number, then observations like these must be stipulated.

we do not know how common it is in a typological sense. We do not know much about either genealogical or geographical distribution of concord systems in the languages of the world. As I will discuss in part II, most existing discussion focuses on systems from Romance, Germanic, and Bantu languages. A systematic study following standard methodology for typological surveys must be conducted before we can know how common concord is. Then, we could carry out more systematic study of concord's interactions with other linguistic properties.

In this section, I discuss some typology aspects of concord that we should seek answers to as well as preliminary answers to some of those questions. This includes the distribution of concord across lexical categories, concord's connection to grammatical gender, ϕ-featureconcord's connection to case concord, and concord's connection to possessor agreement.

2.1 Connection of syntactic category to concord

In the clearest examples of concord, nearly every element inside of the nominal phrase shows concord. However, this is another area where a systematic study of which categories show concord across the languages of the world has not been done. Impressionistically, determiners/demonstratives and adjectives are among the categories that commonly show concord and cardinal numerals show concord less commonly (e.g., only *one* shows concord and nothing else). Baker (2008) conducted the most systematic investigation of concord, although his use of the term was different from how I use it here: he uses CONCORD to refer to adjectival agreement, whether predicative or attributive.[6] Baker does discuss agreement on determiners and similar quantifiers, finding that at least 40 languages from his 108-language sample showed agreement on at least some determiner-like elements (p. 189).[7] This makes determiner/quantifier agreement roughly half as common as verbal person-marking cross-linguistically (296/378 languages in Siewierska's (2013) sample have some form of verbal person-marking). However, we do not know whether the proportion of languages with determiner concord is representative of concord in general.

2.2 Connection of gender to concord

There are also questions to be answered regarding the relationship between nominal concord and grammatical gender. Briefly, we know that grammatical gender is neither necessary nor sufficient for concord. The Finnic languages show that grammatical gender is not necessary for a robust system of concord. There are also languages that have grammatical gender systems but no concord. Kannada is one example, according to Schiffman's (1979) description. The language does have a serious of "independent demonstrative pronouns" which vary for gender, number, and case, but those are not used attributively. Instead, "demonstrative adjectives" are

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[6]In fact, Baker (2008) emphasizes that predicative and attributive adjectives typically have the same agreement behavior— see especially the discussion of potential counterexamples (pp. 60-64).

[7]I say "at least" because Baker's methodology might have missed some languages. He writes (pp. 246–7): "Note that if WALS gives no indication that a language has agreement with subjects, objects, or objects of adpositions, and does not indicate that it has grammatical gender (so adjectival agreement is unlikely), then I did not look up the language, and scored all categories as 'none.'" Thus, it is possible that some instances of agreeing determiners could have been missed (for example, in languages with no gender).

used, and they do not change for gender, case, or number (Schiffman, 1979:43). An example of the independent demonstrative and the demonstrative adjective are given below.

(19) idu   (*mane)
      this.NEUT house.NEUT
      'this' / 'this thing'   (Schiffman, 1979:43)

(20) ii   mane
      this house.NEUT
      'this house'   (Schiffman, 1979:43)

Schiffman does not provide minimal sets of examples, so we must take him at his word that these demonstrative adjectives are invariant. He clearly states elsewhere that attributive adjectives are invariant for case, gender, and number as well (Schiffman, 1979:40). However, finite verbs agree with third-person singular subjects in gender, showing that Kannada's gender system extends beyond pronouns (Schiffman, 1979:68).

However, though we know such a language exists, we do not know how common it is for languages to have grammatical gender without concord. I suspect we will find a strong correlation between grammatical gender and concord, but more descriptive and typological work must be done before the nature of this connection can be investigated.[8]

2.3 Connection of case concord to ϕ-feature concord

Finally, as we have seen, some languages show concord in case. Blake (2004) discusses case concord from a descriptive and typological perspective, but his discussion focuses on determiners/demonstratives and adjectives. In addition to these categories, we should name numerals, quantifiers, and possessors, as shown in the example from Icelandic below.

(21) all-ir   snigl-ar-n-ir   mín-ir   fjór-ir
      all-NOM.M.PL snail-NOM.M.PL-the-NOM.M.PL my-NOM.M.PL four-NOM.M.PL
      'all my four snails'

(22) frá öll-um   snigl-unum   mín-um   fjór-um
      from all-DAT.M.PL snail-the.DAT.M.PL my-DAT.M.PL four-DAT.M.PL
      'from all my four snails'

In these examples, every element that bears ϕ-feature concord also expresses case concord. The categories capable of showing case concord are broadly the same as those that are capable of showing gender/number concord in language. Indeed, many languages are like Icelandic in that case concord and gender/number concord target the same elements.

However, it is not true that case concord tracks gender/number concord in all languages. There are languages with robust case concord which do not show gender/number concord (or show it in a much diminished form). Georgian is one such example.

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[8]In ongoing work, Isa Kerem Bayirli (p.c.) is investigating the connection between kinds of gender systems (e.g., semantic or arbitrary) and concord. He suspects (and I concur), that languages with gender but no concord are more likely to have semantic systems of gender assignment. This is arguably true for Kannada, where the vast majority of masculine nouns refer to biologically male entities, and the same is true for feminine nouns.

(23) Nino gogo-s did(*-eb) c'ign-eb-s uq'itis.
      Nino girl-DAT(*-PL) big.DAT book-PL-DAT will.buy
      'Nino will buy the girl big books.'   (Fuchs, 2017)

Case concord in Georgian is robust in that applies to a variety of modifiers (including adjectives, possessors, and quantifiers), but number concord is ungrammatical. Thus, while *did* 'big' must match the case value of *c'ign-eb-s* 'books', it cannot also bear the same number value.[9]

There also may be languages with ϕ-feature concord but no case concord, though the examples I am aware of are less clear. This is because the border between case-marking and adpositions is not crisp. Therefore, in most probable cases of a language with ϕ-feature concord but no case concord, one could claim that the "cases" are in fact adpositions. Nevertheless, Hebrew may be an example of a language that has ϕ-feature concord but no case concord, based on examples like the following.

(24) raiti et ha-jeladim ha-nexmad-im.
      I.saw ACC the-boys(M.PL) the-nice-M.PL
      'I saw the nice boys.'   (Michael Becker, p.c.)

(25) raiti et ha-jeladot ha-nexmad-ot.
      I.saw ACC the-girls(F.PL) the-nice-F.PL
      'I saw the nice girls.'   (Michael Becker, p.c.)

In these examples, the adjective *nexmad* 'nice' clearly shows ϕ-feature concord and definiteness agreement. If the morpheme *et* can correctly be treated as accusative case-marking, then Hebrew is a language with ϕ-feature concord but no case concord. On the other hand, if *et* is more properly analyzed as a preposition (which is not implausible given that Hebrew is otherwise a prepositional language), then Hebrew is not an example of a language with case-marking but no case concord.

2.4 Concord and possessor agreement

It must be noted that concord is not the only relatively common type of agreement inside nominal phrases. In adnominal possession constructions in many languages, possessed nouns bear a special affix cross-referencing features of the possessor (e.g., person and number). Examples from Hungarian are given below.

(26) a te kalap-ja-i-d
      the you(-NOM) hat-POSS-PL-2SG
      'your hats'   (Szabolcsi, 1994:180)

(27) (a) Mari kalap-ja-i
      the Mari(-NOM) hat-POSS-PL(-3SG)
      'Mari's hats'   (Szabolcsi, 1994:180)

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[9]As Fuchs (2017) shows, adjectives can bear number-marking in cases of putative nominal ellipsis, i.e., in DPs where there is no overt noun. In addition, Isa Kerem Bayirli (p.c.) has informed me that there are other places where Georgian adjectives bear both number and case, thus making this example a bit more complicated— I cannot resolve these issues here, and I keep Georgian as a possible example of a language with case concord but no ϕ-feature concord.

In these examples, the possessum is marked to indicate the person and number of its possessor (-*d* for second-person singular; -∅ for third-person singular). The best-known cases of possessor agreement involve languages that do not have grammatical gender (e.g., Hungarian, Turkic languages, and Mayan languages). Conversely, the best-known cases of concord involve languages with grammatical gender. One could hypothesize that concord and possessor agreement are both connected to grammatical gender: if a language has gender, it can have concord but not possessor agreement; if a language does not have gender, then it may only have possessor agreement.[10] Note as well that, if this were true, it would mean that nominal concord and possessor agreement are mutually exclusive. As it turns out, there are counterexamples for all three of these putative generalizations.

2.4.1 Gender and possessor agreement in the same language

The Finno-Ugric languages with concord show that grammatical gender is not necessary for concord to emerge. As we have seen, Estonian has a robust system of concord in number and case, but it has no grammatical gender (Norris, 2014). Furthermore, there are languages with possessor agreement that also have grammatical gender, showing that possessor agreement does not require a lack of gender. One example is Lavukaleve, a Central Solomons language of the Solomon Islands, as described by Terrill (1999). Lavukaleve has three genders (masculine, feminine, and neuter), and it has possessor agreement, as the following examples demonstrate.

(28)   o-tail
       3SG.POSS-house
       'its house'   (Terrill, 1999:85)

(29)   el   le-na'nug
       1DU.EXCL   1DU.EXCL.POSS-thought
       'our thought'   (Terrill, 1999:86)

In (28), the prefix *o-* indicates a pro-dropped third-person singular possessor, and in (29), the prefix *le-* indicates agreement with the first-person dual exclusive possessor. Terrill observes that the possessor agreement paradigm is nearly identical to the subject agreement paradigm in Lavukaleve— the only difference is the first-person singular marker, which comes instead from the language's object agreement paradigm. This similarity between possessor agreement and subject agreement paradigms is found elsewhere, e.g., in some Turkic languages and in Mayan languages.

2.4.2 Concord and possessor agreement in the same language

Finally, there are many languages that have concord but no possessor agreement or vice versa, but some languages have both. An example of this comes once again from Lavukaleve, which has concord in addition to possessor agreement (Terrill, 1999:130). Concord is shown below for the definite article.

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[10]Carstens (2000) hints at this potential dichotomy when she says (p. 321) "within languages with grammatical gender, a different pattern [i.e., concord] emerges" after discussing possessor agreement.

(30) a. taragau   na
          sea.eagle(M) ART.M.SG
          'the sea eagle'   (Terrill, 1999:64)

      b. ruta   la
          lamp(F) ART.F.SG
          'the lamp'   (Terrill, 1999:64)

The definite article in Lavukaleve agrees in both gender and number: (30a) shows masculine singular form *na*, and (30b) shows feminine singular form *la*. West Greenlandic (Manlove, 2015), Finnish (Norris, 2012), and Lealao Chinanteco (Rupp, 1989) are additional examples of languages that have both possessor agreement and concord.[11] The fact that possessor agreement and nominal concord can co-exist raises a number of interesting theoretical questions that are largely unaddressed, so far as I know. However, it also suggests that possessor agreement and nominal concord are distinct and independent forms of agreement, at least descriptively if not theoretically.

As we will see in Part II, much of the work on concord assumes, formally and/or in prose, that concord is the nominal correlate of subject-verb agreement. However, in the research on parallels between the nominal and clausal domain, it has been possessor agreement that has featured prominently (Abney, 1987; Szabolcsi, 1994). In fact, possessor agreement is often identical to subject-verb agreement (or else there is significant overlap in the paradigms)— in traditional Mayan linguistics, the term SET A is used for agreement markers indicating agreement with both transitive subjects and possessors (see Coon (2017) for a recent analysis). I believe formal analyses of possessor agreement must have a more central place in discussions about agreement parallelisms between the nominal and clausal domain.[12]

3   Uniform vs. mixed concord

For the most part, the examples I have discussed thus far involve full matching throughout the nominal phrase: every element showing concord expresses the same features and the same feature values. I refer to this as uniform concord. However, in addition to uniform concord, there are patterns (i) where every element expresses the same features but not necessarily the same feature values and (ii) where elements expressing concord do not all express the same features. I refer to these systems as mixed concord.

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[11]Plank's (1994) survey of agreement in 50 languages also uncovers some other possible cases of coexistence of concord: Evenki, Hopi, and Palauan. However, Plank does not provide specific examples, thus these examples are tentative.

[12]Another interesting similarity between possessor agreement and subject-verb agreement is multiple-marking and/or marking on adjuncts. In the best-known cases of possessor agreement, it is marked only once per DP and is not marked on modifiers (e.g., adjectives). The one exception I am aware of is Tundra Nenets. Nikolaeva (2005) reports that adjectives may optionally reflect possessor agreement in tandem with the possessum. This is reminiscent of subject-verb agreement appearing on adverbs in that it is also rare, so far as we know.

3.1 Mixed concord type 1: same features; different feature values

One clear example of this first type of concord is Finnish, as discussed by Brattico (2010). In Finnish nominal phrases with numerals, there is non-uniform concord in both case and number.

(31) ne   kaksi   pilaantunut-ta leipä-ä
      those.PL.NOM two.SG.NOM rotten-SG.PAR bread-SG.PAR
      'those two rotten breads' (Brattico 2010:60)

(32) ne   pilaantune-et kaksi   leipä-ä
      those.PL.NOM rotten-PL.NOM two.SG.NOM bread-SG.PAR
      'those two rotten breads' (Brattico 2010:60)

In (31), the noun *leipää* 'bread' is singular and bears partitive case, while the demonstrative *ne* is plural and bears nominative case. Notice as well that the position of the adjective affects its marking: adjectives on the right of the numeral are singular and partitive (as in (31)), while adjectives on the left are plural and nominative (as in (32)). Thus, while these elements all show concord for number and case, the actual feature values are not uniquely determined.

The concord systems of some Romance languages also feature this pattern of expressing different feature values. The most revealing examples I have found come from Cinque (1994), who cites some examples of this type from Ladin (33) and Brazilian Portuguese (34) in a footnote.

(33) nostra   bela   montes   ladines
      our.F.SG beautiful.F.SG mountains.F.PL Ladin.F.PL
      'our beautiful Ladin mountains' (Ladin; (Cinque, 1994:fn28))

(34) minhas   filha   pequena
      my.F.PL   daughter.F.SG small.F.SG
      'my small daughters' (Brazilian Portuguese; (Cinque, 1994:fn28))

In both cases, while the elements do not all agree in number, they do all reflect gender. In the Ladin example in (33), the words after *montes* 'mountains' are plural, but all reflect feminine gender. In the Brazilian Portuguese example in (34), only *minhas* 'my' reflects plural number, but all three words reflect feminine gender.[13]

Landau (2016) discusses and analyzes a pattern of this type in Modern Hebrew, and in his discussion, he also cites Chichewa, Finnish, Lebanese Arabic, Russian, and Serbo-Croatian as languages with this type of mixed concord. I discuss Landau's analysis in part II.

3.2 Mixed concord type 2: Different words express different features

Concord systems may also involve words expressing different features rather than different feature values. The most in-depth study of this type is Deal's (2016) analysis of concord in Nez Perce. One particularly illustrative example is given below.

(35) yox̂-mé   lep-úʔ   ki-kúhet ha-ʔáayat
      DEM.NOM-PL   two-HUM PL-tall PL-woman
      'those two tall women'   (Deal, 2016:320)

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[13]See Bonet (2013); Bonet et al. (2015); Nevins (2011) for discussion of similar patterns in a dialect of Catalan.

In this example, the demonstrative *yox̂-mé* and adjective *ki-kúhet* show concord for number; the numeral *lep-úʔ* does not. The numeral shows concord for gender (based on animacy in Nez Perce), but the demonstrative and adjective do not. Deal (2017) observes that some other Nez Perce quantifiers also show gender concord (e.g., *ʔilex̂ni* 'many'). As Deal (2016) discusses, many aspects of concord are optional in Nez Perce, but the patterns just discussed are consistent: numerals never show concord for number, and demonstratives and adjectives never show concord for gender. Thus, different elements in Nez Perce show concord for different features.

Another example is Hindi. Hindi has concord for gender, number, and case.[14] Adjectives inflect for all three, but demonstratives only inflect for two: number and case. For space reasons, I show only the oblique forms.

(36)   Singular:
    a.   is   acche   laRke   ko
        this.SG.OBL good.M.SG.OBL boy.M.SG.OBL DAT
        'this good boy (dative)'   (Rajesh Bhatt, p.c.)
    b.   is   acchii   laRkii   ko
        this.SG.OBL good.F.SG.OBL girl.F.SG.OBL DAT
        'this good girl (dative)'   (Rajesh Bhatt, p.c.)

(37)   Plural:
    a.   in   acche   laRkoN   ko
        these.PL.OBL good.M.PL.OBL boy.M.PL.OBL DAT
        'these good boys (dative)'   (Rajesh Bhatt, p.c.)
    b.   in   acchii   laRkiyoN   ko
        these.PL.OBL good.F.PL.OBL girl.F.PL.OBL DAT
        'these good girls (dative)'   (Rajesh Bhatt, p.c.)

Thus, regardless of gender, the proximate demonstrative is *is* when singular and *in* when plural. Though not shown here, this is also true of the the distal demonstrative (Rajesh Bhatt, p.c.). This strikes me as different from an accidental syncretism; rather it looks like what Williams (1994) dubs METASYNCRETISM given that it is true for all lexical items of the relevant type. Whether that matters depends, of course, on the particulars of the analysis.

3.3   Optional expression of concord

In most cases of concord analyzed in the literature, concord is obligatory. However, there are concord systems that are sometimes described as having a degree of optionality. The concord system of Nez Perce is one such example. Recall that various elements in the Nez Perce DP show concord for case, number, and gender. As Deal (2016) notes (pp. 320-321, 328-330), concord is optional for noun modifiers. This is shown for gender in (38), number in (39), and case in (40).

(38)   mitáa-w' pi-pít'in' / mitáa-t   pi-pít'in'
        three-HUM PL-girl   / three-SUFF PL-girl
        'three girls'   (Deal, 2016:319)

---

[14]By *case* here I mean what is sometimes called *obliqueness*. There is an oblique form used for objects of postpositions and a direct form used elsewhere.

(39) kii   ha-hácwal
      DEM.NOM.SG PL-boy(NOM)
      'these boys'   (Deal, 2016:329)

(40) yox̂   tuyée-ne
      DEM.NOM.SG grouse-ACC(SG)
      'that grouse'   (Deal, 2016:329)

In (38), the numeral *mitáa* 'three' can show concord for human gender (*mitáaw'*) or appear in its (general) citation form (*mitáat*). In (39), the demonstrative *kii* appears in its singular (citation) form while modifying a noun that bears plural number. In (40), the demonstrative *yox̂* appears in its nominative (citation) form while modifying a noun that bears accusative case.

Deal (2016) makes an interesting argument that the optionality of concord is not determined on a feature-by-feature basis in Nez Perce, but as a whole. In other words, if a particular word shows concord, it must reflect all the features it can express. Her evidence comes from demonstratives, which show concord for number and case. In (39) above, it is clear that number concord has not taken place, but it is not clear whether case concord has applied. The demonstrative could be in its nominative form due to concord or simply because it is the citation (i.e., default) form. The same is true *mutatis mutandis* for case/number in (40).

Interestingly, whenever the form of the demonstrative clearly shows that the demonstrative has participated in concord for either case or number, then it must show concord for both. This is clear from contexts where the noun is neither nominative nor singular, as in the accusative plural DP in (41).

(41) *kon-má   / *kon-yá   / ✓kon-ma-ná ha-ʔáayato-na
       DEM-PL(NOM) / DEM-ACC(SG) / DEM-PL-ACC PL-woman-ACC
      (Deal, 2016:329)

In this case, only the accusative plural demonstrative (*kon-ma-ná*) is acceptable. If the demonstrative clearly shows only number concord (*konmá*) or only case concord (*kon-yá*), the result is ill-formed. On the basis of this, Deal (2016) argues that concord is optional as an operation in Nez Perce rather than on a feature-by-feature basis. That is to say, demonstratives in Nez Perce may participate in concord or not, but if they do participate, they must show concord for both case and number.

I have encountered other instances of optional concord, but the particulars of the optionality are not always clear from discussion, and thus this is an area where more careful descriptive work could be done.

4   Conclusion: Part I

This concludes Part I. Most discussions of concord focus on uniform concord systems, and most focus on languages in Africa and Europe. There is much that we still do not know about the bounds of concord as a relation, in particular as regards mixed systems and systems with optionality. In Part II, I discuss formal analyses of concord patterns, focusing on ϕ-feature concord and case concord.

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Description and analyses of nominal concord (Pt II)

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Abstract

This paper discusses the current understanding of what has been called NOMINAL CONCORD, whereby modifiers of a noun match certain features of the noun (e.g., gender, number, or case features). Part I discusses existing understanding of concord, remaining as descriptive as possible. Concord has been argued to involve gender, number, case, and definiteness, and nearly every word class that can be present inside nominal phrases is capable of showing concord. I consider some questions concerning the typology of concord, which is largely uncharted territory. Part II focuses on existing formal analyses of concord. Analyses of ϕ-feature concord are rather varied, but analyses of case concord more or less converge on the same mechanism. Finally, I consider the insight offered by analyses of cases of mixed concord, where modifiers do not all match each other or the head noun in features or feature values.

1 Introduction: Part II

In part I of this paper, I discussed aspects of the description of nominal concord. In this part, I focus on formal analyses of concord. In section 2, I discuss approaches to ϕ-feature concord, focusing on adjectives, and I discuss the connection between concord and subject-verb agreement. I turn to case concord in section 3. Finally, section discusses analyses of MIXED CONCORD, whereby the various elements showing concord do not all express the same features or feature values.

2 Concord in gender and number

Perhaps the earliest generative treatment of concord was an analysis of determiner concord presented by Chomsky (1965:175).

$$
(1) \qquad \text{Article} \rightarrow
\begin{bmatrix}
\alpha & \text{Gender} \\
\beta & \text{Number} \\
\gamma & \text{Case}
\end{bmatrix}
/ \underline{\quad}
\begin{bmatrix}
+ & \text{N} \\
\alpha & \text{Gender} \\
\beta & \text{Number} \\
\gamma & \text{Case}
\end{bmatrix}
, \text{ where Article} \dots \text{N is an NP.}
$$

This rule is a direct formalization of the traditional characterization of nominal concord as "agreement with the head noun." Since then, research on agreement within the generative tradition has largely focused on argument-predicate agreement (especially subject-verb agreement). There are far fewer formal analyses of nominal concord. As many analyses treat only ϕ-feature concord or case concord but not both, I separate discussion of them in what follows, beginning with ϕ-feature concord. Existing analyses can be divided into two groups: (i) those that analyze concord using the same mechanism as other forms of agreement and (ii) those that do not. I discuss these in turn. In some of these approaches, concord's formal analysis reflects its description as "agreement with the head noun." In others, the precise formalization diverges from this traditional definition.

2.1   Concord and subject-verb agreement via the same mechanism

Much of the research on concord focuses on adjectives, which have been taken as the canonical example of concord (Corbett (2006:40), Anderson (1992:106)). I thus use adjectives to drive discussion, but I will discuss other categories as they become relevant. Using adjectives has an additional benefit, as there are many proposals for the syntax of attributive adjectives, and it has even been proposed that adjectives can appear in many structures within one language. The details of the analysis of concord are dependent on the analysis of the element showing concord under investigation, as Polinsky (2016:223) notes. Thus, the fact that there are multiple proposals for adjectival positions has influenced proposed formalizations of concord.

   The approaches that treat concord and subject-verb agreement with one mechanism can be divided primarily into two groups based on how they treat adjectives: either as specifiers of functional projections or as adjuncts to the nominal spine. I discuss these in turn.

2.1.1   Analyses of concord with adjectives as specifiers of functional projections

Under one proposal, adjectives are specifiers of functional projections within the nominal spine, as represented schematically below (Cinque (1994), among others).

(2)
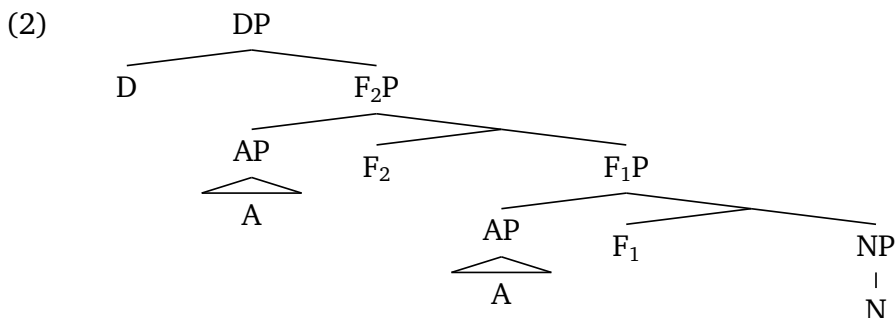
A structure like this for adjectives is assumed in analyses of concord by Bonet (2013); Bonet et al. (2015); Carstens (2000); Cinque (1994); Collins (2004); Danon (2011); Laenzlinger (2005); Mallen (1997), though the identify of the functional heads (F_1 and F_2 above) varies.

   Many analyses of this type focus on Romance or Bantu languages, where the noun does not appear to surface in its base position at the bottom of the structure in (2)— an example from Italian is below in (3).

(3)   la   probabile goffa   **reazione** immediata alla tua   lettra
       the probable clumsy **reaction** immediate to   your letter
       'the probable clumsy immediate reaction to your letter'   (Cinque, 1994:92)

The noun *reazione* 'reaction' appears sandwiched between two adjectives in Italian, as opposed to the English version, where it most naturally occurs after all the adjectives. The surface position of the noun in languages such as Italian has been used as evidence to support the claim that N^0 undergoes head-movement into the functional adjectival projections, with variation across languages based on how high up the spine the N^0 is able to move. Let us assume for the moment that this movement puts the head into the requisite syntactic relationship with the adjective to allow for agreement to occur. So, for example, when N^0 moves to $F1^0$, the adjective in Spec,F1P can agree with it, and so on. This is essentially the analysis proposed by Carstens (2000); Cinque (1994); Mallen (1997).

However, N^0 does not move all the way to the top of the nominal extended projection in every language. Thus, something additional must be said to account for concord on adjectives (and other elements) that are not specifiers of one of N^0's landing sites— for example, the determiner *la* in (3). Cinque (1994) suggests that this agreement can be registered by movement of the N^0 and subsequent feature-checking at Logical Form (LF). However, this solution is assumed rather than argued for, and it is not clear how it could be supported empirically. Furthermore, the agreement relation necessary for this N^0-movement-based account is, in any case, unclear. The relation is akin to the Spec/Head configuration, which has been argued to underlie agreement (especially subject-verb agreement), but it is actually reversed. In a Spec/Head analysis of subject-verb agreement, the head (e.g., I^0) acquires ϕ-features from the subject in its specifier. In the Spec/Head analysis required for this kind of analysis of concord, the adjective in specifier position (e.g., of F_1P) would acquire its ϕ-features from the functional head (or possibly, from the N^0 subconstituent of that head).

The particulars of the analysis sketched above are not shared by all analyses based on a structure like (2). Laenzlinger (2005) proposes movement of NP rather than N^0 following Shlonsky (2004), and this necessitates an additional functional projection—possibly for each adjective (pp. 659-660)—to serve as the NP's landing site, e.g., above F_1P in (2). Again, the mechanism for agreement is unclear— the concord suffix could be the spell-out of the additional functional projection above the adjective (which Laenzlinger (2005) dubs (2005) Agr(NP)). Similarly, Collins (2004) proposes layered functional projections of this type, although agreement itself is analyzed as Agree between the higher functional projection and the NP (see, e.g., Collins (2004:126)).[1] A working definition for Agree is provided below— see Chomsky (2000, 2001); Preminger (2014) among many others for more detailed definitions and explorations.

(4)   **Agree** (working definition): a head X^0 with unvalued features (e.g., ϕ-features) (= the PROBE) searches its c-command domain for a phrase YP with valued features of the same type (= the GOAL). The probe acquires the features of the goal.

It is not clear how this kind of syntactic analysis lines up with the morphological facts. Namely, the relevant features are acquired by a functional head higher than the adjective, but they are

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[1]In fact, Laenzlinger (2005) also suggests (p. 661) Agree for nominal concord in languages where there is no evidence for N(P) movement, although the particulars are not fleshed out formally.

morphologically expressed by the adjective itself. Thus, the details of how the concord affixes end up on the adjective must be clarified.

Similarly to Collins, Danon (2011) proposes that nominal concord is established via Agree, but for Danon, Agree obtains directly between the adjective and N(P) rather than being mediated through a functional head. Based on his discussion, it requires that the maximal projection of AP serve as the probe rather than the head as is traditionally assumed. This assumption is also made in the context of adjectives as adjuncts. Let us turn to that kind of analysis now.

2.1.2 Analyses of concord with adjectives as adjuncts

Another prominent proposal for the syntax of adjectives is that they are adjoined to the nominal spine, as represented schematically below.

(5)
```
                      DP
              ┌───────┴───────┐
              D              NP
                      ┌───────┴───────┐
                     AP              NP
                    ┌─┴─┐      ┌───────┴───────┐
                    A         AP              NP
                          ┌──┴──┐             │
                          A                   N
```
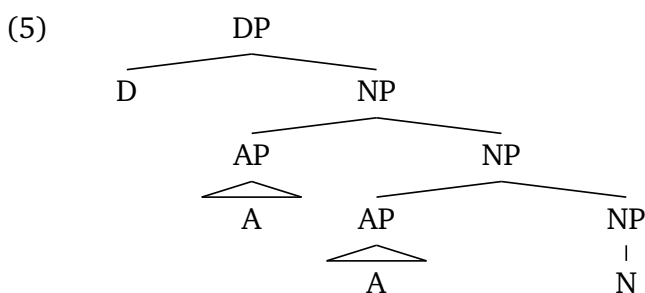
A structure like this for adjectives is assumed in analyses of concord by Baier (2015); Baker (2008); Carstens (2001, 2011, 2016); Ingason & Sigurðsson (2017); Kramer (2009); Landau (2016); Toosarvandani & van Urk (2013).[2] These approaches all analyze agreement as an application of the syntactic relation Agree (see (4) above). However, this relation cannot straightforwardly hold between the A^0 and the N(P) in a structure like (5), because the two are not obviously in a c-command relation. Thus, something additional must be said.

One approach is to assume that the maximal projection AP can serve as the probe rather than the head A^0. This is the approach taken by Carstens (2001, 2011, 2016); Kramer (2009); Landau (2016).[3] In fact, Carstens (2016:7) cites concord as evidence that XPs must be able to serve as probes. Carstens asserts that A^0 first attempts to find a goal within its c-command domain (internal to AP), and upon finding nothing there, $[u\phi]$ (i.e., unvalued ϕ-features) of A^0 becomes $[u\phi]$ of AP, and Carstens assumes AP can then find the features of N(P).[4] This is schematized in the two-step derivation below.

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[2]In fact, Landau (2016) equivocates on the analysis of adjectives, as the particular formalization of concord is tangential to the focus of his paper. I discuss his analysis with the other adjunction analyses because it is similar to them in many respects.

[3]Carstens (2011, 2016) is the only one who actually proposes that the maximal projection can serve as the probe— in the other references cited here, it appears to be tacitly assumed that this is possible (or, at least, an AP is shown adjoined to the nominal spine and it is assumed that it can acquire the relevant features via Agree). Also, I must note that Landau (2016) does not take a stance on whether adjectives are adjoined or in specifier position, but I include discussion of his paper here as it is more similar in formalization to the analyses in this section.

[4]This is predicated on the assumption that AP does, in fact, c-command the NP that it modifies, and this is not obviously the case, as the AP is an adjunct. Whether adjuncts can c-command elements in the constituent they are adjoined to depends crucially on the particular formal understanding of adjunction adopted. The authors referenced here do not detail the properties of adjunction as they understand it.

(6) a. A^0 searches c-command domain; finds nothing

NP
├── AP
│   ├── A $[u\phi]$? ...
└── NP
    └── N $[\phi]$
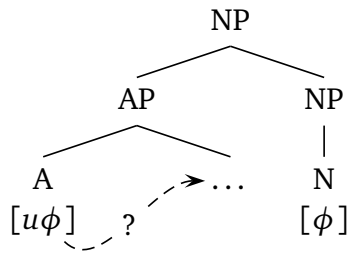
b. $[u\phi]$ of A^0 becomes $[u\phi]$ of AP; AP searches c-command domain and finds $[\phi]$ on N^0

NP
├── AP $[u\phi]$ (A ...)
└── NP
    └── N $[\phi]$
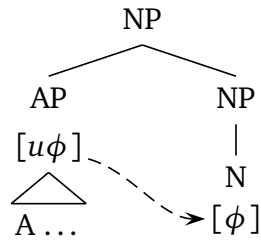
Carstens (2016) does not discuss languages where attributive adjectives can have complements—her analysis predicts that adjectives could show concord with their complements rather than the nouns they modify (assuming those complements could otherwise be suitable goals), and I am not aware of any examples of this type. Thus, independent evidence for that aspect of the proposal is lacking.

A second approach to the apparent lack of c-command between A^0 and NP, proposed by Baier (2015); Baker (2008); Ingason & Sigurðsson (2017); Toosarvandani & van Urk (2013), is to take the Agree relation to be bidirectional. In other words, all that is required is a c-command relationship between a probe and a goal, and it does not matter which c-commands which. Thus, it does not matter that A(P) does not (arguably) c-command N(P). Because A(P) is c-commanded by some other head, e.g., D^0, an Agree relation can obtain between D^0 and $A(P)^0$ once D^0 itself has acquired the requisite features. This could happen via a separate instance of Agree (Baker, 2008; Ingason & Sigurðsson, 2017; Toosarvandani & van Urk, 2013), via head movement (Baier, 2015), or simply due to the fact that D^0 is a member of the same extended projection as N^0 (in the sense of Grimshaw (1991/2005). Once D^0 (or some other higher head) acquires the concord features of N^0, A^0 is then able to show concord with the head noun indirectly by establishing Agree "upwards" with D^0. This is schematized below, assuming Agree between D^0 and N^0 for simplicity.

(7) a. D^0 establishes Agree with N^0, obtaining its ϕ-features.

DP
├── D $[u\phi]$
└── NP
    ├── AP
    │   └── A $[u\phi]$
    └── NP
        └── N $[\phi]$
    ① ─ ─ →
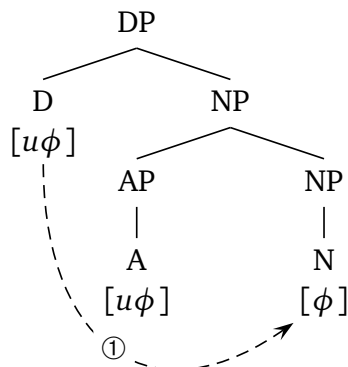
b. A^0 establishes Agree "upwards" with D^0, obtaining N^0's ϕ-features indirectly.

DP
├── D $[\phi]$
│   ② ↑
└── NP
    ├── AP
    │   └── A $[u\phi]$
    └── NP
        └── N $[\phi]$
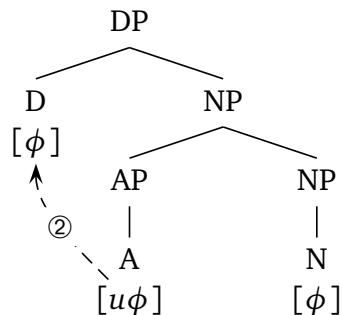
Like the AP-as-probe analyses, these authors by and large do not discuss what happens in languages where attributive adjectives have complements. Toosarvandani & van Urk (2013) come close to discussing this in their analysis of concord on Zazaki ezafe (a type of linker, see Part I). When the ezafe introduces a possessor, it does not match the ϕ-features of the

5

possessor— instead, it matches the ϕ-features of the possessed noun. Toosarvandani & van Urk (2013) propose that the possessor's ϕ-features are inaccessible, because the possessor bears oblique case, and DPs marked with oblique case are otherwise inaccessible for agreement. However, they do not furnish independent evidence for this claim or consider and reject alternative analyses, and thus the analysis still faces open questions.[5]

2.2 Comparing concord and subject-verb agreement

I have just discussed analyses that seek to analyze nominal concord via the mechanisms used to analyze subject-verb agreement. These approaches assume, at least tacitly, that nominal concord is a kind of DP-internal version of subject-verb agreement. Of course, it is in principle possible to propose a unified mechanism, and this could be simpler than using multiple mechanisms. However, whether that is true depends crucially on how the mechanism is able to capture the differences between the behavior of subject-verb agreement and concord. Norris (2014) identifies four differences between nominal concord and subject-verb argument (or more broadly, argument-predicate agreement), and he argues that these differences should be taken into account by theories which aim to collapse the two forms of agreement.

First, there is a difference in the number of loci of agreement expression. It is impressionistically common for concord to be expressed on multiple elements within the same DP. In contrast, subject-verb agreement is often expressed just once. For example, in Estonian, sentences involving auxiliary verbs only show agreement on the auxiliary— the main verb surfaces in an invariant participial form. Accompanying adverbs are also invariant.

(8) a. Heiko on kiiresti lahku-nud.
H.NOM be.3 quickly leave-PST.PCPL
'Heiko has quickly left.'

b. * Heiko on (kiiresti) lahku-b.
H.NOM be.3 (quickly) leave-3

Of course, there are languages where constructions like (8b), with agreement on both the auxiliary and the main verb, are the norm. They are well-documented in Bantu (Carstens, 2001; Henderson, 2006) and have also been observed and analyzed in Ibibio (Baker & Willie, 2010), Hindi (Bhatt, 2005), and Moroccan Arabic (Ouali, 2014). Bantu and Semitic languages are also well-known for their robust concord systems. Thus, in these languages, there is robust ϕ-feature agreement in both nominals and clauses. However, the observed facts in languages such as Estonian are puzzling against this backdrop, because Estonian (among other languages) has a rich system of concord, but subject-verb agreement is only expressed once.

Second, elements showing concord can occupy a variety of syntactic positions. Whether or not this is the case depends on syntactic analyses of the categories in question, but Norris (2014) contends that concord may be seen on heads (e.g., determiners, strong quantifiers), specifiers (e.g., numerals, demonstratives, possessors), and adjuncts (adjectives). In contrast, subject-verb agreement is frequently found only on heads. There are very few examples of agreeing adverbs in the literature (see D'Alessandro (2011:37) on the Ripano dialect of Italian, Grosz & Patel-Grosz (2014:228) on Kutchi Gujarati, and Carstens & Diercks (2013) on

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[5]There is a longer unpublished version of the analysis that faces the same issues— see Toosarvandani & van Urk (2014).

Lubukusu/Lusaamia). If it is correct to say that adverbs are syntactically similar to adjectives as is often assumed, then the failure of adverbs to show agreement is noteworthy. Adjectives regularly show concord, but adverbs agree only rarely.

Third, the relationship between the origin of features and the location of their ultimate expression is different. Subject-verb agreement is a relationship between two different extended projections (in the sense of Grimshaw 1991/2005). In other words, a verbal element expresses nominal features of one of its arguments. The features are expressed on elements of the verbal projection, but they originate in the nominal projection. In concord, a nominal element expresses features of the same nominal extended projection that contains it. It is not a relationship between two different extended projections, but a relationship between an extended projection and its members. The features are born in a particular nominal extended projection, and they are expressed there.

Finally, Bobaljik (2008) and Preminger (2014) (among others) have argued that there is a connection between subject-verb agreement and case. Concretely, they have argued that agreeing heads like T^0 may be sensitive to the case values of possible goals, such that they cannot agree with an element bearing any other case but nominative. This is true for Estonian, where verb agreement can only be controlled by nominative arguments (Erelt et al., 1993, 2000).

(9) Õue-s   ✓mängi-s   / *mängi-si-d   lapsi.
     yard-INE play-PST.3SG / play-PST-3PL children.PL.PAR
     'There were children playing in the yard.'

(10) Õue-s   *mängi-s   / ✓mängi-si-d   lapse-d   sulgpalli.
     yard-INE play-PST.3SG / play-PST-3PL children-PL.NOM badminton.PAR
     'There were children playing badminton in the yard.'
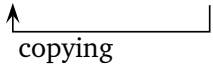
In (9), the partitive plural *lapsi* does not trigger plural verb agreement, and in (10), the nominative plural *lapsed* must trigger plural verb agreement. Norris (2014) notes that no such descriptive link between case and concord has been found. Concord is not connected to the assignment of a particular case, nor is there a "failure of concord" if concord involves some case or other.

The differences just discussed are given in brief in Table 1. These differences give reason

	SUBJECT-VERB AGREEMENT	CONCORD
NUMBER OF LOCI OF EXPRESSION	one	many
STRUCTURAL POSITION OF AGREEING ELEMENTS	head	head, specifier, adjunct
FEATURE ORIGIN	external	internal
CASE-DEPENDENCE	yes	no

Table 1: A comparison of subject-verb agreement and concord

to be skeptical of the attempt to collapse nominal concord and subject-verb agreement under one mechanism. Of course, as Norris (2014) notes, these differences are not analytically insurmountable. However, any analysis that treats concord as a subcase of subject-verb agreement

should take their differences seriously and carefully consider where those differences are to be found within the grammar.

Let us turn now to analyses that analyze concord and subject-verb agreement using different formal mechanisms.

2.3 Concord and subject-verb agreement as separate mechanisms

As discussed in section 2.1, there are many approaches to concord which assimilate it to other well-studied forms of agreement (namely, subject-verb agreement). In most cases, alternative approaches are not considered— this may be due to the inherently appealing nature of collapsing two different forms of agreement under one formal operation. However, some authors do not take the same tack, proposing that concord is a different type of agreement relationship. There are fewer of this type of analysis, and those that I am aware of are fairly distinct.

2.3.1 Polinsky (2016): Concord in Archi

Polinsky (2016) proposes that concord must be a separate operation from subject-verb agreement in Archi. Her primary argument comes from a class of participles formed with the suffix *-t:u*. A simple example is presented below.

(11)　　bala-t:u-t　　　　　　ac:'i
　　　　be.difficult-ATTR-IV.SG disease(IV).SG.ABS
　　　　'bad (tough) disease'　　　　　　　　　　　　　　　　(Polinsky, 2016:226)

Here, the participle *balat:u* 'bad' shows concord in gender and number with the noun *ac:'i* 'disease', indicated by the *-t* suffix. The most interesting arguments come from participles that are built from complex VPs/tensed clauses. One such example is below.

(12)　　χ:ʷalli　　　　　　　b-ača-r-t:u-t　　　　　　　di
　　　　bread(III).SG.ABS III.SG-bake-IPFV-ATTR-IV.SG smell(IV).SG.ABS
　　　　'the smell of bread being baked'　　　　　　　　　　(Polinsky, 2016:227)

Here, *-t:u* is attached to what is otherwise a tensed verb. The verb agrees in gender and number with its object (see the prefix *b-*). However, the suffix after *-t:u* also agrees just as before. Interestingly, it matches the gender of *di* 'smell' (the noun it modifies) rather than the gender of χ:ʷ*alli* 'bread'.

Polinsky shows that the best analysis for *-t:u* is adjunction, as there is no evidence for N^0-movement of the type discussed in section 2.1.1. Polinsky then argues that Agree cannot hold between the participle and the head noun, because the two are not in a c-command relationship (see the structures on p. 225). This tacitly denies the viability of an XP-as-probe analysis of concord, but it also provides an additional argument against it. Importantly, in Carstens's (2016) analysis the A^0 head first searches its own c-command for a suitable goal, and AP only serves as a probe if the initial search fails. Archi challenges this approach— given the fact that there can be a suitable goal within the participial phrase (as evidenced by the fact that the embedded verb bears agreement with it), it is not clear why the participle would nevertheless agree with the head noun rather than agreeing twice with the embedded object.

Polinsky (2016) thus proposes that concord in Archi is derived via a separate mechanism, which she treats as feature-copying, schematized in the diagram in (13).

(13) $[_\text{NP} [_\text{PtcpP} [_\text{TP} [_\text{PredP} [\ldots]]]]]\text{-}\phi$ $[\text{NP}]_\phi]$ (Polinsky, 2016:230)

copying

While Polinsky does discuss the ways in which concord is **not** constrained (i.e., it is not constrained by locality in the same way as subject-verb agreement), she does not consider what other possible constraints could be placed on concord.

2.3.2   Norris (2014): Concord in Estonian

Norris (2014) rejects the analysis of concord whereby elements showing concord are syntactic probes that participate in Agree, largely due to the behavior of adjectives (pp. 104-120). As Polinsky (2016) notes, adjectives are not canonically taken to be in a position to c-command the noun, and there are no known examples of adjectives agreeing preferentially with their complements as might be expected in an Agree-based approach. Instead, Norris proposes that some parts of concord are syntactic and some are morphological. On the syntax side, he proposes feature percolation mechanisms for both case and ϕ-features such that the features are spread throughout the nominal extended projection. ϕ-features spread upward and case features spread downward. This is schematized in the simple structure below, where the origins of the features are boxed and arrows indicate direction of spreading.

(14)
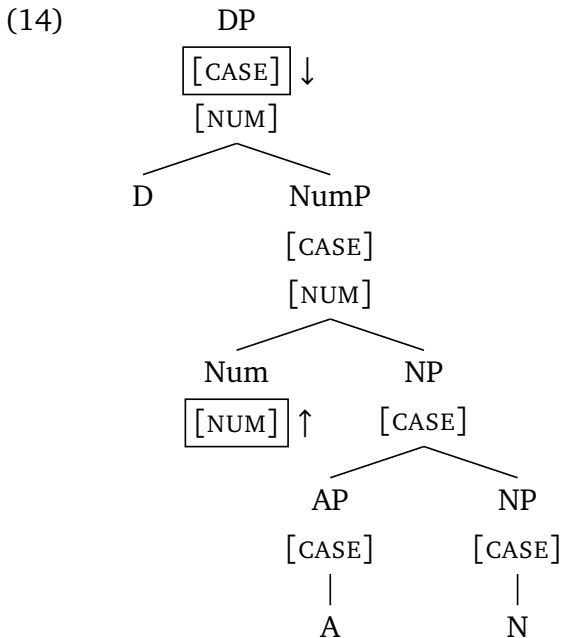
The end result is a DP where every head in the main nominal spine is marked for the features of the entire nominal (e.g., for Estonian, case and number are represented throughout the nominal spine).

The process of concord-bearing elements acquiring and expressing the relevant features is carried out postsyntactically within the framework of Distributed Morphology. First, heads that must show concord trigger insertion of dissociated Agr^0 nodes adjoined to the heads themselves. These Agr^0 nodes are specified for the features that are relevant for concord in the given language. Then, a rule of Feature Copying copies feature values from the closest source to the Agr^0 node, where closest is determined by domination rather than c-command (see also Kramer

(2010) for an analysis of adjectival definiteness agreement that makes use of Agr^0 nodes and Feature Copying). Concord is thus formally a local relation, as closeness comes into play. The feature values that a particular concord-bearing element expresses are dependent on that element's merge position.

This locality is necessary to capture the version of mixed concord where different elements in a DP bear different feature values (as discussed by Landau (2016); Norris (2014)). However, the mechanism also extends to uniform concord, where every concord-bearing element expresses the same features and feature values. In these cases, only one value for each feature is available, giving the appearance that concord is a global operation (as proposed by Norris (2012)). However, the apparent global nature is strictly-speaking epiphenomenal.

2.3.3 Giusti (2008): Concord in Romance

Giusti (2008) explicitly proposes that concord should be formally divorced from Agreement (i.e., subject-verb agreement). For Giusti, subject-verb agreement is a two-step operation involving (i) an Agree relation and (ii) movement of the formal features of the goal to the specifier of the probe, either alone (i.e., Agree without movement) or along with the goal constituent itself (i.e., Agree with movement). In contrast, Concord is the relation between a head and its externally-merged specifier—Giusti assumes the specifier analysis of adjectives (see section 2.1.1)—and Giusti (2008) proposes that Concord never involves movement.

Crucial to this analysis is Giusti's proposal that the functional heads hosting adjectives are, at least in part, copies of the ϕ-features (and possibly, case features) of the the N(P) (pp. 220-1). This is similar to Norris's (2014) proposals concerning feature percolation in that relevant ϕ-features are represented throughout the DP. Giusti's proposal ensures that every functional head that can host an AP specifier has the features that the adjective needs. Then, she treats Concord as a kind of Spec/Head relation between the AP specifier and its host, with features flowing from the head—a copy of the noun's ϕ-features—to the adjective specifier.[6] Again, I note that this Spec/Head agreement relation is the reverse of Spec/Head subject-verb agreement, where features are copied from the specifier to the head.

Giusti focuses primarily on adjectival concord, and it is not clear how her analysis extends to elements that are heads within the nominal spine, e.g., Q^0 or D^0. Given that these heads are often expressed by actual lexical items, it is less likely that they can simply be trivial copies of the ϕ-features of the noun phrase, as Giusti proposes for the functional heads hosting adjectival specifiers. It also seems unlikely that they are in the requisite Spec/Head configuration with other functional heads in a manner similar to adjectives. Thus, some aspects of the formalization of the agreement mechanism require further precision.

2.3.4 Concord in unification-based frameworks

Finally, there are approaches to concord in unification-based morphosyntactic frameworks (Grimshaw, 1991/2005; Nikolaeva, 2005; Svenonius, 1993; Wechsler & Zlatić, 2003). In these approaches, lexical items are pre-specified for the relevant features, and the feature matching

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[6]This is a bit of a simplification, as Giusti's actual proposal is that APs are complements to a functional head F^0, and it is FP that is the specifier of the other functional heads (she calls them Conc1^0, Conc2^0, etc.) in the nominal spine.

indicative of concord is enforced through principles that govern feature unification for various syntactic relationships. I discuss these in the current section, because they arguably rely on more than one mechanism to capture concord for all the elements that show it. For example, Svenonius (1993) analyzes concord as selection, but in the case of determiners, it is selection via the COMPS feature (allowing heads to select features of the heads of their complements), and in the case of adjectives, it is selection via a MOD feature (allowing adjuncts to select features of their hosts). Wechsler & Zlatić (2003) share the MOD assumption but analyze determiners as specifiers of the NP, and so agreement in that case is regulated by the Valence Principle, which essentially requires specifiers and hosts to match in particular features. Thus, while concord can be captured using existing mechanisms, the mechanisms are varied.

For the most part, these accounts all share the requirement that each element showing concord expresses the same feature value. This straightforwardly captures uniform concord, but it is less clear how these approaches can be applied to the various types of mixed concord. See Landau (2016) for the most thorough challenge to this kind of approach on the basis of mixed concord.

2.4   Summing up: approaches to ϕ-feature-concord

Approaches to ϕ-feature-concord vary widely. Approaches that aim to assimilate concord to subject-verb agreement all require additional assumptions to work; those assumptions are not always independently-motivated. Approaches that treat concord as a separate mechanism are fewer in number. Perhaps unsurprisingly, they vary much more, and their motivation comes primarily from the claim that concord is fundamentally different from better-studied forms of agreement. However, the boundaries of the separate concord operation are not always clear. Future analyses of concord should carefully consider how unattested concord relations can be excluded in a principled way.

3   Case concord

Let us now turn to a discussion of case-marking. In languages with suffixal case-marking, there are two common distributions of case morphemes according to Blake (2004:99ff). In one type of language, the case-marker is on the final word in the noun phrase, which is often (not always) the head noun. In the second type, case-marking appears not only on the noun, but on its modifiers as well (e.g., determiners or adjectives). This second type has come to be known as CASE CONCORD, and this is what I focus on in this section.

3.1   Case concord as a relation between N^0 and its modifiers

In Indo-European languages that show case concord, ϕ-feature concord and case concord are clearly connected in that whatever elements show ϕ-feature concord also show case concord. Given the fact that the head noun, as the locus of gender features, is directly or indirectly implicated in concord, one approach to case concord uses the noun as an intermediary, just as in ϕ-feature concord. This seems intuitively like a simplification, and it could derive the fact that all the heads showing ϕ-feature concord in many Indo-European languages also show case

concord. Chomsky's initial formalization of case concord in (1) above takes this tack, treating concord (on the article) as "agreement with the head noun", equally for case as for gender.

In contemporary analyses, this formalization is taken only rarely. Giusti (2008) is the author who comes closest to such a proposal. I discussed Giusti's proposal in section 2.3— all that we must add is her proposal that case features are merged with N^0 (pp. 226-227). The functional heads in the nominal spine hosting adjectives, which Giusti interprets as "trivial copies of the ϕ-features of the nominal expression," crucially involve the noun's case features. These are ultimately checked when the features reach the topmost head in the DP, but along the way, they are passed to agreeing elements via concord. As a result, this mechanism for case concord faces the same challenges as the mechanism of ϕ-feature agreement. Namely, the agreement mechanism requires further precision, and something additional must be said about how to incorporate overt heads in the nominal spine (e.g., determiners), which presumably could not be trivial copies of the noun's ϕ-features.

3.2 Case concord as a relation between DP and its constituents

Rather than treating case concord as arising from N^0, contemporary analyses more often take a top-down approach: case is assigned to maximal projections, and that value is then passed down the nominal projection. This is essentially the reverse of the relation assumed for gender/number concord, which begins lower in the DP and is accessed by higher elements via some additional mechanism. The reversed direction for case concord is motivated in part by the behavior of case at large, which is frequently treated as a relation between maximal nominal projections, i.e., NPs or DPs, and the piece of syntactic structure they are related to.

Under some approaches, case is first assigned to the NP/DP, and then a separate rule ("case concord") shares this case value with the other members of the DP. This is the approach taken by Babby (1987); Chomsky (1981, 1986); Delsing (1993); Halpert (2015); Norris (To Appear). This is represented below, with the double-lined arrow corresponding to case assignment and the dotted arrows corresponding to case concord.

(15)
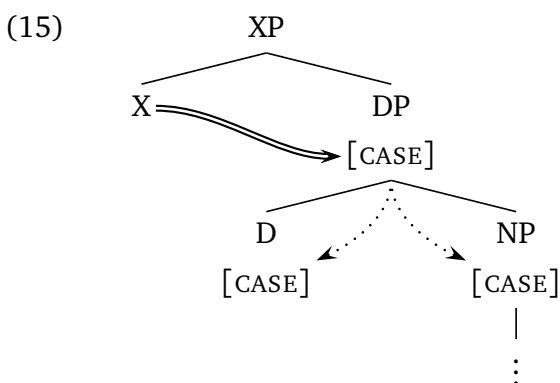
In other approaches to case concord, the maximal nominal projection does not serve a role as an intermediary— rather, case assigners assign case directly to the various lexical items bearing case (Brattico, 2008, 2010, 2011; Matushansky, 2008; Richards, 2012).[7] This is represented below, with double-lined arrows indicating case assignment.

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[7]In truth, some aspects of Richards's (2012) formal analysis of concord remain unclear. There is discussion of both the head and its associated relative clause being assigned the same case (p. 20), and this shows direct

(16)

```
              XP
           ╱      ╲
         X          DP
        ╱ ╲       ╱    ╲
              D          NP
           [CASE]         │
                          N
                       [CASE]
```
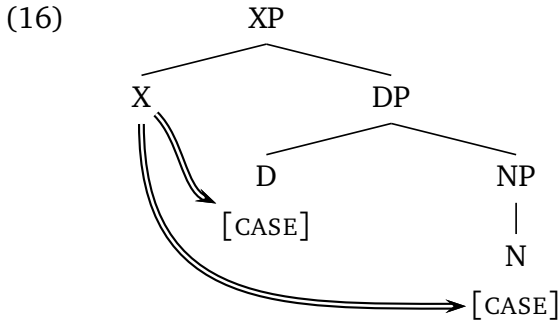
Merchant (2006) suggests both of the types just mentioned as possibilities but does not decide between the two.

There are approaches that do not treat case concord differently from ϕ-feature-concord. Some authors propose that the feature sets for concord are ultimately shared throughout the DP as one block; the formalization of the creation of that set of features varies (Baker, 2008; Deal, 2016; Danon, 2011; Mallen, 1997; Norris, 2012).[8] Somewhat unique among these approaches are those of Harley (2013) and Toosarvandani & van Urk (2013), who propose that case concord (like ϕ-feature concord) is handled by an Agree relation. In ordinary circumstances, elements lower in the DP probe upwards to find the case feature on D^0, but case probes may search downward when a value is available.[9]

These approaches all have in common the claim that the head noun has no special status in the NP/DP with respect the assignment or distribution of case (Babby 1987:91). This is in contrast to approaches that treat case concord as "agreeing in case with the head noun" discussed briefly above. While Chomsky's original proposal and contemporary approaches are interchangeable in analyses of uniform concord, they are not equivalent in cases of mixed concord, where elements showing concord do not necessarily match the features expressed by the noun. Examples from Finnish are given in (17)-(18) below.

(17) ne   kaksi   pilaantunut-ta leipä-ä
     those.PL.NOM two.SG.NOM rotten-SG.PAR   bread-SG.PAR
     'those two rotten breads'   (Brattico 2010:60)

(18) ne   pilaantune-et kaksi   leipä-ä
     those.PL.NOM rotten-PL.NOM two.SG.NOM   bread-SG.PAR
     'those two rotten breads'   (Brattico 2010:60)

In (17), the noun *leipää* 'bread' is singular and bears partitive case, while the demonstrative *ne* is plural and bears nominative case. Thus, the demonstrative does not match either feature value of the head noun, yet it still seems correct to say that the demonstrative shows concord

assignment from case assigner to case-bearing element. However, there is no discussion of the mechanism that ensures that the case assigned to the relative clause is marked on constituents inside of it, e.g., on the subject of the predicate in the relative clause.

[8]Baker (2008) focuses on primarily on ϕ-feature concord, but he does discuss case concord on determiners briefly (pp. 188-191) and ultimately proposes that D and N share a single case feature, which is why I include Baker's work in the list of "feature sharing" proposals.

[9]Toosarvandani & van Urk (2013) argue that this accounts for the fact that *ezafe* associated with possessors in Zazaki show impoverished concord possibilities relative to *ezafe* associated with adjectives, but they do not provide independent evidence for the proposal.

in Finnish. Examples such as these challenge the idea that case concord is agreement with the case feature of the head noun.[10] Under Brattico's (2010, 2011) analysis, the partitive elements receive their case value from the numeral, and the nominative elements receive their case value from the clausal spine.

Thus, the more promising analysis of case concord is the top-down approach, although it is not clear how to decide between the analyses that use DP/D as an intermediary from those that assign case directly to the elements showing concord. Brattico (2010) argues against the intermediary approach, but the argument is largely theory-internal: because multiple assignment by a single head is arguably already necessary, it does not require additional stipulation to suggest that multiple assignment is also the source of case concord. However, I am not aware of any empirical evidence in favor of one approach or the other.

3.3   Loose end: case concord in the clause

Thus far, I have focused exclusively on case concord within nominal constituents. However, the term "case concord" has also been used to describe other phenomena. In particular, there is case matching in quantifier float and with predicate adjectives. Examples from Icelandic are given in (19)-(20) below.

(19)   Strákarnir   vonast til að PRO   vanta ekki alla   í skólann.
       the.boys.NOM hope   for   PRO.ACC lack   not all.M.PL.ACC in the.school
       'The boys hope not to be all absent from school.' (Landau 2006:155)

(20)   Ég   taldi   hana   vera kennara.
       I.NOM believed her.ACC be   teacher.ACC
       'I believed her to be a teacher.'   (Matushansky, 2008)

Thus, in (19), the quantifier *alla* 'all' matches the case that an overt subject of *vanta* 'lack' would bear in such a position (and this has been leveraged as an argument that PRO must bear case-marking). It is worth mentioning here that it also matches the gender of PRO's associate. In (20), the predicate noun *kennara* 'teacher' matches the case of *hana* 'she' (and an adjective in that position would match the case as well). Space considerations prevent me from covering these approaches in detail here, but see Landau (2004, 2006); Matushansky (2008) and references there for extensive discussion. It is an open question whether the mechanism behind these processes and DP-internal case concord is the same. It is certainly possible to devise a formal theoretical mechanism that can be extended to both, but I believe even the empirical landscape is not settled. The most interesting languages to investigate in this domain are languages that have either (i) DP-internal case concord or (ii) predicate case agreement but not both. If no such languages (or few such languages) exist, that would make a strong case for collapsing the phenomena.

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[10]I believe such examples also pose a challenge to the approach of Toosarvandani & van Urk (2013), as they predict that the higher elements would probe downward for case and thus reflect partitive case. Instead, the higher elements bear the case that is assigned to the entire DP.

4 Analyses of mixed concord

In the previous two sections, I discussed approaches to concord that mostly analyzed patterns of uniform concord. Mixed concord presents novel challenges and raises unique questions for the formalization of concord. I briefly discuss three important contributions here— each proposal is distinct, and space considerations prevent me from getting into their details.

4.1 Landau (2016) on semantic and morphological feature mismatch

Landau (2016) provides the most thorough discussion of concord involving different feature values in his analysis of situations where the semantic value of the noun is in conflict with its morphological specification. These situations involve sets of examples where modifiers may match either the noun's morphological specification or its semantic value. This is shown below for Landau's paradigm case, the Hebrew noun *be'alim* 'owner(s)'.

(21) ha-be'al-im   ha-kodem   maxar   et   ha-makom lifney šana.
      the-owner-PL the-previous.SG sold.3SG ACC the-place   before year
      'The previous owner sold the place a year ago.'

(22) ? ha-be'al-im   ha-kodm-im   maxar   et   ha-makom lifney šana.
      the-owner-PL the-previous-PL sold.3SG ACC the-place   before year
      'The previous owner sold the place a year ago.'

The noun *be'alim* bears the plural suffix *-im* but may refer to a singular owner (though this is not the only interpretation, as Landau discusses). In (21), the adjective *ha-kodem* 'previous' does not bear a plural suffix; it is matching the semantic number value of *be'alim*. In (22), the adjective *ha-kodm-im* 'previous' bears the plural suffix, matching the morphological form of *be'alim*.[11] Landau (2016) discusses similar patterns in Chichewa, Finnish, Lebanese Arabic, Russian, and Serbo-Croatian.[12] They have in common the fact that, once the switch to "semantic" value is made, all future agreeing elements must match that value.

Landau analyzes these systems by adopting portions of Wechsler & Zlatić 2003: ϕ-features are split into two types: INDEX and CONCORD. Index features are tied to semantics, and Concord features are tied to morphology. Landau proposes that Concord features are introduced on N^0, while Index features are introduced on Num^0, which merges after N^0 and potentially after the merger of (some number of) adjectives. Thus, the feature value expressed by an element showing concord is determined entirely based on its merge position: if it is merged after Num^0, it bears the Index value, and otherwise, it bears the Concord value.[13]

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[11]The example (22) is marked with *?* because, as the verb bears singular number in agreement with the noun's INDEX. Landau (2016) describes this example and similar versions as "slightly off for some speakers" (p. 985) although they are incomparably better than the reverse mismatch (singular adjective; plural verb)— understanding that asymmetry is the focus of Landau's article. However, despite the hesitancy of some speakers, Landau notes that many examples similar to (22) can be found on the web, and he treats them as grammatical in the remainder of the article.

[12]Norris (2014) also discusses an alternation of this sort from Estonian. The facts are identical to the Finnish facts discussed by Landau (2016) in all relevant ways. The analysis Norris (2014) proposes differs from Landau's in a few small respects but also proposes that it is an element's merge position that determines the feature value it expresses.

[13]Recall from Part I that Landau (2016) analyzes concord as Agree. Because one of the requirements of Agree

4.2 Bonet et al. (2015) on optional number-marking in Catalan

Bonet (2013); Bonet et al. (2015) present analyses of concord patterns similar to the Ladin pattern given in part I in a variety of Catalan: number-marking is optional for pre-nominal modifiers but obligatory for post-nominal modifiers[14]

(23) aquest(-s) cabell-s llarg-s   tenyit-s
      this(-PL)   hair-PL long-PL dyed-PL
      'these long dyed hairs'   (Bonet et al., 2015:10)

They propose a split in the treatment of prenominal and postnominal concord. Postnominal concord is treated as a syntactic operation similar to the adjectives-as-specifiers analyses discussed in section 2.1.1. Prenominal concord is enforced postsyntactically via an account in Optimality Theory. Formalizing postnominal concord and prenominal concord in different ways as Bonet (2013); Bonet et al. (2015) do opens the door for an account of their differing behavior. Briefly, they propose that postnominal concord must be preserved during postsyntactic manipulations because it is enacted in the syntax (via Spec-Head agreement in Cinque (1994)-style analysis). On the other hand, prenominal concord is not enacted in the syntax, and it can therefore differ—across languages, dialects, or even utterances—due to the availability of different constraint rankings, as is standard within Optimality Theory.[15]

4.3 Deal (2016) on mixed and optional concord in Nez Perce

As discussed in Part I, Deal (2016) analyzes a particularly intricate system of mixed concord in Nez Perce. An example from Part I is repeated below.

(24) yox̂-mé   lep-úʔ   ki-kúhet ha-ʔáayat
      DEM.NOM-PL two-HUM PL-tall   PL-woman
      'those two tall women'   (Deal, 2016:320)

Here, the demonstrative and adjective reflect number but do not obviously reflect gender. The numeral, in contrast, reflects gender but not number. Deal's investigation focuses primarily on the exponence of number, although gender plays a crucial role in explaining why number-marking on nouns differs from number-marking on demonstratives and adjectives.

   Despite the mixed nature of concord in Nez Perce, Deal asserts at many points that the system of concord is the same as in uniform concord languages—the features "move through the DP together, as a bundle" (p. 330)—but that in Nez Perce, certain lexical categories can be sensitive to which features are overtly expressed. For example, gender features are available

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is that the probe find the closest value, the analysis makes the correct prediction that merge position with respect to the position of Num[0] determines the feature value expressed.

[14]It is not clear from the discussion whether gender-marking is also optional in the Catalan examples that Bonet (2013); Bonet et al. (2015) discuss, as the focus is on the loss of a plural *-s* morpheme. Further, this is definitely a simplification of the pattern: there are also phonological considerations that must be met in order for the *-s* to be dropped.

[15]Bonet (2013); Bonet et al. (2015) do not present an analysis of Brazilian Portuguese, and it is not clear how their analysis could extend to Brazilian Portuguese. This is because plural-marking appears only on the prenominal element in Brazilian Portuguese, yielding a pattern that is basically the opposite of the Catalan/Ladin pattern.

for demonstratives to reflect, but demonstratives just do not do so. Thus, this account of mixed concord, like Landau's, treats mixed concord as the result of combining the mechanics of uniform concord with language-specific complications (special INDEX features on Num^0 for Landau (2016); lexical stipulations about which features are exponed in Nez Perce for Deal (2016)).

The most interesting evidence for Deal's view of the relationship between uniform and non-uniform concord is the behavior of optional concord in Nez Perce. Recall from Part I that concord is optional for most categories and features in Nez Perce, but that optionality is constrained. If a given element show concord for any of its available features, it must reflect all the features it can express, as shown in (25) below.

(25)   *kon-má   / *kon-yá   / ✓kon-ma-ná   ha-ʔáayato-na
       DEM-PL(NOM) / DEM-ACC(SG) / DEM-PL-ACC PL-woman-ACC
       (Deal, 2016:329)

In this example, a demonstrative modifies an accusative plural noun. If the demonstrative clearly reflects plural number or accusative case, it must reflect both. Deal argues that this shows that concord is not optional on a feature-by-feature basis in Nez Perce, but operationally. Formally, she treats concord as an operation that (at least in part) adjoins an Agr^0 to any element showing concord, pre-specified for all of the features that the element can express. If a demonstrative shows concord, it obtains an Agr^0 node containing both number and case features. If it does not participate in concord, there is no Agr^0 node. Further systematic study of optional concord in other languages must be done in order to see whether Nez Perce is typical in this respect.

5   Conclusion

This paper has explored formal analyses of nominal concord. Despite the fact that concord is well-known, there are still many unanswered questions concerning both its description and its analysis. However, we have seen that its traditional description—agreement with the head noun—cannot be extended to all instances of concord. The formal analyses of gender and number concord are varied, and some of the formal aspects—especially the mechanism for agreement—require further precision. The formal analyses of case concord are more cohesive, converging on the idea that case features come from outside the DP and spread downward.

A common theme in research on ϕ-feature concord is that it can be treated as a subject-verb agreement internal to the noun phrase. Such analyses vary in the degree of their success. In future work, more careful attention should be paid to the place of concord within the typology of existing agreement types. Again, as Polinsky (2016) notes, it is possible that concord is not a unified phenomenon cross-linguistically or even within the same language. The different style of analyses posited for ϕ-feature concord and case concord already supports the idea that the behavior of concord may be less uniform than its appearance (at least in Western languages) suggests.

Part of the challenge of investigating concord is that there are still unanswered descriptive questions about concord. Thus, documenting and analyzing instances of concord in under-studied languages and language families is critical to the development of theories of nominal

concord. In this vein, mixed concord is especially important, as it is more revealing about the nature of concord than uniform concord is. Careful investigations of concord in a variety of languages will shed light on its fundamental properties, helping to differentiate the core and periphery of this familiar process in human language.

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