The emergence of case matching in discontinuous DPs

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Abstract

This paper explores a distinction between two phenomena that yield multiple realizations of case associated with one nominal. The first is the familiar type of nominal case concord; the second is a new phenomenon we label "case iteration." While case concord involves the morphological realization of case on categorially distinct elements via feature sharing, case iteration arises via a separate mechanism and involves the realization of multiple instances of a functional head, which we model as D. In this sense, the case concord/case iteration distinction mirrors the agreement/clitic doubling distinction in the domain of argument-predicate matching. We argue for the existence of case iteration as a separate phenomenon primarily on the basis of novel data from Tiwa (Tibeto-Burman; India). In Tiwa, traditional case concord in continuous DPs is ruled out, but case iteration is obligatory in discontinuous DPs. We also demonstrate that this phenomenon is attested in Amahuaca (Panoan; Peru) and explore related patterns crosslinguistically.

Keywords Case concord · Case iteration · Discontinuous DPs · Tiwa · Amahuaca

1 Introduction

It is well known that similar surface patterns in natural language can arise via distinct underlying mechanisms. One domain where this has been explored extensively in the recent literature is argument-predicate matching. In this literature, it has been demonstrated that what pretheoretically looks like "agreement" in the verbal domain can actually be divided into two distinct phenomena: agreement and clitic doubling. True agreement arises when a verbal head directly bears the features of one of the nominal arguments of its clause. On the other hand, it is now

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typically assumed that clitic doubling involves the realization of an instance of the functional head D within the verbal complex. Crucially, agreement does not involve any overt material from the DP being realized on the verb, but clitic doubling does involve an overt instance of D from the nominal argument being realized on the verb.

These two mechanisms—agreement and clitic doubling—account for two distinct patterns that, while similar, have clear empirical differences. For example, Arregi and Nevins (2008) and Nevins (2011) argue that clitics, but not agreement markers, are tense-invariant—they have the same morphophonological form regardless of the tense and aspect marking of the verb on which they surface. Preminger (2009) has argued that agreement and clitic doubling can be distinguished by what happens when the respective operations fail. Failed agreement typically results in default features being spelled out on the verb, while failed clitic doubling results in no morphological realization of ϕ-features on the verb. Additionally, Harizanov (2014), Kramer (2014), and Baker and Kramer (2018) have noted that clitic doubling can change the calculus of binding relationships while agreement cannot. This growing body of work has not only contributed to our theoretical understanding of how agreement and clitic doubling are derived, but also to our empirical understanding of which properties pattern together in the realm of argument-predicate matching and why. Thus, developing our understanding of this somewhat fine-grained distinction has served to advance both theory and description.

In this paper, we argue that a similar distinction should be made in the domain of nominal concord. Focusing specifically on case, we propose that what pretheoretically looks like case concord is actually derived via two distinct underlying mechanisms. The first mechanism we will continue to refer to as "case concord"; the second we will label "case iteration." These two phenomena yield similar surface patterns, but arise via distinct derivations, resulting in distributional differences. We argue that concord is similar to agreement in that it involves case features being morphologically realized on multiple categorially distinct elements within the DP. This is similar to how agreement results in features of the nominal being realized both on the nominal and the verb. In contrast, case iteration involves the realization of multiple instances of a functional head, which we model as D, similar to how clitic doubling is the result of an instance of D realized in the verbal complex.

We argue for the existence of this separate phenomenon of case iteration primarily on the basis of novel data from original fieldwork on Tiwa (Tibeto-Burman; India). In Tiwa, case can only be realized once in a continuous DP; case concord is impossible. However, in discontinuous DPs, the two pieces of the DP match in case. This basic contrast is illustrated in (1).[1]

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[1] All Tiwa data are presented in the orthography of Jose's (2014) dictionary. Note that tone on affixes is orthographically marked or unmarked depending on the tone of the preceding morpheme. Alternations of tone marking on case are thus purely orthographic. See Jose (2014: viii–ix) and Dawson (2020: 13–14) for discussion. The following abbreviations are used in glossing throughout: 1 = first person, 3 = third person, ACC = accusative, ADD = scalar additive, AUX = auxiliary, C = complementizer, CAUS = causative, CL = classifier, COM = comitative, COP = copula, DAT = dative, DECL = declarative, DEF = definite, DU = dual, EMPH = emphatic, ERG = ergative, FOC = focus, GEN = genitive, IPFV = imperfective, LG = long

(1) 'Mukton fed rice to a newborn baby.'

    a.   Mukton mai-go [korkhyá lurî-**na**   ] chái os-ga.
          Mukton rice-ACC child   tender-DAT eat CAUS-PFV

    b.   * Mukton mai-go   [korkhyá-**na** lurî-**na**   ] chái os-ga.
          Mukton rice-ACC child-DAT tender-DAT eat CAUS-PFV

    c.   Mukton [korkhyá-**na**] mai-go [lurî-**na**   ] -lo   chái os-ga.
          Mukton child-DAT   rice-ACC tender-DAT -FOC eat CAUS-PFV

    d.   * Mukton [korkhyá] mai-go [lurî-**na**   ] -lo   chái os-ga.
          Mukton child   rice-ACC tender-DAT -FOC eat CAUS-PFV

                                                (Tiwa)

In (1a), dative case surfaces as an enclitic on the adjective *lurî* 'tender,' which is the final element of the DP. In (1b) we see that it is ungrammatical for the noun *korkhyá* 'child' to also bear dative case in a continuous DP. However, the situation is reversed in a discontinuous DP. In (1c), we see that both the noun and adjective surface with dative case when they form a discontinuous DP, and (1d) shows that it is ungrammatical for case marking to be left off of the noun. We take this concord-like pattern that occurs only under discontiguity to be indicative of the phenomenon of case iteration.

We argue that case iteration does not arise via the mechanisms traditionally assumed to underlie concord. In particular, case iteration is not the morphological realization of case features on categorially distinct elements such as adjectives and nouns. Instead, we propose that case iteration arises when DPs contain nested DP shells, where the head of each DP is spelled out as an instance of case. Thus, in a language like Tiwa, case is only ever realized on D. We argue that this is the key to understanding the empirical differences between a language like Tiwa, which allows case matching only in discontinuous DPs, and languages having canonical case concord, which display concord even within continuous DPs.

In making this argument for case iteration, we first outline the properties of Tiwa discontinuous DPs and the case matching patterns we find in Sect. 2. We then briefly consider languages with true concord in Sect. 3 and outline why theories of concord cannot easily be extended to cover the Tiwa data. In Sect. 4 we lay out our analysis of case iteration, which involves a DP shell structure and feature sharing between nested instances of D. We illustrate how this analysis can account for the basic Tiwa pattern as well as instances of differential object marking and case stacking. After making our main argument, we then turn our attention to the larger picture beyond Tiwa. In Sect. 5 we discuss data from original fieldwork on an unrelated language, Amahuaca (Panoan; Peru), and demonstrate that a similar pattern of case matching in this typologically different language can also be accounted for under our DP-shell analysis. In Sect. 6 we zoom out even further, considering the crosslinguistic picture of case iteration

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and other possibly related phenomena. Sect. 7 offers concluding remarks about the concord/case iteration distinction and the empirical signature of each phenomenon.

2 Case matching in Tiwa

In this section, we introduce basic information about the morphosyntax of DPs in Tiwa as well as the pattern of case matching in discontinuous DPs in the language. We demonstrate that a variety of elements can be separated from the noun in a discontinuous DP and that case matching can occur with various case markers. We also show that while case matching is obligatory for the majority of discontinuous DPs, there are instances of case-marking mismatches. We show that these mismatches are highly constrained, mirroring a more general pattern of differential object marking in the language.

2.1 Tiwa nominals and case marking

Tiwa is a Tibeto-Burman language spoken primarily in Assam, India by approximately 33,900 speakers.[2] Data presented here were collected by the second author through work with three speakers between 2015 and 2022 in Umswai, Karbi Anglong district, Assam, and in 2020–21 via WhatsApp with one of those speakers. Tiwa is a head-final language with accusative alignment. The basic SOV order can be obscured by scrambling, as seen in (2).

(2)   'Mukton saw Tonbor.'

    a.   Mukton **Tonbor-go** nú-ga.
            Mukton Tonbor-ACC see-PFV

    b.   **Tonbor-go** Mukton nú-ga.
            Tonbor-ACC Mukton see-PFV

                                               (Tiwa)

In (2a) we see the basic SOV order of the language, but in (2b) the object DP *Tonborgo* scrambles across the subject *Mukton*. The order of elements within a DP is also variable in Tiwa, but case always surfaces as an enclitic on the final element of the DP, as demonstrated in (3) and (4).

(3)   'I tore down the old house.'

    a.   Ang [kojâm nó-**gô**   ] phí   hál-ga.
            1SG old   house-ACC break AUX-PFV

    b.   Ang [nó   kojâm-**go**] phí   hál-ga.
            1SG house old-ACC   break AUX-PFV

                                               (Tiwa)

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[2]This estimate is from the 2011 Indian census, as reported in Ethnologue (Eberhard et al. 2023).

(4) 'Mansing gave meat to the red dog.'

    a.   Mansing [kojá khúgri-**na**] tú   hán-gô   os-ga.
            Mansing red dog-DAT   chicken meat-ACC give-PFV

    b.   Mansing [khúgri kojá-**na**] tú   hán-gô   os-ga.
            Mansing dog   red-DAT   chicken meat-ACC give-PFV

                                  (Tiwa)

In (3a) the head noun *nó* 'house' is the final element of the DP and the accusative case marker surfaces on it. However, the order of the noun and adjective is switched in (3b) and here the accusative case marker surfaces on the adjective *kojâm* 'old' instead. The same pattern holds for dative case in (4). In (4a) the dative case marker surfaces on the noun *khúgri* 'dog,' which is final in the DP, while in (4b) the order is reversed, and dative surfaces on *kojá* 'red.' Like adjectives, numerals, quantifiers, and relative clauses can appear before or after the head noun (Dawson 2020: 45–46). Demonstratives, indefinite articles, and possessors must appear before the head noun, but show variable order among themselves and with quantifiers, which can precede these elements. In all instances, case is realized on the right-most element. The consistent DP-final position of case suggests that case is realized in the position of a high functional head in the nominal, which we will model as D.[3]

Note that the variability in word order of both DPs within the clause and elements within the DP does not clearly track traditional information structural categories such as focus and topic. As discussed below, Tiwa marks information structure through enclitics on the DP, which we assume are adjoined to DP and not associated with a particular structural position within the clause.

2.2 Case matching in discontinuous DPs

There is no case concord in continuous DP structures in Tiwa, as can be seen in (5a), where it is ungrammatical for the dative marker *-(n)a* to surface twice in the DP.[4] This case marker can only appear on the adjective *lurî* 'tender,' which is the final element in the DP, not on the noun *korkhyá* 'child.' However, Tiwa allows various modifiers that are typically DP-internal to surface non-adjacent to the noun of their DP. In such discontinuous DPs, the modifier and noun match in case, as seen in (5b), where both *lurî* and *korkhyá* surface with dative case.[5]

(5) 'Mukton fed rice to a newborn baby.'

    a.   Mukton mai-go   [korkhyá(***-na**) lurî***(-na)**   ] chái os-ga.
            Mukton rice-ACC   child-DAT   tender-DAT   eat CAUS-PFV

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[3] See Sect. 4.1 below for more discussion on this analytical choice.

[4] The form of the dative case marker is *-na* when it attaches to a vowel-final element, and *-a* when it attaches to a consonant-final element. The same alternation is found with genitive case *-(n)e*.

[5] We assume a structural definition of discontiguity. We define a discontinuous DP as consisting of multiple elements that together serve as a single syntactic argument but that are not dominated by the same nominal maximal projection within their minimal clause at the level of surface syntactic structure.

b. Mukton [korkhyá***(-na)**] mai-go   [lurî***(-na)**] -lo   chái
    Mukton child-DAT   rice-ACC tender-DAT -FOC eat
    os-ga.
    CAUS-PFV

(Tiwa)

In discontinuous DP structures in Tiwa, both elements behave like independent DPs. As seen in (5b), they can both be case-marked, with the case enclitic surfacing at the end of each element. Additionally, both elements of a discontinuous DP can undergo scrambling independently, as illustrated in (6). In (6a), the adjective *lurî* has scrambled over the subject, while in (6b), the noun has scrambled over the subject. Additionally, (6c) and (6d) show that the two pieces of the discontinuous DP can be separated by more than one constituent.[6]

(6) 'Mukton fed rice to a newborn baby.'

a. [Lurî**-na**] -lo   Mukton [korkhyá**-na**] mai-go   chái os-ga.
    tender-DAT -FOC Mukton child-DAT   rice-ACC eat CAUS-PFV

b. [Korkhyá**-na**] Mukton [lurî**-na**] -lo   mai-go   chái os-ga.
    child-DAT   Mukton tender-DAT -FOC rice-ACC eat CAUS-PFV

c. [Lurî**-na**] -lo   Mukton mai-go   [korkhyá**-na**] chái os-ga.
    tender-DAT -FOC Mukton rice-ACC child-DAT   eat CAUS-PFV

d. [Korkhyá**-na**] Mukton mai-go   [lurî**-na**] -lo   chái os-ga.
    child-DAT   Mukton rice-ACC tender-DAT -FOC eat CAUS-PFV

(Tiwa)

The usual position for the separated modifier in a discontinuous DP is immediately before the verb, structurally lower than the head noun. However, this is a tendency, rather than a requirement. As seen in (6a) and (6c), it is possible for the modifier to scramble to a higher position in the structure.

The pattern of case matching only under discontiguity is possible with any modifier that can be separated from the head noun in a discontinuous DP. This was illustrated for an adjective by the pair in (5). The same pattern is also found for numerals, (7); quantifiers, (8); relative clauses, (9); demonstratives, (10); indefinite articles, (11); and possessors, (12).

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[6]It is also possible for elements of a discontinuous DP that exhibit case matching to be linearly adjacent so long as they are structurally discontinuous, as shown in (i).

(i) Saldi [khôlom**-go**] [thin-tha**-go**] (-lo) khol   lá-ya-m.
     Saldi pen-ACC   three-CL-ACC   -FOC pick.up AUX-NEG-PST
     'Saldi didn't take three pens.'

(Tiwa)

Evidence from prosody suggests that such structures involve structurally discontinuous elements. Both linearly adjacent case-marked pieces in a structure that involves case matching display a pitch rise at the right edge, which is characteristic of the right edge of a DP. In contrast, multiple elements within a single DP do not show pitch rises on those elements. For instance, the continuous DP *khôlom thin-tha-go* 'pen three-CL-ACC' does not show a pitch rise on *khôlom* 'pen.'

(7) 'I gave money to five priests.'

    a.   Ang [phas chonâ loró-râw**-a**   ] phûisa os-ga.
            1SG five CL   priest-PL-DAT money give-PFV

    b.   [Phas chonâ**-na**] -lo   ang [loró-râw**-a**   ] phûisa os-ga.
            five CL-DAT -FOC 1SG priest-PL-DAT money give-PFV

                                                                (Tiwa)

(8) 'Mansing gave flowers to every woman.'

    a.   Mansing [sógol margî-raw**-a**   ] khum-go os-ga.
            Mansing every woman-PL-DAT flower-ACC give-PFV

    b.   Mansing [margî-raw**-a**   ] khum-go [sógol**-a**   ] -lô os-ga.
            Mansing woman-PL-DAT flower-ACC every-DAT -FOC give-PFV

                                                                 (Tiwa)

(9) 'My mother gave water to the man that was running.'

    a.   Ái má   ti-go   [cholói lí-wa   libíng**-a**   ] os-ga.
            my mother water-ACC run   AUX-NMLZ person-DAT give-PFV

    b.   [Cholói lí-wa**-na**   ] -lô ái má   ti-go
            run   AUX-NMLZ-DAT -FOC my mother water-ACC

            [libíng**-a**   ] os-ga.
            person-DAT give-PFV

                                                                  (Tiwa)

(10) 'Mukton gave money to this person.'

    a.   Mukton [hêbe libíng**-a**   ] phûisa-go os-ga.
            Mukton this person-DAT money-ACC give-PFV

    b.   Mukton [libíng**-a**   ] phûisa-go [hêbe**-na**] -lo os-ga.
            Mukton person-DAT money-ACC this-DAT -FOC give-PFV

                                                                  (Tiwa)

(11) 'Mukton gave money to some priest.'

    a.   Mukton [sharkhí loró**-na**   ] phûisa-go os-ga.
            Mukton some priest-DAT money-ACC give-PFV

    b.   Mukton [loró**-na**   ] phûisa-go [sharkhí**-na**] -lô os-ga.
            Mukton priest-DAT money-ACC some-DAT -FOC give-PFV

                                                                  (Tiwa)

(12) 'Monbor saw Sonali's cat yesterday.'

    a.   Monbor [Sonali-ne miyâw**-go**] khóna   nú-ga.
            Monbor Sonali-GEN cat-ACC   yesterday see-PFV

    b.   Monbor [miyâw**-go**] khóna   [Sonali-ne**-go**   ] -lo nú-ga.
            Monbor cat-ACC   yesterday Sonali-GEN-ACC -FOC see-PFV

                                                                  (Tiwa)

In (7b), we see that the numeral *phas chonâ* 'five' receives dative case, as does the noun *lorórâw* 'priests.' Likewise, in (8b), the quantifier *sógol* 'every' receives dative case, as does the noun *margîraw* 'women.' The sentence in (9b) contains a relative clause *cholói líwa* 'that ran.'[7] This relative clause receives dative case, as does the head noun *libíng* 'person.' (10b) shows that both the head noun *libíng* 'person' and the demonstrative *hêbe* 'this' receive data case under discontiguity. (11b) likewise shows that the noun *loró* 'priest' and the indefinite article *sharkhí* 'some' receive dative.[8] Finally, in (12b), *Sonali*, which already has genitive case due to the fact that it is a possessor, receives additional accusative case marking, as does the noun *miyâw* 'cat.'[9]

So far, the case matching examples we have considered have almost all involved the dative case marker *-(n)a*. However, matching in discontinuous DPs occurs with other case markers as well, including nominative, which is unmarked, (13); accusative *-gô*, (14); genitive *-(n)e*, (15); and comitative *-rê*, (16).

(13) 'Every woman didn't come yesterday.'

    a.   [Sógol margî-raw] khóna   phi-ya-m.
         every woman-PL   yesterday come-NEG-PST

    b.   [Margî-raw] khóna   [sógol] -lô   phi-ya-m.
         woman-PL yesterday every -FOC come-NEG-PST

                               (Tiwa)

(14) 'Mukton greeted every priest in the market.'

    a.   Mukton [sógol loró-râw**-go**] hat-o   sêwa os-ga.
         Mukton every priest-PL-ACC market-LOC greet-PFV

    b.   Mukton [loró-râw**-go**   ] hat-o   [sógol**-gô**] -lo
         Mukton priest-PL-ACC market-LOC every-ACC -FOC
         sêwa os-ga.
         greet-PFV

                               (Tiwa)

(15) 'Lastoi bought the book that every teacher read yesterday.'

    a.   Lastoi [DP [RC [sógol sígai kirî-raw**-e**] khóna   lekhé-wa   ]
         Lastoi   every teacher-PL-GEN yesterday read-NMLZ
         lái-gô   ] pre-ga.
         book-ACC buy-PFV

[7]Relative clauses in Tiwa are externally-headed nominalized clauses that can appear either to the left or right of the head noun.

[8]On the nature of this indefinite article, see Dawson (2018, 2020).

[9]Possessor matching is illustrated here with accusative case, rather than dative, due to a general ban on genitive-dative sequences in Tiwa. This ban applies in discontinuous DPs, in ellipsis, and in the standard of comparatives (which are assigned dative case). See Sect. 4.3 for further discussion of discontinuous possessors.

    b.   Lastoi [_{DP} [_{RC} [sígai kirî-raw-**e**] khóna   [sógol-**e**   ] -lô

Lastoi [DP [RC [sígai kirî-raw-**e**] khóna   [sógol-**e**   ] -lô

Lastoi   teacher-PL-GEN   yesterday   every-GEN   -FOC

lekhé-wa   ] lái-gô   ] pre-ga.

read-NMLZ   book-ACC   buy-PFV

                                                                           (Tiwa)

(16)   'Lastoi went to market with every man.'

    a.   Lastoi [sógol mewâ-raw-**re**] hat-a   lí-ga.

Lastoi   every man-PL-COM   market-DAT go-PFV

    b.   Lastoi [mewâ-raw-**re**] hat-a   [**sógolarê**   ] -lo   lí-ga.

Lastoi   man-PL-COM   market-DAT   every.COM   -FOC go-PFV

                                                                                 (Tiwa)

In (13b), both pieces of the discontinuous DP are unmarked for case. This is expected since the entire DP is nominative, which has no overt phonological realization in Tiwa. In (14b), the noun *lorórâw* 'priests' and the universal quantifier *sógol* both surface with the accusative case marker. The examples in (15) each contain a non-finite relative clause with a genitive-marked subject. In (15b), the subject DP is split within the relative clause so both the noun *sígai kirîraw* 'teachers' and the quantifier *sógol* bear genitive case. Finally, in (16b), the noun *mewâraw* 'men' and the corresponding quantifier both surface with comitative case.

Finally, as the examples above show, the discontinuous modifier is typically focus-marked, usually with the information focus clitic *-lô*. This feature of discontinuous DPs in Tiwa is not surprising from a crosslinguistic perspective. It has been shown for many languages that discontinuous DPs provide a way of conveying different information structural statuses for different subparts of a single noun phrase (see Reinholtz 1999; De Kuthy 2002; Fanselow and Féry 2006; among many others). In Tiwa, focus is marked with enclitics that adjoin to the DP, to the right of any case marking. None of these clitics can appear on a subconstituent within the DP, even when that subconstituent is narrowly focused. This is shown in (17), with the contrastive focus clitic *-sê*, which is often used in corrective contexts. In this example, one speaker states that Mukton bought a new car. Another speaker wishes to correct the first speaker by clarifying that Mukton bought an old car. (17a) shows that the speaker can do this by cliticizing the contrastive focus clitic to the entire object DP. (17b) shows that it is ungrammatical for this clitic to appear directly on the corrected adjective.

(17)   Mukton [karî kodâl-go] pre-ga.

Mukton   car new-ACC   buy-PFV

'Mukton bought a new car.'

Another person responds:

    a.   Hyá, Mukton [kojâm karî-go] **-se**   pre-ga.

no   Mukton old   car-ACC   -FOC buy-PFV

'No, Mukton bought an OLD car.'

b.   * Hyá, Mukton [kojâm-**se** karî-go] pre-ga.
      no   Mukton old-FOC car-ACC buy-PFV

(Tiwa)

Discontinuous DPs provide a way of unambiguously signaling which part of the DP is focused. This is shown in (18), which also serves as a corrective response to the speaker's original statement in (17). Here the corrected adjective is separated from the head noun and surfaces with its own case marking. The contrastive focus clitic can now be directly cliticized to this constituent.

(18)   *As a response to (17):*

    Hyá, [kojâm-go] **-se**   Mukton [karî-go] pre-ga.
    no   old-ACC   -FOC Mukton car-ACC buy-PFV
    'No, Mukton bought an OLD car.'

(Tiwa)

While the vast majority of discontinuous DPs involve a two-way split with focus marking on one of the two pieces, speakers also accept three-way splits in the right information structural contexts. For instance, the sentence in (19) is accepted in contexts where a previous speaker has mistakenly identified Ruphadoi as buying red *pháskai*s (a type of traditional Tiwa clothing). This speaker corrects the color with the contrastive focus marker *-sê* and adds the additional new information of how many *pháskai*s with the general information focus marker *-lô*. The noun *pháskai* remains unmarked, as it is old information. Each of the three pieces of the discontinuous DP in this sentence surfaces with accusative case marking.

(19)   Kojá-gô hyá,   [hûldya-go] **-se** Ruphadoi [pháskai-gô]
    red-ACC COP.NEG yellow-ACC -FOC Ruphadoi phaskai-ACC
    khóna   [thin khêna-go] **-lo** pre lá-ga.
    yesterday three CL-ACC   -FOC buy AUX-PFV
    'Not red, it was a YELLOW phaskai that Ruphadoi bought *three* of.'

(Tiwa)

We assume that, in principle, further splits could be possible, though this would perhaps require a context that is too complicated to result in pragmatic felicity.

Finally, while focus marking of the discontinuous modifier is typical, it is also possible for the separated modifier to appear without focus marking, as seen in (20) where the numeral *soshátha* 'one hundred' surfaces with dative case marking, but not focus marking.

(20)   [Khúgri-**na**] khóna   [so-shá-tha-**na**   ] Lastoi tú
     dog-DAT   yesterday hundred-one-CL-DAT Lastoi chicken
    hán-gô   os-ga.
    meat-ACC give-PFV
    'Lastoi gave chicken to a hundred dogs yesterday.'

(Tiwa)

Given this, and the fact that discontinuous DPs are not required in cases of narrow focus, as in (17a), we assume that the mechanism for deriving discontinuous DPs is not directly triggered by information structural marking, but is instead generally available. Narrow focus simply provides a frequent functional motivation for this mechanism to be applied.

2.3 Case mismatches in discontinuous DPs

All examples of discontinuous DPs discussed so far have shown case matching between the head noun and stranded modifier(s). There is a pattern in Tiwa that at first glance appears to be an exception to the generalization that case matching always occurs under discontiguity: accusative case matching is seemingly "optional" in some sentences, as in (21).

(21)   Lastoi [ngá-**gô**   ] khóna   [mile**(-go)**   ] -lo   pre-ga.
       Lastoi   fish-ACC   yesterday   every-ACC   -FOC buy-PFV
       'Lastoi bought all the fish yesterday.'

                                               (Tiwa)

In (21), the noun *ngá* 'fish' shows accusative case marking while the stranded quantifier *mile* 'every' can surface without case marking. This apparent optionality is only found with accusative case; case matching with other case markers, like dative, is obligatory, as shown in (22).

(22)   'Sonali gave milk to three cats.'
      a.   Sonali [thin-tha   miyâw-**a**] kakhîr-go os-ga.
              Sonali   three-CL cat-DAT   milk-ACC give-PFV
      b.   Sonali [miyâw-**a**] kakhîr-go [thin-tha***(-na)**] os-ga.
              Sonali   cat-DAT   milk-ACC   three-CL-DAT   give-PFV

                                               (Tiwa)

That case mismatching is only possible with accusative case is not entirely surprising given that Tiwa exhibits differential object marking (DOM). An example of DOM is given in (23), which shows that the object *ngá* 'fish' can appear either with or without accusative case marking.

(23)   Sonali [ngá**(-gô)**   ] pre-ga.
       Sonali   fish-ACC   buy-PFV
       'Sonali bought (the) fish.'

                                               (Tiwa)

DOM in Tiwa is sensitive to a number of factors including animacy, definiteness, and specificity (see Bossong 1991; Aissen 2003; among many others). What is interesting from the perspective of the current discussion is that the patterns of accusative case marking in discontinuous DPs are exactly as we would expect if both pieces of a discontinuous DP are independent DPs eligible for separate case assignment.

Specifically, if a continuous object DP must be marked with accusative case, so too must both pieces of the resulting discontinuous DP if that DP is split. For example, possessed object DPs must always surface with accusative case. This is true for

continuous DPs, as in (24), and also for both the noun and possessor when they form a discontinuous DP, as in (25).

(24)   Sonali [Tonbor-e   ngá**(-gô)**] pre-ga.
         Sonali Tonbor-GEN fish-ACC   buy-PFV
         'Sonali bought Tonbor's fish.'

                                                                    (Tiwa)

(25)   Monbor [miyâw**(-go)**] khóna   [Sonali-ne**(-go)**] -lo   nú-ga.
         Monbor cat-ACC   yesterday Sonali-GEN-ACC -FOC see-PFV
         'Monbor saw Sonali's cat yesterday.'

                                                                    (Tiwa)

The same pattern holds for demonstratives. (26) shows that objects with demonstratives must be marked accusative. (27) shows that the demonstrative in a discontinuous object DP must likewise surface with accusative case.

(26)   Ang [pe kashóng**(-gô)**] kan lái-do-ng.
         1SG   that dress-ACC   wear AUX-IPFV-1SG
         'I'm putting on that dress.'

                                                                    (Tiwa)

(27)   Mukton [libíng-gô   ] khóna   [pe**(-go)**] (-lo) nú-ga.
         Mukton person-ACC yesterday that-ACC -FOC see-PFV
         'Mukton saw that person yesterday.'

                                                                    (Tiwa)

In contrast, DPs that do not require accusative case marking when continuous also do not require accusative case when discontinuous. For instance, continuous DP objects with quantifiers can appear without accusative case marking, as in (28). The same holds for discontinuous DPs with quantifiers, as shown in (29) and in (21) above. Note that all four case marking possibilities are attested for example (29): both pieces can be unmarked, both can be marked, and either piece can be marked while the other remains unmarked.

(28)   Pe margî   [mile ngá**(-gô)**] pre-ga.
         that woman   every fish-ACC buy-PFV
         'That woman bought all the fish.'

                                                                    (Tiwa)

(29)   [Ngá**(-gô)**] sálang [mile**(-go)**] -lo   pre-ga.
          fish-ACC   quickly every-ACC -FOC buy-PFV
         'She quickly bought all the fish.'

                                                                    (Tiwa)

The same pattern holds for objects modified by a numeral. (30a) shows that a numeral-modified object can appear without accusative case. (30b) shows that the numeral can be unmarked when discontinuous as well.

(30)   'Mukton gave Lastoi four flowers.'

    a.   Mukton Lastoi-na   [shar-tha khum(**-go**)] os-ga.
          Mukton Lastoi-DAT   four-CL flower-ACC   give-PFV

    b.   Mukton [khum-go   ] Lastoi-na   [shar-tha(**-go)**] os-ga.
          Mukton   flower-ACC   Lastoi-DAT   four-CL-ACC   give-PFV

                                            (Tiwa)

Note that there is a loose correlation between accusative case marking and structural height within the clause. In particular there is a general preference for overt case marking on objects that appear to the left of adverbs or other arguments. This pattern is reflected in discontinuous DPs, where speakers prefer overt case marking on pieces that are higher in the structure. Note, however, that while accusative case marking in Tiwa is typically associated with DPs that appear in a structurally higher position than unmarked DPs, a purely structural account of DOM in Tiwa faces empirical challenges as unmarked objects can appear higher than the subject in some instances (Dawson 2020).

2.4 Summary

In this section, we have seen that Tiwa allows discontinuous DPs and that each element of a discontinuous DP behaves like an independent DP. Interestingly, the majority of these discontinuous DPs display case matching even though this same type of case concord is not possible internal to a continuous DP constituent. This pattern of case matching occurs with a variety of case markers and with any element that can be separated from the other DP elements in a discontinuous structure. The only exception to case matching is found with split object DPs, which may or may not match in accusative case marking. This pattern reflects a broader phenomenon of DOM in the language. With these basic facts in mind, we now turn to a discussion of previous proposals for analyzing case concord.

3 Theories of concord

Previous analyses of concord have been primarily concerned with languages that display concord in continuous DPs. The patterns of concord found in these languages are empirically distinct from the type of case matching found only in discontinuous DPs in Tiwa. We argue that analyses designed to account for DP-internal concord patterns cannot be straightforwardly extended to the Tiwa pattern.

Languages like Warlpiri show concord internal to continuous DPs as well as in discontinuous DPs.[10]

(31)   a.   [Kurdu-**jarra-rlu** wita-**jarra-rlu**] ka-pala   maliki wajili-pi-nyi.
          child-DU-ERG   small-DU-ERG   PRS-3DU.S dog   chase-NPST

          'The two small children are chasing the dog.'

                          (Warlpiri; Simpson 1991: 258–259)

---

[10]Note that concord in continuous DPs is optional in Warlpiri, while concord in discontinuous DPs is obligatory (Simpson 1991).

b.   [Kurdu-**jarra-rlu**] ka-pala   maliki wajili-pi-nyi
         child-DU-ERG   PRS-3DU.S dog   chase-NPST

    [wita-**jarra-rlu**].
     small-DU-ERG

    'Two small children are chasing the dog.'

(Warlpiri; Simpson 1991: 257)

As seen in (31), multiple elements of the DP may surface with number and case marking. It is this type of DP-internal concord pattern that has been the subject of a majority of the literature on concord.

An additional pattern that some analyses of concord attempt to derive arises when elements that originate external to the DP also show concord to match features of the DP. This type of pattern can occur with elements such as predicative adjectives and secondary predicates in languages like Icelandic, Latin, Modern Greek, and Serbo-Croatian (Matushansky 2008). An example of this pattern with an Icelandic "semi-predicate" is given in (32).

(32) a.   [Ólafur   ] fór [einn   ] í veisluna.
            Olaf.NOM went alone.NOM.MASC.SG to party.the
            (no translation given)

     b.   [Ólaf   ] vantaði [einan   ] í veisluna.
            Olaf.ACC lacked   alone.ACC.MASC.SG in party.the
            (no translation given)

(Icelandic; Sigurðsson 2008: 412)

Here we see that the semi-predicate meaning 'alone' surfaces in the nominative, masculine, singular form *einn* to match the nominative subject *Ólafur* in (32a). In (32b) it surfaces in the corresponding accusative form *einan*, showing concord with *Ólaf*. Crucially, Icelandic and other languages that show concord in predication structures also show concord internal to DPs as well, as shown in (33).

(33) um fjór-**a**   snigl-**a**
     about four-ACC.MASC.PL snail-ACC.MASC.PL

     'about four snails'

(Icelandic; Norris 2017: 4)

Various mechanisms for deriving concord internal to DPs as well as in predication have been proposed in the literature. Here we focus on analyses of case concord.[11] Two of the main families of analyses that have been proposed differ in how many instances of case assignment are taken to be involved in structures that show concord. Under one family of analyses, each overt reflex of case is the result of an independent instance of case assignment. Under the second family of analyses we will consider, case is assigned only once, with additional morphological reflexes of case arising due to feature spreading.

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[11]We do not attempt to provide a comprehensive overview of all analyses of case concord. We refer interested readers to Norris (2017) and sources cited therein for a more complete summary of the analytical landscape.

The first family of views includes accounts such as that of Brattico (2008) and Matushansky (2008). Brattico (2008) follows Kayne (2002) in assuming that case is assigned to lexical items, not maximal projections. Thus, any lexical item that bears case is assigned case directly. In structures that show concord, multiple elements bear case morphology, and are taken to have been independently assigned case. Under Matushansky's (2008) account, the domain of case assignment is the complement of the case assigner. For example, if *v* is taken to be the locus of accusative case assignment, the sister of *v*, that is, VP, will be the domain for accusative case assignment. Each case-bearing element in that domain is then assigned case.

The second family of views is represented by accounts such as that of Babby (1987) and Norris (2014). Babby (1987) argues that case is assigned to nominal maximal projections and percolates down through the nominal to all elements that can bear case and that have not already been assigned a different case internal to the nominal. Norris (2014) adopts a view of concord that is morphological in nature. Case is assigned to nominal maximal projections (KPs) in the syntax, but the realization of case on various DP-internal elements is due to operations that occur in the morphological component. Norris argues that an Agr^0 node (Embick 1997) is inserted at the site of each concord-bearing element and that the case feature of the Agr^0 node receives the value of the most local case-bearing head that dominates it.

Both families of analyses considered here have in common that they are designed to account for the possibility of multiple realizations of case internal to a continuous DP. This DP-internal case concord is not possible in Tiwa, as demonstrated in Sect. 2. It is unclear how to straightforwardly rule out case concord in continuous DPs while ensuring that case matching in discontinuous DPs is obligatory under either type of theory we have considered. If case matching is derived by assigning case to multiple items in the DP, it is unclear why this multiple case assignment can only occur in discontinuous structures. Likewise, if case is assigned once and then spread, it is not obvious why case feature spreading only occurs under discontiguity.

If we found the reverse of the Tiwa pattern in a language—case concord in continuous DPs, but a lack of concord in discontinuous DPs—we could easily salvage a traditional concord analysis by appealing to the order of operations. If the operation that results in concord were to apply fairly late in the derivation, the movement that splits a discontinuous DP could bleed concord. If case concord is the result of multiple instances of case assignment, multiple case assignment could be bled if one piece of the DP moved out of the domain where case was assigned prior to case assignment. This would be consistent with a view of case assignment as happening after at least some narrow syntactic operations like movement, perhaps as late as in the morphological component. If, instead, case concord results from case feature spreading throughout a DP, concord could be bled if the DP were to be split prior to this feature spreading. There would be no case in the piece of the DP that did not contain the head to which case was originally assigned. This type of view would be consistent with concord being a morphological operation, as argued for by Norris (2014). Therefore, no matter which type of theory we adopt, we could in principle derive a pattern where movement bleeds concord. The problem is explaining the reverse: the pattern we see in Tiwa would actually be an instance of movement *feeding* concord. This cannot be derived simply by reordering the operations of movement and concord. If the mechanism responsible for concord applied before splitting a DP, this

should result in concord in both continuous and discontinuous structures. This is the Warlpiri pattern, but is simply not the pattern we see in Tiwa.

One way we might attempt to salvage a traditional concord analysis for Tiwa is by positing that the pattern of case matching only in discontinuous structures is a purely morphological pattern. That is, one might assume that the familiar type of DP-internal concord applies across the board in Tiwa but is simply blocked from surfacing in continuous DPs. This could potentially be operationalized as some type of constraint or rule that forbids the pronunciation of more than one instance of case in each structurally continuous portion of a DP (e.g. an impoverishment rule). However, the mechanism for choosing which instances of case to pronounce under such an analysis would need to be constrained. While case concord is ruled out in continuous DPs, as we demonstrated in Sect. 2, multiple instances of case can surface within a DP, provided that DP contains additional clausal structure. For example, in relative clauses, DPs internal to the relative clause are case-marked, as seen in (34).

(34) Lastoi khónana [_DP_ [_RC_ [libíng-râw-**go**] mokhále [sógol-**gô**] -lo
      Lastoi tomorrow   person-PL-ACC last.year every-ACC -FOC
      chí-wa   ] khúgri-**gô**] róm mán-o.
      bite-NMLZ dog-ACC   catch AUX-NEUT
      'Tomorrow, Lastoi will catch the dog that bit all the people last year.'

(Tiwa)

Here the entire DP containing the relative clause is assigned accusative case, which is realized on the head noun *khúgri* 'dog.' No accusative case surfaces on the relative clause, even though relative clauses match their head noun in case when they are split from the noun to form a discontinuous DP. However, internal to the relative clause, accusative case does surface on the object. In fact, since the object of the relative clause is a discontinuous DP, accusative case surfaces on both the noun *libíngrâw* 'people' and the universal quantifier *sógol*. Thus, if the lack of concord in Tiwa is due to non-pronunciation of identical instances of case, this pronunciation algorithm must be able to differentiate between instances of case with different sources, namely case assigned internal to relative clauses versus at the matrix level.

The Tiwa pattern could potentially be captured by assuming that there is traditional concord plus a phase-bound case impoverishment rule that is bled by movement. The deletion rule would target all instances of case that were not final in a DP, and the fact that this rule would be sensitive to phases could account for realizations of case internal to relative clauses. If this rule were post-syntactic, it could be bled by the type of movement that splits discontinuous DPs, accounting for why each portion of the DP surfaces with an instance of case. However, this type of account has some shortcomings. First of all, it is incompatible with the order of operations proposed by Arregi and Nevins (2012). Under their account, impoverishment precedes linearization, but the type of impoverishment rule needed to account for Tiwa would have to identify the linearly final instance of case in a DP in order to spare it from deletion. Second, the fact that case is always realized as a DP enclitic in Tiwa is an accident under this morphological account. It is purely coincidental that the final instance of case is preserved in this strongly head-final language. Third, data from differential subject marking in Amahuaca (the topic of Sect. 5.3) make it clear that the higher

element of a discontinuous DP must be independently eligible for case assignment. As will be discussed, these facts are difficult to capture without assuming that the higher element of the discontinuous structure is a full DP, which is not predicted by the morphological account.

Given these issues, we will not adopt this version of a morphological account here. However, in what follows we will draw on certain of its core ideas; in particular, we will argue that movement indeed creates the conditions for multiple instances of case that are always present to actually be spelled out. Under the account we will develop, movement has this effect not because it bleeds the application of an impoverishment rule, but because it splits apart two layers in a DP shell structure. If these layers were realized in a continuous structure, a morphological operation—haplology—would apply to block the multiple realization of case. (This operation, in contrast to impoverishment, applies only very locally, and may apply post-linearization.) This account improves on the impoverishment account by tying the case matching behavior of Tiwa to the fact that its case marker is a DP-level enclitic, surfacing in a position where we expect to find a head in this head-final language. Crucially, under the account we propose, the pattern of case matching only under discontiguity that we find in Tiwa is not merely a special instance of the familiar type of case concord, as an impoverishment account assumes. Instead, it reflects an empirically different phenomenon that arises as the result of spelling out multiple instances of D that each bear case.

4 The DP-shell analysis

An empirically adequate theory of case matching in discontinuous DPs in Tiwa should minimally be able to account for two key properties of the pattern. The first is that case matching is possible only under discontiguity in Tiwa. Case matching is entirely ruled out in continuous DPs, which, as we discussed in Sect. 3, is not predicted by existing theories of case concord. The second aspect of the Tiwa pattern that a theory should be able to account for is the fact that each piece of a discontinuous DP behaves like an independent DP. As discussed in Sect. 2, each piece of a discontinuous DP can independently undergo the type of scrambling that is available to DPs and each piece can bear case. We also saw that each piece of a discontinuous DP can be assigned accusative case independently in DOM contexts. We argue that both of these aspects of the Tiwa case matching pattern can be captured under an account that assumes that DPs contain multiple DP shells, the heads of which are spelled out as case. This is the phenomenon we refer to as case iteration. In the following sections we lay out our analysis and demonstrate how it can be leveraged to account not only for the basic facts in Tiwa, but also the more complicated pattern of DOM as well as instances of case stacking.

4.1 Analysis of basic case iteration in Tiwa

The analysis we put forth here assumes nested DP shells. What is important for our analysis is that the highest projection in the nominal constituent can iterate in a lan-

guage like Tiwa. We specifically assume that D can recursively select another DP as its complement. It would also be possible to analyze this iteration as recursion of K in a KP-shell structure if K is taken to be the highest head in the extended nominal projection.[12] We choose to treat this shell structure as a DP shell structure because of connections to the other conceptions of multiple DP layers in analyses of phenomena such as clitic doubling (Torrego 1992; Uriagereka 1995) and polydefiniteness (Alexiadou and Wilder 1998; Lohrmann 2010; Panagiotidis and Marinis 2011; Lekakou and Szendrői 2012; Alexiadou 2014; Hankamer and Mikkelsen 2021; among others), which we return to in Sect. 6.[13]

In a Tiwa DP that will be split to form a discontinuous constituent, there are multiple DP layers, as shown for the DP *korkhyá lurî* 'newborn baby' in (35).

(35)
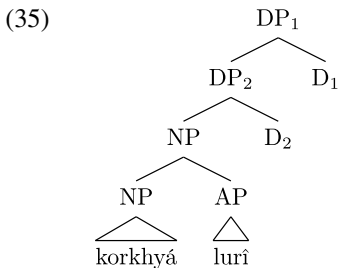
In (35), D_1 selects DP_2 as its complement. This leads to a structure where DP_1 serves as an outer DP shell to DP_2. The complement of D_2 is an NP. The NP *korkhyá* also has an AP adjunct *lurî*.

We argue that discontinuous DPs in Tiwa result from the movement of a subconstituent of a lower DP to the specifier of a higher DP, followed by remnant movement of the lower DP. First, the element that will be stranded, in this case the AP, undergoes movement to the specifier of the higher DP, as illustrated in (36).[14]

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[12]If (at least some) languages without articles lack DP entirely (e.g. Bošković 2005, 2008), this could be a reason to adopt an iterated KP structure.

[13]By treating the shell structure in Tiwa as involving multiple instances of D, we do not intend to suggest that Tiwa DPs involve multiple semantically contentful determiners. We assume that this iterated head is semantically vacuous since case marking does not directly affect the interpretation of nominal reference in Tiwa. In this way, the iterated DP structure could be analogized to so-called expletive determiners (Longobardi 1994; Roussou and Tsimpli 1994; Lekakou and Szendrői 2012). Both clitic doubling and polydefiniteness often have interpretive consequences (e.g. Anagnostopoulou 1994; Alexiadou and Wilder 1998; Panagiotidis and Marinis 2011; Lekakou and Szendrői 2012; Alexiadou 2014), and these interpretive effects are sometimes directly attributed to the semantic contributions of different functional projections in the DP (e.g. Julien 2005; Lohrmann 2010). While DP discontinuity in Tiwa often does involve interpretive consequences, as noted in Sect. 2, we do not attribute this directly to extra functional structure in the DP but rather to the fact that discontinuity allows for other morphosyntactic devices, like focus marking, to be applied to a subpart of a nominal.

[14]If all elements that can be separated from the noun in Tiwa are independent phrases that do not contain the noun, then all discontinuous DP structures will be derived via movement similar to the movement in (36). If some are heads that select the phrase containing the noun, then the structures would involve long-distance head movement of the head to a higher specifier position. This view of syntactic head movement has been argued for by Harizanov (2019) and Harizanov and Gribanova (2019).

(36)

```
                    DP₁
              ┌──────┴──────┐
             AP            D′₁
             △         ┌────┴────┐
            lurî      DP₂        D₁
                   ┌───┴───┐
                  NP       D₂
               ┌───┴───┐
              NP       AP
              △        △
           korkhyá   lurî
```
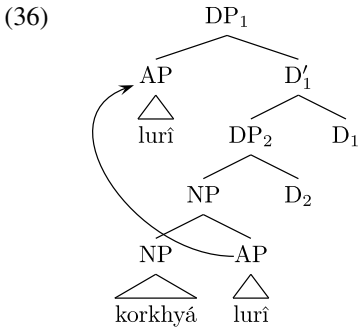
After the AP has moved to Spec,DP₁, DP₂, which contains the noun, can undergo remnant movement to a position higher in the clausal spine, stranding the AP in DP₁. This remnant movement results in discontinuous DPs like the one in (37).

(37) Mukton [DP₂ korkhyá-**na**] mai-go [DP₁ lurî t_DP₂ **-na**] -lo chái
      Mukton   child-DAT   rice-ACC   tender   -DAT -FOC eat
      os-ga.
      CAUS-PFV
      'Mukton fed rice to a newborn baby.'

                                                                      (Tiwa)

Here, DP₂ contains the NP and an instance of D, and DP₁, which remains lower in the structure, contains the previously moved AP as well as an instance of D. This means that there are two instances of D that are linearly non-adjacent. In this structure, both instances of D expone case and they both surface as the dative marker -*na*, resulting in the pattern of case matching. Instances where a DP is split into more than two pieces would be derived by positing additional DP shells with movement to the specifier of each DP and multiple instances of remnant movement. Since each piece would contain an instance of D, all pieces of the DP could match in case.

Evidence that the pieces of a discontinuous DP are related via movement and not via base-generation comes from islands. First, note that discontinuous DPs in Tiwa can be split across a finite clause boundary, as expected given that continuous DPs can scramble from a complement clause into the matrix clause (Dawson and Deal 2019). This is shown in (38), which shows a split between the head noun *korkhyárâw* 'children' and its modifier *sógol* 'every.' While the modifier appears in the complement clause, the head noun has undergone long-distance scrambling into the matrix clause.

(38) [Korkhyá-râw-a] Rupson [CP ang [sógol-a   ] -lô   khum os-ga
        child-PL-DAT   Rupson   1SG every-DAT -FOC flower give-PFV
      honmandé,] atkhâl lá-ga.
      C   think-PFV
      'Rupson thinks that I gave flowers to all the children.'

                                                                      (Tiwa)

That part of a discontinuous DP can scramble across a finite clause boundary shows that discontiguity is not subject to general clausal locality constraints.

While discontinuous DPs can be split across a finite clause boundary, they cannot be split across a syntactic island. Relative clauses are syntactic islands in Tiwa. As (39) shows, elements that originate inside a relative clause cannot be scrambled out.

(39) 'I met a woman who loves Tonbor.'

    a.   Ang [DP sája   [RC Tonbor-go hán sha-wa] margî-go   ]
        1SG   one.CL   Tonbor-ACC love-NMLZ woman-ACC
        lak mán-ga.
        meet-PFV

    b.   * Tonbor-go$_i$ ang [DP sája   [RC t_i hán sha-wa] margî-go   ]
        Tonbor-ACC 1SG   one.CL   love-NMLZ woman-ACC
        lak mán-ga.
        meet-PFV

                                (Tiwa)

Similarly, in discontinuous DPs, a noun cannot be separated from its modifier across the boundary of a relative clause island, as demonstrated in (40).

(40) 'Tomorrow, Lastoi will catch the dog that bit all the people (last year).'

    a.   Lastoi khónana [DP [RC [libíng-râw-**go**   ] (mokhále) [sógol-**gô**   ]
        Lastoi tomorrow   person-PL-ACC last.year every-ACC
        -lo chí-wa   ] khúgri-gô] róm mán-o.
        -FOC bite-NMLZ dog-ACC   catch AUX-NEUT

    b.   * Lastoi [libíng-râw-**go**   ] khónana [DP [RC (mokhále) [sógol-**gô**   ]
        Lastoi person-PL-ACC tomorrow   last.year every-ACC
        -lo chí-wa   ] khúgri-gô] róm mán-o.
        -FOC bite-NMLZ dog-ACC   catch AUX-NEUT

    c.   * Lastoi khónana [DP [RC (mokhále) [sógol-**gô**   ] -lo chí-wa   ]
        Lastoi tomorrow   last.year every-ACC -FOC bite-NMLZ
        khúgri-gô] [libíng-râw-**go**   ] róm mán-o.
        dog-ACC   person-PL-ACC catch AUX-NEUT

                                (Tiwa)

As seen in (40a), discontinuous DPs can occur inside relative clauses. Here, the modifier *sógol* 'every' is separated from the noun *libíngrâw* 'people.' (40b) and (40c) show that when the noun *libíngrâw* appears outside of the relative clause, the result is ungrammatical. The fact that a quantifier and its restrictor cannot be separated by a relative clause boundary to form a discontinuous DP suggests that discontinuous DPs in Tiwa are derived via movement.

These facts also hold of coordinate structures, as shown in (41). In (41a), two object DPs are coordinated. (41b) and (41c) show that the noun *hadî* 'elephant' from the second conjunct cannot appear outside of the coordinate structure to form a discontinuous DP with its modifier *kiníng* 'two.'

(41)   'Lastoi saw one cat and two elephants.'

    a.   Lastoi khóna   [[miyâw kishá-gô   ] arô [hadî
            Lastoi yesterday   cat   one.CL-ACC and elephant

            kiníng-**gô**   ]] nú-ga.
            two.CL-ACC   see-PFV

    b. * Lastoi [hadî-**go**   ] khóna   [[miyâw kishá-gô   ] arô
            Lastoi elephant-ACC yesterday   cat   one.CL-ACC and

            [kiníng-gô   ] (-lo)] nú-ga.
              two.CL-ACC -FOC see-PFV

    c. * Lastoi [[miyâw kishá-gô   ] arô [kiníng-**gô**   ] (-lo)] khóna
            Lastoi   cat   one.CL-ACC and two.CL-ACC -FOC yesterday

            [hadî-**go**   ] nú-ga.
              elephant-ACC see-PFV

                                                        (Tiwa)

In summary, then, the pattern is that when the pieces of a discontinuous DP are related across an island boundary, the result is ungrammaticality. This suggests that the pieces of discontinuous DPs in Tiwa are related via movement rather than base generation.[15]

It is, in theory, possible to derive a pattern like island sensitivity without assuming that the two pieces of a discontinuous constituent are generated as a single continuous DP if, for instance, there are locality constraints on the generation of two DP constituents that are to be construed as constituting a single thematic argument. A concrete proposal for how to implement such a restriction has been offered by Ott (2012) to account for German split topicalization. Ott argues that split topicalization structures involve two nominal constituents that begin in a bare predication structure as {DP,NP} or {DP,QP}. Because this predication structure cannot be labeled, one of the two subconstituents has to move to a higher position to break the symmetry and allow for labeling. Because the two pieces of a split topic originate as part of the same predication structure, splits show locality effects such as island sensitivity. However, because the two pieces do not originate as a single DP, this account makes several desirable predictions for German. Both pieces of a split topic should be able to contain a distinct noun, splits should be able to show orders or combinations of elements that are not possible in a single continuous DP, and there should be restrictions on the referential properties of the pieces of the split topic since one must be able to be a predicate.

However, none of these predictions hold for Tiwa. Crucially, in Tiwa, only elements that can form an acceptable continuous DP can be split to form a discontinuous DP. Given the number of empirical differences between discontinuous DPs in

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[15]The island facts considered here contrast with the behavior of spilt DPs in Georgian, which Fuchs (2021) argues should be analyzed as involving base generation of two independent DPs. Fuchs demonstrates that Georgian split DPs are not sensitive to islands, such as a coordinate structures. The fact that base generated splits in Georgian do not show island sensitivity suggests that the island sensitivity in Tiwa reflects a genuine movement derivation rather than a universal constraint on the types of structures that split DPs can be interpreted across.

Tiwa and the split topicalization structures discussed by Ott (2012), we assume that these instantiate two different types of constructions and that locality restrictions on discontinuous DPs in Tiwa cannot be derived by appealing to a predication relationship between the two pieces. Therefore, we assume that the island sensitivity seen in Tiwa is truly evidence that the two pieces of a discontinuous DP originate as a single continuous DP that is subsequently split via movement.

With this understanding of how discontinuous DPs are derived, the question that remains is how a case iteration account can derive the empirical pattern of case matching only in discontinuous DPs. How do iterated instances of D come to bear the same case value and what blocks the realization of multiple instances of case in a continuous DP if iterated DP layers are possible? As in theories of DP-internal concord that argue that case is assigned to the highest head in the DP and then spread to other heads, we assume that case is assigned to the outermost D and then spread. However, this operation of feature spreading is significantly more constrained in Tiwa than it is in languages that exhibit concord in continuous DPs. In Tiwa, only iterated instances of D share case features. That is to say, this feature spreading is limited to configurations in which an instance of D selects a DP as its complement. Case concord is not a general process in the language and case cannot be spread to any other DP-internal elements. (This is why case is always realized as a DP enclitic rather than on a consistent element, such as the noun, in the DP.)

If a continuous DP contains multiple DP shells, case will be assigned to the outermost instance of D and then will spread to lower instances of D in a nested configuration like (35). However, in a head-final language like Tiwa, iterated instances of D will all be linearized to the right, thus resulting in linear adjacency between multiple instances of D, as schematized in (42). Since these adjacent instances of D are featurally identical, a process of morphological haplology ensures that only one instance will be pronounced (see Nevins 2012, and sources cited therein).[16] This rules out two or more adjacent instances of case marking at the end of continuous DPs, favoring instead the attested pattern of a single instance of case marking in continuous DPs, as shown in (42).

(42)   Mukton mai-go [$_{DP_1}$ [$_{DP_2}$ korkhyá lurî-**na**   ] **(*-na)**] chái
        Mukton rice-ACC   child   tender-DAT -DAT   eat
        os-ga.
        CAUS-PFV

        'Mukton fed rice to a newborn baby.'

                                                                    (Tiwa)

There are two distinct pieces of independent evidence for haplology of featurally identical, linearly adjacent case markers. The first of these comes from NP ellipsis, illustrated in (43).

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[16]We remain agnostic as to whether this process involves deletion of the entire D node or simply impoverishment of the case feature. Both approaches appear to be compatible with the available data.

(43)   Context: Everyone's wife made a vegetable curry. Tonbor ate Mukton's wife's curry, Mansing ate Tonbor's wife's curry, and Mukton ate Mansing's wife's curry.

Tonbor [Mukton-e   sí-ne   ságar-gô   ] chá-ga, Mansing
Tonbor   Mukton-GEN wife-GEN curry-ACC   eat-PFV Mansing

[Tonbor-e   sí-ne-gô   ] chá-ga, arô Mukton
  Tonbor-GEN wife-GEN-ACC   eat-PFV and Mukton

[**Mansing-e(*-ne)-go**   ] chá-ga.
  Mansing-GEN-GEN-ACC   eat-PFV

'Tonbor ate Mukton's wife's curry, Mansing ate Tonbor's wife's (curry), and Mukton ate Mansing's (wife's curry).'

                                                   (Tiwa)

In this sentence, NP ellipsis in the second clause eliminates *ságar* 'curry,' leading to a genitive-accusative sequence. In the third clause, NP ellipsis targets both *ságar* 'curry' and *sí* 'wife.' However, the result is not a genitive-genitive-accusative string, as we would expect if no haplology applied, but rather a genitive-accusative string.

    The second piece of evidence for haplology comes from the realization of dative case marking on future-oriented temporal expressions in the standard of a phrasal comparative. In Tiwa, temporal expressions are by default past-oriented, with future-oriented temporal expressions formed by affixing dative case *-(n)a* (Dawson 2020: 30). This process applies generally across the language, as shown for a sample of temporal expressions in (44).

(44)   a.   *khóna* 'yesterday' → *khóna-na* 'tomorrow'

        b.   *sóne* 'the day before yesterday' → *sóne-na* 'the day after tomorrow'

        c.   *mokhále* 'last year' → *mokhále-na* 'next year'

        d.   *pakhál* 'when (past)' → *pakhál-a* 'when (future)'

                                                (Tiwa)

    Comparatives in Tiwa are phrasal, rather than clausal, with the standard of comparison assigned dative case by the comparative postposition *khúli* 'than' (Dawson 2020, 2021), as shown in (45). Temporal expressions can serve as the standard of comparison, as shown in (46), with the expected dative case marking.

(45)   [Bibiana***(-na)** khúli] Ginny chui-do.
      Bibiana-DAT than   Ginny tall-IPFV
    'Ginny is taller than Bibiana.'

                                                (Tiwa)

(46)   [Khóna**-na**   khúli] táw parâ túng-do.
      yesterday-DAT than   today more hot-IPFV
    'Today is hotter than yesterday.'

                                                (Tiwa)

When a future-oriented temporal expression serves as the standard of comparison, there is only one surface realization of dative case, as shown in (47). If there were no haplology, we would expect a dative-dative string—the first because the temporal expression is future oriented, and the second assigned by the comparative *khúli*.[17]

(47) [Khóna-**na(*-na)** khúli] sóne-na-sê   parâ túng-o.
        tomorrow-DAT   than   day.after.tom-FOC more hot-NEUT
      'The day after tomorrow will be hotter than tomorrow.'

                                                                    (Tiwa)

In continuous DPs, haplology occurs when nested instances of D are linearly adjacent, resulting in only one instance of the case marker. In discontinuous DPs, on the other hand, each piece surfaces with matching case because the iterated instances of D are separated by intervening material. In deriving these discontinuous structures, the case feature is shared between instances of D when the DPs are nested. For example, since both the noun and adjective in (37), repeated as (48), surface with dative case, dative case is assigned when the DPs are still in a nested configuration.

(48) Mukton [$_{DP_2}$ korkhyá-**na**] mai-go [$_{DP_1}$ lurî   t$_{DP_2}$ **-na**] -lo   chái
        Mukton   child-DAT   rice-ACC   tender   -DAT   -FOC eat
      os-ga.
      CAUS-PFV
      'Mukton fed rice to a newborn baby.'

                                                                    (Tiwa)

The dative case feature is spread from D_1 to D_2, and when the DP is split via remnant movement, both instances of D surface as the dative case marker, resulting in the pattern of case matching.

Before moving on to consider various extensions of our analysis, it is worth considering briefly another alternative to the DP-shell account we have proposed. The island facts discussed here support a movement derivation of discontinuous DPs. However, an alternative possibility to the view that we argue for here is to assume that the entire DP containing the noun and modifiers undergoes movement and that the appearance of a discontinuous DP arises because different elements of the DP are pronounced at different positions along the path of movement (Fanselow and Ćavar 2002). This type of analysis would not require positing multiple DP shells, but rather would rely on some process like scattered deletion (Nunes 1999) to derive the surface distribution of elements. Under this type of account, if we assume that case is only realized in D, the correct case matching results could be derived so long as D could never be targeted for scattered deletion. This is because there would be a single instance of D in each copy in the movement chain, which, if pronounced, would result in a case enclitic on whatever other material was pronounced at that position in the chain.

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[17]Note that the grammatical sentence in (47) is actually ambiguous between the meaning given in the translation, derived via haplology, and an interpretation with no haplology on which the day after tomorrow will be hotter than yesterday. The given reading is more salient for pragmatic reasons, and was clearly established via context when the sentence was elicited. However, when asked, speakers confirm that the sentence can be used with a 'yesterday' reading too.

A major issue for this type of account lies in constraining the deletion operation. An unconstrained deletion operation could, for example, produce the appearance of island violations. As discussed, a modifier cannot be separated from its head noun across a relative clause island. If scattered deletion were allowed to freely apply to any terminal nodes in a copy of a moved DP, a seemingly island-violating string could be derived without any genuine island violations. Consider the example in (49).

(49) * Lastoi [DP [RC ~~mokhále~~ [DP ~~sógol~~ libíng-râw-**go**] ~~lo~~ ~~chí-wa~~]
  Lastoi   last.year   every person-PL-ACC -FOC bite-NMLZ
  ~~khúgri-gô~~] khónana [DP [RC mokhále [DP sógol ~~libíng-râw-gô~~] -lo
  dog-ACC   tomorrow   last.year   every person-PL-ACC -FOC
  chí-wa   ] khúgri-gô] róm mán-o.
  bite-NMLZ dog-ACC   catch AUX-NEUT
  'Tomorrow, Lastoi will catch the dog that bit all the people last year.'

  (Tiwa)

In this structure, the entire DP containing the relative clause undergoes movement. In the higher copy, all material in the DP and the relative clause it contains is deleted except for the noun *libíngrâw* 'people' and its accusative case marker—an instance of D. In the lower copy, only the restrictor of the quantifier *sógol* inside the relative clause is deleted. This deletion would result in the appearance of an island violation without any true movement out of an island. Such configurations are ungrammatical, suggesting that scattered deletion would have to be constrained so as not to allow such strings to arise.[18] An additional constraint on deletion would have to prevent case markers themselves from being deleted in movement copies. If deletion of D were not ruled out, case matching would appear to be optional.[19] As we showed in Sect. 2, the only place where pieces of discontinuous DPs are allowed to mismatch in case is in DOM contexts. Otherwise, case matching is obligatory.

As outlined here, a scattered deletion account would have to be significantly constrained in order to derive the correct results. The problem is that there is little consensus about how to properly constrain this mechanism, and the Tiwa data conflict with some prominent proposals for how to do so. This is clear, for instance, for constraints along the lines of those put forth by Nunes (1999) and Bošković (2001). They consider scattered deletion to be a last resort option—it is only licensed if full deletion of a lower copy is blocked for PF reasons. The types of patterns found with discontinuous DPs in Tiwa do not seem indicative of a last resort strategy. There is no consistent position that the lower piece of a discontinuous DP must occupy such that its pronunciation appears to be motived by PF considerations. Likewise, structures with continuous DPs in the highest position in the chain are always possible

[18]It is possible that some interaction of the scattered deletion mechanism with phases could be proposed to avoid the generation of strings such as the one in (49). However, such an account of scattered deletion would still have to grapple with the fact that the data from discontinuous DPs in Tiwa seem to conflict with existing proposals for constraining scattered deletion, as discussed below.

[19]If scattered deletion could not target D, the accusative case marker on the head noun *khúgri* 'dog' of the relative clause in (49) could not be deleted by scattered deletion. However, haplology of case markers, which is independently motivated in Tiwa, could result in the deletion of this case marker since it would surface adjacent to the accusative case marker on the noun *libíngrâw* 'people.'

alternatives to their discontinuous counterparts. Thus, it appears that scattered dele-tion would have little motivation in Tiwa discontinuous DPs, in addition to requiring multiple stipulations to rule out unattested deletion patterns.

The proposal we have sketched here based on DP shells is able to derive the key pattern of case matching only under discontiguity with fewer stipulations than al-ternative accounts require. In the following two sections we will discuss how this analysis is able to be straightforwardly extended to derive case mismatches in DOM contexts as well as patterns of case stacking in Tiwa.

4.2 Deriving case mismatches

As discussed in Sect. 2.3, pieces of a discontinuous DP in Tiwa may mismatch in case only if the case associated with the DP is accusative. This can be understood as part of a broader pattern of DOM in the language.

The analysis laid out above must assume that case assignment can precede remnant movement of the lower DP in a nested structure in order to derive feature sharing between instances of D and thus case matching. Case is assigned and shared between nested instances of D; later movement then allows each instance of D to realize the matching case value that was assigned earlier. This is schematized in (50).

(50) a. Step 1: Case assignment to the nested DP
$[\ldots [_{DP_1} \ldots [_{DP_2} \ldots D_2{:}\underline{ACC}] D_1{:}\underline{ACC}] \ldots]$

b. Step 2: Remnant movement
$[\ldots [_{DP_2} \ldots D_2{:}\underline{ACC}] \ldots [_{DP_1} \ldots t_{DP_2} D_1{:}\underline{ACC}] \ldots]$

However, in order to derive case mismatches, it must also be possible for case as-signment to follow the movement that splits a DP, leading to only one of the resulting DPs appearing with case marking. If movement occurs before case assignment, the two resulting pieces of a DP can be assigned case independently, yielding a possible mismatch in case. This is schematized in (51).

(51) a. Step 1: Remnant movement
$[\ldots [_{DP_2} \ldots D_2{:}\underline{}] \ldots [_{DP_1} \ldots t_{DP_2} D_1{:}\underline{}] \ldots]$

b. Step 2: Case assignment to the higher DP
$[\ldots [_{DP_2} \ldots D_2{:}\underline{ACC}] \ldots [_{DP_1} \ldots t_{DP_2} D_1{:}\underline{}] \ldots]$

Crucially, the instances where case assignment can follow remnant DP movement are significantly more restricted than the instances where case assignment must pre-cede movement. Specifically, case assignment only appears to be able to follow move-ment when the case that is being assigned is accusative case. We argue here that this state of affairs is expected under prominent approaches to the treatment of accusative case.

Under Agree-based approaches to case assignment, accusative case is generally taken to be a structural case that is assigned by *v*/Voice (Kratzer 1996; Chomsky 2000, 2001; Legate 2008; among others). If we assume that object DPs are merged within the VP, this means that the head that assigns accusative case to the object is not merged until after the object has been merged, allowing for the possibility that remnant movement of part of the object DP could occur prior to Merge of *v*. If

this remnant movement took place before *v* was merged, *v* could assign accusative case only to the higher of the two DPs in the discontinuous DP structure, as in (51). If case were assigned after the DP was split, the accusative case feature could not spread between instances of D since they would not be in the requisite local nested configuration.

This same kind of flexible ordering of movement and case assignment would not be possible with other overt cases that display matching. For example, dative on indirect objects can be analyzed as an inherent case, associated with an applicative or *v* structure above the VP (e.g. Woolford 2006). If a DP is merged as the specifier of ApplP, it will be assigned inherent dative case by Appl upon external Merge. Because dative case is assigned as soon as the DP in question is merged and not once a higher head is merged in the structure, there is no flexibility in the relative timing of case assignment and movement. Remnant movement of a lower DP in a nested DP structure cannot take place until after dative case has been assigned, resulting in no possible mismatches in dative case. A similar situation holds for the other cases that show obligatory matching: they are not assigned via Agree with a higher head outside of the phrase where they are externally merged, yielding a pattern of obligatory matching.

Another prominent approach to accusative case assignment, and particularly DOM, is dependent case theory (Yip et al. 1987; Marantz 1991; Baker and Vinokurova 2010; Baker 2015; among others). Under dependent case theory, it is generally assumed that accusative case is assigned to the lower of two DPs in a c-command configuration in a clause. Patterns of DOM can be derived by assuming that the internal argument must move out of the VP in order to be in the same case domain as the external argument. If the internal argument moves into the correct case domain, it is assigned accusative case; if it remains low, it does not receive dependent accusative case.

We do not take a stance on whether this approach to DOM is ideal for Tiwa, and we acknowledge that the very existence of discontinuous DPs presents some challenges for standard dependent case algorithms since two pieces of what was underlyingly a single DP should not be able to count as case competitors for one another. However, we aim to show that the case mismatches that we see only for accusative case could be derived under a dependent case approach as well. In order for dependent case assignment to interact correctly with the timing of movement to derive both accusative matches and mismatches, we must assume that dependent case assignment applies in the narrow syntax (Preminger 2011, pace Bobaljik 2008). If the entire nested internal argument DP moves into the same case domain as the external argument DP before it is split, the entire thing could be assigned accusative case. If the nested DP is then split by remnant movement of the lower DP, both pieces would have accusative case.[20] If, however, only one piece of a discontinuous DP moves high enough in the structure to be in the same case domain as the external argument, only that piece will be assigned dependent accusative case, resulting in a case mismatch. This kind of approach to case assignment would not derive case mismatches for other cases, such

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[20]Alternatively, accusative case matching could be derived by both pieces of a discontinuous DP moving independently into the same case domain as the external argument.

as dative, since none of the other cases require a DP to first move into a different case domain to be assigned case.

While case mismatch data in the context of DOM can be accounted for under the nested DP approach to case matching we present here, regardless of whether an Agree-based or dependent view of accusative case is adopted, these data are problematic for concord-based views of case matching. For the purely morphological view of case matching considered in Sect. 3, case matching would be the result of true concord plus deletion of all but the final instance of case in each continuous portion of the DP. It is unclear how case mismatches could be derived in DOM contexts under such a view. If case were always assigned to the entire DP, it should always surface on both pieces of the discontinuous object DP. If, as under our account, case is assigned only to the piece of the discontinuous DP that surfaces with case in DOM contexts, then the highest piece of the DP must be independently eligible for case assignment. This is captured under our account by the fact that the piece of a discontinuous DP that surfaces with case is itself a full DP, eligible for case assignment. At the very least, it seems that a surface-oriented account involving concord plus impoverishment would have to allow each piece of a discontinuous DP to be assigned case independently, requiring something like multiple DP layers—one for each piece of a DP.

Likewise, another possible alternative analysis based on traditional concord would be one in which concord is only possible in certain domains in the DP (Pesetsky 2013; Bayırlı 2017). According to this type of view, case concord within the DP would be blocked from applying below a certain layer of structure in the DP. Above this boundary, all elements would be able to participate in the feature sharing necessary for concord, but below this boundary, feature sharing would be blocked completely. Under this type of account, nouns and modifiers in Tiwa would typically be too low in the DP to undergo case feature sharing with D. However, if discontinuous DPs were formed by moving an element out of DP and if this movement out of DP were preceded by a step of movement higher in the DP, specifically to Spec,DP, this intermediate movement step would allow the moving element to enter the domain in which concord was active and thus show concord. The DOM data prove challenging for this type of account. If case were assigned prior to the DP splitting, it is unclear how a case mismatch could be derived. Both D and the element that moved through its specifier should bear case. If case were assigned after the DP was split, the higher, case-bearing piece of the DP would need to be independently eligible for case assignment. As with the impoverishment that was just discussed, this would still require an appeal to multiple DP layers.[21]

4.3 Case stacking

An interesting facet of the phenomenon of case iteration in Tiwa is that it can result in case stacking, as seen in (52) and (53).

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[21]For another argument against this type of account based on constituency of moving elements, see footnote 28.

(52) Monbor [miyâw-**go**] khóna   [Sonali-**ne-go**   ] -lo   nú-ga.
      Monbor cat-ACC   yesterday Sonali-GEN-ACC -FOC see-PFV
      'Monbor saw Sonali's cat yesterday.'

                                                          (Tiwa)

(53) Monbor [miyâw-**re**] payâr-o   [Sonali-**ne-re**   ] -lo   omlê-dom.
      Monbor cat-COM   outside-LOC Sonali-GEN-COM -FOC play-PST
      'Monbor played outside with Sonali's cat.'

                                                          (Tiwa)

In (52), the possessor *Sonali* surfaces with genitive case, as we expect since it is a possessor. However, stacked outside of the genitive case marker *-ne* is the accusative case marker *-gô*. This accusative case is what we expect since *Sonali* originates within a DP that itself is accusative-marked, as evidenced by the accusative case on the noun *miyâw* 'cat.' The same pattern holds with comitative case, as shown in (53), where the genitive-marked possessor *Sonaline* also takes the comitative marker *-rê*.[22]

We propose that the reason discontinuous possessors can exhibit case stacking is because they contain two instances of D that bear different case features. We assume the base structure of a DP with a possessor that will be split from the rest of the DP is as shown in (54) for the DP *Sonaline miyâw* 'Sonali's cat.'

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[22]Interestingly, case stacking cannot result in genitive-dative sequences, as shown in (i).

(i) 'Mukton gave fish to Sonali's cat yesterday.'

  a. Mukton khóna   [Sonali-**ne** miyâw-**a**] ngá-gô os-ga.
      Mukton yesterday Sonali-GEN cat-DAT   fish-ACC give-PFV

  b. * Mukton [miyâw-a] khóna   [Sonali(**-ne**)(**-na**)] -lo   ngá-gô os-ga.
      Mukton cat-DAT   yesterday Sonali-GEN-DAT -FOC fish-ACC give-PFV

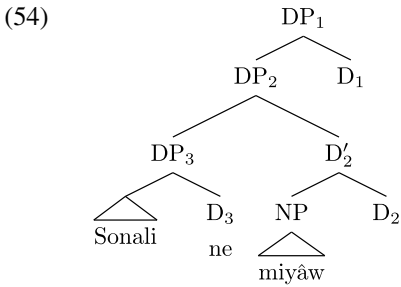   (Tiwa)

This ban is not specific to discontinuous DPs, however, but applies throughout the language as a whole. For example, while NP ellipsis often results in case stacking (e.g. (57) below), NP ellipsis is banned when it would result in a genitive-dative sequence, as shown in (ii).
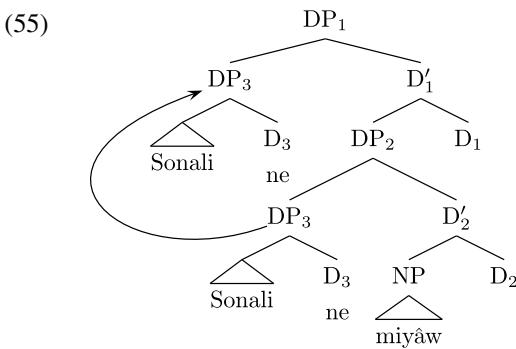
(ii) 'Mukton gave fish to Sonali's cat, and Tonbor to Lastoi's.'

  a. Mukton [Sonali-ne   miyâw-**a**] ngá os-ga,   arô Tonbor [Lastoi-**ne** miyâw-**a**] ngá
      Mukton Sonali-GEN cat-DAT   fish give-PFV and Tonbor Lastoi-GEN cat-DAT   fish
      os-ga.
      give-PFV

  b. * Mukton [Sonali-ne   miyâw-a] ngá os-ga,   arô Tonbor [Lastoi-**ne-na**   ] ngá
      Mukton Sonali-GEN cat-DAT   fish give-PFV and Tonbor Lastoi-GEN-DAT fish
      os-ga.
      give-PFV

   (Tiwa)

As (ib) also shows, the genitive-dative sequence cannot be repaired by deleting either the genetive case marker or the dative case marker. Instead, such configurations seem to be avoided entirely.

(54)

$$
\begin{array}{c}
DP_1 \\
\diagup \diagdown \\
DP_2 \qquad D_1
\end{array}
$$

- DP$_2$
  - DP$_3$
    - Sonali
  - D$'_2$
    - D$_3$: ne
    - NP: miyâw
    - D$_2$
- D$_1$

When the possessor *Sonaline* is stranded, it first moves to Spec,DP$_1$, as shown in (55).

(55)

- DP$_1$
  - DP$_3$
    - Sonali
    - D$_3$: ne
  - D$'_1$
    - DP$_2$
      - DP$_3$
        - Sonali
        - D$_3$: ne
      - D$'_2$
        - NP: miyâw
        - D$_2$
    - D$_1$

Accusative case is assigned to DP$_1$, and case is spread from D$_1$ to D$_2$. Finally, DP$_2$ undergoes remnant movement, stranding DP$_1$, which contains the possessor. The structure of the stranded element is shown in (56), in which D$_1$ and D$_3$, the head of the possessor DP, are adjacent.

(56)

- DP$_1$
  - DP$_3$
    - Sonali
    - D$_3$: ne
  - D$'_1$
    - <DP$_2$ >
    - D$_1$: go
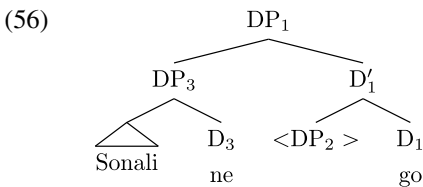
In this structure, D$_3$ is realized as the genitive case marker *-ne* and D$_1$ is realized as the accusative case marker *-gô*. Since the two instances of D bear different features, haplology does not apply, resulting in surface case stacking.

This configuration of two adjacent, featurally distinct instances of D occurs elsewhere in the language, namely in NP ellipsis. When a possessed noun is elided in Tiwa, the case marker that would typically appear on the noun stacks onto the genitive-marked possessor. This is shown in (57).

(57)   Milton-e   [Monbor-e   thílu-gô   ] chá-wa-ne   khélango,
          Milton-GEN   Monbor-GEN banana-ACC   eat-NMLZ-GEN after
          Monbor-bo   [**Milton-e-go**   ] chá-ga.
          Monbor-ADD   **Milton-GEN-ACC**   eat-PFV
          'After Milton ate Monbor's banana, Monbor ate Milton's.'

                                                    (Tiwa)

In the DP *Miltonego* 'Milton's' in (57), the noun *thílu* 'banana' is elided under identity with the previous instance of the noun in the phrase *Monbore thílugô* 'Monbor's banana.' Even though the NP is elided, the accusative case marker that would otherwise surface on the noun remains: it is stacked on the genitive-marked possessor. Just like the structure in (56), the DP *Miltonego* involves two adjacent instances of D—one internal to the possessor DP, and the other in the main DP. We take this parallel as support for the idea that case stacking in discontinuous DPs involves multiple adjacent instances of featurally distinct D.

    The DP-shell analysis we have proposed for case iteration is able to account not only for the pattern of case matching that we find in discontinuous DPs in Tiwa, but also for case mismatches that arise in DOM contexts as well as instances of case stacking. In the following section we show that this DP-shell analysis can also be extended to account for a similar pattern of case iteration in an unrelated and typologically different language, Amahuaca.

5 Extending the DP-shell analysis to Amahuaca

Amahuaca is a Panoan language spoken in the Peruvian and Brazilian Amazon by approximately 500 speakers (Eberhard et al. 2023). The data presented here were collected by the first author through fieldwork with four speakers carried out in the district of Sepahua in Atalaya Province, Ucayali, Peru between 2015 and 2018. Amahuaca is mixed headed, being mostly head final, but having a head-initial AspP and CP (Clem 2022). Scrambling of arguments and adjuncts is largely available. As in Tiwa, DP-internal word order in Amahuaca is flexible (Clem 2019a: 47–50), suggesting the availability of movement operations within the DP. One difference from Tiwa, which displays accusative alignment, is that Amahuaca exhibits a tripartite alignment system with nominative, ergative, and accusative case. Case surfaces as a DP enclitic. Another difference we will see is that Amahuaca has differential subject marking rather than differential object marking, and this differential case marking is clearly structural in nature (Clem 2019b). Despite these differences between the two languages, we will demonstrate that the DP-shell analysis we have pursued for Tiwa can be easily extended to derive the Amahuaca patterns.

5.1 Case matching in Amahuaca

As in Tiwa, there is no case concord in continuous DP structures in Amahuaca. In matrix declarative clauses, a second position clitic =*mun* surfaces with exactly one syntactic constituent preceding it (Clem 2019b). It is ungrammatical for a DP with

multiple instances of case marking to appear in the initial position before this clitic, as shown in (58).[23]

(58)   [Kiyoo {=vi   / *=vini=**n**}   joni*(=**n**)] =mun jono
          all   =EMPH / =EMPH.LG=ERG man=ERG   =C   peccary
        rutu=hi=ki=nu.
        kill=IPFV=3.PRS=DECL
        'All the men are killing a peccary.'

                                                                (Amahuaca)

In (58), ergative marking is obligatory at the end of the DP, but it is ungrammatical internal to the DP on the quantifier *kiyoovi(ni)*. From the position of the DP before the second position clitic, we can conclude that the noun and its modifier form a single constituent. Therefore, the ungrammaticality of double case marking demonstrates that when a noun and its modifiers occur as a single continuous constituent, case concord is impossible. Note that this pattern contrasts with that found in a language with true concord like Warlpiri. Warlpiri also has a second position clitic (the auxiliary *kapala* in (31) above), and when a DP is clearly a single constituent before the second position clitic, case concord is still possible (Simpson 1991: 257–258).

    Also like in Tiwa, case matching on the noun and its modifiers becomes available when the DP is discontinuous in Amahuaca. Modifiers that are separated from the noun match the noun in case, as seen in (59) with ergative case.

(59)   [Joni=**n**   ] =mun jono   [kiyoo=vini=**n**   ]
          man=ERG   =C   peccary   all=EMPH.LG=ERG
        rutu=hi=ki=nu.
        kill=IPFV=3.PRS=DECL
        'All the men are killing a peccary.'

                                                                (Amahuaca)

We see in (59) that when the noun is separated from the quantifier, both pieces surface with ergative case marking.

    In Amahuaca, like in Tiwa, various modifiers can be separated from the head noun to form a discontinuous DP. When they are separated, they match the noun in case. Modifiers displaying this behavior include quantifiers, as was seen in (59), and also numerals (60), and adjectives (61).

(60)   'Two men are looking for capybaras.'
        a.   [Ravuu joni=**n**   ] =mun hamun   vuna=hi=ki=nu.
               two   man=ERG   =C   capybara look.for=IPFV=3.PRS=DECL

---

[23]Some DP-internal elements, such as the emphatic marker =*vi* appear in a form with an extra syllable when they precede a case marker, as seen in (i).

(i)   [Joni kiyoo**vini**=n   ] =mun jono   rutu=hi=ki=nu.
          man all=EMPH.LG=ERG   =C   peccary kill=IPFV=3.PRS=DECL
        'All the men are killing a peccary.'

                                                                (Amahuaca)

See Clem (2019a: 11–14) for further discussion.

b.   [Ravuuta**=n**   ] =mun [joni**=n**   ] hamun
         two.LG=ERG =C   man=ERG capybara
         vuna=hi=ki=nu.
         look.for=IPFV=3.PRS=DECL

                                                (Amahuaca)

(61)   'The tall man is looking for a paca.'

a.   [Joni chaiita**=n**   ] =mun hano vuna=hi=ki=nu.
         man tall.LG=ERG =C   paca look.for=IPFV=3.PRS=DECL

b.   [Chaiita**=n**   ] =mun [joni**=n**   ] hano
         tall.LG=ERG =C   man=ERG paca
         vuna=hi=ki=nu.
         look.for=IPFV=3.PRS=DECL

                                                (Amahuaca)

In (60b), both the numeral *ravuu(ta)* 'two' and the noun *joni* 'man' surface with ergative case. In (61b), the adjective *chaii(ta)* 'tall' and the noun *joni* 'man' both surface with ergative case.

Like in Tiwa, it is also possible for Amahuaca DPs with more than one modifier to be split into more than two pieces under the right conditions. This is shown in (62) for a three-part split.

(62)   'All the white chickens are looking for food.'

a.   [Hatapa joxo kiyoopa**=n**] =mun jiriti
         chicken white all.LG=ERG =C   food
         vuna=hi=ki=nu.
         look.for=IPFV=3.PRS=DECL

b.   [Kiyoopa**=n**] =mun [joxo**=n**   ] jiriti vuna=hi   [hatapa]
         all.LG=ERG =C   white=ERG food look.for=IPFV   chicken
         =ki=nu.
         =3.PRS=DECL

                                                (Amahuaca)

In (62b) both the quantifier *kiyoo(pa)* 'all' and the adjective *joxo* 'white' are split from the noun *hatapa* 'chicken,' and both modifiers surface with ergative case.[24]

In addition to matching in ergative case, as we have seen in the examples so far, discontinuous DPs can also match in nominative case, as seen in (63). Note that nominative case receives a non-zero realization in Amahuaca.[25]

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[24]The lack of ergative case on the noun is due to its syntactic position, and this ergative mismatch pattern is discussed in Sect. 5.3.

[25]Amahuaca accusative case is morphologically null. As with Tiwa nominative DPs, Amahuaca accusative DPs can be split to form discontinuous DPs. In such structures both pieces surface in a morphologically unmarked form.

(i)   'I saw all the peccaries.'

a.   [Jono   kiyoo] =mun hun hiin=ku=nu.
         peccary all   =C   1SG see=1.PST=DECL

(63)   'The tall man fell.'

    a.   [Joni chaiita**=x**   ] =mun pakuu=xo=nu.
           man tall.LG=NOM =C   fall=3.PST=DECL

    b.   [Joni**=x**   ] =mun [chaiita**=x**   ] pakuu=xo=nu.
           man=NOM =C   tall.LG=NOM fall=3.PST=DECL

                                                (Amahuaca)

As seen in (63b), when the head noun *joni* 'man' is separated from the adjective *chaii(ta)* 'tall,' both pieces can surface with nominative case.

Similar to what was seen for Tiwa, discontinuous DPs in Amahuaca show sensitivity to islands. Relative clauses in Amahuaca are islands for movement (Clem 2019a: 46, 2023). As shown in (64b), it is impossible for a modifier of a non-head constituent of a relative clause to surface outside of the relative clause despite the fact that DP splits are possible within relative clauses, as seen in (64a).

(64)   'The snake that all the children saw died.'

    a.   [_RC_ [Kiyoo=vini**n**   ] [vaku-**vaun**   ] rono hiin=hato   ]
                all=EMPH.LG=ERG   child-PL.ERG   snake see=PFV.LG
        =x=mun na=xo=nu.
        =NOM=C die=3.PST=DECL

    b.   * [Kiyoo=vini**n**   ] =mun [_RC_ [vaku-**vaun**   ] rono
            all=EMPH.LG=ERG   =C   child-PL.ERG snake
        hiin=hato   ] =x   na=xo=nu.
        see=PFV.LG   =NOM die=3.PST=DECL

                                                (Amahuaca)

In (64a), the subject of the internally-headed relative clause is structurally discontinuous. The modifier *kiyoovinin* 'all' is split from the noun *vakuvaun* 'children' and both surface with ergative case. However, when the modifier *kiyoovinin* is moved out of the relative clause to a position before the second-position clitic *=mun*, as in (64b), the result is ungrammatical. This provides evidence that the two pieces of a discontinuous DP in Amahuaca are related via movement since they cannot be split across a relative clause island.[26]

A final interesting point to consider in terms of the basic patterns of discontinuous DPs in Amahuaca is a restriction on the surface position of nouns and their modifiers. There are, in general, few restrictions on the surface position of various pieces of discontinuous DPs in Amahuaca. However, one important generalization emerges. If one piece of a discontinuous subject appears in the base position of the

---

    b.   [Kiyoo] =mun hun [jono   ] hiin=ku=nu.
           all   =C   1SG peccary see=1.PST=DECL

                                                (Amahuaca)

[26]As was seen for Tiwa, there is no evidence in Amahuaca that the pieces of a discontinuous DP can ever involve a structure that is impossible in a continuous DP, suggesting that an account that would base generate the pieces of the discontinuous DP as two separate constituents, such as the predication analysis provided by Ott (2012), makes undesireable predictions for Amahuaca.

DP, the noun must surface in this piece of the discontinuous DP. We assume that the externally-merged position of subjects in Amahuaca is in Spec,*v*P (modulo un-accusativity). Head-initial AspP dominates *v*P, meaning that subjects that remain in their externally-merged position linearly appear immediately to the right of aspect marking (Clem 2019b). Modifiers may not be stranded in this position, as seen in (65) and (66). (The distribution of ergative case in examples like (65)–(67) is the subject of Sect. 5.3.)

(65)   'All the men are killing a peccary.'

    a.   Jono=mun rutu=hi   [**kiyoo=vi joni**] =ki=nu.
        peccary=C kill=IPFV   all=EMPH man =3.PRS=DECL

    b.   Jono=mun [kiyoo=vini=n   ] rutu=hi   [**joni**] =ki=nu.
        peccary=C all=EMPH.LG=ERG   kill=IPFV   man =3.PRS=DECL

    c. * Jono=mun [joni=n   ] rutu=hi   [**kiyoo=vi**] =ki=nu.
        peccary=C man=ERG   kill=IPFV   all=EMPH   =3.PRS=DECL

                                         (Amahuaca)

(66)   'The black dog is chasing a chicken.'

    a.   Hatapa=mun chivan=hi   [**hino chaho**] =ki=nu.
        chicken=C   chase=IPFV   dog black   =3.PRS=DECL

    b.   [Chaho=n   ] =mun hatapa chivan=hi   [**hino**] =ki=nu.
         black=ERG   =C   chicken chase=IPFV   dog   =3.PRS=DECL

    c. * [Hinan   ] =mun hatapa chivan=hi   [**chaho**] =ki=nu.
         dog.ERG   =C   chicken chase=IPFV   black   =3.PRS=DECL

                                         (Amahuaca)

In (65a), we see that a continuous DP with a quantifier and noun can appear in the externally-merged position of the subject. The example in (65b) shows that the noun can be stranded in this low position with the quantifier surfacing higher in the structure. However, (65c) demonstrates that it is ungrammatical to strand the quantifier in a similar way, even though quantifiers can, in general, appear lower than their restrictors, as in (59).[27] This ungrammaticality is not remedied by causing the two pieces of the DP to match in case. The same pattern is shown for an adjective in (66)—only the noun, not the adjective that modifies it, can be stranded in the base position of the subject.

Interestingly, when a noun contains more than one modifier, one of the modifiers can be stranded along with the noun in the base position of the subject, as shown in (67).

---

[27]This pattern provides a further challenge to a scattered deletion account of case matching. If scattered deletion were responsible for the appearance of discontinuous DPs, the mechanism would have to be constrained so as to only allow deletion of modifiers in the base position of the DP in Amahuaca. It is not obvious how this could be motivated from a PF perspective since a quantifier can freely surface in its externally-merged position when it has no phonologically overt restrictor elsewhere in the sentence.

(67)   'Three black dogs are chasing a chicken.'

    a.   Hatapa=mun chivan=hi   [**hino chaho kimisha**] =ki=nu.
           chicken=C   chase=IPFV dog   black   three   =3.PRS=DECL

    b.   [Kimishana=n] =mun hatapa chivan=hi   [**hino chaho**]
            three.LG=ERG =C   chicken chase=IPFV dog black
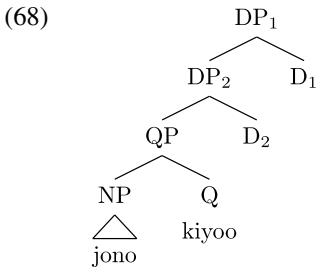   =ki=nu.
           =3.PRS=DECL

    c.   [Chaho kimishana=n   ] =mun hatapa chivan=hi   [**hino**]
            black three.LG=ERG =C   chicken chase=IPFV dog
           =ki=nu.
           =3.PRS=DECL

(Amahuaca)

In (67a), we see a DP with a noun, adjective, and numeral in the base subject position. It is possible for the noun *hino* 'dog' and the adjective *chaho* 'black' to remain in this position while the numeral *kimisha(na)* 'three' moves higher, as in (67b). Note that it is also possible for both modifiers to move together to a higher position, stranding only the noun, as seen in (67c).[28] Therefore, the generalization that emerges is that, in a discontinuous subject DP, if any piece remains in the base position, that piece must contain the noun. This generalization will factor into our discussion of the derivation of discontinuous DPs in Amahuaca in the following section.

5.2 Analysis of Amahuaca case matching

As discussed for Tiwa in Sect. 4, we assume that case matching under discontiguity arises in Amahuaca due to the presence of multiple shells in the DP. In this section, we highlight how this case iteration analysis is able to be extended to Amahuaca with minimal additions, despite the differences between Amahuaca and Tiwa.

We assume that iteration of D is possible in the Amahuaca DP, with remnant movement of the lower DP in discontinuous structures. This means that a DP like *jono kiyoo* 'all peccaries' will have a base structure as in (68) prior to undergoing splitting.

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[28] This type of pattern provides an additional challenge for the type of concord-based analysis involving concord within limited domains that was presented in Sect. 4.2. Under this type of account, discontinuous DPs would be the result of a DP-internal element moving through Spec,DP before moving out of DP. The intermediate step of movement to Spec,DP would result in the moving element being in a sufficiently local relationship to D to undergo the type of feature sharing assumed to underlie traditional concord. What is problematic for this type of account is the fact that the element that can be moved higher in the structure to form a discontinuous DP need not be a constituent, as with *chaho kimisha* 'black three' in (67c). These two modifiers should not form a constituent to the exclusion of the noun given standard assumptions about DP-internal structure. Therefore, they should not be able to move together. If they moved separately, they should each bear case under this alternative type of account. Under our analysis, the reason that these two modifiers can undergo movement together is because they form a remnant DP that the noun has already vacated by moving to the specifier of the higher DP shell.

(68)

```
                    DP₁
                   ╱  ╲
              DP₂      D₁
             ╱   ╲
          QP      D₂
         ╱  ╲
       NP    Q
       △    kiyoo
      jono
```

In the tree in (68) we see that D_1 takes DP_2 as its complement. In turn, the head of this DP selects a QP, which contains the quantifier and NP. Given the noun-stranding data discussed in Sect. 5.1, we must make one stipulation for Amahuaca that was not necessary for the Tiwa data. As we saw, a piece of a discontinuous DP containing the noun may be stranded in the base position of the DP in Amahuaca, but a piece containing only modifiers may not. We argue that this is due to the fact that, in Amahuaca, the subconstituent that moves to the specifier of a higher DP must contain the noun.[29] This will leave the lower DP, which will then contain only modifiers, free to undergo remnant movement and strand the noun. This NP movement to Spec,DP_1 is illustrated in (69).

(69)

```
                    DP₁
                   ╱  ╲
              NP      D′₁
              △      ╱  ╲
             jono  DP₂    D₁
                  ╱   ╲
                QP      D₂
               ╱  ╲
             NP    Q
             △    kiyoo
            jono
```
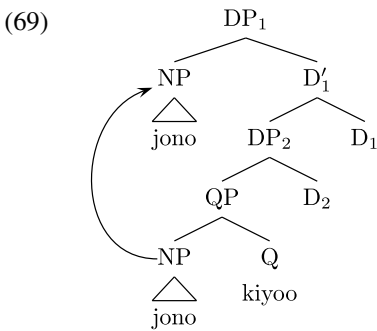
Once this movement to Spec,DP_1 occurs, DP_2, which contains the universal quantifier *kiyoo*, is free to undergo remnant movement, stranding the noun in the position occupied by DP_1. This remnant movement results in configurations like those shown in (70).

---

[29]This stipulation regarding what kind of DP-internal constituents can undergo movement in Amahuaca may be related to Cinque's (2005) argument that DP-internal word order variation crosslinguistically is due to movement of the NP or constituents that contain it within DP. However, the order of elements within continuous DPs in Amahuaca is quite variable and also potentially subject to some degree of interspeaker variation, as discussed in Clem (2019a: 47–50). Therefore, we do not take a position on whether the types of movement posited by Cinque (2005) are able to derive all possible word order patterns within the Amahuaca DP.

(70)   [$_{DP_2}$ Kiyoopa=**n**] =mun [$_{DP_1}$ jono   t$_{DP_2}$ =**n**] jiriti
       all.LG=ERG   =C   peccary   =ERG   food
     vuna=hi=ki=nu.
     look.for=IPFV=3.PRS=DECL
     'All the peccaries are looking for food.'

                                                   (Amahuaca)

In (70), the quantifier and the noun match in case. This case matching is derived via feature spreading of the ergative case feature from D_1 to D_2. When the head of DP_1 is assigned ergative case, it passes this feature on to the head of DP_2, which is still nested within DP_1. When DP_2 undergoes remnant movement, both D_1 and D_2 will surface as ergative case.

In a continuous DP in Amahuaca, only one case marker surfaces. For Tiwa, we argued that both instances of D did not surface as adjacent case markers in continuous DPs due to haplology. In Amahuaca, the ergative case marker is simply suprasegmental nasality that surfaces on the preceding vowel (orthographically represented as =*n*) and the nominative case marker is a palatal fricative (orthographically represented as =*x*). Given that Amahuaca does not phonologically show more than a two-way nasality contrast for vowels nor a length contrast for fricatives, we assume that there is not a phonologically licit way to contrastively realize adjacent case markers at the right edge of a continuous DP in Amahuaca. Only when a DP is split can multiple case markers surface.

5.3 Differential subject marking

Having demonstrated how the DP-shell analysis can derive the case iteration in Amahuaca, we now turn to a slightly more complicated set of data. Like Tiwa, Amahuaca exhibits differential case marking. However, in Amahuaca, it is ergative subjects that can appear in a case-marked or unmarked form, and the marking of ergative case depends strictly on the syntactic position of the transitive subject.[30] Interestingly, this pattern of structural differential case marking interacts with case iteration. This interaction falls out from the architecture of the DP-shell analysis and the assumption that case assignment can be timed before some instances of movement and after others (i.e. the assumption that case assignment can occur in the narrow syntax; Preminger 2011).

As mentioned in the discussion of noun-stranding, Amahuaca subjects that appear to the right of aspect are those that appear in their base position. In this position, transitive subjects are unmarked for case. Transitive subjects that appear higher in the structure receive ergative case, as demonstrated in (71).

(71)   'The man is killing the peccary.'
     a.   Joni**(=n)**=mun jono   rutu=hi=ki=nu.
          man=ERG=C   peccary kill=IPFV=3.PRS=DECL

---

[30]Intransitive subjects can also appear in a marked or unmarked form. However, nominative marking is sensitive to focus, not syntactic position (Clem 2019b). It is possible for discontinuous nominative DPs to mismatch in case when only one piece is focused. The focused piece appears with nominative case, as expected from the general pattern of nominative marking.

b.   Jono=mun rutu=hi   joni**(*=n)**=ki=nu.
           peccary=C kill=IPFV man=ERG=3.PRS=DECL

<div align="right">(Amahuaca)</div>

In (71a), we see that the transitive subject *joni* 'man' is marked with ergative case, as expected. However, in (71b), this subject DP remains low in its externally-merged position and does not receive ergative case marking. Clem (2019b) provides a more detailed description of this pattern of differential ergative marking and analyzes ergative case as the result of agreement with two heads, *v* and T. In order to be marked with overt morphological ergative case, a DP must agree with *v* in Spec,*v*P and must also agree with T, which goes hand-in-hand with movement of the DP out of *v*P.

Important for our purposes is the interaction between this pattern of differential subject marking and case matching. The only types of configurations where the two pieces of an ergative DP mismatch in case is when one piece remains in the low *v*P-internal position, where DPs generally lack overt case. In such instances, the piece of the DP that remains low is not marked ergative, while the piece that moves higher surfaces with ergative case, as demonstrated in (72).

(72)   [Kiyoo=vini**=n**   ] =mun jono   rutu=hi [joni**(*=n)**]
        all=EMPH.LG=ERG =C   peccary kill=IPFV man=ERG
        =ki=nu.
        =3.PRS=DECL
        'All the men are killing a peccary.'

<div align="right">(Amahuaca)</div>

In (72), the subject quantifier surfaces with ergative case. However, the corresponding noun remains low and cannot surface with ergative case. Crucially, this pattern is exactly what we would expect given the general pattern of ergative case marking in the language. Thus, as in Tiwa, case matching and mismatching reflect the more general patterns of case marking.

This case mismatching can be derived by considering the timing of case assignment and movement. Recall that in structures like (73), repeated from (70), case matching results because D_1 is assigned ergative case prior to the splitting of the DP.

(73)   [$_{DP_2}$ Kiyoopa**=n**] =mun [$_{DP_1}$ jono   t$_{DP_2}$ **=n**   ] jiriti
        all.LG=ERG =C   peccary   =ERG food
        vuna=hi=ki=nu.
        look.for=IPFV=3.PRS=DECL
        'All the peccaries are looking for food.'

<div align="right">(Amahuaca)</div>

In (73), the entire nested DP is the goal for Agree with T and moves to the higher position associated with overt ergative case. D_1 is assigned ergative case, and this case is spread to D_2 in the nested configuration. When DP_2 undergoes remnant movement, both D_1 and D_2 are realized with ergative case.

This case matching derivation can be contrasted with a derivation that results in a mismatch like we see in (74).

<div align="right"></div>

(74) [$_{DP_2}$ Kiyoopa=**n**] =mun jiriti vuna=hi   [$_{DP_1}$ jono   t$_{DP_2}$]
          all.LG=ERG   =C   food look.for=IPFV   peccary
      =ki=nu.
      =3.PRS=DECL

      'All the peccaries are looking for food.'

                                                          (Amahuaca)

In structures like (74), the nested DP is not the goal for Agree with T. Instead, DP_2 undergoes remnant movement out of DP_1 and subsequently is a goal for Agree with T, moving to the higher position associated with overt ergative case. Because D_1 and D_2 are no longer in a nested configuration at the time of case assignment, feature spreading between the two instances of D does not apply. Thus D_2 is assigned ergative case directly and D_1 does not receive case. This results in the mismatch in case that we find. Like in Tiwa, the availability of a case mismatch is due to the fact that (overt) ergative case is not assigned immediately upon external Merge of the DP in Amahuaca, allowing for the DP to be split prior to case assignment.

    We have thus demonstrated that the DP-shell analysis pursued for Tiwa can be straightforwardly extended to Amahuaca, which is typologically quite different in various respects. Amahuaca has a tripartite alignment system and exhibits differential subject marking, while Tiwa shows accusative alignment and differential object marking. However, the shared pattern of case matching only under discontiguity can be accounted for under the same basic case iteration analysis that relies on nested DP shells.

6 Case iteration crosslinguistically

We have argued that case iteration in Tiwa and Amahuaca is an empirically different phenomenon from case concord. In case iteration, multiple instances of D originating in the same DP shell structure spell out the same case features. In case concord, various categorially distinct elements in the DP bear morphological reflexes of case. In this section, we discuss crosslinguistic predictions of the DP-shell account of case iteration we have developed here and its possible connections to the phenomenon of determiner spreading.

    Tiwa and Amahuaca are unrelated languages with quite different typological profiles. These languages show similar case iteration patterns because (i) they mark case as an enclitic on the DP, (ii) they allow discontinuous DPs, and (iii) they lack DP-internal case concord. In this section we will discuss two additional languages that show these features.

    The first language we will consider is Huallaga (Huánuco) Quechua (Quechuan; Peru). In Huallaga Quechua, case surfaces on the final element of the DP, regardless of whether that element is the head noun or a modifier, as shown in (75).[31]

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[31]The symbol : found in the Huallaga Quechua examples is used by Weber (1989) to indicate that first person singular subject agreement is expressed via lengthening the vowel of the verb root.

(75) 'I see the big man.'

    a.   [Hatun runa-**ta**] rika-:.
            big   man-OBJ see-1SG

    b.   [Runa hatun-**ta**] rika-:.
            man big-OBJ   see-1SG

(Huallaga Quechua; Weber 1989: 250)

In (75) object case *-ta* appears on the final DP-internal element, which is *runa* 'man' in (75a) but *hatun* 'big' in (75b) when the modifier appears post-nominally. Note that in these examples we see only one instance of case marking within the DP rather than observing concord.

Discontinuous DPs are also possible in Huallaga Quechua, and when they occur, each element must bear a copy of the appropriate case marker for the DP (Weber 1989: 231, 250). This case iteration pattern is exemplified in (76).

(76) 'I see the big man.'

    a.   [Hatun-**ta**] rika-:   [runa-**ta**   ].
            big-OBJ   see-1SG   man-OBJ

    b.   [Runa-**ta**] rika-:   [hatun-**ta**].
            man-OBJ   see-1SG big-OBJ

(Huallaga Quechua; Weber 1989: 250)

Here, the modifier and head noun are split across the verb and both must surface with the object case marker *-ta* in this discontinuous configuration.[32]

The second language that appears to show a similar case iteration pattern to the one observed in Tiwa and Amahuaca is Diyari (Pama-Nyungan; South Australia). In Diyari, case is marked as an enclitic on the DP (Austin 1981; Dench and Evans 1988), and DP-internal elements do not show case concord, as demonstrated in (77).

(77) [kaṇa ŋanka-ṇṯa-**li**   ] ŋaṇa ṇanda-yi
     man beard-PROP-ERG 1SG.O hit-PRS

    'The bearded man is hitting me.'

(Diyari; Austin 1981: 42)

In (77), ergative case is marked on the final word of the DP, in this case the modifier. There is no case marking on the noun. In contrast, just like in Tiwa and Amahuaca, each element of a discontinuous DP is marked for case in Diyari, as shown in (78).[33]

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[32]Weber (1983: 49–55, 1989: 231, 250) notes that the two pieces of a discontinuous DP may actually be adjacent, as in (i). However, he still categorizes these types of examples as involving structural disconti-guity. In fact, Weber (1983: 53) explicitly argues against a "case spreading" analysis, which looks like a process of concord, in favor of an analysis that requires movement of a subconstituent out of the nominal in order to result in multiple case markers.

    (i)   [Runa-**ta**] [hatun-**ta**] rika-:.
           man-OBJ   big-OBJ   see-1SG

        'I see the big man.'

(Huallaga Quechua; Weber 1989: 250)

[33]Austin (1981: 94) reports that linearly adjacent DP elements may each be case marked if "there is special emphasis or contrast intended." If such focus constructions involve structural discontinuity with surface

(78) [mankada-**li**] ŋaṉa ṉayi-ṉa wara-yi [paḷpa-**li**]
      girl-ERG   1SG.O see-PART AUX-PRS some-ERG

'Some girls saw me.'

(Diyari; Austin 1981: 94)

The emergence of similar case iteration patterns in multiple unrelated language leads us to suspect that case matching under discontiguity will ultimately be attested much more broadly.

While the three features listed above (case enclitics, discontinuous DPs, and no case concord) give rise to the pattern of case iteration in Tiwa, Amahuaca, and possibly Huallaga Quechua and Diyari, nothing in our analysis crucially hinges on a language displaying this constellation of properties. For example, it is possible that a language could show both case iteration and case concord: case iteration would arise through the spell out of multiple identical heads, while concord would arise via the mechanisms found in languages like Warlpiri and Icelandic.[34] A possible example of a language that displays both of these phenomena may be Kanum (Papuan; Donohue 2011). In Kanum, case is marked as an enclitic on the noun (or, if the noun is elided, on a modifier). Modifiers do not show case concord, as illustrated in (79). In contrast, demonstratives, which follow the noun, are separately marked for case, as in (80).

(79) ntaop(***-ne**) klawo-**ne**
      big-DAT   child-DAT

'for the big child'

(Kanum; Donohue 2011: 503)

(80) klawo-**w**   pyengkw
      child-ERG that.ERG

'that child'

(Kanum; Donohue 2011: 503)

In discontinuous DPs, each piece of the DP (including modifiers) is marked for case, just like in Tiwa and Amahuaca. This is shown in (81).

(81) [Yrye-**w**   pyengkw] sreyerknt   [ntaop-**w**.]
      man-ERG that.ERG   he.will.stalk.it big-ERG

'That big man will stalk it.'

(Kanum; Donohue 2011: 505)

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adjacency, like we find in Tiwa and as indicated in (i), the DP-shell analysis straightforwardly extends to Diyari. (Note that, unlike Warlpiri, Diyari does not have a second position clitic that would allow us to determine whether the two pieces in (i) are a single constituent or not.)

(i) [kiṉṯala-**li**] [ṉuŋkaṉi-**yali**] ŋaṉa maṯa-ṉa wara-yi
     dog-ERG   3SG.DAT-ERG   1SG.O bite-PART AUX-PRS

'HIS dog bit me.'

(Diyari; Austin 1981: 94)

[34]It is also possible that both of these processes exist within Warlpiri itself. Recall that concord is optional in continuous DPs but obligatory in discontinuous DPs. It is possible that Warlpiri has an optional process of true concord coupled with case iteration in discontinuous DPs.

A possible analysis of Kanum could treat the case marking on the noun and demonstrative as true concord.[35] On the other hand, the case marking that appears on other modifiers in discontinuous DPs could be analyzed as case iteration, arising through the spell out of two identical heads.

We also expect that similar patterns of case iteration could be found in languages with typological profiles that differ more substantially from Tiwa and Amahuaca. For example, this same type of structure could be found in head-initial languages. In such languages, multiple instances of D may be able to be spelled out even in continuous DPs, rather than only discontinuous DPs, so long as the instances of D are not linearly adjacent. (Recall that multiple instances of D are not spelled out in continuous DPs in Tiwa due to haplology.) There is also no reason, in principle, that the same shell structure could not arise with heads other than D or in languages where some feature other than case is realized in D. For example, languages that have canonical determiners in D could also have nested DP shells.

Here it is worth noting the potential connection between the DP-shell analysis presented here and the phenomenon of polydefiniteness. In some languages, DPs may contain multiple realizations of definiteness. This has been argued to arise via concord involving a [DEF] feature in some instances. For example, Kramer (2010) argues that optional polydefiniteness in Amharic, like that seen in (82), arises via agreement. The obligatory determiner spells out D itself.

(82) k'ondʒo-**w** tɨllɨk'**(-u)** k'äyy**(-u)** kwas
     beautiful-DEF big-DEF   red-DEF ball
     'the beautiful big red ball'

<div align="right">(Amharic; Kramer 2010: 200)</div>

While some instances of polydefiniteness may arise via concord, Alexiadou (2014) notes that other patterns of polydefiniteness may instead arise via spelling out multiple instances of D. Thus, we see a distinction in the domain of polydefiniteness between feature sharing and the spell out of multiple instances of D, mirroring the agreement/clitic doubling and concord/case iteration distinctions. Determiner spreading in Modern Greek, illustrated in (83), is one example of what has been argued to be the latter pattern of spelling out multiple instances of D.

(83) **to** vivlio **to** kokkino **to** megalo
     the book the red   the big
     'the big red book'

<div align="right">(Modern Greek; Alexiadou and Wilder 1998: 302)</div>

Multiple determiners are possible in Greek DPs that contain predicative adjectives in certain orderings (see Alexiadou and Wilder 1998 for details). Various competing analyses have been offered for the Greek determiner spreading pattern, and we mention only a few of them here (see Alexiadou 2014 for an overview). Alexiadou

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[35] In Norris's (2019) survey of languages with nominal concord, if only one category of element displayed concord with the noun, it was most common for demonstratives to exhibit concord. Thus it is unsurprising that demonstratives in Kanum appear to exhibit true concord while other modifiers are only marked with case when there is case iteration.

and Wilder (1998) analyze determiner spreading in Greek as the spell out of separate instances of D, with each DP layer nested inside a reduced relative clause that introduces the predicate adjective. Panagiotidis and Marinis (2011) argue for a DP predication structure of determiner spreading with multiple DPs where one DP is the specifier of another DP (Alexiadou 2014 notes the similarity of this structure to the structure often assumed for clitic doubling). Lekakou and Szendrői (2012) offer a loose apposition analysis of determiner spreading, with each determiner spelling out an instance of D in one of multiple DPs that form a larger complex DP. Crucially, all of these analyses involve multiple instances of D in a single continuous DP constituent.

Outside of Greek, there are other languages that show a pattern of polydefiniteness that also suggests the existence of multiple D-like layers in a single nominal constituent. For example, polydefiniteness in Scandinavian languages has been argued by some to result from a cartographic split DP structure (similar to Rizzi's 1997 split CP structure). The presence of multiple layers of the DP yields the presence of multiple determiners (Julien 2005; Lohrmann 2010; among others).

Overall, there is substantial crosslinguistic variation in patterns of determiner spreading/polydefiniteness (see Alexiadou 2014 for an overview). While some patterns appear to involve a concord-like operation, others look similar to what we would expect to find if there were DP shells with true determiners, rather than case, in D. The possibility of multiple determiners in a continuous DP would not be unexpected on a DP-shell account if the language in question were head initial, given that haplology would not apply. We therefore leave it an open question whether some patterns of polydefiniteness and the case iteration patterns we have discussed here can be unified under the type of DP-shell analysis we have offered here.

7 Conclusion

In this paper, we have argued for the existence of case iteration as an empirically distinct phenomenon from case concord. While both result in similar surface patterns, they show some differences and they arise due to distinct underlying mechanisms. Case concord is the result of the morphological realization of case features on categorially distinct elements within the DP. It typically results in multiple instances of case internal to a continuous DP constituent. We have argued that case iteration, on the other hand, is the result of spelling out multiple instances of D that each realize case. We have demonstrated how this analysis can capture the case matching pattern that we find in Tiwa, where multiple realizations of case are possible only under discontiguity. This pattern looks empirically different from concord as it does not result in multiple realizations of case in continuous DPs. This analysis of case iteration can be extended to account for a similar pattern in Amahuaca, and possibly related patterns crosslinguistically that appear to be distinct from canonical examples of concord.

As we noted at the outset, the concord/case iteration distinction is analogous to the agreement/clitic doubling distinction found in the verbal domain. In both concord and agreement, the same (case or ϕ) features are realized on multiple categorially distinct

elements, while in both case iteration and clitic doubling, there are multiple syntactic instances of D that realize the relevant features. It is our hope that illuminating this contrast in the nominal domain will result in a richer understanding of both the theoretical and empirical landscape involving multiple realizations of case. Further, we hope that future descriptive and analytical work will serve to sharpen the contrast between the two phenomena and provide additional diagnostics for distinguishing concord and case iteration.

Declarations

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