

Contextual Allomorphy in the Mehri DP

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1. Introduction

Contextual allomorphy, and its relation to locality and cyclicity, has received much attention in recent morphological literature (see Bobaljik 2000; Carstairs-McCarthy 2001, 2003; Adger, Béjar and Harbour 2003; Embick 2010; Harizanov and Gribanova 2014; among others). This project introduces novel data from Mehri (Modern South Arabian, Semitic) that exhibits contextual allomorphy, and develops a Distributed Morphology (DM) analysis of the allomorphies evidenced in pronominal possessive constructions. The Mehri data presents a puzzle in which certain plural features are apparently not exponed in the context of an agreement marker (an adjacent AGR node), despite the evidence that the agreement markers subsequently exhibit allomorphy triggered by this plural feature. Mehri, a language largely unfamiliar to modern linguistic theory, can thus inform current debate on the nature of contextual allomorphy, locality and Vocabulary Insertion. The analysis presented ultimately provides further support for the idea sketched in Adger, Béjar and Harbour (2003) that grammatically-conditioned inwardly-sensitive allomorphy can be licensed hierarchically. Additionally, the analysis demonstrates empirically that Linearization/Vocabulary Insertion (VI) of a complex head occurs cyclically node-by-node (contra Embick 2010). Finally, the analysis necessitates that idiosyncratic properties of the Root (List 1) are more highly specified than phonological or grammatical features with regards to the ordering of Vocabulary Items.

Section II will give a brief overview of the contextual allomorphy literature, emphasizing a few key theoretical issues. In Section III, I present the data of pronominal possessive constructions in Mehri and will argue that the suffixes involved are possessor agreement of a pro-dropped possessor. In Section IV, I propose an analysis of these facts with a system of contextual allomorphy that encompasses key ideas from previous literature, and eventually argue that grammatically-conditioned contextual allomorphy can be inwardly licensed by hierarchical adjacency (following Adger, Béjar, and Harbour 2003). Section V concludes.

2. Contextual Allomorphy

Broadly speaking, contextual allomorphy within a DM framework is schematized as follows:

- 1) Selected VIs for Feature [α]
 - a. [α] \leftrightarrow X / Context₁
 - b. [α] \leftrightarrow Y / Context₂

In the above schema, Feature [α] will be exponed with different Vocabulary Items depending on its context. A classic example of contextual allomorphy in English is evidenced by the plural morpheme: the default plural VI is /-z/, although in the context of \sqrt{OX} the plural feature is exponed as /-en/.

While many theoretical questions have been raised with regards to contextual allomorphy, this paper will focus on the precise nature and limitations of “Context₁” and “Context₂”. For example, does the allomorphic context require immediate adjacency, and should any adjacency requirements be defined hierarchically or linearly? Can context make reference to grammatical features, phonological features, or both? Can allomorphy be sensitive to the context of features closer to the root (inwards sensitivity) or features further from the root (outwards sensitivity)?

To address these issues, Carstairs (1987) distinguishes between inwards sensitivity and outwards sensitivity in his proposed Peripherality Constraint, repeated below (*italics original*):

*Many thanks to Ruth Kramer, Aaron Rubin, and the students in the Morphosyntax Seminar at Georgetown University for helpful comments and feedback.

2) Peripherality Constraint (Carstairs 1987, 193)

The realisation of a property P may be sensitive inwards, i.e., to a property realised more centrally in the word-form (that is, closer in linear sequence to the root), but not outwards to an individual property realised more peripherally (further from the root). The realisation of P may, however, be sensitive outwards consistently to *all the independently realised properties within a given category, that is to all those properties within the category with which the realisation of P is not entirely simultaneous.*"

In his work, Carstairs uses the term "property" to refer to specific features (e.g., [PL]) as opposed to "category" which refers to a grammatical node, regardless of its features (e.g., Num). Thus Carstairs proposes that more peripheral features may be inwardly-sensitive to more central features without limitation, while outwards-sensitivity is available only when the presence of a grammatical category dictates the allomorphy (as opposed to its specific featural content).

Bobaljik (2000) builds upon Carstairs' generalizations and translates them into a DM framework, primarily using data from Chukotko-Kamchatkan. In his paper, Bobaljik argues that both inwards and outwards sensitivity is possible, although they make reference to different types of context. Specifically, Bobaljik argues that morphemes are inwardly sensitive exclusively to phonological properties and outwardly sensitive exclusively to morphosyntactic properties. This stems from two core assumptions of DM: 1) cyclicity: that derivations proceed from the root outwards (Bobaljik 2000, Embick 2010, among others) and 2) rewriting:

3) Rewriting (Bobaljik 2000)

As morphosyntactic features are *expressed* by vocabulary items, these features are *used up* and no longer a part of the representation.

Bobaljik thus makes the prediction that morphemes should not be inwardly sensitive to grammatical features (partially contra Carstairs (1987) who made no distinction between grammatical and phonological features in his allowance of inwards sensitivity).

Carstairs-McCarthy (2001) continues the discussion by largely rejecting Bobaljik's assertions and instead seeking explanatory adequacy of the Peripherality Constraint outside the framework of Distributed Morphology. Citing data from Latin and Hungarian, Carstairs-McCarthy develops the "Ancestry Constraint on inflectional sensitivity" which states that contextual allomorphy is only available between "ancestors" and direct "descendants" of a node. Carstairs-McCarthy dissents from Bobaljik in two key ways: 1) Bobaljik does not distinguish between the existence of a grammatical node and its specific featural content in allowing outwards sensitivity; Carstairs-McCarthy asserts that outwards sensitivity is only available in the former and 2) contra Bobaljik, Carstairs-McCarthy allows for grammatically-conditioned inwards sensitivity.

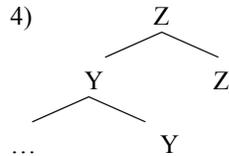
Embick (2010) addresses the apparent existence of grammatically-conditioned inwards sensitivity in Latin by rejecting the rewriting hypothesis and simply permitting morphemes to make reference to grammatical features even after Vocabulary Insertion.² Additionally, Embick further constrains contextual allomorphy by asserting that linear concatenation is required for contextual allomorphy (concatenation marked by \curvearrowright). In his model, Embick assumes that a Spell-Out cycle is fully Linearized before Vocabulary Insertion takes place, and these linear concatenation relations are available to condition Vocabulary Insertion.

Harizanov and Gribanova (2014) present Bulgarian data that is apparently inwardly sensitive to both grammatical and phonological conditions, and give two possible solutions to account for the data. The first, as adopted by Embick (2010), is to simply reject the rewriting hypothesis altogether. The second possible solution, credited to Bye and Svenonius (2012) is referred to as L-match. In this approach, Vocabulary Insertion is a two-step process. First, L-match associates a set of possible allomorphs for a given morpheme based on morphosyntactic properties, and secondly, Insert chooses amongst this subset based on phonological conditions. Harizanov and Gribanova do not distinguish empirically between these two

² Embick does say in a footnote that the discharge of features "may be required" under some circumstances, and directs the reader to Bobaljik 2000 (Embick 2010, 146).

solutions, only noting that they are both potential approaches to accounting for inwards sensitivity that is both phonologically and grammatically conditioned.

Unlike Embick (2010) and Harizanov and Gribanova (2014), Adger, Béjar, and Harbour (2003, hereby AB&H) do not reject the rewriting hypothesis or develop additional mechanisms for Vocabulary Insertion, and instead demonstrate that a minor modification of Bobaljik’s theory of contextual allomorphy can account for the apparent grammatically-conditioned inwards sensitivity. While accepting the rewriting hypothesis, AB&H argue that morphemes can still make inwards reference to grammatical features within a hierarchical structure. Despite the fact that the grammatical feature has been discharged from the terminal node following Vocabulary Insertion, its mother retains the featural content of the discharged node and it is to this non-terminal node that more peripheral morphemes can be sensitive. This can be schematized below with the following syntactic representation:



In the above schema, AB&H’s proposal states that after a Vocabulary Item has been inserted at terminal node Y, its mother, the non-terminal node Y, is still available in the derivation. It is this non-terminal node Y, which is sister to Z, that can condition allomorphy during Vocabulary Insertion at terminal node Z.

While AB&H did not give a precise formalism for the distribution of features on non-terminal nodes (other than that a terminal node’s mother “maintains its feature specification”), AB&H’s proposal fits nicely within the analysis of concord from Norris (2014). In his dissertation, Norris argues for an analysis of concord as feature spreading in the narrow syntax coupled with a DM analysis of inserted post-syntactic Agr⁰ nodes. Norris proposes two feature percolation principles to facilitate concord:

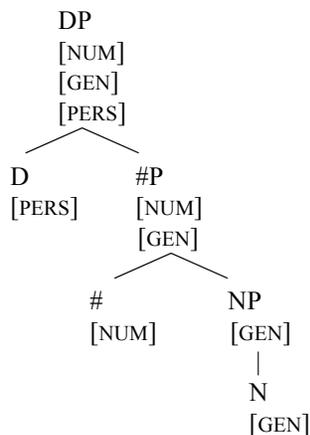
5) Feature Percolation Principles:

(Norris 2014)

- a. All projections of a head X⁰ have the feature-value pairs that X⁰ has.
- b. Let [F:val] be a valued feature on XP
 - Let Z⁰ be a head lacking the feature [F]
 - Let X⁰ and Z⁰ be members of the same extended projection (i.e., both [+N]).
 - When Z⁰ merges with XP, projecting ZP, ZP also has the valued feature [F:val].

These principles allow features in a nominal projection to accumulate as new features are projected, with the resulting DP projection as a compilation of all the phi-features it contains. This is schematized below:

6) Feature Percolation based on Norris (2014)



- 9) a. bayt b. bayt-ī (Watson 2012: 71)
 house house-POSS.1SG
 my house
- c. ḥayb d. ḥáyb-əkən (Rubin 2010: 34)
 father father-POSS.2FPL
 your (F.PL) fathers
- e. ḥə-brīt f. ḥə-brət-eh⁶ (Rubin 2010: 35)
 DEF-daughter DEF-daughter-POSS.3MSG
 the daughter his daughter

If the plural is formed via a suffix, the suffix is absent in the presence of the agreement marker, which takes a special plural form. Note the different forms of the agreement marker in (9b) and (10c), despite the phi-features of the possessor remaining the same. (Also note that the feminine suffix is expounded only in the context of the plural feature in (10b-c) and (10e-f). I argue that this is contextual allomorphy of *n*, seen in select feminine plurals).

- 10) a. ḥayd b. ḥād-ūt-ən⁷ c. ḥād-it-ya (Watson 2012: 77)
 hand hand-F-PL hand- F-POSS.PL.1SG
 hands my hands
- d. ‘ayn e. ‘āyən-t-ən f. ‘āyən-t-isən (Rubin 2010: 36, 65)
 eye eye-F-PL eye-F-POSS.PL.3FPL
 eyes their (f) eyes
- g. ḡayt h. a-ḡawt-an i. a-ḡit-ya (Watson 2012: 77)
 sister DEF-sister-PL DEF-sister-POSS.PL.1SG
 the sisters my sisters

However, if a plural is formed via ablaut, the plural form of the noun remains unchanged and the plural form of the agreement marker is suffixed:

- 11) a. xəlēk b. xəlōwək c. xəláwək-əya⁸ (Rubin 2010: 36, 67)
 cloth, dress cloth.PL cloth.PL-POSS.PL.1SG
 clothes my clothes

Such facts present a puzzle in which the agreement nodes are clearly allomorphically conditioned by the plural feature, even when the plural feature is apparently absent (or not expounded). An analysis of these facts must be constrained enough to prevent the plural feature from being expounded as a suffix in certain contexts, but allow for the plural feature to be expounded via a vocalic pattern in all contexts. Additionally, I account for the special plural forms of the possessive agreement that appear regardless of whether the plural feature is expounded.

⁶ The reduction of syllable-final vowel to a schwa in the context of a suffix is a well-attested phonological process in Mehri (Rubin 2010).

⁷ While Watson and Rubin both describe the *-Vtən* plural suffix as one morpheme, I propose that the suffix can be broken into the feminine suffix *-Vt* and the feminine plural suffix *-ən*. Feminine nouns are often marked with the suffix *-Vt*, which can be clearly seen in this masculine~feminine pair (Rubin 2010: 60):

0) a. ḡōr b. ḡər-īt
 servant servant-F
 male servant female servant

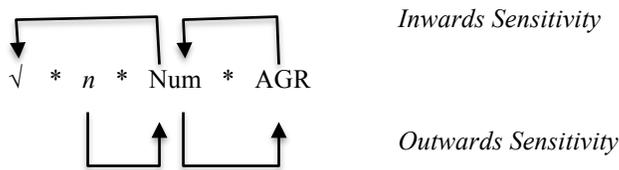
⁸ The deletion of the schwa between [w] and [k] in (20c) is the result of a common phonological process in Mehri.

4. Analysis

As noted above, I am adopting the theory of Distributed Morphology (DM) (Halle and Marantz 1993) in this paper. In a DM framework, the syntax sends a hierarchical structure to PF, and the morphology performs a set of operations to this syntactic output (Embick and Noyer 2001, among others). It is in PF that the structure is Linearized, and morphemes, which are terminal nodes consisting of bundles of features, are given phonological content, an operation called Vocabulary Insertion. The Vocabulary Items must match in features either partially or fully with the features on the morpheme, but may not contain features that the morpheme does not have (Subset Principle, Halle 1997).

My analysis proposes the following allomorphic relations in Mehri pronominal possessive constructions:

12) Proposed contextual allomorphy in the Mehri DP



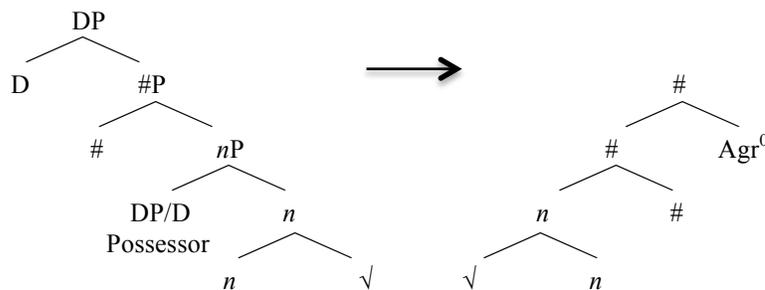
This analysis includes lexically-conditioned inwardly-sensitive allomorphy of Num to the Root (10b vs. 11b), as well as two types of grammatically-conditioned outwardly-sensitive allomorphy: *n* to Num (10a vs. 10b) and Num to Agr⁰ (10b vs. 11c). Additionally, the analysis proposes grammatically-conditioned inwardly-sensitive allomorphy of Agr⁰ to Num (10c, 11c vs. 9b). This final type of allomorphy is problematic for the DM assumption of rewriting as discussed in Section II. I now sketch a proposal in which grammatically-conditioned inwardly-sensitive contextual allomorphy is viable without violating rewriting.

To support my proposal, I follow Adger, Béjar and Harbour (2003) in assuming that grammatically-conditioned inwardly-sensitive allomorphy can be licensed hierarchically. Consider the following structure:

13) Proposed Mehri possessive pronominal structure

a. Possessive structure (narrow syntax):

b. After head movement (PF):

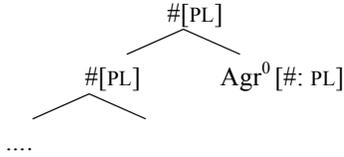


Following head movement, a complex head is formed within which the phi-features of the possessor have been copied onto an Agr⁰ node inserted post-syntactically. This entire complex head (13b) will be Spelled-Out in the same cycle, making the nodes available for contextual allomorphy under locality domains (Embick 2010). I assume inside-out cyclicity (Carstairs 1987, Bobaljik 2000, Embick 2010) in which Vocabulary Insertion begins at the Root and works upwards to *n* and then Num. The VI for Agr⁰ will be inserted last. As we saw in (9b), (10c), and (11c), the Agr⁰ takes a special form when adjacent to a plural node. This would suggest the following Vocabulary Item:

14) Agr⁰ ↔ plural allomorph / Num[PL] __

However, because of rewriting, (14) is illicit in DM. Instead, I follow Norris' (2014) feature percolation conventions and assert that Agr^0 is allomorphically sensitive to the grammatical features of its sister, the non-terminal Num node:

15)



Note that (15) is the same as the schematic tree shown in (13b), applied to a particular construction. Thus the Vocabulary Item for Agr^0 would be modified as follows:

16) $\text{Agr}^0 \leftrightarrow \textit{plural allomorph} \ / \ \text{Num}[+PL] \wedge _ _$

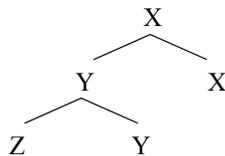
Where I have used the symbol [\wedge] to indicate the hierarchical relationship of sisterhood⁹, in contrast to Embick's [\frown] to indicate linear concatenation (2010). Thus in (16), contextual allomorphy is still conditioned by a strict adjacency relation (sisterhood), and the rewriting assumption has been maintained.

4.1 Additional Theoretical Implications of this Analysis

The analysis presented above leads to two theoretical consequences regarding the timing and nature of Linearization/Vocabulary Insertion, both of which will be discussed below.

First, the analysis necessitates that Linearization/Vocabulary Insertion occur cyclically (node-by-node). This is schematized as follows:

17)



Option A:

1. Linearization of the M-Word ($Z * Y * X$)
2. Vocabulary Insertion at Z
3. Vocabulary Insertion at Y
4. Vocabulary Insertion at X

Option B:

1. Linearization/Vocabulary Insertion of Z
2. Linearization/Vocabulary Insertion of Y
3. Linearization/Vocabulary Insertion of X

The present analysis necessitates Option B. Otherwise, during Vocabulary Insertion of Agr^0 , there would be no sisterhood relation with a non-terminal node, and thus the adjacency relation necessary for contextual allomorphy would be inaccessible. This analysis is contra Embick (2010) that states contextual allomorphy requires linear concatenation, thus necessitating Option A.

The second theoretical consequence of the analysis proposed above relates to the ordering of Vocabulary Items. Specifically, the analysis requires that the idiosyncratic properties of the Root are more highly specified than grammatical or phonological properties with regards to Vocabulary Insertion. In order for the plural feature to be expounded via a vocalic pattern in all contexts (regardless of whether it is adjacent

⁹ It may be maximally clear to indicate somehow in the VI in (16) that the $\text{Num}[+PL]$ is a non-terminal node, though I am unaware of such conventions.

to an Agr⁰ node, as seen in 11b and 11c), the idiosyncratic property of the Roots (whether it is listed as a “broken plural”) must be the most specific context with regards to the Subset Principle:

- 18) Selected VIs for [Num]
- a. [PL] ↔ $\bar{o}w$ / { $\sqrt{x}lk$, $\sqrt{x}tm$, \sqrt{ftx} ... }
 - b. [PL] ↔ \emptyset / $\underline{\text{AGR}}$
 - c. [PL] ([FEM]) ↔ $-\bar{a}n$
 - d. [PL] ↔ $-\bar{a}m$

Consistent with DM (Halle and Marantz 1993), the above VIs are ordered. If the grammatically-conditioned Vocabulary Item (18b) were listed above the lexically-conditioned Vocabulary Item (18a), then no plural feature would ever be exponed in the context of an AGR node (erroneously, see 11c). This analysis is akin to the position in Harizanov and Gribanova (2014) that phonological context is more highly specified than a morphosyntactic context. Thus the Mehri data can inform the current theoretical discussion in the literature on ordering in Vocabulary Insertion when the Subset Principle cannot apply.

5. Conclusion

This paper proposes an analysis of the pronominal possessive constructions in Mehri within the framework of Distributed Morphology. The data presented, in a language largely unknown to the DM literature (exception being a brief discussion in Halle 1997), demonstrates how an intricate system of contextual allomorphy can account for puzzling facts regarding possessor agreement. The analysis has theoretical implications regarding locality conditions on contextual allomorphy by proposing grammatically-conditioned inwardly sensitive contextual allomorphy that is licensed under hierarchical relations (rather than linear concatenation). Additionally, the consequences of the analysis bear directly on the timing and nature of Vocabulary Insertion. Further work deriving lesser-known Semitic languages in DM will continue to shed light and expand our growing knowledge of DM and open questions of locality, cyclicity, and allomorphy.

References

- Adger, David, Susana Béjar and Daniel Harbour. 2003. Directionality of allomorphy: a reply to Carstairs-McCarthy. *Transactions of the Philological Society* 101:109–115.
- Arad, Maya. 2003. Locality constraints on the interpretations of roots. *Natural Language and Linguistic Theory* 21:737-778.
- Bobaljik, Jonathan. 2000. The Ins and Outs of Contextual Allomorphy. *University of Maryland Working Papers in Linguistics* 10:35–71.
- Bonet, Eulàlia and Daniel Harbour. 2012. Contextual Allomorphy. Jochen Trommer, ed. *The Morphology and Phonology of Exponence*. Oxford linguistics.
- Carstairs, Andrew. 1987. *Allomorphy in Inflexion*. Croom Helm, London.
- Carstairs-McCarthy, Andrew. 2001. Grammatically conditioned allomorphy, paradigmatic structure, and the ancestry constraint. *Transactions of the Philological Society* 99:2, 223–245.
- Embick, David. 2010. *Localism versus Globalism in Morphology and Phonology*. Linguistic Inquiry Monographs.
- Embick, David, and Rolf Noyer. 2001. Movement Operations after Syntax. *Linguistic Inquiry* 32:4, 555-595.
- Embick, David and Rolf Noyer. 2007. Distributed morphology and the syntax/morphology interface. In Gillian Ramchand and Charles Reiss, eds. *The Oxford Handbook of Linguistic Interfaces*. Oxford: OUP.
- Halle, Morris. 1997. Distributed morphology: impoverishment and fission. In Benjamin Bruening, et al., eds., *MIT Working Papers in Linguistics* 30: Papers at the Interface. Cambridge: MITWPL. 425-449.
- Halle, Morris and Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In Ken Hale and Samuel Jay Keyser, eds. *The View from Building 20*. Cambridge: MIT Press. 111-176.
- Harizanov and Gribanova. 2014. Inward-sensitive contextual allomorphy and its conditioning factors. In H.-L. Huang, E. Poole and A. Rysling, eds. *Proceedings of the 43rd Annual Meeting of the North East*

- Linguistic Society (NELS)*. 1:155-166.
- Harley, Heidi and Rolf Noyer. 1999. Distributed morphology (State-of-the-Article). *Glott International* 4. 3-9.
- Kramer, Ruth. 2009. Definite markers, phi-features, and agreement: a morphosyntactic investigation of the Amharic DP. Doctoral dissertation, UC Santa Cruz.
- Kramer, Ruth. 2012. A Split Analysis of Plurality: Evidence from Amharic. In *The Proceedings of WCCFL 30*, eds. Nathan Arnett and Ryan Bennett. Somerville, MA: Cascadilla. 226-236.
- Kramer, Ruth. 2013. Gender in Amharic: A Morphosyntactic Approach to Natural and Grammatical Gender. *Language Sciences*.
- Kramer, Ruth. 2014. Clitic Doubling or Object Agreement: The View from Amharic. *Natural Language and Linguistic Theory* 32. 593-634.
- Marantz, Alec. 1988. Clitics, Morphological Merger, and the Mapping to Phonological Structure. in Michael Hammond and Michael Noonan, eds., *Theoretical Morphology*, Academic Press, San Diego, 253-270.
- Marantz, Alec. 1997. No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon. in Alexis Dimitriadis, Laura Siegel, Clarissa Surek-Clark, and Alexander Williams, eds., *Proceedings of the 21st Penn Linguistics Colloquium*, UPenn Working Papers in Linguistics, Philadelphia, 201-225.
- Marantz, Alec. 2001. Words Ms., Massachusetts Institute of Technology.
- Norris, Mark. 2014. A Theory of Nominal Concord. Doctoral dissertation, UC Santa Cruz.
- Tucker, Matthew. 2011. The Morphosyntax of the Arabic Verb: Toward a Unified Syntax-Prosody. *Morphology at Santa Cruz: Papers in Honor of Jorge Hankamer*. Linguistics Research Center. UC Santa Cruz.