Morphosyntactic Reduplication in Chechen and Ingush

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Introduction
Chechen and Ingush, two closely related Nakh languages spoken in the northern Caucasus, exhibit an interesting verbal doubling construction which we claim is an example of morphosyntactic reduplication. The construction is analogous to the well-known phenomenon of morphophonological reduplication—just as morphophonological reduplication can be conceived of as a phonological correspondence between two different morphemes, this construction exhibits morphological correspondence between two syntactic words. The goal of this paper is to describe the behavior of the verbal doubling construction as morphological correspondence at the level of the syntactic verb phrase, and thus as reduplicative in nature.

The basic structure of the presentation is as follows: Section 1 covers the relevant data from Chechen and Ingush. Section 2 contains a formalization of the data within Head-driven Phrase Structure Grammar (HPSG) (Sag and Wasow 1999). Section 3 discusses some of the implications of the data.

1 Morphosyntactic reduplication
1.1 Basic data

The most straightforward environment in which to observe the reduplication construction is in negative imperatives.

(1) a. (Ga) ma guo
     (see.RED) NEG see.IMP
     'Don’t look!' Chechen

b. (Qi era) ma qiera
     (fear.RED) NEG fear.IMP
     'Don’t be afraid!' Ingush

The standard way to form a negative imperative in Chechen and Ingush is to put the negative imperative marker ma before the imperative verb. As indicated by the verbs in parentheses in (1), a reduplicative copy of the main verb can optionally precede ma. In cases like these, using the reduplication construction makes the statement emphatic. The Chechen sentence, (1a), shows that the optional verb is not an exact phonological copy of the imperative verb—rather, it can appear in a different morphological form. The restrictions on the form of reduplicated verbs will be discussed in section 1.4.

In many environments where reduplication is observed, it is optional. However, there are cases where the construction is obligatory. An important instance involves the enclitic chaining particle ‘a’. This particle always directly precedes the verb in its clause. When there is no non-adjunct element of the VP preceding the verb, reduplication is obligatory (Peterson 1999). Importantly, when the construction is required, there is no emphatic meaning associated with it. Sentences (2c) and (3c) show the required reduplication. In (2c) a reduplicant based on the main verb ‘stay’ precedes the enclitic chaining particle ‘a’ and serves as its host, and in (3c) a reduplicant based on ‘laugh’ precedes ‘a’ and serves as its host. By contrast, in (2a) the host of ‘a’ is či’aara, the object of the verb ‘see’, and in (3b)
kinashjka, the object of read, serves as the host for 'a. In (2b), the preverb jaz hosts 'a, and in (3b) the host for 'a is a deictic proclitic.

(2) a. Cickuo, ch'araa='a gina, 'i bu'u. Chechen
cat.ERG fish=3S ABS B.EAT.PRS
'The cat, having seen a fish, eats it.'

b. Ahmada, kiekhja jaz='a dina, zhejna dueshu.
Ahmad.ERG letter write=3S ABS D.DO.PP book D.read.PRS
'Ahmad, having written a letter, reads a book.'

c. Ahmad, y'a='a yiina, d'ya-vaghara.
Ahmad stay.RED=3S STAY.PP DX-V.GO.WP
'Ahmad stayed (for a while) and left.'

(3) a. Muusaaz, kinashjka='a diishaa, ghealot-lotjar. Ingush
Musa.ERG book=3S read.CVAN cigarette light-I.AUX.WP
'Musa read the book and (then) lit a cigarette.'

b. Muusaaz, shii kinashjka ha='a lakhua, dishar.
Musa.ERG RELGEN book D=ABS find.CVAN D.read.WP
'Musa found his book and read it.'

c. Muusa, viila='a viila, vakhar.
Musa v.laugh.RED=3S v.laugh.CVAN V.GO.WP
'Musa laughed and left.'

Instances of obligatory verbal doubling like (2c) and (3c) are central examples to our claim that this construction should be analyzed as a morphosyntactic reduplication. If the construction were limited to special emphatic uses, it might be possible to analyze it as a special pragmatic construction without a central role in the grammar. The obligatory form of the construction, however, has no special pragmatics—it is simply required in order to make certain syntactic constructions grammatical. In sections 1.2.2 and 1.2.3, we review two aspects of Chechen and Ingush grammar, verb phrase structure and chaining constructions, in order to show how the enclitic status of the chaining particle 'a interacts with the verb phrase in such a way that this construction becomes obligatory. While this phonological conditioning of the construction is interesting in its own right, here we are concerned with it only in order to show how the verbal doubling construction becomes grammatically obligatory.

1.2 Some grammatical facts of the languages

1.2.1 Gender

Chechen and Ingush both exhibit a form of gender agreement wherein the first consonant of certain verbs changes in order to reflect the gender of its absolutive argument. A gender minimal pair is given (4). In (4b) the absolutive argument of the verb 'run' is a female human. Female humans are of the j gender, so the verb for 'run' surfaces with an initial j. Male humans are of the V gender, so in (4b), where the absolutive argument is 'Ahmad', the verb 'run' begins with a v. Chechen has four genders: B, D, J, and V.

(4) a. Malika d'ya-jedira. Chechen
Malika DX-J.run.WP
'Malika ran away.'
seen in (2) and (3). An example of the second one, ma (not to be confused with the negative imperative marker of the same shape), is given in (6).

(6) C’a ma je’i, Ahmad gira Malikina. Chechen
home EMPH J.come.RP Ahmad see.WP Malika.DAT
‘As soon as she came home, Malika saw Ahmad.’

In the two-clause chained structures in (7), we have bracketed off the subordinate clause from the main clause. In the orthography, subordinate clauses are marked off by commas.

(7) Muusaa, [kinashika=’a diishah], gheallie lota-jar. Ingush
Musa.ERG book=& D.read.CVant cigarette light-J.AUX.WP
‘Musa, having read the book, lit a cigarette.’

The structure of the English translation given for (7) closely matches that of Chechen and Ingush and chained structures.

We are now in a position to look more closely at the sentences given above in which the reduplication construction was required. They are repeated below in (8).

(8) a. Ahmad, [Ya=’a Sliina], d’ya-vaghara. Chechen
Ahmad stay.RED=& stay.PP DX-V.go.WP
‘Ahmad stayed (for a while) and left.’

b. Muusaa, [viila=’a viilla], vakhara. Ingush
Musa v.laugh.RED=& v.laugh.CVant V.go.WP
‘Musa laughed and left.’

As in (7), we have bracketed the subordinate clauses of the chained structures in (8). Both of these subordinate clauses contain the slot 2 chaining particle ‘a. As mentioned in 1.2.2, ‘a is enclitic and requires a slot 3 element to be its host. However, neither of the subordinate clauses in (8) has a natural slot 3 element. Their head verbs are simplex, intransitive, and not motion verbs. Thus, there is no preverb, object, or deictic prolocic in their VP. It is in the subset of cases like this that the reduplication construction becomes obligatory. It seems to serve as a repair strategy to extend the size of the VP just enough so that there is a host for the chaining enclitic. As said above, the fact that the reduplication, a syntactic construction, is phonologically conditioned is interesting in its own right. Our primary concern here, however, is that a grammatical constructions exists in Chechen and Ingush where it is (i) required and (ii) not associated with any special meaning—it is simply the case that the only way to grammatically chain ‘small’ VP’s into larger matrix clauses is to place a reduplicant of the main verb of the VP in slot 3.

1.3 Environment of the reduplication

In this section, we give more examples where reduplication can occur both in environments where it has already been seen and in several others.

In (9) are two examples of negative imperatives, which do not exhibit reduplication where it is shown that the negative imperative marker ma must occur in slot 2 of the VP. In (10) are two more examples of optional reduplication in negative imperatives.

(9) a. Ya ma khallah Ingush
DX NEG sit_IMP
‘Don’t sit down!’

b. Chu ma vuola Chechen
DX NEG V.come_IMP
‘Don’t come in!’

(10) a. Vie ma vie Ingush
V.kill.RED NEG V.kill_IMP Maj.ABS
‘Don’t kill him!’

b. Diica ma diica Chechen
D.tell.RED NEG.D.tell_IMP Is.ALL
‘Don’t tell me!’

In (11) are two examples of chained structures where the subordinate VP’s contain a natural host for ‘a, and thus the supportive reduplication is not required. In (11) are two more instances where it is required in order to give a host to the chaining particle. (12a) shows that slot 4 elements, i.e., VP adjuncs cannot serve as hosts for ‘a since the reduplicant is required even though the adverbial form baikha ‘at work’ is present in the VP.

(11) a. Muusaa, gaziet=’a dineshaz, aara-vakhara. Ingush
Musa newspaper=& D.read.CVsim DX-V.come.WP
‘Musa left reading the newspaper.’

b. Ahmad, nia=’a jwellush, chucha veelara. Chechen
Ahmad door=& I.open CVsim inside V.come.WP
‘Opening the door, Ahmad came inside.’

(12) a. Muusaa, baikha ga=’a gejna, avtobusaa Ingush
Musa work.ADV delay.RED=& delay.CVant bus.DAT
‘Musaa was hung up at work and missed the bus.’

b. Kiekkhat, daat=’a deatt’a, telkharha Chechen
paper rip.RED=& rip.PP spoil.WP
‘The paper ripped and was spoiled.’

In Ingush, the negative marker ca is also a slot 2 element and can trigger emphatic reduplication like that seen for negative imperatives in (1) and (10). In (13), two sentences are given which are the same except that a reduplicant is present in (13b) and not present in (13a).

(13) a. Bod ca=sejsacha, meaqa merza khalac. Ingush
dough NEG=rise.CV bread sweet be.NEG
‘When the dough does not rise, the bread is not sweet.’

b. Bod sejsa ca=sejsacha, meaqa merza khalac.
dough rise.RED NEG=rise.CV bread sweet be.NEG
‘When the dough does not rise, the bread is not sweet.’
Obligatory reduplication without emphatic meaning has also been observed in Chechen under VP coordination. Since such coordination involves the use of the slot 2 chaining enclitic 'a', it can be viewed as motivated by the same factors involved in obligatory reduplication in clause chaining.

(14) Maalik [viel'a viilarda] [vielkh'a vilkhara]. Chechen
Malik v.laugh.RED=& v.laugh.WP v.CTRY.RED v.CTRY.WP
'Malik laughed and cried.'

Finally, in clause chaining it is often possible to use the reduplication construction if the verb is being emphasized or contrasted in some way—even if the reduplication is not required as it was in examples (2c), (3c) and (11c). Example (15) contrasts with the pragmatically unmarked (3b). This chaining emphatic reduplication seems to be essentially the same as that seen for emphatic negative imperatives—an optional doubling which is allowed because of the presence of a slot 2 particle in the VP.

(15) Muusaaz, shii kinizhka ha-lakha'a lakhaa. Ingush
Musa.ERG refl.gen book dx-find.RED=& find.CVant
dishar.
D.read.WP
'Musa found his book and read it.'

1.4 The form of the copied verb
In both Chechen and Ingush the copied verb differs from the main verb in that it lacks the full inflection of the main verb. Its form is that of the stem. However, the forms the two languages use differ in an interesting way. In Chechen the reduplicant has the shape of an infinitive, which can differ from the present and past stem by regular ablaut alternations (see, e.g., (1a)). In Ingush the reduplicant is, except for a few exceptional verbs, always of the same stem as the main verb.

A small class of irregular verbs in Chechen shows suppletion between the present and infinitive verbal stems. For these verbs, when the main verb uses the present stem, there is variation possible in the reduplicant—it can either be the canonical infinitive or a form based on the suppletive stem which looks like a regular infinitive. Our consultant prefers to use the canonical infinitive for the reduplicant. The chart in (16) gives the infinitive, present, and reduplicated verb forms of some of the suppletive verbs.

(16) CHECHEN SUPPLETIVE REDUPLICANTS

<table>
<thead>
<tr>
<th>INFinitive</th>
<th>Present</th>
<th>REDUPLICANT</th>
<th>GLOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dala</td>
<td>Iwo</td>
<td>Dala or la</td>
<td>'give'</td>
</tr>
<tr>
<td>Dâa</td>
<td>Daha</td>
<td>Dâ or Daha</td>
<td>'bring'</td>
</tr>
<tr>
<td>Dagha</td>
<td>Duedu</td>
<td>Dagha or Duoda</td>
<td>'go'</td>
</tr>
<tr>
<td>Dâ</td>
<td>Dooghu</td>
<td>Dâa</td>
<td>'come'</td>
</tr>
</tbody>
</table>

So, for example, the reduplication construction for 'go' with the main verb in the present tense could be either Dagha 'a Duedu or Duoda 'a Duedu, with the first possibility preferred.

In Ingush, there is a small class of verbs with CV infinitives which show irregular reduplicants. The chart in (17) reproduces the base-verb/reduplicated-verb relationships seen in the examples above. Note that the verb gaa, 'delay', is one of the CV verbs which has an irregular reduplicant. The verbs gu 'see' and lie 'die' are in the same regular class as gaa.

(17) INGUSH REDUPLICANTS

<table>
<thead>
<tr>
<th>EX.</th>
<th>HEAD VERB</th>
<th>FORM</th>
<th>REDUP.</th>
<th>INF.</th>
<th>GLOSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1b)</td>
<td>qiera</td>
<td>IMP</td>
<td>qiera</td>
<td>qiera</td>
<td>'fear'</td>
</tr>
<tr>
<td>(3c)</td>
<td>vilaa</td>
<td>CVant</td>
<td>vilaa</td>
<td>vilaa</td>
<td>'laugh'</td>
</tr>
<tr>
<td>(10a)</td>
<td>vie</td>
<td>IMP</td>
<td>vie</td>
<td>vie</td>
<td>'kill'</td>
</tr>
<tr>
<td>(11a)</td>
<td>gejna</td>
<td>CVant</td>
<td>ga</td>
<td>gaa</td>
<td>'delay'</td>
</tr>
<tr>
<td>(13b)</td>
<td>sejsaacha</td>
<td>CV</td>
<td>sejsa</td>
<td>sejsa</td>
<td>'rise'</td>
</tr>
<tr>
<td>(15)</td>
<td>lakhaa</td>
<td>CVant</td>
<td>lakha</td>
<td>lakha</td>
<td>'find'</td>
</tr>
</tbody>
</table>

The form of the copied verb in Chechen, particularly for suppletive verbs, offers striking evidence that the relationship between the main verb and its reduplicant is morphosyntactic. The reduplicant takes the form of the infinitive of the main verb—in other words, the form of a syntactic word is determined by a morphological relationship between it and another syntactic word. The Ingush data, too, offers evidence for a morphosyntactic relationship between the main verb and its reduplicant. Instead of the correspondence being at the level of the morphological infinitive as it is in Chechen, it is at the level of the morphological stem. Finally, the irregular verbal copulas of CV in Ingush also support the idea of a morphosyntactic relationship between main verb and copied verb. Such irregularities show that the relationship between two words is morphological (as opposed to phonological). So, in Ingush, too, we have the form of a syntactic word being determined by its morphological relationship to another syntactic word.

1.5 Copied verbs as morphosyntactic reduplicates
The central claim of this paper is that the verbal doubling construction presented above should be thought of as morphosyntactic reduplication. This claim is justified by two facts. The first is that verb doubling in Chechen and Ingush is clearly grammatical in nature and not simply a case of purely pragmatically conditioned emphasis. The evidence for this comes from sentences like those in (8), (12), and (14) where the construction is obligatory and associated with no special semantics or pragmatics. Given that this structure is grammatical in nature, it must properly be considered part of the syntax of Chechen and Ingush since it exists at the level of the verb phrase. The construction, at the same time, involves a morphological relationship between the two verbs as discussed in section 1.4. Thus, we can view this verbal doubling as the morphosyntactic construction which must contain two words formed from the same basic morphological root. This characterization of the verbal doubling indicates it is a canonical instance of reduplication: a grammatical construction where two linguistic elements are independent constituents at one level of grammar but have the same basic linguistic specifications at a lower level of grammar. Most cases of reduplication discussed in the literature involve independent morphological constituents sharing basic phonological specifications—thus the relationship is morphophonological. The sharing relationship between verbs in the doubling construction described here
clearly exists between the syntax and the morphology, which is the basis for our claim that it is an instance of morphosyntactic reduplication.

2 Formalization
Two major aspects of the reduplication need to be formalized: (i) the syntactic environments where it occurs and (ii) the morphological relationship between the reduplicant and the base. We will formalize the data within Head-driven Phrase Structure Grammar (HPSG) (Sag and Wasow 1999), by directly defining a special verb phrase in the syntax. We have chosen HPSG because its lexicalist, construction-oriented approach to grammatical formalism is ideal for describing data like Chechen and Ingush reduplication which involves a special, idiomatic phrasal construction some of whose constituents have a feature sharing relationship to each other.

We first state the existence of three types of verb stems in Chechen and Ingush: infinitive stems (inf-stem), past stems (pax-stem), and present stems (prs-stem). The existence of these types is justified from predictable ablaut relationships between them.

It will be important to define the structure of verbs in Chechen and Ingush to allow an appropriate formalization for the correspondence between the main verb and its reduplicant. In particular, we will need to be able to make reference to the stem of the verb (vb-stem) to properly describe the facts of Ingush and the root of the verb (vb-root) to describe the facts of Chechen. We achieve this formally by placing a special MORPH feature within the specification of the verb which contains specifications for the verb's root and stem. Placing morphological information within a word's syntactic representation is a departure from the formalism of Sag and Wasow (1999). However, we feel it is amply justified by the facts of Chechen and Ingush morphosyntactic reduplication.

That class of verbs exhibiting gender agreement via their initial consonant (agr-vb-stem) discussed in section 1.2.1 will have to have a slightly more elaborate feature structure where the root has a special GENDER feature, as in (19).

\[ \text{Given these formalizations of the structure of the verb, we can describe the Chechen reduplication by defining the structure in (20) directly in the syntax. The structure given below is for a verb which exhibits gender agreement in order to show how the construction encodes the fact that the verb and its copy always have the same gender marking. There is essentially no difference in the construction for verbs which do not agree in gender. The verbs within it will simply lack a gender feature at the root level.} \]

The \( X_2 \) in the tree refers to any element which can occupy the second position of the Chechen VP as described in section 1.2.2. The identity of main verb and the copied verb is maintained by coindexing the verb roots in the structure defined in (20). (The boxed “1” in the specification for the two verbs is the notation used for coindexing, or sharing, of features.) In (20) the reduplicant is explicitly described.
as being an infinitive stem and the correspondence is defined at the root level in order to formalize the facts for Chechen described in section 2.4.

Since the Ingush reduplicant is always of the same stem as the main verb in the phrase, its reduplication construction must be formalized slightly differently, along the lines of (21).

(21)

\[
\begin{array}{c}
\text{VP} \\
\begin{array}{c}
\text{word} \\
\text{PHON} \{\ldots\} \\
\text{HEAD} \text{ verb} \\
\text{MORPH} \text{ STEM [\ldots]} \\
\end{array}
\end{array}
\]

In (21) the coindexing between the main verb and the reduplicant is one level higher in the morphological structure—namely, at the stem. In this way, the closer correspondence between the morphological structure of the base verb and the reduplicant in Ingush, as described in section 2.4, can be formalized.

Both the reduplication structures require additional mechanisms to ensure that the appropriate verb stem—either the infinitive or present stem—is selected at the stem level. Such mechanisms would properly be part of the morphology, and not the morphosyntax, and are required to account for a much wider range of phenomena in Chechen and Ingush than simply morphosyntactic reduplication.

In (22), a particular instantiation of the Chechen reduplication construction is given based on the sentence in (11b). The important thing to note is how the construction predicts the appropriate morphology for the stems of the base and reduplicant at the word level (i.e. the surface level) for each word of the construction. Not formalized is how the appropriate inflectional marking is added to the verbs in the phrase. (The vowel alternation between the stems of the two verb in (22) is a completely predictable phonological alternation sensitive to syllable structure.)

(22)

\[
\begin{array}{c}
\text{VP} \\
\begin{array}{c}
\text{word} \\
\text{PHON} \{\text{daar'a}\} \\
\text{HEAD} \text{ verb} \\
\text{MORPH} \text{ STEM [\text{agr-inf-stem}]} \\
\text{PHON} \{\text{\ldots}\} \\
\text{vb-root} \\
\text{ROOT} \\
\text{PHON} \{\text{\ldots}\} \\
\text{GENDER} \text{ gender} \\
\end{array}
\end{array}
\]

(23) is an instantiation of the Ingush reduplication construction based on example (3c). Like with the Chechen example, this construction predicts the appropriate word level morphology for the two verbs.

(23)

\[
\begin{array}{c}
\text{VP} \\
\begin{array}{c}
\text{word} \\
\text{PHON} \{\text{vi\textipa{a}}\} \\
\text{HEAD} \text{ verb} \\
\text{MORPH} \text{ STEM [\text{agr-inf-stem}]} \\
\text{PHON} \{\text{vi\textipa{a}}\} \\
\text{vb-root} \\
\text{ROOT} \\
\text{PHON} \{\text{\ldots}\} \\
\text{GENDER} \text{ gender} \\
\end{array}
\end{array}
\]

3 Implications

Most analyses of reduplication have only looked at cases of morphophonological reduplication. However, the data here indicates that at least one other sort of reduplication exists—namely morphosyntactic reduplication. It would be worthwhile to see if other languages exhibit phenomena which could be viewed as morphosyntactic reduplication. One possible example is the English cognate object construction seen in (24).

(24) **Fight** the good **fight**.
**Live** the good **life**.

Though we do not claim that sentences in (24) are exactly the same as morphosyntactic reduplication in Chechen and Ingush, they do look suspiciously similar to the data presented here. In particular, (24) shows that the correspondence between the verb and its object in these sentences is, if anything, morphological.

The Chechen and Ingush morphosyntactic reduplication construction offers valuable insight into the nature of the morphology and syntax interface in those
languages. In particular, if the analysis seen here is correct, it has been shown that their syntax can select for particular morphological stems. Thus, looking for similar constructions in other languages might help us better understand other ways in which the syntax can refer to the morphology.

The data presented here also has consequences for a general theory of reduplication. Inkelas and Zoll (1999) have suggested that all reduplication should be viewed as morphological double stem selection rather than phonological correspondence (McCarty and Prince 1995). The Chechen and Ingush data lends support to their proposal by showing that there are some instances of reduplication which are unambiguous examples of double stem selection (or, in the case of Chechen, double root selection) which could not be straightforwardly analyzed as arising from phonological correspondence.

Notes

1 We are thankful to Andrew Garrett, Sharon Inkelas, Andreas Kathol, and Johanna Nichols for their contributions to this paper. We also acknowledge the efforts of our two consultants in helping us obtain the data. The work here was done as part of the UCB Ingush Project funded by NSF grant 98-16448 and a Chechen field methods class which was supported by the Deans of the Social Sciences and the Humanities and the Graduate Division of UC Berkeley.

2 The orthography in this paper is an adapted version of one developed for Ingush and Chechen by Johanna Nichols as part of the UCB Ingush project. In the chart below, we give the phonetic equivalent for those consonants whose value may be unclear and for all the vowels.

Consonants

<table>
<thead>
<tr>
<th>TRANSCRIPTION</th>
<th>PHONETIC EQUIVALENTS</th>
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<tbody>
<tr>
<td>p', t', k'</td>
<td>[tʃ]</td>
</tr>
<tr>
<td>ch</td>
<td>[x]</td>
</tr>
<tr>
<td>gh</td>
<td>[ɣ]</td>
</tr>
<tr>
<td>sh</td>
<td>[ʃ]</td>
</tr>
<tr>
<td>cch, kkh, ggh, ssh</td>
<td>geminates for ch, kh, gh, sh and '</td>
</tr>
</tbody>
</table>

Vowels

<table>
<thead>
<tr>
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<th>[i]</th>
<th>y</th>
<th>[y]</th>
<th>uu</th>
<th>[u]</th>
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<tbody>
<tr>
<td>i</td>
<td>[i]</td>
<td>y</td>
<td>[i]/[y]</td>
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<td>[ɔ]</td>
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<td>[e]</td>
<td>o</td>
<td>[e]/[o]</td>
<td>ou</td>
<td>[ɔ̃]</td>
</tr>
<tr>
<td>ai</td>
<td>[a]</td>
<td>o</td>
<td>[a]/[o]</td>
<td>ou</td>
<td>[ɔ]</td>
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<td>[a]</td>
<td>a</td>
<td>[a]/[a]</td>
<td>aau</td>
<td>[ɔ̃]</td>
</tr>
</tbody>
</table>

3 The following are the gloss abbreviations used in the article.

Gloss Abbreviations

'a' Chaining particle
CV Converb
CVant Anterior converb
CVsim Simultaneous converb
DX Deictic proclitic
EMPH Emphatic Marker

References

Inkelas, Sharon and Cheryl Zoll. 1999. Reduplication as double stem selection. Phonology 2000 Symposium at Harvard and MIT.

