

Munda mimetic reduplication

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Abstract

The Munda languages of South Asia exhibit sound symbolism in their use of mimetic reduplication, to which they devote a surprisingly large percentage of their lexicons, typically upwards of ten percent. We present an extensive empirical typology of mimetic reduplication in seven Munda languages: Ho, Kera Mundari, Kharia, Mundari, Remo (Bondo), Santali, and Sora (Savara). Munda Mimetic forms can depict sensory qualities of sound, space, movement, texture, smell, taste, temperature, feelings, and sensations. The typology of mimetic reduplication in Munda varies across syntactic class, semantic domain and phonological form. This can shed light on the breadth of diverse structures in Munda languages, and may also be extrapolated to other languages and other examinations of reduplication and/or mimesis. This work provides a wealth of data to researchers of mimesis and reduplication, challenging the definition of what it means for forms to be sound-symbolic or reduplicated.

Keywords: mimesis, reduplication, sound symbolism, Munda, India

Résumé

Les langues Munda de l'Asie du Sud présentent un symbolisme sonore dans leur utilisation de la reduplication mimétique, qui constitue un pourcentage très élevé – typiquement plus de dix pour cent – de leur lexique. Nous présentons ici une typologie empirique abondante de la reduplication mimétique dans sept langues Munda: le Ho, le Kera Munari, le Kharia, le Mundari, Le Remo (Bondo), le Santali, et le Sora (Savara). Les formes mimétiques des langues Munda peuvent représenter les qualités sensorielles du son, de l'espace, du mouvement, de la texture, de l'odorat, du goût, de la température, des sentiments et des sensations. La typologie de la reduplication mimétique Munda varie selon la catégorie syntaxique, le domaine sémantique et la forme phonologique. Cela peut éclairer la diversité des structures dans les langues Munda, et peut également s'appliquer à d'autres langues et à d'autres études de la reduplication ou de la mimésis. Ce travail fournit aux chercheurs d'abondantes

données de mimésis et de réduplication, et complique la définition de ce que cela signifie quand on dit que les formes sont symboliques de manière sonore, ou encore rédupliquées.

Mots clés: mimésis, réduplication, symbolisme sonore, Munda, Inde

1. INTRODUCTION

Like many languages across continents and language families, the Munda languages of South Asia use sound symbolism as a way to represent the world around them. In the Munda languages, this often takes form of mimetic¹ reduplication.

In this article, we present an extensive empirical typology of mimetic reduplication in seven Munda languages: Ho, Kera Mundari, Kharia, Mundari, Remo (Bondo), Santali, and Sora (Savara). These languages have been selected because we have original elicitation materials collected in the field, with the exception of Mundari for which we have the dialectal fieldwork on Kera Mundari. The data collected in the field is paired with data culled from legacy lexicographic sources.

This work builds upon Phillips (2013) which explores a model of reduplication in Sora, finding that an astounding 13 percent of the lexicon contains reduplication. Moving beyond Sora, we see that other Munda languages also exhibit striking amounts of reduplication, which is most often mimetic rather than morphological. The typology presented here will consider only Munda languages, so as to show the breadth of forms across the family, but we believe that this can be extended to any examination of mimesis across language families.

For the purposes of this study, we define reduplication as the repetition of any two segments separated by at most one intervening segment. While we find Rubino's (2013) definition of reduplication as the "repetition of phonological matter within a word for semantic or grammatical purposes" to be clear, succinct and largely theory-neutral, we do not believe it necessary to differentiate between semantically-productive reduplication and other reduplicative structures, like phonologically-motivated copying (Urbanczyk 1998, Newman 2000, Yu 2005) or onomatopoeic reduplication (Fischer 2011), as these are exactly the structures we wish to examine; and we wish to examine them together. We reject the notion that reduplication as a phenomenon needs to be morphologically productive, following a cognitive theory of reduplication in which precedence loops can formally account for the repetition of phonological content regardless of the semantics of the expression (Raimy 2000). Simply, we see the surface similarities in reduplicated structures as more meaningful than their different derivational processes.

Examining Munda languages, we use the term *mimetic* to describe the phenomenon by which the sounds of a given word depict a sensory quality associated with that object, action, or idea. Mimetic forms in Munda can depict sensory qualities of sound, space, movement, texture, smell, taste, temperature or feelings and sensations. Here we use the term *depict* following Dingemanse (2009: 83), in which depiction "implies iconicity, a perceived resemblance between form and meaning". We believe

¹Also: ideophonic, sound-symbolic or iconic.

that this definition is sufficiently broad to capture the crosslinguistic generalizations regarding sound symbolism, without being too narrow and excluding a variety of forms and languages. This contrasts with Dingemans (2009) who proposes that in addition to depicting sensory qualities, ideophones must be both marked and vivid, where *marked* requires that ideophones “stand out from other words in [one of] several ways, including special phonotactics, expressive morphology, syntactic aloofness, and prosodic foregrounding” and *vivid* requires that they “[turn the] speaker into performer by transporting the narrated event into the speech event” (Dingemans 2009: 83). While these characteristics are undeniably present in ideophones in many languages, it is yet to be determined if the mimetic forms in Munda need always to be performative or phonologically marked, as most of the terms here were elicited rather than observed. However, it is the case that many of these forms have been lexicalized, using the same phonemic inventory and the same inflectional morphology as the rest of the lexicon. This is of particular interest because the process under investigation here – reduplication – can be used for mimetic purposes as well as in other morphological and phonological environments.

Ultimately, the primary goal of this paper is descriptive; we wish to provide an empirically rich typology of mimetic reduplication in Munda, which varies across syntactic class, semantic domain and phonological form. We believe that this not only can shed light on the breadth of diverse structures in Munda languages, but can also be extrapolated to other languages and other examinations of reduplication and/or mimesis. Typologies need to be redefined and expanded with new empirical evidence, and we believe that this work provides a wealth of data to researchers of mimesis and reduplication, challenging the definition of what it means for forms to be sound-symbolic or reduplicated.

1.1 Munda languages

The Munda languages are a branch of the Austroasiatic family spoken chiefly in eastern India and western Bangladesh, as well as southeastern Nepal (Figure 1). Traditional classifications of Munda (Zide 1969) have a distinct branch for North Munda (Korku, Santali and Mundari) and South Munda (Juang, Kharia, Gutob, Remo, Hill Gta?, Plains Gta?, Sora and Gorum) as well as multiple sub-branches and groupings in South Munda. Revised classifications (Anderson 2001) maintain the primary split between North and South Munda, but reject many of the sub-groupings of South Munda, maintaining only those that are ‘obvious’. Most accounts agree to eleven Munda languages, each with their corresponding dialects. In this article, we examine seven of the Munda languages: Ho, Kera Mundari, Kharia, Mundari, Remo, Santali, and Sora.

The Munda languages examined here vary greatly with respect to number of speakers, vitality, and prestige, as seen in Table 1. Santali is a robust and vibrant language with over six million speakers and a codified writing system used in education. Santali is the only Munda language considered an official language of a state of India in addition to being one of the twenty-two scheduled languages under the Indian



Figure 1: Distribution of all Munda languages in South Asia, including those examined in this article. (Anderson 2007)

	Number of Speakers	Language Status	Source
Ho	1,000,000	5 (Developing)	Lewis (2009)
Kera Mundari	200,000	5 (Developing)	Kobayashi and Murmu (2008)
Kharia	240,000	5 (Developing)	Lewis (2009)
Mundari	1,120,000	5 (Developing)	Lewis (2009)
Remo	9,000	6a (Vigorous)	Lewis (2009)
Santali	6,000,000	4 (Educational)	Lewis (2009)
Sora	253,000	5 (Developing)	Lewis (2009)

Table 1: Language status

Constitution. In contrast, Remo is threatened with 9,000 speakers, an increasing number of whom are bilingual. However, the majority of the languages examined here, while primarily oral (i.e., few established writing traditions), maintain sustainable speaker populations and are spoken primarily within tribal jurisdictions.

Sora², for example, has 253,000 speakers in the hills of Odisha and Andhra Pradesh. Sora is primarily an oral language; some efforts have been made to introduce writing systems, using the Latin, Telugu, and Sora Sempang scripts, although these have primarily been used to translate the Christian Bible by missionaries (Lewis 2009). Additionally, while the language continues to be used in day-to-day interactions, there is a gradual shift occurring as speakers are adopting the majority language Odia (Anderson and Harrison 2008).

The Sora people were historically hunter-gatherers and utilized shifting cultivation, but have adopted Western agricultural methods especially in growing paddy fields (Vitebsky 1993). The Sora people's rich connection to their environment is mirrored in their lexicon: an estimated 16% of its lexicon relates to or depicts the natural world (cf. 3.3% in Modern Standard Arabic (Wortabet and Porter 1995) and 2.9% in French (McNeillie et al. 2007)). Terms relating to the natural world in Sora, as in other languages – both Munda and otherwise – are ideophonic at much higher rates than the rest of the lexicon. As ideophones in Sora often have structures containing reduplication, it is thus unsurprising that the Sora lexicon has a high proportion of reduplication.

2. REDUPLICATION IN MUNDA

The Munda languages provide an ideal typology of reduplication, as it spans categories in form and in class. Furthermore, the Munda languages, particularly Kharia, Remo, and Sora, have lexica rich in reduplication, each with over 5% of the lexicon containing reduplication.

In this section, we present a typological overview of reduplication in the Munda languages, illustrating the breadth of reduplicative forms in the languages. In the subsequent sections, we focus on mimetic reduplication, presenting an in-depth typology of mimetic reduplication that illustrates the breadth of forms depicting sensory qualities through language.

2.1 Reduplication and the lexicon

In a survey of Sora reduplication, Phillips (2013) found an extraordinary 13% of the headwords to be reduplicative in Ramamurti's (1938) Sora to English dictionary. With data collected in the field,³ we have found similarly high percentages of the glossed lexica to be reduplicative, as can be seen in Table 2.

The values for reduplication in Table 2 follow from the definition presented in the introduction to this article, that reduplication encompasses all words in which

²Sora will be used most frequently as the example language of choice, as this is the primary language of study for the first author of this article. We believe that Sora is a representative Munda language, but note that especially with respect to reduplication, Sora exhibits more (and a greater variety) than do the other Munda languages.

³These data come from elicitation sessions that were not designed to elicit reduplication; rather, the goal was to elicit extensive lexica for online talking dictionaries.

	Percent Reduplication	Source
Ho	4.26%	Anderson et al. (2010)
Kera Mundari	3.82%	Anderson and Harrison (2013a)
Kharia	7.85%	Anderson and Harrison (2013b)
Remo	6.91%	Anderson and Harrison (2011)
Santali	4.36%	Anderson and Harrison (2013c)
Sora	8.40%	Harrison et al. (2011)

Table 2: Reduplication in the lexica (from elicitation)

there are two or more repeated segments with maximally one intervening segment, in order to account for echo reduplication (Inkelas 2014). This approach highlights the surface similarities, but is agnostic about derivational status, that is to say, whether the reduplication is morphological, phonological, mimetic, or simply lexicalized. Furthermore, following a precedence-model approach (Raimy 2000), we can derive these structures regardless of their morphological makeup, as a precedence loop simply stipulates that a phonological string is repeated. Crucially, this can model a given structure whether the process is productive or not.

We do not attempt here to identify base vs. reduplicant, or to parse the internal morphological structure of reduplicated forms. Such analysis requires a fuller understanding and description of Sora morphology than is currently available to us.

While we have proposed that reduplication is an overarching phenomenon that spans processes, we also acknowledge that there are differences between the various forms of reduplication. Semantically productive, phonologically motivated, and mimetic reduplication are all present in Sora, although mimetic reduplication is the most prolific.

Semantically productive reduplication is the form that most clearly fits many accepted definitions of reduplication in morphosyntax. In these structures, we can clearly identify the base, which is a morphologically free word and is reduplicated yielding a consistent, productive semantic change. One example in Sora is the causative. For many verb stems, the causative is derived using a prefix and reduplication of the base verb, as can be seen in (1)–(3).

- | | | | |
|-----|--------------|----------------------------|-----------------------|
| (1) | [al-lo-lo:] | ‘to employ someone to hoe’ | |
| | [lo:] | ‘to hoe’ | Sora (Ramamurti 1938) |
| (2) | [ab-diŋ-diŋ] | ‘to keep someone waiting’ | |
| | [diŋ] | ‘to delay’ | Sora (Ramamurti 1938) |
| (3) | [ap-pe-pe:] | ‘to let flow’ | |
| | [pe:] | ‘to leak’ | Sora (Ramamurti 1938) |

We see in (1) that the base *lo:* ‘to hoe’ is a unique lexical item that, when prefixed and reduplicated, yields the causative verb *al-lo-lo:* ‘to employ someone to hoe’. The same pattern holds in (2) and (3).

Conversely, Sora also exhibits reduplication that appears to be purely phonological. In Sora, there are two forms of each noun: a monosyllabic bound form of the noun used only in noun incorporation and compounding, and a minimally disyllabic free form used elsewhere. For example, take the Sora word ‘house’ which has a free form *suʔuŋ* and a combining form *-siŋ-* (Starosta 1992: 81). In a compound like ‘mother-in-law’s house’, the combining form is used yielding *kinar-siŋ-ən*, where *kinar* is the free form of ‘mother-in-law’ and *-ən* is a suffix attached to most nouns. However, in the phrase ‘in the house’ the free form is used yielding *suʔuŋ-leŋ-ən* where *-leŋ-ən* is a postposition meaning ‘in’ or ‘at’.

As the free form in Sora must be minimally disyllabic, there are a number of processes that apply to derive these forms from the combining form (Zide 1976, Starosta 1992, Anderson 2007). Some nouns use infixation; others suffixation. Some are simply suppletive, but some use reduplication. In CV incorporating forms, the free nominal form is derived by glottal stop epenthesis and reduplicating the vowel. We can see these forms in (4)–(5).

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|-----|---------|------------------------------|----------------------|
| (4) | [daʔa:] | ‘water’ (free form) | |
| | [-da-] | ‘water’ (incorporating form) | Sora (Anderson 2007) |
| | | | |
| (5) | [siʔi:] | ‘hand’ (free form) | |
| | [-si-] | ‘hand’ (incorporating form) | Sora (Anderson 2007) |

It is clear in these forms that reduplication does not add any semantic information, nor does the result appear to be mimetic. Rather, it satisfies the phonotactic requirements of the language.

However, phonotactic requirements can also be satisfied by reduplication in some CVC incorporating forms. In these forms, the entire CVC base is fully reduplicated, as shown in (6)–(7).

- | | | | |
|-----|-----------|---------------------------------|----------------------|
| (6) | [saŋ-saŋ] | ‘turmeric’ (free form) | |
| | [-saŋ-] | ‘turmeric’ (incorporating form) | Sora (Anderson 2007) |
| | | | |
| (7) | [bud-bud] | ‘worm’ (free form) | |
| | [-bud-] | ‘worm’ (incorporating form) | Sora (Anderson 2007) |

Despite these clear cases of both semantically productive and phonologically motivated reduplication, the majority of reduplicated words in Munda languages can best be described as mimetic, a type that will be explored in depth throughout this article.

3. SYNTACTIC CLASSES OF MIMETIC REDUPLICATION

While crosslinguistically, ideophones are typically limited to specific syntactic categories, often adjectives and adverbs, we see in the Munda languages that mimetic reduplicative forms span syntactic classes, from modifiers to nouns and verbs to determiners and adpositions.

In Kharia and Santali, mimetic reduplication appears to be restricted to adjective/adverbs and nouns. In Mundari, Remo and Ho, ideophones can also be verbs. And in

Sora it appears that mimetic reduplication extends even into closed categories like determiners and prepositions.

3.1 Adjectives/Adverbs

Mimetic reduplication in Munda is very robust in modifiers, as is expected crosslinguistically. In modifiers with mimetic reduplication, the terms may depict the state of an object, as in (8), or how a given action occurs, as in (9).

- | | | | |
|------|---|------------------------|--|
| (8) | [ku-kuru] | ‘hollow (like a tree)’ | Ho (Anderson et al. 2010) |
| (9) | [t ^h urte-t ^h urte] | ‘quickly’ | Kera Mundari (Anderson and Harrison 2013a) |
| (10) | [kole-kole] | ‘slow’ | Remo (Anderson and Harrison 2011) |
| (11) | [lo-lo] | ‘hot’ | Santali (Anderson and Harrison 2013c) |

3.2 Verbs

Verbs also commonly exhibit mimetic reduplication in Munda languages, frequently depicting the intensity of the action and often capturing the iterative or durative nature of the action.

- | | | | |
|------|---------------|---------------------|-----------------------------------|
| (12) | [ka-kala] | ‘to shout’ | Ho (Anderson et al. 2010) |
| (13) | [gadʒa-gadʒa] | ‘to quarrel loudly’ | Mundari (Hoffman 1950) |
| (14) | [me-meʔ] | ‘to dance’ | Remo (Anderson and Harrison 2011) |
| (15) | [beʔ-beʔ-den] | ‘to suck’ | Sora (Harrison et al. 2011) |

In (12), the reduplication depicts the intensity of the volume, while in (14), the reduplication captures the iterativity of the movement. Furthermore, in an example like (15), the reduplication mimics the sound of the event rather than its intensity.

3.3 Nouns

Mimetic reduplication is also common in nouns in Munda, suggesting that these forms are fully lexicalized and perhaps not as performative as has been proposed for other languages.

- | | | | |
|------|------------|-------------|--|
| (16) | [dur-dur] | ‘waterfall’ | Ho (Anderson et al. 2010) |
| (17) | [bal-bal] | ‘sweat’ | Kera Mundari (Anderson and Harrison 2013a) |
| (18) | [ku-kusak] | ‘lion’ | Remo (Anderson and Harrison 2011) |
| (19) | [puʔa-ʔa] | ‘heart’ | Sora (Harrison et al. 2011) |

Mimetic nouns often depict a characteristic that is central to that noun, whether that be its sound, shape or texture. In (16) the reduplication appears to depict the tumultuous sound associated with the object while in (17) the form appears to depict the tactile wetness that defines sweat. Body parts are often reduplicated cross-linguistically, as we see in (19), where the reduplication captures the repetition of the heart beating.

3.4 Other

Finally, a few possible structures with mimetic reduplication are observed in Sora outside the expected classes, with an example found for both determiners (20) and prepositions (21).

- (20) [bote-bote] ‘some (det)’ Sora (Ramamurti 1938)
 (21) [jar-jar] ‘around; on all sides (prep)’ Sora (Ramamurti 1938)

In neither (20) *bote-bote* ‘some’ or (21) *jar-jar* ‘around’ is there a non-reduplicated base present in the lexicon, suggesting that these structures pattern more with mimetic forms not derived from independent base words. Furthermore, these terms fit neatly into the semantic generalizations of ideophones, explored in the next section, with both depicting visual patterns through their phonological form.

4. SEMANTIC DOMAINS OF MIMETIC REDUPLICATION

In the previous section, it was shown that mimetic reduplication in the Munda languages spans syntactic categories. In this section, we show that it likewise spans both sensory and semantic domains.

While it has long been known that ideophones can be more than onomatopoeic, that is, they can capture other qualities than just sound, the exact qualities that they do depict, and how to categorize those qualities, has been a long-standing question in the field. Early work on ideophones (Alexandre 1966 for Bulu) categorized ideophonic expressions into five basic categories based on the “Western folk model of perception” (Dingemans and Majid 2012: 300): auditive (sound), visual (sight), tactile (touch), gustative (taste), and olfactive (smell). However, work has since illustrated that the senses transcend these basic categories and include internal senses such as the sense of one’s proprioceptive/physiological (Møller 2003) and cognitive/emotional states (Dingemans 2011).

With the expanded notion of the senses in mind, Dingemans (2012), building on Akita (2009) and Kilian-Hatz (1999), presents an implicational hierarchy of sensory classes for ideophones, taking into account the crosslinguistic generalizations of sound symbolism. In the hierarchy in (22), touch, taste and smell have been collapsed into the single category labelled ‘other sensory perceptions’.

- (22) sound < movement < visual patterns < other sensory perceptions < inner feelings and cognitive states (Dingemans 2012: 663)

Thus, any language that is purported to exhibit ideophones would be expected to have ideophonic expressions for sound. Furthermore, if a language were purported to have ideophones for visual patterns, it would be expected to also have expressions for movement and sound.

The implicational hierarchy in (22) is roughly supported in Munda languages. An overview of each of the examined languages and the sensory domains they depict is outlined in Table 3. However, it is crucial to note that the corpora upon which these analyses are based upon are by no means exhaustive, suggesting that

	Sound	Manner	Quant.	Visual	Touch	Scent	Taste	Temp.	Internal
Ho	✓		✓	✓				✓	✓
K. Mundari	✓	✓	✓	✓					
Kharia		✓	✓			✓			
Mundari	✓	✓	✓	✓	✓	✓	✓		✓
Remo	✓	✓	✓	✓					
Santali	✓	✓	✓	✓				✓	
Sora	✓	✓	✓	✓	✓				✓

Table 3: Mimetic reduplication by sensory domain

some of the holes will undoubtedly be filled. For example, Kharia most likely does have mimetic reduplication depicting sound. The sensory categories in the table include sound, manner, quantity/repetition, visual patterns, touch, scent, taste, temperature, and internal feelings and cognitive states. Table 3 illustrates that more Munda languages utilize mimetic reduplication depicting sound and quantity than scent, touch, or taste, as predicted by the hierarchy in (22). Furthermore, Table 3 suggests that thus far only Ho, Mundari, and Sora are known to exhibit forms for feelings or inner states.

Furthermore, the notion that the categories must be derived independently from an examination of the language or that they need to be constant across languages has also been questioned. Dingemanse and Majid (2012) sought to answer this question for Siwu (Niger-Congo) via experimentation. From a similarity task, they allowed categories to emerge organically, finding higher level groupings including taste, color, sound, touch, texture, shape, wet, quiet, adverbial, quantity and size. These categories illustrate an interesting interplay between the senses and semantic domain, with some categories possibly spanning senses, for example, with wet spanning both visual and tactile sensory representations.

In this section, we show that Munda mimetic reduplication spans the senses, no matter how the senses are defined and delineated. Following Dingemanse and Majid (2012), we allowed the categories to emerge organically from the corpora we examined, finding similar categories with the striking differences in a questionable taste class but a prolific sound class that can be subdivided by semantic domain. However, it is crucial to note that the categorization here was done by native speakers of English and thus may be heavily influenced by our model of perception, and that results may vary if native speakers were given categorization tasks. However, since the goal of this article is to compare different languages, we cannot rely upon native-speaker judgments within a single language to derive the categories crosslinguistically following Dingemanse and Majid.

4.1 Sound

The most robust sensory quality depicted in Munda mimetic reduplication was, perhaps unsurprisingly, sound. These onomatopoeic words are the most familiar

form of mimesis to speakers of Indo-European languages, which make use of sound symbolism when mimicking the sounds of their environment. In English, this is also often done through reduplication, from animal calls like ‘cuckoo’ to “fully lexicalized” words like ‘murmur’ (Fischer 2011: 58). Not surprisingly, the same phenomenon exists in Munda languages, with a variety of reduplicative structures, as in (23)–(26).

- | | | | |
|------|-----------------------|------------------------|-----------------------------------|
| (23) | [ca-caʔ] | ‘to rip’ | Ho (Anderson et al. 2010) |
| (24) | [rejō-rejō] | ‘creak of a wheel’ | Ho (Anderson et al. 2010) |
| (25) | [rūrū-ruru] | ‘buzz’ | Remo (Anderson and Harrison 2011) |
| (26) | [jinjan-jinjan-gamle] | ‘in a jingling manner’ | Sora (Ramamurti 1938) |

These forms, across syntactic categories, neatly illustrate that Munda mimetic forms cannot easily be categorized, as they span domains in form and meaning. In the few examples above, we see the wide range of forms from nouns in (24) to verbs in (23) to modifiers in (26), depicting diverse sound imagery. However, these sound-symbolic forms are most numerous relating to the natural world or the body.

4.1.1 *Natural world*

As mentioned before, the Munda lexica are rich with ethnobiological terms, capturing their relationship with and connection to the environment. The first class of terms relating to the natural world is animal calls. In many languages, the linguistic forms for animal calls are often repeated or reduplicated, mimicking the repetition with which they are used in the environment: ‘ribbit-ribbit’ for a frog’s croaking or ‘caw-caw’ for the screeching of a crow, in English. It is thus expected that many of the animal calls in Munda utilize mimetic reduplication, as in (27)–(30).

- | | | | |
|------|-----------------------|-------------------------|------------------------|
| (27) | [tʃi:n-hē-hē-hē-hē] | ‘neighing of a horse’ | Mundari (Hoffman 1950) |
| (28) | [dʒi:ŋ-dʒi:ŋ] | ‘cry of a squirrel’ | Sora (Ramamurti 1938) |
| (29) | [ke-ke-ke] | ‘scream of the peafowl’ | Sora (Ramamurti 1938) |
| (30) | [pi:mpiduŋ-pi:mpiduŋ] | ‘cry of a hawk’ | Sora (Ramamurti 1938) |

Unsurprisingly, however, these tokens did not emerge from any of our elicitation sessions as they have very limited pragmatic environments. Nonetheless, they are undoubtedly mimetic as they clearly mimic the sounds which they denote linguistically.

In addition to animal calls, animal nomenclature also tends to be mimetic and reduplicative in Munda languages, again often capturing the sound the animal makes, in either its call or its movements.

- | | | | |
|------|-------------|-----------|-----------------------------------|
| (31) | [ko-kor] | ‘owl’ | Ho (Anderson et al. 2010) |
| (32) | [su-surpaŋ] | ‘wasp’ | Ho (Anderson et al. 2010) |
| (33) | [ku-kuŋ] | ‘peacock’ | Remo (Anderson and Harrison 2011) |
| (34) | [lɔg-lɔk] | ‘calf’ | Remo (Anderson and Harrison 2011) |
| (35) | [kuk-kur] | ‘dove’ | Sora (Ramamurti 1938) |

- (36) [mir-mir] ‘grasshopper’ Sora (Harrison et al. 2011)

In (32), the repetition of the sibilant depicts the sound of the flight of the wasp. Likewise, in (34), the repetition of back vowels and dorsal consonants mimics the calf lowing. Some, however, are less obvious to non-speakers, with *mir-mir* in (36) probably depicting the chirping of the insect, but also possibly capturing the hopping path of its movements.

Mimetic reduplication for the natural world extends beyond animals, often depicting weather patterns and the sky.

- (37) [pisir-pisir (gama)] ‘drizzle (rain)’ Ho (Anderson et al. 2010)
 (38) [gisir-gisir] ‘cold draught of air’ Mundari (Hoffman 1950)
 (39) [luŋ-luŋɖak] ‘thunder’ Remo (Anderson and Harrison 2011)

Again, we see both sound mimetic forms like in (37) and (38), where the repetition of the high vowels and sibilants evokes the falling of the rain or the hiss of the wind. In contrast, the back vowels and velar nasals in (39) mimic the low rumbling of the thunder.

4.1.2 *Body*

A second class rich in sound-mimetic forms is the body. Unlike animals and their calls, the forms relating to the human body are, at first blush, less clearly sound-mimetic to speakers of English. However, an examination of these forms shows that they pattern similarly to terms relating to the natural world.

The first and most obviously mimetic forms relating to the body denote coughing. These forms are sound-mimetic and are found across the Munda languages.

- (40) [ku-kuʔ] ‘to cough’ Ho (Anderson et al. 2010)
 (41) [k^har-k^har] ‘to cough’ Kera Mundari (Anderson and Harrison 2013a)
 (42) [ku-kub] ‘to cough’ Remo (Anderson and Harrison 2011)
 (43) [ku:-ku:] ‘to cough’ Sora (Harrison et al. 2011)

All of the forms in (40)–(43) use a similar strategy to capture the sound of coughing, using dorsal sounds to approximate the production of a cough. The reduplication of these sounds perhaps captures the iterativity associated with coughing, which will be explored further in section 4.3.

Following ‘cough’, other bodily functions are clearly mimetic, typically depicting the sounds of the body.

- (44) [hagi-hagi] ‘diarrhea’ Kera Mundari (Anderson and Harrison 2013a)
 (45) [lugum-lugum] ‘to chew with one’s lips’ Mundari (Hoffman 1950)
 (46) [kəl-kəlai] ‘to rinse one’s mouth’ Remo (Anderson and Harrison 2011)
 (47) [pam-pam] ‘to flow (milk)’ Sora (Ramamurti 1938)

Some of the forms here are clearly ideophonic, depicting the sounds of the body: in (45), alternating velar and labial articulations mimic chewing, while (47) mimics the sound of a nursing infant.

A final set of mimetic terms relating to the body are terms for body parts themselves. Unlike terms for bodily functions, these forms are less clearly mimetic. However, in form and use, they do not differ from other mimetic forms like animal names or weather terms.

- (48) [buli-buli] ‘thigh’ Remo (Anderson and Harrison 2011)
 (49) [raŋ-raŋ] ‘back’ Remo (Anderson and Harrison 2011)
 (50) [meʔ-meʔ] ‘breast’ Sora (Harrison et al. 2011)
 (51) [puʔa-ʔa] ‘heart’ Sora (Harrison et al. 2011)

With some, like (50), one can imagine that an auditory quality is depicted, connected to the representation of nursing that we saw in (47). Or with (51), the repetition captures the beating of the organ. However, with (48) and (49), it is not clear to a non-native speaker what quality they may depict, if any, illustrating the lack of an obvious boundary between ideophonic and prosaic lexical items.

4.2 Manner

Moving to another domain, we see that mimetic forms are used across Munda languages to depict not only concrete nouns and actions, but also to depict the way actions occur. This category, referred to here as ‘manner’, is consistent with the adverbial category for ideophones in Dingemans and Majid (2012).

Mimetic manner expressions span semantic categories, but are most commonly used to depict speed. An exception to that can be seen in (52) and (53) which denote that an action is occurring cautiously.

- (52) [baŋ-baŋ-le] ‘carefully’ Sora (Ramamurti 1938)
 (53) [so:r-sa:r-so:r-amge] ‘cautious’ Sora (Ramamurti 1938)

Interestingly, the most commonly elicited mimetic adverbial forms across Munda languages express that an action is either fast or slow.

- (54) [sara-saraiki] ‘fast’ Kera Mundari (Anderson and Harrison 2013a)
 (55) [soʔbre-soʔbre] ‘quickly’ Kharia (Anderson and Harrison 2013b)
 (56) [suriʔ-suriʔ] ‘quickly’ Remo (Anderson and Harrison 2011)
 (57) [du-du-du-du] ‘hastily’ Sora (Ramamurti 1938)

The example in (57) *du-du-du-du* ‘hastily’ contrasts with the rest of the sounds, expressing hastiness rather than speed, by using a stop rather than a fricative and most obviously in having a single syllable repeated three times rather than a disyllable repeated once. It is interesting to note that the terms in (54)–(57) involve the repetition of coronal sounds almost exclusively. This contrasts to the expressions for slow actions which often involve the repetition of dorsal or bilabial sounds, as in (58)–(61).

- (58) [hapa-hapa] ‘slow’ Kera Mundari (Anderson and Harrison 2013a)
 (59) [maʔi-maʔi] ‘slowly’ Kera Mundari (Anderson and Harrison 2013a)
 (60) [kole-kole] ‘slowly’ Remo (Anderson and Harrison 2011)
 (61) [bəi-bəi-te] ‘slowly’ Santali (Anderson and Harrison 2013c)

Furthermore, during some elicitation sessions, the speech rate for these manner-mimetic forms differed from other elicited words, suggesting that they depict a quality of speed in an acoustically tangible fashion. That is, they are more iconic. For example in Remo, (56) was articulated at a much faster speech rate than the rest of the sentence in which it was uttered, and at a much faster rate than (60).

4.3 Quantity/Repetition

Cross-linguistically, reduplication is often used to express iterativity. This has been proposed to be morphological rather than ideophonic, like Wood and Garrett (2001) for Yurok, or morphological and ideophonic, like Bergman and Dahl (1994) for Swedish Sign Language.

However, in Munda languages, reduplication does not appear to lead consistently to an iterative reading, implying that this is not a productive morphological process in these languages. Nonetheless, mimetic reduplication often characterizes inherently repetitive actions, despite the fact that frequently the unreduplicated form is not present in the lexicon, with the noted exception of (68).

(62)	[hopor-hopor-te]	‘to crawl’	Ho (Anderson et al. 2010)
(63)	[liṭib-liṭib]	‘to palpitate’	Ho (Anderson et al. 2010)
(64)	[lugui?-lugui?]	‘to jiggle one’s fat’	Mundari (Hoffman 1950)
(65)	[ruku-ruku]	‘to shiver’	Ho (Anderson et al. 2010)
(66)	[ḍolo-lo]	‘to laugh’	Remo (Anderson and Harrison 2011)
(67)	[bor-boram]	‘bubbling of water’	Sora (Ramamurti 1938)
(68)	[gaḍ-gaḍ]	‘to cut repeatedly’	Sora (Ramamurti 1938)
	[gaḍa]	‘to cut’	Sora (Harrison et al. 2011)

We see in (67) that repetitive actions need not be a verb, as the sound mimetic repetition can be captured in the nominal *bor-boram* ‘bubbling of water’. Furthermore, other inherently repetitive actions, like *liṭib-liṭib* ‘palpitate’ in (63), *ḍolo-lo* ‘laugh’ in (66), *ruku-ruku* ‘shiver’ in (65) and even *lugui?-lugui?* ‘jiggle’ in (64) are depicted through reduplication in Munda languages.

Interestingly, in (68) there is a contrast between the iterative verb *gaḍ-gaḍ* ‘to cut repeatedly’ and the telic verb *gaḍa* ‘to cut’. While this contrast does not exist across the verb paradigm in Sora and other Munda languages, it does illustrate the diverse applications of reduplication in verbs, blurring the boundaries between the derivational and ideophonic processes.

4.4 Surface Appearance

Though less common than denotations of sound and motion cross-linguistically, denotations of surface appearance are also common and found in many of the Munda languages. However, unlike in other languages where colors or other qualities may be ideophonic (Dingemanse and Majid 2012 for Siwu), the terms depicting surface appearance with mimetic reduplication in Munda languages all appear to have some iterative quality, as seen in (69)–(73).

(69) [gurul-gurul]	‘to stare with shining eyes’	Mundari (Hoffman 1950)
(70) [mor-mori:]	‘mist’	Sora (Ramamurti 1938)
(71) [kalik-kalik]	‘glitter’	Sora (Ramamurti 1938)
(72) [tu-tudʒa]	‘star’	Sora (Harrison et al. 2011)
(73) [mo-mortoʔ]	‘star’	Remo (Anderson and Harrison 2011)

Each of the examples in (69)–(73) can be seen to depict a twinkling/sparkling quality with reference to the surface appearance. Thus, the quality captured by the sounds in the mimetic form is the iterative aspect of the surface appearance, not unlike the forms seen in section 4.3, though those were typically analyzed with respect to iterativity in verbs. Here the form of the words in (72) and (71) captures the visual change in the light emitted by the object. The same holds of (69), or even (70), where the repetition of the syllables depicts a quality of the light refracting off the suspended water particles.

4.5 Visual patterns

In addition to mimetic denotations of movement, repetitive actions and surface appearance, Mundari exhibits mimetic denotations of visual patterns and space, though few tokens were elicited. Dingemanse (2012: 664) explains that depictions of space and visual patterns share the “suprasensory attributes (e.g., intensity and aspectual structures such as iteration and durativity)” with sound and movement, despite the fact that they are not as obviously salient in spoken language mimesis. This again fits in with the general characteristic that mimetic reduplication captures something inherently iterative or repetitive in a sensory quality.

(74) [tʃunduku-tʃunduku]	‘isolated; scattered’	Mundari (Hoffman 1950)
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In (74), the mimetic form depicts a sense of iteration, not unlike animal calls or repetitive actions, as the visual pattern is scattered and seen repeatedly in a fictive fashion (Talmy 1996). Here, the pattern is static, unlike (71), but is conveyed dynamically through reduplication.

4.6 Surface texture

Mimetic depictions of texture in Munda languages are thus far found only in Sora and Mundari. The depictions of texture in (75)–(77) illustrate three very different depictions, highlighting some of the differences between depicting sensory perceptions like texture and those like sound and vision.

(75) [leɽe-leɽe]	‘slippery to the touch’	Mundari (Hoffman 1950)
(76) [juju-jeje]	‘wrinkled’	Sora (Ramamurti 1938)
(77) [pore-pore]	‘bent’	Sora (Harrison et al. 2011)

In (76), it appears to be the case that the sense of touch is able to capture an iterative depiction not dissimilar to depictions of sound and space, as the reduplication depicts the repetitive nature of the crests and valleys of the folds in fabric or skin. In (75), however, the reduplication relies upon the repetition of the liquids and

vowels to depict a smooth and continuous image of a slick surface, capturing the intensity of the image rather than any iterative quality.

4.7 Scent

Turning to smells, which we find only in Mundari, the break from the iterative or repetitive aspects prominent in depictions of sound and movement is even greater. Here, reduplication depicts intensity alone, rather than conveying any characteristic of iteration.

- (78) [goroŋ-goroŋ] ‘stench of human waste’ Mundari (Hoffman 1950)
 (79) [mondol-mondol] ‘strong smell’ Mundari (Hoffman 1950)

4.8 Taste

While no obvious examples of mimetic reduplicative forms depicting taste were observed, the example in (80) was the one exception.

- (80) [gol-gol] ‘to turn sour [milk]’ Ho (Anderson et al. 2010)

While we believe that it is most likely that the sensory quality depicted here is sound and/or movement, as *gol-gol* could capture the irregular flow of curdled milk, it is undeniable that the actual characteristic described relates to taste. It is also worth noting that the verb here is a change-of-state verb with a durative component, a semantic element often expressed through ideophones and/or reduplication in the same way as intensification.

4.9 Quiet

Ideophones for silence are not uncommon cross-linguistically (Noss 2001; Dingemanse 2009, 2011) and the mimetic form for silence in (81) richly depicts silence through the repetition of velar consonants and back vowels.

- (81) [ŋak-ŋak] ‘silence’ Sora (Ramamurti 1938)

4.10 Temperature

Temperature is expressed through mimetic reduplication in some Munda languages. While both ‘hot’ and ‘cold’ were present in the stimuli in Dingemanse and Majid (2012), they did not form a sensory class, with ‘hot’ patterning with taste and ‘cold’ with quiet.

- (82) [lo-lo] ‘hot’ Santali (Anderson and Harrison 2013c)
 (83) [ge-gep] ‘to be hot’ Remo (Anderson and Harrison 2011)

In (82) and (83), it is unclear from their glosses that there is any relation to taste as was found in Siwu. Furthermore, while these terms pattern in form and function with the other mimetic expressions examined here, it is not clear to the authors exactly how the sensory quality is depicted in the phonological form.

4.11 Inner feelings and cognitive states

Finally, Munda languages exhibit some mimetic reduplicative forms for feelings and states that are purported to be the rarest ideophones cross-linguistically (Dingemans 2012). These depictions are the least observable as, for obvious reasons, they are internal to the speaker. Nonetheless, we find these internal depictions using reduplication in three of the seven languages studied: Ho, Mundari and Sora.

- | | | | |
|------|-----------------|--|---------------------------|
| (84) | [bijuŋ-bijuŋ] | ‘dizzy’ | Ho (Anderson et al. 2010) |
| (85) | [maŋgra-maŋgru] | ‘to be lonely’ | Mundari (Hoffman 1950) |
| (86) | [baŋ-baŋ] | ‘to feel strong’ | Sora (Ramamurti 1938) |
| (87) | [sib-sib] | ‘to feel the sensation of being pinched’ | Sora (Ramamurti 1938) |

Some, like (85), are very opaque to a non-native speaker of Mundari, despite the fact that in every other way, (85) patterns with these otherwise clear forms depicting clear sensory qualities. Others, like (86), intuitively feel less opaque, as the listener can relate to the image of two simple, clear and strong syllables and understand the conveyed sense of fortitude and strength.

These forms, despite their more opaque nature than other mimetic forms in the languages, provide interesting insight into the diversity of possible mimetic depictions and illustrate the diversity of semantic and pragmatic information that reduplication can convey.

5. FORMS OF REDUPLICATION

In the previous section, we illustrated that Munda languages abound with diversity of mimetic reduplicative forms across semantic domains, going so far as to include mimetic forms for smells and sensations. In this section, we will explore the diversity of mimetic reduplication in Munda in form, whether that be considered phonological or morphological.

5.1 Full reduplication

The simplest and most common form of reduplication in Munda languages is full reduplication. Traditionally, full reduplication has been viewed as reduplicating the entire base. However, no matter how one views the morphological process, the form can simply be described as having the phonological content fully repeated twice.

This construction is most common with monosyllabic (88) and disyllabic (89) phonological information reduplicated, although a few examples can be seen of trisyllabic (90) or even quadrisyllabic (91) reduplication.

- | | | | |
|------|-------------------------|----------------------|-----------------------|
| (88) | [diŋ-diŋ] | ‘rattling sound’ | Sora (Ramamurti 1938) |
| (89) | [dakkib-dakkib] | ‘tick-tock’ | Sora (Ramamurti 1938) |
| (90) | [boŋkode-boŋkode] | ‘crooked’ | Sora (Ramamurti 1938) |
| (91) | [kadikkadaŋ-kadikkadaŋ] | ‘cry of a wild fowl’ | Sora (Ramamurti 1938) |

5.1.1 Triplication

For greater emphasis, many forms rely on the repetition of the phonological information a third or fourth time. Many forms in Munda contain triplicated information, as in (92) and (93).

- (92) [ke-ke-ke] ‘scream of the peafowl’ Sora (Ramamurti 1938)
 (93) [sid-sid-sid-lamge] ‘commotion; tumult’ Sora (Ramamurti 1938)

5.1.2 Quadruplication

Other forms contain information repeated a fourth time, as in (94) and (95).

- (94) [dʒaŋdʒan-dʒaŋdʒan-dəm] ‘dry; hard; arid’ Sora (Ramamurti 1938)
 (95) [tapta:p-tapta:p] ‘sound of slapping one’s cheeks’ Sora (Ramamurti 1938)

Similarly, these could be viewed as stem reduplication in which the root is reduplicated to form a stem which is further reduplicated. Under this analysis the examples in (94) and (95) would be better described as examples of ordered reduplication, explored in section 5.4.

While the forms provided throughout this paper represent the lexicalized number of repetitions of the sound sequences in Munda languages, it is often the case cross-linguistically that some forms can be reduplicated further to add emphasis, or perhaps emotional or humorous effects as is noted in other studies of reduplication and ideophones (Zwicky and Pullum 1987, Dingemanse 2011).

5.2 Partial reduplication

Partial reduplication takes many forms. The simplest and smallest was the vowel reduplication that was prosodically motivated in (4), reproduced here as (96).

- (96) [daʔa:] ‘water’
 [-da-] ‘water’ Sora (Anderson 2007)

However, these forms do not appear to be performative or mimetic, but rather satisfy obligatory prosodic constraints in Sora.

On the other hand, many other partial reduplication patterns exist that do convey sensory depictions. In Munda, any portion of the word can be reduplicated, which, accepting a morphological approach, can be described as prefixing, suffixing, or infixing. Typically, only a monosyllable, V or CV, is reduplicated in structures with partial reduplication.

- (97) [ka:-kad-ən] ‘crab (children’s talk)’ Sora (Ramamurti 1938)
 (98) [gati-ti:] ‘to tickle’ Sora (Ramamurti 1938)

5.3 Echo reduplication

Echo reduplication (Inkelas 2014), also referred to as fixed segmentism (Alderete et al. 1999), involves replacing a portion of the base with some invariant segment that overrides the base structure to some semantic end, like the English pejorative [ʃm-] reduplication (McCarthy and Prince 1986). However, while we see echo

reduplication in Munda, it is not always semantically productive nor are specific segments repeatedly used.

(99)	[rata-pata]	‘to rustle; rattle’	Ho (Anderson et al. 2010)
(100)	[andəla:i-sundəla:i]	‘sound of boiling water’	Sora (Ramamurti 1938)
(101)	[ersu-kursu]	‘mumbling; grumbling’	Sora (Ramamurti 1938)

Thus, as we see in (99)–(101), the mimetic forms include reduplicated phonological information although one or more segments has been altered. Ideophonically, this allows the depiction to convey a sense of iterativity, yet also capture the constantly changing nature of the action. This is particularly salient with speech in (101), as despite the monotonous nature of the mumbling, there are continuous changes in the speech signal which is mirrored in the segment change in the mimetic form. Furthermore, in (99), the onset of the reduplicated structure alternates, from [r] to [p], yet as a mimetic form, neither portion can definitely be declared the base and thus neither onset can definitely be declared the replacement segment.

5.4 Embedded reduplication

The final form of reduplication attested in Munda is embedded reduplication in which multiple pieces of phonological information can be reduplicated within a single word. This topic is explored in greater depth in Sora, using the precedence relations model (Raimy 2000) by Phillips (2013).

(102)	[siuŋsiuŋ-noiŋnoi]	‘cry of a starling’	Sora (Ramamurti 1938)
(103)	[juju-jeje]	‘to be wrinkled/puckered’	Sora (Ramamurti 1938)
(104)	[dadaŋ-dadaŋ]	‘sound of cutting wood’	Sora (Ramamurti 1938)

In the first two forms, two separate portions of the word are reduplicated separately leading to a form like (103), in which a reduplicated set of sounds is followed by another reduplicated set of sounds.

In (104), however, the structure is slightly more complicated as it appears that, if we accept a morphological process approach to mimetic reduplication, there are two separate but ordered processes. This is what Phillips (2013) refers to as ‘ordered reduplication.’ First, there is partial reduplication, and then the resulting form is fully reduplicated.

Like echo reduplication, ordered reduplication, or more generally embedded reduplication, conveys a sense of iterativity but characterizes a more accurate representation of that sound. In (102), the separate reduplicated portions mimic the true sounds of the starling, while in (104), the unique reduplicative structure here perhaps captures the sound of each blow of the axe followed by a muffled echo; or perhaps it illustrates the inconsistent rhythm of the axeman. These structures allow for greater variability in the depictions, adding even greater diversity to the possibilities of mimetic depictions in Munda.

6. CONCLUSION

Munda languages make use of mimetic reduplication to depict the world in which they are situated, from the scream of a peafowl to the stench of human waste. The breadth of mimetic reduplication in Munda languages, across syntactic class, semantic domain, and phonological form, has shown that these languages are rich with sensory depictions.

Ultimately, the empirical typology outlined in this article can serve not only to highlight the diversity of forms in Munda languages, but also to shed light on cross-linguistic studies of reduplication and mimesis. There is much left to be done, both in studies of reduplication and ideophones, and we believe that an examination of the wide range of forms in Munda can challenge and aid in the development of new discussions and models.

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