Diminutives in Yangxin Gan

Lysander Schleh
Tulane University, USA

Abstract

Diminutives, long an area of interest for researchers in phonology and morphology, are typically formed by the suffixation of a diminutive affix onto a root word and denote the smallness or youthfulness of whatever is referred to. In Yangxin Gan, a dialect of Gan spoken in southern Hubei, China, diminutive forms are highly variable. They may be formed by the addition of a diminutive morpheme, the insertion of a high-rising tone, insertion of a nasal or change in vowel quality. The latter three processes may simultaneously apply in cases where the diminutive is monosyllabic, in which case a high-rising tone is obligatory, although the phonological realization of the nasal and nucleus is variable. While these sound change processes are seemingly unpredictable, this paper seeks to account

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Lysander Schleh
Ph.D. Student, Interdisciplinary Program in Linguistics, Tulane University, New Orleans, LA, USA
Email: lschleh@tulane.edu

for them through an Optimality Theory analysis in which feature spreading is partially determined by the underlying feature specification of vowels and partially by language-specific constraint rankings. Outlier examples are suggested to present evidence of contrast preservation and different diminutive forms are argued to be different phonological realizations of a single diminutive morpheme.

Keywords: phonology, diminutive, Gan, Chinese, underspecification, Optimality Theory, contrast preservation

1. Introduction

Diminutives are variations of a root word that communicate smallness. They may be used in a literal sense, to mean something is physically small or young, or as terms of endearment. They may be formed by adding a word, e.g., 'little', or by sound change of the root word. Examples from English and German are given in (1a) and (1b), respectively. Both 'y' and 'chen' function as diminutive suffixes.

(1)   a. Jim   →   Jimmy
       b. Maria →   Marichen

Diminutive formation is not always so simple. Across language families as diverse as Sino-Tibetan, Indo-European and Bantu, diminutive formation has been shown to vary, reflecting the interaction between the root word and the diminutive affix (Lin 1993, Burheni 2014, Lamont 2017, van de Weijer, 2002). This implies that more complicated phonological processes are occurring than the affixation of a diminutive morpheme to a root.

Huang (1995) notes that diminutives in Yangxin Gan[1] are formed

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[1] Yangxin Gan is a relatively understudied variety of Gan spoken in Yangxin County,

by the suffixation of a diminutive morpheme to a root word. This suffixation results in systematic phonological changes, including tone change and vowel quality change. Examples are given below.

(2)   a. [kɛ³³]   →   [kɛn⁴⁵]   'dog'
      b. [ɲiau²¹²]   →   [ɲjɐn⁴⁵]   'cow'
      c. [tʰɛ²¹²]   →   [tʰɛn⁴⁵]   'head'

In this paper, I draw on feature specification theory and OT[2] to analyze diminutive production in Yangxin Gan. I argue that feature spreading is at the root of the changes seen here, but that these changes are also partially motivated by OT constraints. This analysis suggests that the underlying specification of vowels can be determined by their ultimate phonological Output after feature spreading from the diminutive morpheme occurs.

Furthermore, I argue that outlier examples are motivated by constraints disallowing the loss of phonological contrast between morphemes when affixation occurs. These constraints demand that contrasts found in the Input must have a corresponding contrast in the Output (Lubowicz 2003). These have been found to have an effect on diminutive production in other Sinitic languages and suggest a commonality in morphophonological production within this language family (Lin 2009). Ultimately, seemingly disparate phonological changes can be modeled through the simple interaction of straightforward phonological processes and universal constraints. This approach is paralleled in phonological analyses of processes such as reduplication

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   Hubei Province, China. It shares many features with other Sinitic languages, most obviously, the fact that it is a tonal language with a maximal syllable structure of CGVN, in which G represents any glide and N any nasal.

[2] The following abbreviations are used in this paper: OCP (obligatory contour principle), OT (Optimality Theory), PC (contrast preservation).

and lexical borrowing (Chand & Kar 2017, Ehineni 2017, Nguyen & Dutta 2017, Ghorbanpour et al. 2019). As with these analyses, mine relies on a set order of constraints which generate varied outputs rather than requiring multiple rules.

This paper has the following structure. Section 2 is a review of the literature in which I first provide a brief overview of research in cross-linguistic research in diminutive phonology and then the phonology of diminutives in Chinese languages. Section 3 presents data on Yangxin Gan diminutives collected by Huang (1995). Section 4 is an analysis and discussion of the data. Section 5 provides a conclusion and opportunities for further research.

2. Literature Review

2.1. Research in Diminutive Phonology

Outside of the Sinitic languages, research on diminutives in other language families has often sought to find universals and determine patterns and motivation of associated sound change, particularly as diminutive forms show variation not explained through simple adjunction of diminutive morphemes. Gregová (2013) analyzed a broad range of languages drawn from the Indo-European, Niger-Congo and Austronesian language families. Her overview sought to determine whether iconicity was a universal feature of diminutives, i.e., are front vowels and palatal consonants a universal feature of palatals across languages. She determined that there was a lack of evidence for this hypothesis; However, diminutive morphological markers were found to trigger sound changes in the stems to which they were attached. For example, diminutive markers triggered

insertion of [i] and palatalization of consonants in about a quarter of surveyed Indo-European languages. Similar processes were observed in Bantu languages, including Bemba, Xhosa and Zulu.

Gibson et al. (2017) also provide an overview of diminutives across languages. Their examination of diminutives in Bantu languages focuses on the range of classifiers used to mark diminutives. For example, in Herero, the diminutive form of *o-mu-ndu* 'person' is formed by the insertion of the *ka* classifier, resulting in *o-ka-ndu*, 'little person'. These classifiers, depending on the language, may be prefixes or suffixes. In both cases, the formation of diminutives regularly triggers phonological phenomena seen in other languages, e.g., epenthesis or deletion, to conform to the individual language's syllable structure.

Besides these broad studies, other researchers have utilized an OT framework to analyze diminutive phonology in individual languages. Such studies examined languages including Dutch, Afrikaans, Spanish, Xitsonga, Cree and Arabic (van de Weijer 2002, Lee & Melnychuk 2003, Norrmann-Vigil 2012, Burheni 2014, Lamont 2017). Across languages, a limited set of universal constraints can be used to derive diminutive outputs.

Furthermore, the underlying representation of segments in the root word and diminutive affix is an important motivator for sound change. For example, in Xitsonga, the suffixation of the diminutive affix [ana] to [ʃi-pótó] 'pot' results in [ʃi-pótw-áná], resulting from constraints that disallow adjacent vowels, *VV, but require the identity of labial features in the input and output, Ident(Lab). Deletion of these segments is disallowed due to a MAX constraint (Lee & Burheni 2014). Similarly, assimilation is observed in Afrikaans in cases where the diminutive suffix [ⁱki] is appended to sonorant final roots, as in the case of [mɑːn] 'moon' becoming [mɑɲjki] (Lamont 2017). Finally, phonological descriptions of diminutive formation in languages such

as Spanish and Hungarian have noted similar processes (Crowhurst 1992, Rebrus & Szigetvári 2021).

2.2. Diminutive Phonology in Chinese Varieties

While diminutive formation in Chinese varieties is very similar, it does vary, and most phonological research focuses on sound change triggered by suffixation involved in diminutive formation. Yip (1992) analyzes data from Yanggu, a northern Mandarin dialect. Yanggu diminutives are marked by both /r/ suffixation and /l/ infixation. Yip's (1992) analysis draws on feature geometry in arguing that a rhotic segment is inserted word finally while [+lateral] is a floating feature that surfaces depending on whether there is a Coronal node to dock at. A Coronal node within the word results in /l/ infixation while an underlying Coronal node at word-final position results in a coronal /R/. For example, if a coronal segment is in the word, the floating feature [+lateral] can attach to its Coronal node resulting in an infixed [l] followed by normal suffixation of [r]. If no coronal segment is in the word, [+lateral] has no node to attach to, resulting in the diminutive formation being limited to suffixation of an [r]. Thus, *hai* 'child' with the diminutive suffix would have a surface form of *hai-er*, not *hlai-er*, while *tu* 'rabbit' would result in a surface form of *t-l-u-er* after suffixation (Yip 1992: 4).

This was developed further by Lin (1993), who also draws on underspecification theory, in which noncontrastive features are left unspecified underlyingly, in her analysis of diminutive rime change in multiple Chinese varieties. The suffixation of 'zi' or 'er'[3] across

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[3] Pronunciation varies widely across Chinese languages. I have used Standard Mandarin pronunciations of the 子 and 儿 characters. They mean 'seed' or 'child' and 'son' or 'child', respectively. These morphemes are consistently used as suffixes to form diminutives.

varieties results in a change to the rime either in vowel quality, tone or both. Under this analysis, these suffixes are more properly termed "microfixes", in that they are not full segments (Lin 1993: 653). Instead, they are features that associate with particular nodes in the stem, resulting in the final form. Affixation is not a process of attaching a segment to the end of a word but instead of filling in underspecified features, which helps explain varying phonological Outputs. This analysis is further developed in Lin (2004, 2009) to include OT constraints on final outputs. The primary extension in this work is the notion that contrast preservation constraints rank highly and aid in accounting for much of the data.

Ma (1997) and Tian (2009) both present OT analyses of northern Mandarin diminutives that employ the 'er' morpheme. They primarily diverge in referencing the structure of the Mandarin syllable, something that is left out of Tian's (2009) analysis. Faithfulness constraints that make morphological realization of the affix obligatory as well as Markedness constraints that delete extrametrical segments and unassociated features produce the final output. Their respective rankings motivate the phonological realization of the diminutive suffix in a single syllable output.

Zhang (1999) analyzes northern Mandarin dialects. These dialects realize the affixation of the /-ɹ/ as [-n] or [-ŋ]. Zhang (1999) finds that an OT analysis best captures the data. In his analysis, the Output is "due to a phonetically based universal ranking, Max{[+nas] ŋ) ~ Max([+nas]n)" (Zhang 1999: 1). This conclusion was based on phonetic data gathered from native speakers. This is a feature not often included in other studies of this type.

Li (2017) draws on feature geometry to examine historical and regional variation in Beijing. In this analysis, a syllable's vowel's Place feature is the key factor in fusion of the 'er' suffix and host

syllable. The OCP motivates a process of dissimilation if an /r/ is appended to a coronal vowel followed by a gradual reduction of contrasting features. In this way, Li (2017) is able to account for an apparent generational divide in the phonology of Mandarin diminutives.

Su (2017) presents an analysis of Wu diminutives. Wu diminutives are formed by the inclusion of the word '*xiao*', i.e., 'small' and the insertion of a default tone to the base word. Some words also include a nasal coda. Su (2017) determines that this is a byproduct of affixation of the 'er' morpheme, which in Wu ends in a nasal coda. While nasality has been gradually reduced, resulting in the deletion of nasal codas in many diminutives, the resulting tone change has been left intact.

3. Data

This data is drawn from Huang (1995) and includes 224 individual tokens of diminutives in Yangxin. Diminutives can be formed by combining a base word with a diminutive morpheme [zɐn^{45}], as in Example (3b) below.

(3)   a. [kɛ^{21}]   'dog'
      b. [kɛ^{21}-zɐn^{45}]   'little dog'
      c. [kɛn45]   'little dog'

The diminutive can be formed as seen in (3b), but this is rarely used. Speakers will almost invariably form diminutives as seen in (3c). The diminutive morpheme varies in phonological realization. Diminutive formation is variable with regard to rime change but always marked

by the insertion of a rising tone. By far, the most common marker of diminutives after rising tone is a nasal in coda position or nasalized vowel in the nucleus. Some examples are shown below. The root word is shown on the left and diminutive is shown on the right.

(4)   a. [tɕi³³]   →   [tɕjɐn⁴⁵]   'chicken'
      b. [ɕy³³]   →   [ɕɥɐn⁴⁵]   'book'
      c. [ɲiau²¹²]   →   [ɲjɐn⁴⁵]   'cow'
      d. [tʰɛ²¹²]   →   [tʰɛn⁴⁵]   'head'
      e. [kwæ̃³³]   →   [kwɛn⁴⁵]   'jar'

As can be seen from the examples, the diminutive form often, though not always, coincides with change to the nucleus of the syllable. Furthermore, there are additional words in which a rising tone is inserted but no nasal is inserted. In such cases, a nasal coda or nasal vowel is already present. Examples are shown below.

(5)   a. [wæ̃³³]   →   [wæ̃⁴⁵]   'praise'
      b. [kæ̃³³]   →   [kæ̃⁴⁵]   'space/room'
      c. [læ̃²¹²]   →   [læ̃⁴⁵]   'basket'

From the data available, we can draw some generalizations about the phonological processes involved in diminutive formation. Rising tone is obligatory, as it is found in all diminutives. Rime change appears to be nearly universal as well. Rime change often involves the insertion of a nasal feature, which may surface as a nasal consonant or on the vowel. The nucleus may also be affected in rime change, though this process seems to be constrained by the original vowel's Place features. Rimes with high vowels will surface with the suffix [-ɐn], those with mid-vowels tend to surface as [-ɛn], and those with

low vowels will generally surface as [-æ̃]. These changes are found in the majority of those that undergo rime change. Each group is shown below with the full range of base rimes and surface diminutive form in Table 1.

Table 1. Diminutive Output Paradigms

Root Word Rime	Output
/-i/, /-y/, /-u/, /-au/, /-ɐŋ/	[-ɐn]
/-o/, /-ɛ/, /-ɔ/, /-ɐn/, /-æ̃/, /-ɔŋ/	[-ɛn]
/-ɒ/, /-æ/, /-ɒn/, /-æ̃/	[-æ̃]

There is one final group of words which can be considered an outlier category, as it accounts for a minority of diminutive rime change in the data set, but which needs to be examined for a full analysis. These are words which include the glide [j] and a nasalized vowel in their final as well words that have the rime [in].

(6) a. [tɕjɛ̃²¹²] → [tɕin⁴⁵] 'bridge'
     b. [tjĩ³³]   → [tin⁴⁵]   'tiptoe'
     c. [tsjĩ³³]   → [tsin⁴⁵] 'point'
     d. [ɲjɔŋ²¹²] → [ɲin⁴⁵]   'young woman'
   e. [pin³³]   → [pin⁴⁵]   'ice'

Note that words with the [au] nucleus like [ɲjau] surface as [ɲjɐn], meaning they pattern with other words such as seen in (4a), (4b) and (4d).

4. Analysis

A single diminutive morpheme is suffixed to a root word to derive diminutives in Yangxin Gan. But how to explain the variable surface forms of different diminutives? The matter of explaining the tone change seen in Yangxin Gan diminutives is straightforward as it is categorical. There is no derived word in the dataset that does not surface with high-rising tone. However, there are other changes which are less straightforwardly explained. I suggest these phonological changes are tied to a root words interaction with a diminutive morpheme.

I noted earlier that this surfaces variably as [zɐn^{45}] or [ɐn^{45}]. As shown in (3b) and (3c), either form can be combined with a root word to derive a diminutive. I will consider the second form to be the underlying form of the morpheme, while the first form is produced with an onset to avoid violating language-specific constraints. In Yangxin Gan, both an onset and a nasal coda are obligatory in any syllable containing the nucleus [ɐ]. This segment is likely minimally specified for features, and unspecified for height. I suggest something like the following structure for this segment in Figure 1.

Figure 1. Structure of [ɐ]


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        M-H        TONE

          |

         V         ROOT

          |

                   PLACE
   [-back, -round]
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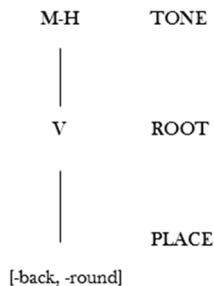
I will analyze the sound changes shown in (4a)–(4e) in turn. First, those shown in (4a)–(4c) can be understood to generally be a sequence of affixation and restructuring. First, the affix [ɐn⁴⁵] is suffixed to the root word. In cases where the nucleus position is already filled by a vowel with a corresponding glide, that segment moves from the nucleus to the onset to avoid violating the NoHiatus constraint, which disallows vowel hiatus. This means that /i/ surfaces as [j], /y/ surfaces as [ɥ] and /u/ surfaces as [w]. /au/ cannot be reanalyzed as a glide, so must be deleted.

The sound changes shown in (4d) and (4e) are also systematic. After suffixation, feature spreading from the diminutive morpheme results in a default vowel, [ɛ] in the case of mid-vowels and [æ̃] in the case of low vowels. I suggest that the [-back] and [-round] features spread from the diminutive morpheme. Height differences are consistently maintained, a pattern that can be captured through the Ident[height] constraint, which requires that vowel height in the input and output be identical. Based on the observed changes, I propose the following feature specifications for vowels in Yangxin Gan in Table 2.

Table 2. Feature Specification of Yangxin Gan Vowels

	High	Low	Round	Back	Front
i					+
o	−	−	+		
u			+	+	
y			+	−	+
ae		+		−	
oe	−	−	+		
ɒ		+		+	
ε	−	−	−	−	
ɔ	−	−	+	+	

This proposal assumes restricted underspecification, in which only contrastive features are specified. While it is only a tentative proposal, we can use this model to capture most of the sound changes seen in forming diminutives. Below are tableaux which demonstrate my proposed ranking of constraints. MAX and DEP disallow deletion and insertion, respectively. MorphReal is a constraint which requires a morpheme be phonologically realized.

In Tableau 1, [tɕiɐn] and [tsɐn] are rejected as candidates due to violating NoHiatus by having two adjacent vowels and MAX for deleting material from the original morpheme, respectively. In Tableau 2, [tɐn] is rejected due to not matching [o] for the height feature. [toɐn] is rejected for violating NoHiatus, as is [xɒæ̃] in Tableau 3. [xæ̃] is selected as the optimal candidate as the diminutive morpheme is fully realized as a change of vowel quality and nasality on the vowel. In all three tableaux, candidates that do not show any sound change are rejected for not including the diminutive suffix, and thereby violating MorphReal.

Tableau 1. OT Tableau for /tɕi/

/tɕi/	MorphReal	Ident[height]	NoHiatus	MAX	DEP
☞ tɕjɐn					*
tɕiɐn			*		
tsɐn				*	
tɕi	*				

Tableau 2. OT Tableau for /to/

/to/	MorphReal	Ident[height]	NoHiatus	MAX	DEP
☞ tɛn					*
to	*				
tɐn		*		*	
toɐn			*		

Tableau 3. OT Tableau for /xɒ/

/xɒ/	MorphReal	Ident[height]	NoHiatus	MAX	DEP
xæ	*				*
☞ xæ̃					*
xɒæ̃			*		

However, we are still left with unanswered questions. Why are finals /in/ and /j-/ surfacing as [in] as shown in (5)? At first glance, it would seem apparent that affixation of the diminutive morpheme should result in the production of [-jɐn]in all cases. So why do these stand out as outliers? First, let us consider why [pin²¹²] is produced as [pin⁴⁵]. Suppose that spreading of features occurs in the manner shown in Figure 2.

Figure 2. [-rnd] Feature Spreading
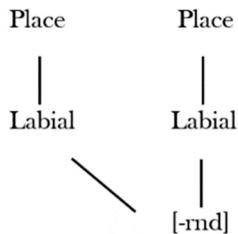
If spreading of [-back] and [-round] features occur, /i/ will remain unchanged in terms of production, even if feature specification has been changed. However, the constraints I discussed earlier would not motivate the sound changes shown in (5). So why do they not follow the systematic changes seen in (4a)–(4c)?

These outliers are still produced through a morphological process of affixation, but PC constraints motivate their output form. The same effect was found in the Hong'an dialect of Chinese (Lin 2009). I draw on PC theory for my analysis (Lubowicz 2003). Under this analysis, each previously established category forms a paradigm. The core idea of PC theory is that contrasts between paradigms are maintained, but the contrasts may be different. For example, a contrast in height in the Input may be realized as a contrast in rounding in the Output. A contrast is maintained, even if the contrastive features are not the same (Kenstowicz 2001, Tessier 2004).

Under my analysis, rimes with high vowels pattern a particular way while rimes containing mid vowels pattern in a different way. It would be more accurate to say they operate on groups of words rather than specific rimes. I suggest this is a good reason to borrow the notion of 'family resemblance', a concept more often used in semantics but with previous applications to phonology (Lindau 1985, Sebregts 2015). Each of the four phonological paradigms I have discussed is formed by links of family resemblance. There are shared features, but the commonalities may be rather loose. This is enough to group them together.

If this is the case, it would be reasonable to predict that constraints motivating contrast preservation are maintaining that contrast between the different paradigms. This would motivate the 'outliers' we see in (6a)–(6e).

What contrast is being maintained by the proposed PreserveContrast

constraint? Rimes in (4a) contain a high vowel or corresponding glide, as do all rimes in (6a)–(6e). But those in (6a)–(6e) also all contain a nasal coda or nasal feature. An Input-oriented PreserveContrast, PC_{IN} (nasal) constraint could do the job. This constraint necessitates that a contrast in the Input must have a corresponding contrast in the output. The table below shows two scenarios: One in which both paradigms have the same Output and one in which they have contrasting Outputs as shown in Tableau 4.

Tableau 4. OT Tableau for Diminutive Output Paradigms

$V_{[+high]} \rightarrow$ suffix $V_{[+high]} N \rightarrow$ suffix	MorphReal	Ident[height]	PC_{IN}(nasal)
Scenario 1: $V_{[+high]} \rightarrow$ [ɐn] $V_{[+high]} N \rightarrow$ [ɐn]			*
☞ Scenario 2: $V_{[+high]} \rightarrow$ [ɐn] $V_{[+high]} N \rightarrow$ [in]			

The two scenarios are differing ranges of outputs. The second scenario is found to be optimal due to not violating the PreserveContrast constraint. This model provides a workable solution to the problem of explaining outlier phonological productions.

5. Conclusion

In this paper, I have sought to establish that sound change observed in Yangxin Gan diminutive formation can be explained as a process

of feature spreading. This feature spreading is motivated by a language-specific ranking of universal constraints. Specifically, constraints such as MorphReal, Ident[height] and NoHiatus constrain most Output production. Furthermore, asymmetries within diminutive formation were identified. Namely, some finals beginning with segments /i/ or /j/ and ending with a nasal did not pattern with finals beginning with the same segments but ending in an oral vowel. I explained the former by means of contrast preservation theory.

The data presented here bears similarities to that seen in Sinitic and non-Sinitic languages. Across language families, including Sino-Tibetan, Indo-European, Bantu, Algonquian and Austronesian, diminutive forms are variable to a degree that requires more explanation than simply appending a suffix to the end of a root due to regular observance of sound change triggered by diminutive affixation (Lin 1993, Melnychuk 2003, Gregová 2013, Lee & Burheni 2014, Lamont 2017).

Viewing diminutives as bundles of features helps understand why we see phenomena like the infixation of [l] noted by Yip (1992), the widespread palatalization in Indo-European and Bantu languages noted by Gregová (2013), or the variable realization of nasality as a nasal segment or nasalized vowel in the data presented here and seen in other Sinitic languages (Zhang 1999, Su 2017). Furthermore, glide formation as a strategy to avoid violating phonotactic constraints shown is also observed in languages as distinct as Bantu languages such as Xitsonga and Indo-European languages such as Afrikaans (Lee & Burheni 2014, Lamont 2017). A constraint-based analysis is able to capture variation within a language in a way that a rule-based explanation does not.

There are promising paths for future research. First, the data presented here represent production by speakers in the 1980s and 1990s, and while it corresponds with Yangxin Gan as currently

spoken[4], more current data from speakers would be useful. A recording project currently underway should be particularly fruitful. A closer phonetic analysis might be more revealing. With that, we would have a much clearer picture of Gan as currently spoken.

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[4] This is based on my own impressionistic analysis. No discrepancies were found between Huang's (1995) data and current pronunciation of diminutives.

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