Abstract

This research investigates similarities between class 1 deverbal nouns and class 15 infinitive verbs. The research used data from Kwayedza as well as focused group discussions for verification and addition of data as well. These were useful data gathering techniques because Kwayedza is written in Shona and also the groups comprised of Honours students at the University of Zimbabwe who have Shona as their main subject and being native speakers as well. The study utilizes a descriptive tool to explain the morphological similarities between class 1 deverbal nouns and class 15 infinitive verbs. The study also uses Optimality Theory (Prince and Smolensky, 1993; 2004) to explain the hiatus resolution strategy that is operative in both classes. This research has found out that the class 1 deverbal nouns and class 15 infinitive verbs have the same morphological structure, that is, they are both made up of noun prefix, verb root and final vowel. However, the final vowel for class 15 infinitive verbs is –a and that for class 1 deverbal nouns is –i or o. Therefore, the final vowel for the class 1 deverbal nouns is called a nominaliser because it derives nouns from verbs. It should be noted that the nominalisation of deverbal nouns only becomes complete with the addition of the noun class prefix. hiatus resolution is used in this research as a diagnostic tool to examine the morpho-phonemic structure of class 1 deverbal nouns and class 15 infinitive verbs. These classes utilize glide epenthesis/spreading as a repair strategy to resolve hiatus. Based on the similarity in the application of hiatus resolution strategy employed, the research concludes that the boundaries between a noun class prefix and a deverbal noun stem, and those between a noun class and an infinitive stem, are the same.

Key Words: Morpho-Phonological Twins, Class 1 Deverbal Nouns, Class 15 Infinitive Verbs

Introduction

The study seeks to explore the similarities between class 1 deverbal nouns and class 15 infinitive verbs in Shona. Nouns and verbs are word categories that are basic in many languages. Nouns in general, are words that are used to refer to a person, animal, place, quality or even an idea. It is within this category of nouns that Shona has both deverbal and verbal nouns. Verbs are those words that indicate action, event and state. It is within this category that we can talk of infinitive verbs (a verbal noun formed from the infinitive of a verb). In particular, the study intends to find out more on the similarities between the deverbal nouns in class 1 and the infinitive verbs in class 15.

Typologically, Shona is an agglutinative language which consists of root words combined but not materially distorted as to form or meaning. Deverbal nouns and non-deverbal nouns all comprise of a noun class prefix and a noun stem. Mudzingwa and Kadenge (2014) note that, the stems of non-deverbal nouns are monomorphemic whereas
those of deverbal nouns are minimally bimorphemic and are derived from verb roots. In this regard, it is clear that deverbal nouns have a more complex structure as compared to non-deverbal nouns. Therefore, this study seeks to answer the following research questions:

- What are the similarities between deverbal nouns of class 1 and infinitive verbs of class 15?
- Which hiatus resolution strategies apply to both class 1 deverbal nouns and class 15 infinitive verbs?

This study is motivated by the striking morpho-phonological similarities between these two classes in Shona. This study is an interface of two areas of Linguistics, that is, morphology and phonology. This forms morpho-phonology. According to Crystal (2008 morpho-phonology (morphophonemics) is a branch of linguistics referring to the analysis and classification of the phonological factors which have an effect on the appearance of morphemes, or, equally, the grammatical factors which affect the appearance of phonemes. Its chief focus is the sound changes that take place in morphemes (minimal meaningful units) when they merge to form words. Therefore, this present study seeks to use hiatus resolution phonological processes in order to explain the morphological structure of deverbal nouns and infinitive verbs the language under study, Shona.

**Brief literature review**

**Shona nominal morphology**

Following Fortune (1985), Doke (1931)’s works, a characteristic that most Bantu languages (Shona included) seem to have is a complex noun class system according to which each noun is grouped into a specific class marked by a prefix. Shona (Southern Bantu, Guthrie Zone S10) noun class prefixes display dedicated functions and related to this fact, Fortune (1984) notes that it is according to whether they have descriptive or expressive content. Generally, there are 21 noun classes, which are grouped according to similarities in their meaning (semantic criterion), or by grouping them with other nouns that have similar form(morphology) or through arbitrary convention thus classes 1-2 are for human nouns, 3-11 are for non-humans, 12-13 are the diminutive (those that relate to size in this case small or little), class 14 is for abstract noun, class 15 is for verbal infinitives, 16-18 are for prepositions or locatives, 19 is for diminutives, and class 21 is for the augmentative (opposite of diminutive in that it expresses greater intensity often in size). In actual fact 19 and 21 are class prefixes with expressive content providing evaluative information relating to size. Therefore, this particular study is much concerned with class 1 deverbal nouns and class 15 infinitive verbs.

Infinitive verbs can be defined as the verbal nouns formed from the infinitive of a verb. In other words, these can be referred to as verbal nouns. The construction of such verbs is based on the following pattern: prefix + verb root + final vowel –a. It is in class 15 that we talk of infinitive verbs hence the focus of this study.

A descriptivist, Fortune (1985), gives an analysis of the noun classification in Bantu. He notes that the prefix of class 15 ku- is always associated as constituent with terminal vowel –a for example;

1. (a) ku-imb-a ‘to sing’
   (b) ku-taur-a ‘to talk’
   (c) ku-sek-a ‘to laugh’.

Fortune further outlines that the same ku- is different when found in the cases of a few divergent stems like –ti, -nzi, -nge that is,

2. (a) ku-nge
   (b) ku-nzi
   (c) ku-ti

An analysis of Fortune’s work indicates that nominal constructions of class 15 are neutral and do not indicate number.
Semantically, class 15 is only found in constructions with radical segments. A major difference between this class and other classes is that all members of this class indicate verbal actions. All that Fortune did was to give a comprehensive description of these classes in general. However, the present study differs from Fortune’s work in that it seeks to explore the similarities between class 15 and another member of noun classification that is class 1.

**Shona verbal morphology**

Shona verb morphology as in other Bantu languages is complex and markedly different from nominal morphology (Mutaka and Hyman, 1990, Hyman, 2005, Myers, 1990). The most dominant feature of the Shona verb, like other Bantu languages, is the capacity of the verb root to take on a number of affixes on both sides such that the verb alone can function as a complete sentence. A verb root can be characterized as a bound morpheme which can be both prefixed and suffixed. Phonologically, verb roots are said to be syllabically incomplete because they always end in a consonant which is not permissible in Shona to have a closed syllable. Concerning these verb roots, it can be noted that Shona has both derived and underived verb roots from other word classes such as idiophones and adjectives.

Underived verb roots are a group of verb roots that have a minimum size of a single consonant and a maximum size of three syllables. Generally, they are monomorphemic and they are consonant final. For example:

[3] (a) -f- ‘die’
(b) -on- ‘see’
(c) -far- ‘be happy’

It appears that in Shona, derived verb roots are from idiophones and adjectives. An idiophone is used to mark vivid or dramatic speech. To produce a verb root, a verbaliser is attached to the idiophone and hence a derived verb root. Mudzingwa (2010) notes that these verb roots are morphologically complex and their constructional pattern is that they are made up of an idiophone or adjective and a verbaliser suffix which is a consonant. For example:

[4] (a) simu-r ‘to replant’
(b) kwamu-r ‘to beat’
(c) simu-k ‘stand up’

As previously highlighted that the verb morphology is more complex, it must be pointed out that the verb root and the verb extensions are encompassed in the derivational stem. The derivational stem corresponds to the prosodic stem. The verbal extensional suffixes come immediately after the verb root. They do not have an inherent tone, and always assume the tone pattern of the verb root. Mkanganwi (2002) derivational stem in Shona are formed when the affixes except the final vowel is joined after the verb root.

The outcome of the construction explained above to give the derivational stem, is encompassed in the inflected verb stem together with the final vowel and this can be referred to as the inflectional final suffix. Mudzingwa (2010) notes that when the terminal vowel is attached to the verb root or derivational stem it forms the inflected verb stem. The inflected verb stem corresponds to the prosodic stem.

Ngunga (2000) notes that the morphemes that come immediately before the inflected stem are the Macro stem. The marking of tense, aspect, and object agreements certain morphemes perform these grammatical functions hence occupying the macro stem position. It should be emphasized that all the morphemes that come before the macro stem and fulfill a grammatical purpose are known as the prestem. These morphemes include the subject marker, and tense marker. According to Mudzingwa (2010) the prestem is also corresponding to the prosodic stem.

In short about verbal structures, the root and extensions exhibit the greatest degree of
phonological coherence and interaction, and this grouping is often termed the derivational stem (DS). The derivational stem then groups with the final vowel, which expresses tense distinctions, to yield the Inflectional Stem (Downing, 1997). Addition of object prefixes results in a higher domain known as the macrostem, and finally, other prefixes join with the macrostem to form the fully-inflected verb.

**Shona deverbal nominal morphology**

Deverbal nouns are those nouns that are derived from verbs but grammatically behave purely as nouns not verbs. Du Plessis (1997) asserts that the changing of a verb into a noun occurs by means of the rules of lexical derivation. Therefore, some of the characteristics of such nouns are that their structure has a verb root as the nucleus and are characterized minimally as bimorphemic (meaning those nouns that consist of two morphemes) for example:

[5] (a) mu-tengi “buyer”
(b) mu-biki “cook”
(c) mu-rizdi “owner.”

In this regard, Mudzingwa and Kadenge (2014) have concluded that deverbal nouns have a more complex structure in that they are at least bimorphemic. The derivation of nouns in African languages has always revolved around the changing of verbs into nouns, and the issue of noun classes, as specified by Du Plessis (1997), Poulos and Louwrence (1994), Poulos and Msimang (1998), and Brindle (2009), among many linguists.

Derivation of nouns has also received attention from Ziervogel and Mabuza (1976: 28) suggest that deverbatives are derived by prefixing the required class prefix and suffixing the required ending which is mainly –i or –o or –a to the root. The ending –a may be used with other classes with verbal root or extended root, and it may also be with all nouns derived from passive stems.

Mudzingwa and Kadenge in (2014) conducted a study which was comparative in nature in that they laid bare the differences between class 1 deverbal and non-deverbal nouns. The main aim of their work was to present a comparative analysis of some synchronic morphological properties of Shona class 1 non-deverbal and deverbal nouns for example 6(a-c) exemplifies non-deverbal nouns and 7 (a-c) exemplifies deverbal nouns:

[7] (a) mu-komana “boy”,
(b) mu-sikana “girl”,
(c) mu-kadzi “woman”

[8] (a) mu-teng-i ‘the one who buys’
(b) mu-rim-i ‘the farmer’
(c) mu-gar-i ‘the one who sits at a particular place’.

They emphasized that the latter are monomorphemic and strictly made up of a noun root, which is co-extensive with a noun stem, to which a noun class prefix is attached and the former to the right of the derived stem is a nominalising final vowel and to the left is a noun class prefix. They further went on to demonstrate that class 1 non-deverbal and deverbal nouns display the following differences: the stems of non-deverbal nouns are monomorphemic whereas those of deverbal nouns are minimally bimorphemic and are derived from verb roots, the boundaries between the class prefix and the nominal stem behave differently. Another emphasis of their study was to demonstrate that deverbal and non-deverbal nouns behave differently with respect to their phonology and derivational properties. A review of this study shows that it differs from the present in that the current researchers focus on the similarities of two different classes, that is,
class 1 deverbal nouns and class 15 infinitives even though both studies are exploring the same language, Shona.

Furthermore, Mletshe (2010) studied deverbal nominals in one of the Bantu languages, Xhosa. Mletshe investigates how the syntactic properties of verbs from which deverbal nouns are derived are invoked in explaining the argument structure and event structure properties of deverbal nouns within the Generative Lexicon Theory (Putsejovsky, 1996). Mletshe takes into consideration classes 1,5,7,9. From this analysis, one can note that the current research is related to Mletshe’s study in that the present researcher is also concerned with deverbal nouns. However, differences can be noted between the present study and Mletshe’s research in that the present focuses on the similarities between deverbal nouns in class 1 and infinitive verbs in class 15 and Mletshe has class 1,5,7,9 to explain the deverbals in Xhosa. Even though, both studies are focusing on Bantu languages which seem to have a similar noun classification system.

Methodology

This study used Kwayedza as a source of data and focused group discussions as a verification mode and addition of data as well. This is in line with Robson (1993) who stresses that if two sources give the same message then, to some extent they validate and confirm each other.

In carrying out this research, the researchers used written material. In Zimbabwe, there is a local newspaper called Kwayedza which was used as a source that provided data that is not manipulated. The major advantage of the Kwayedza (Shona newspaper) is that the researchers get to appreciate how language is used in natural contexts and in support of this Kwayedza is a national wide newspaper and has the mainstream of Shona as a language. In addition, Kwayedza has been chosen because it uses formal language and hence it becomes one of the richest sources that can provide the researcher with data. To validate the data, the researchers intend to use focused research groups help in verifying the data collected and to add the data as well. Using focused group discussions helps to verify whether the data from Kwayedza is Shona and also to understand use and usage of the language under discussion.

The other method of data gathering that is employed in this study is focused group discussions which comprised of people who are proficient in the subject under discussion. This is the method that was used for data verification in order to avoid biased data so that only relevant data is preserved. The speakers of a language are always the ultimate judges of its naturalness (Samarin, 1967). It is also significant to have such groups so that the researcher knows whether he or she has collected enough data for the study. For this current study, the researchers have established three focus groups with native speakers of Shona at the same time having Shona as their major subject at the University of Zimbabwe. The major task of these groups was to discuss, verify and even to add to the already collected data.

Theoretical framework

For proper data management, the data is going to be in tabular forms having the two classes juxtaposed as this helps in giving an analysis that is vivid and easy to comprehend. Qualitative analysis is used as well because it is a comparison of two noun classes. To formalize the analysis of hiatus resolution as a diagnostic tool in exposing the morpho-phonological structure of class 1 deverbal nouns and class 15 infinitive verbs, the study use analytical tools of Optimality Theory1, hence forth OT (Prince and Smolensky, 1993; 2004).
This research enterprise is couched in Optimality Theory (Prince and Smolensky, 1993; 2004) and Moraic Phonology (Hayes, 1989) in which syllabification is a consequence of best-satisfying syllable structure well-formedness constraints. These theories offer an account of hiatus resolution by showing that surface outputs can be accounted for in terms of optimal satisfaction of a universal set of violable constraints (Rosenthal, 1994, Casali, 1996). According to Kager (1999: xi), the central idea of the OT theory is that surface forms of language reflect resolutions of conflicts between competing demands or constraints. A surface form is ‘optimal’ in the sense that it incurs the least serious violations of a set of violable constraints, ranked in a language-specific hierarchy… Languages differ in the ranking of constraints, giving priorities to some constraints over others.

OT recognizes two basic types of constraints: markedness constraints and faithfulness constraints. Markedness constraints militate against dispreferred structures by assigning violation marks to output candidates guilty of these structures. For example, syllables without onsets are considered ‘marked’ structures cross-linguistically; the constraint ONSET assigns violation marks to all candidates with onsetless syllables. According to McCarthy and Prince (1995), constraints in OT must assess the faithfulness of the output to the input. This faithfulness is measured in terms of Correspondence, which is defined as a relation between the elements of a string S1 and the elements of a string S2. Correspondence captures faithfulness by requiring every segment of the input to have a correspondent in the output and vice versa. McCarthy and Prince (1993; 1995; 1999) identify various Correspondence relations which can be characterized as constraints. In other words, faithfulness constraints, on the other hand, require that output candidates be faithful to the input. Violation marks are assigned to output candidates which have in some way altered the input form. Faithfulness constraints are generally assumed to be of two types: DEP constraints, which prohibit the addition of new information, and MAX constraints, which prohibit the loss of information. DEP and MAX constraints may be further specified depending on the particular ‘information’ in question—for example, faithfulness constraints may be formulated in terms of faithfulness to features, segments, moras or any other information present in the input. The interaction of faithfulness and markedness constraints with respect to ranking determines the optimal analysis of any given input (Prince and Smolensky, 2004). One of the merits of employing OT in this thesis is that OT recognizes the role of the marked configuration (ONSET), and OT captures the central aspect of the conspiracy: to repair hiatus. OT captures the generalization that the goal of each of the strategies is ONSET satisfaction. This constraint is schematized as follows,

\[
\text{(1) ONSET} \quad \sigma[V \text{ syllables must have onsets)}
\]

(iTo, 1989:223)

This constraint requires all syllables to begin with onsets hence all onsetless syllables are marked. Following, Kadenge (2013) the analysis of hiatus resolution presented in this article appeals to markedness, alignment and correspondence constraints. The constraints used in this research are general syllable structure constraints and constraints on segmental representation.

Data presentation and analysis

This section presents a comparative analysis of morpho-phonological properties of Shona class 1 deverbal nouns and class 15 infinitive nouns with a view of enlightening on the similarities between these two classes. OT
(Prince and Smolensky, 1993; 2004) is used to explain the hiatus resolution strategies that are used in both class 1 deverbal nouns and class 15 infinitive verbs to bring to light similarities identified.

The structure class 1 deverbal nouns and class 15 infinitive verbs

The Shona class 1 deverbal nouns and class 15 infinitive verbs have the same morphological structure. Consider the following data.

The above data show that both class 1 deverbal nouns and class 15 nouns display both nominal and verbal properties. Like nouns, Deverbal Nouns and infinitive nouns in class 15 have a class prefix. The noun prefix is important for classificatory purposes.

The above data show that deverbal nouns have the same morphological structure as the verb stem the only difference is that deverbal nouns have a nominal final vowel instead of a verbal one. The compulsory morphological constituent of a deverbal noun is the derivational stem. To the right of the derivational stem there is a nominalising final vowel and to the left is a noun class prefix (Mudzingwa and Kadenge, 2014:139, Mutonga work in progress). The quality of the final vowel is different from that found in the verbs which is consistently /a/. Similar to the verbs, the core morpheme in the deverbal nouns is a verb root, to which a noun class prefix and a suffixal vowel are attached. The Shona verb root has three distinct properties. Firstly, it is syllabically incomplete and always ends in a consonant (C-final) and yet all Shona syllables are open. Secondly, it takes the form of a bound morpheme which accepts morphemes before and after it. Consider the following example;

\[9\] (a) /mu-famb-i/
\text{CL.1.SG.-walk-fv}
‘the one who walks’

/-famb/- is the verb root because it is prefixed by /mu/ of class 1 and also suffixed by the nominalising vowel /i/. When the ‘nominaliser’ [i] is added to the verb root, the verb root becomes a deverbal noun stem. However, the nominalisation only becomes complete with the addition of the noun class prefix. Consider the following examples,

\[10\] (a) /mu- it-i/
\text{CL.1.SG.-try-fv}
‘the one who does’

(b) /mu-imb-i/
\text{CL.1.SG-sing-fv}
‘the one who sings’

(c) /mu-far-i/
\text{CL.1.sg-visit-fv}
‘the one who visits’

| Table 1: Class 1 deverbal nouns and class 15 infinitive nouns in Shona |
|---------------------------|------------------|---------------------------|------------------|
| **CL.1 DEVERBAL NOUNS**   | **ENGLISH GLOSS** | **CL.15 INFINITIVE VERBS** | **ENGLISH GLOSS** |
| /mu-f-i/                  | The one who died | /ku-f-a/                  | To die           |
| /mu-tor-i/                | The one who takes| /ku-tor-a/                | To take          |
| /mu-Satsir-i/             | The one who helps| /ku-Satsir-a/             | To help          |
| /mu-rim-i/                | The one who farms| /ku-rim-a/                | To farm          |
| /mu-pfek-i/               | The one who wears| /ku-pfek-a/               | To wear          |
| /mu-sung-i/               | The one who ties | /ku-sung-a/               | To tie           |
| /mu-tf kair-i/            | The one who drives| /ku-tf kair-a/            | To drive         |
| /mu-gar-i/                | The one who sits | /ku-gar-a/                | To sit           |
| /mu-famb-i/               | The one who walks| /ku-famb-a/               | To walk          |
Commenting on the above examples, it is clear that vowel /i/ is nominalising the constructions given but it becomes complete with the aid of the class prefix. Myers (1987) argues that what is crucial in these constructions is that they contain a verbal radical but the final vowel makes the word a nominal and for this reason the final vowel of the deverbal noun is known as the nominalising vowel. The structure of the deverbal noun is given in the following figure:

![Figure 1: The structure of deverbal nouns in Shona](image)

Here, the deverbal noun is made up of the prefix /mu-/ and a deverbal stem, the latter being composed of a VRoot and a nominalising FV. The verb root in the deverbal nominals is regarded as a deverbal stem because it is an attachment site for a class prefix mu-, similar to other nominal stems of classes 1 to 21. This verb stem comprises the derivational stem /-famb-/ and the nominaliser /-i/. However, the nominalisation only becomes complete with the addition of the noun class prefix. This is in line with the observations by Du Plessis (1997), Poulos and Louwrence (1994), Poulos and Msimang (1998), and Brindle (2009) who argue that the derivation of nouns in African languages has always revolved around the changing of verbs into nouns. The above discussion has established that the deverbal noun is composed of class prefix + verbal stem + final vowel.

Infinitive verbs in class 15 display the properties of a noun and a verb. Class 15 infinitive verbs are marked by the class prefix /ku-/ which is described as the infinitive prefix. The stem is also made up of the verb root/verb stem and the final vowel. In other words, the core morpheme of the infinitive is a verb stem. However, the final vowel of the infinitive verbs is always –a whereas in the deverbal nouns it is /–i/ or /–o/ as in /mutengi/ ‘buyer’ and /mutongo/ ‘judgement.’ For this reason, Mudzingwa (2010:100) argues that infinitive verbs can be termed ‘verbal nouns.’ Shona Class 15 stems belong to the nominal construction because they have prefixes and it is only nominals that have a class prefix—verbs do not. The quality of the final vowel in infinitive verbs is the same as that found in the citation forms of the verbs. What completes the nominalization of class 15 nouns is the addition of class prefix /ku-. Similar to other nominals, the class prefix triggers concordial agreement and is the basis for the classification of the infinitive. The following is the morphological structure of an infinitive as a nominal word:
The above figure shows that the infinitive is a nominal construction which is made up of a class prefix, the infinitive /ku-/ and an Inflected verb stem /famba/. The inflected Verb Stem is in turn made up of a derivational stem /-famb-/, and a FV, /-a/. The infinitive corresponds to a prosodic word3 and the inflected verb stem to a prosodic stem4.

This research agrees with the conclusion of Mudzingwa and Kadenge (2014:137) when they say, “...when the final vowel is /a/, it satisfies the prosodic constraint that all Shona syllables must be open and when the final vowel is /e/ or /i/, in addition to satisfying this prosodic constraint, it also provides morphological information.” As part of their findings, they observed that the final vowel /o/ just as /i/ nominalises verb root because deverbal nouns are derived from verbs. In the following figure, the research provides a juxtaposed structure of a deverbal noun and that of the infinitive verbs to illustrate the similarities in morphological complexity amongst these constructions.

Figure 3 shows that the morphological structures of a class deverbal nouns and class 15 infinitive verb are the same because they are all composed of a noun prefix + verb root + terminal vowel. The difference is on the quality of the final vowel. In deverbal nouns we have /i/ and /o/ as the nominaliser and in class 15 infinitive verbs we have /a/.

Pre-prefixation in class 1 deverbal nouns and class 15 nouns and class 15 infinitive verbs

The infinitive is similar to the inflected deverbal stem, in that its core morpheme is verbal. This present research has found out that both constructions can be attachment sites for any other class prefix. In other words, the inflected class 1 deverbal nouns and inflected class 15 infinitive nouns allow for the stacking of prefixes in the form of pre-prefixation. Consider the following examples,

[11] Class 1 deverbal nouns
class 15 nouns
(a) /zi-mu-famb-i/
   */zikufamb-a/
   CL.21.CL.1.SG-walk-fv
   ‘Big walker’
(b) /zi-mu-tƒat-i/
   */zikutƒat-a/
   CL.21.CL.1.SG.bride/groom-fv
   ‘The bride/groom’
The above pre-prefixed inflected deverbal noun comprises the class prefix /zi-/ and the inflected deverbal stem for example /mu-batsir-i/. The inflected deverbal stem /mu-batsir-i/ is in turn made up of the Inflected Verb Stem /-batsir-i/ and the nominaliser /-i/. Contrary to claims made by Mudzingwa (2010: 144) that unlike the inflected deverbal stem, inflected infinitive stems cannot be an attachment site for any other class prefix because it does not allow pre-prefixation, this study has observed that class 15 infinitive nouns cannot be pre-prefixed by */zi/ as shown in the above examples but pre-prefixing is permissible with diminutive prefix /ka-/ of class 12 for example;

[12] (a) ka-ku-bik-a a-ka
CL.12.SG. CL.15.cook.fv –sta.this
‘This type of cooking’

(b) ka-ku-d’g-a a-ka

The stacking of prefixes in deverbal nouns and infinitives shows that in addition to classifying the noun, the prefix qualifies the stem as it provides other additional semantic and descriptive information. Different class prefixes add different semantic and descriptive information to the noun (Mudzingwa and Kadenge, 2014). Therefore, when the diminutive noun prefix is added to class prefix of deverbal nouns and infinitives it plays a dual role of classifying the noun and qualifying the noun by giving additional information such as size or whether or not it is pejorative. The fact that the inflected deverbal stem and inflected infinitive stem can take class prefix, to become a pre-prefixed inflected deverbal noun stem and a pre-prefixed inflected infinitive stem, they are all referred to as prosodic stems.

**Verbal Extensions in Class 1**

**Deverbal Nouns and Class 15 Infinitive Verbs**

The research has also found out that the derivational stems of both deverbal and infinitive nouns are the same if we consider the application of verbal extensions. The derivational stem of these construction allow verbal extensions to be attached to them. Consider the following examples:

The above data show that the class 1 deverbal nouns and infinitives can take the same verbal extension and these verbal extensions have the same effect. The applied extension /-ir/- and causative extension /-is,-es,-dz/- are attached to both deverbal nouns and infinitives. This means that the

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**Table 2 Verbal extensions in class 1 deverbal nouns and class 15 infinitives.**

<table>
<thead>
<tr>
<th>/mu-tor-er-i/</th>
<th>The one who takes on behalf of someone</th>
<th>/ku-tor-er-a/</th>
<th>To take on behalf of someone</th>
</tr>
</thead>
<tbody>
<tr>
<td>/mu-famb-is-i/</td>
<td>The one who cause others to walk</td>
<td>/ku-famb-is-a/</td>
<td>To make others walk</td>
</tr>
<tr>
<td>/mu-rim-is-i/</td>
<td>The one who make others plough the land</td>
<td>/ku-rim-is-a/</td>
<td>To make others farm</td>
</tr>
<tr>
<td>/mu-pfek-edz-i/</td>
<td>The one who cause other people to put on clothes</td>
<td>/ku-pfek-edz-a/</td>
<td>To cause other people to put on clothes</td>
</tr>
<tr>
<td>/mu-sung-is-i/</td>
<td>The one who cause other people to be arrested</td>
<td>/ku-sung-is-a/</td>
<td>To cause other people to be arrested</td>
</tr>
</tbody>
</table>
The derivational stem of class 1 deverbal nouns and infinitives is the same. The structure of the derivational stem is illustrated in the following figure 3.4 (cf. Myers, 1990, Downing, 2000).

Reading Figure 3.4 from top to bottom, the Derivational stem comprises a verb root and verb extensions. The verbal extensional suffixes come immediately after the verb root in both class deverbal nouns and infinitives. More so, a closer analysis of data presented in table above shows that every class 1 deverbal noun is also found in class 15 as an infinitive noun. This shows that the deverbal nouns they are derived from verbal constructions and they basically refer to the person who does an activity and the class 15 infinitive nouns indicate the action that has been undertaken but without a time limit. However, a class 1 deverbal noun /mu-gadhijer-i/ has no class 15 infinitive noun counterpart. This might be a result of adoption since /mu-gadhijer-i/ has been adopted from English ‘jail guard’ and has been made to fit in the Shona vocabulary.

Hiatus Resolution in Class 1 Deverbal Nouns and Class 15 Infinitives

Hiatus resolution is used in this study as a diagnostic tool to illuminate the similarities between class 1 deverbal nouns and class 15 infinitives. Hiatus, a heterosyllabic sequence of adjacent vowels has been a subject of considerable empirical and theoretical discussion in Shona (Myers, 1987, Harford, 1997, Kadenge, 2010a, b, Mudzingwa, 2010, Mkanganwi, 2011, Mudzingwa and Kadenge, 2011, Mudzingwa, 2013). These researchers have concluded that Shona does not tolerate adjacent heterosyllabic vowels and vowel sequences may be subject to any one of several possible hiatus resolution strategies which include glide formation, vowel coalescence, secondary articulation, glide epenthesis and coalescence. In Shona, hiatus is resolved without exception and hiatus resolution strategies are meant to achieve the CV syllable structure of Shona. Mudzingwa (2010), Mudzingwa and Kadenge (2011), Simango and Kadenge (2014) and Kadenge and Simango (2014) have convincingly argued that hiatus resolution strategies operate in different morphosyntactic and phonological contexts. Therefore, this section seeks to examine the hiatus resolution strategy that is utilized in the class 1 deverbal nouns and class 15 infinitives in Shona, hence the hiatus resolution strategy that is utilized in these contexts is taken as evidence that show that class 1 deverbal nouns and class 15 infinitives have the same morpho-phonemic structure. This section utilizes OT (Prince and Smolensky, 1993; 2004) to analyze the resyllabification processes which are involved when hiatus is resolved in class 1 deverbal nouns and class 15 infinitives. Consider the following data;

The above data shows the morphosyntactic contexts in which spreading/glide epenthesis process takes place in Shona. The application of glide epenthesis/spreading as a hiatus resolution strategy in the above examples is conditioned by the verbal morpheme (verb root) in the deverbal noun and infinitive noun. This hiatus resolution strategy applies in the deverbal noun and infinitive nouns, hence patterning with the verbs which also have the verb root as the core morpheme. According to Mudzingwa (2010), Downing and Kadenge (2014) and Kadenge and Simango (2014), spreading or glide epenthesis is used to resolve hiatus across prosodic stem boundaries.
Spreading is where all or some of the features of the epenthetic segment are supplied by one of the input segments (Lombardi, 2002). Default segmentism is the opposite: it is where all the features of the epenthetic segment are inserted. Mudzingwa (2010: 149) notes, “Spreading is economical; all that the speaker does is spread features from a neighboring segment”. The major disadvantage of any form of spreading is the loss of bijectivity. Bijectivity refers to the unique one-to-one relationship between segment and feature is disrupted, as there is multi-linking: one feature is linked to more than one segment (consonant or vowel) (Mudzingwa, 2010; 2013). A constraint that bans such linkages is UNIQUE, which must be ranked below ONSET, in order to allow for spreading to repair hiatus.

(2) UNIQUE

\[ x, \text{ where } x \text{ is a feature or class node, } x \text{ must have a unique segmental anchor } y. \] (Benua, 1997)

Following, Mudzingwa (2010), this study argues that spreading is the preferred strategy at the Prosodic Stem edge. The default strategy, glide formation, is blocked by an alignment constraint that requires the left edges of the Prosodic Stem and the syllable to be aligned. This constraint is defined as follows:

(3) ALIGNL-PSTEM

The left edge of a Prosodic Stem must coincide with the left edge of a syllable (Mudzingwa, 2010:158)

This same constraint disqualifies secondary articulation, elision and coalescence because they have the same misalignment effect. Zezuru utilizes two hiatus-breakers, viz., \([j, w]\), and they can be best analyzed as products of spreading (Mudzingwa, 2010). These hiatus-breakers occur in complementary distribution.

**GLIDE /j/ EPENTHESIS**

Regardless of the quality of \(V_1\), when \(V_2\) is a coronal vowel, \([i]\) or \([e]\), the homorganic glide \([j]\) functions as a hiatus-breaker. Consider the following data:

<table>
<thead>
<tr>
<th>Underlying representation</th>
<th>Surface representation</th>
<th>gloss</th>
<th>Underlying representation</th>
<th>Surface representation</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/mutʃkairi/</td>
<td>[mutʃkairi]</td>
<td>The one who drives</td>
<td>/kutʃkaira/</td>
<td>[kutʃkaira]</td>
<td>To drive</td>
</tr>
<tr>
<td>/muimbi/</td>
<td>[muimbi]</td>
<td>The one who sings</td>
<td>/kuimba/</td>
<td>[kuimba]</td>
<td>To sing</td>
</tr>
<tr>
<td>/muendii/</td>
<td>[muendii]</td>
<td>The one who goes</td>
<td>/kuenda/</td>
<td>[kuenda]</td>
<td>To go</td>
</tr>
<tr>
<td>/muurai/</td>
<td>[muurai]</td>
<td>The one who kills</td>
<td>/kuuraja/</td>
<td>[kuuraja]</td>
<td>To kill</td>
</tr>
<tr>
<td>/muumbi/</td>
<td>[muumbi]</td>
<td>The one who makes claypots</td>
<td>/kuumba/</td>
<td>[kuumba]</td>
<td>To make clay pots</td>
</tr>
<tr>
<td>/muuji/</td>
<td>[muuji]</td>
<td>The one who comes</td>
<td>/kuuja/</td>
<td>[kuuja]</td>
<td>To come</td>
</tr>
</tbody>
</table>

Table 3: Glide epenthesis in class 1 deverbal and class 15 infinitive nouns
The above example illustrates that regardless of the quality of V₁, when V₂ is a coronal vowel, [i] or [e], the homorganic glide [j] functions as a hiatus-breaker. There is feature spreading, from a high vowel to the epenthetic root node on its immediate left. Glide epenthesis incurs a number of faithfulness violations. However, the output is more harmonious with an epenthetic glide.

This research assumes that [j] is a /i/ or /e/ in consonantal position. Furthermore, the research assumes that spreading can only be regressive, that is, that it comes from V₂ rather than from V₁. In the following tableau, the study analyzes the glide as a product of spreading from V₂. In the following tableau, the study analyzes the glide [J] as a product of spreading from V₂.

<table>
<thead>
<tr>
<th>/mu_je_ri/ ‘one who makes things the same’</th>
<th>ONSET</th>
<th>MAX-IO</th>
<th>UNIQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) [mu_je_ri]</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) [me_ri]</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>(c) [mu_je_ri]</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
Table 1 above shows that candidate (a) violates the ONSET constraint; this constraint does not allow the sequence of V₁ /u/ and the onsetless syllable /e/. The ONSET constraint also disallows the existence of the onsetless syllable /e/ to appear in the output. Candidate (b) which deletes the V₁ also violates the MAX-IIO. Shona favours candidate (c) although it violates UNIQUE; this constraint blocks the insertion of the unique segment /j/. The assumption from the discussion above is that a root node is inserted (to break up hiatus), which then takes on the features of the subsequent high vowel. This can be expressed as /ai/ → aCi → [aji], although the derivational appearance of the formulation is not truly meant to imply that there are multiple stages involved, the chosen candidate (d) must, therefore, be resyllabified to suit the required structure in Shona. Glide [j] epenthesis is inserted in the same morphosyntactic contexts in both class 1 deverbal nominals and class 15 infinitive nouns.

**GLIDE [w] EPENTHESIS**

In the context of a labial V₂ [u] or [o], the homorganic glide [w] is used as a hiatus-breaker. Consider the examples below:

In the above data, V₂ is a labial vowel [u] or [o]. The hiatus breaker employed is [w]. The research analyzes the glide [w] as a product of spreading from V₂. This is similar to the pattern observed for [j]. In both cases, the hiatus breaker and V₂ are homorganic. Gliding only occurs when the two vowels at the configuration boundary are different, whereas similar vowels coalesce. The glide only occurs when there are contiguous vowels and the glide, which is either [j] or /w/, must agree in rounding with the second of the vowels in the vowel sequence. The phenomenon is best understood as spreading of the [back] feature of the second vowel in hiatus to the first syllable node. This captures the fact that the value of the emergent glides depends completely on the backness specification of the trigger. One question that may arise from such an analysis is how other

<table>
<thead>
<tr>
<th>[14] CLASS 1 DEVERBAL NOUNS</th>
<th>CLASS 15 INFINITIVE NOUNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) [mu-won-i]</td>
<td>[ku.won-a]</td>
</tr>
<tr>
<td>CL.1.SG.see.NOM</td>
<td>CL.15.see.fv</td>
</tr>
<tr>
<td>‘One who sees’</td>
<td>‘to see’</td>
</tr>
<tr>
<td>(b) [mu-wongoror-i]</td>
<td>[ku-wongoror-a]</td>
</tr>
<tr>
<td>CL.1.SG.investigate-NOM</td>
<td>CL.15.investigate-fv</td>
</tr>
<tr>
<td>‘One who investigates’</td>
<td>‘to investigate’</td>
</tr>
<tr>
<td>(c) [mu-wuj-i]</td>
<td>[ku-wuj-a]</td>
</tr>
<tr>
<td>CL.1.SG.come.NOM</td>
<td>CL.15.come.fv</td>
</tr>
<tr>
<td>‘One who sees’</td>
<td>‘to come’</td>
</tr>
<tr>
<td>(d) [mu-wuk-i]</td>
<td>[ku-wuk-a]</td>
</tr>
<tr>
<td>CL.1.SG.prophesy-NOM</td>
<td>CL.15.prophesy-fv</td>
</tr>
<tr>
<td>‘The one who prophesy’</td>
<td>‘to prophesy’</td>
</tr>
</tbody>
</table>
necessary features for the resulting glides, such as [+high], [+sonorant] and [+continuant], are derived if only [a back] feature spreads. The interpolation of these features takes place in the phonetic component as in Japanese (Lombardi, 2002) wherein a vocalic [+back] that is directly dominated by a syllable node is interpreted as [w] and, similarly, [-back] as [j]. V₂, has the advantage of spreading within the same syllable—tautosyllabic spreading. In contrast, V₁ spreading (heterosyllabic spreading), has the demerit of linking features across a syllable boundary. A constraint that militates against spreading across a syllable boundary is CRISP EDGE σ which is defined as:

(4) CRISP EDGE σ
A syllable has fine edges (feature should not be shared across a syllable boundary (Itô and Mester, 1999:208).

In cases involving the high vowels [i] and [u], all the features are spread from the vowel. Such an analysis is in agreement with the assumption that glides and high vowels have the same structure as shown by the figure below:

![Figure 5: Root node spreading (Mudzingwa, 2013)](image)

We, analyse all spreading from vowels as involving the spreading of place features, namely, V place spreading. This means relativizing the constraint DEP to place features, V₂, [coronal] and [labial] in order to ban the insertion of place features. The constraint DEP (Place) is used as a cover constraint for (DEP [labial]; DEP [coronal]).

(5) DEP (PLACE)
A place feature in the output must have a correspondent (feature) in the input.

Consider the tableau 2:
Candidate (a) violates the undominated constraint ONSET. Candidate (b) violates DEP (Place). Candidate (c) and (d) violate CRISPEDGE and UNIQUE. Candidate (e) is the most harmonic candidate and violates the least ranked constraint UNIQUE.

The above discussion shows that the Shona class 1 deverbal nouns and class 15 infinitive nouns utilize the same hiatus resolution repair strategy which is glide epenthesis. Based on the similarities in Hiatus resolution strategies employed, the research may conclude that class one deverbal and class 15 infinitive nouns have a symmetrical morpho-phonological structure. In other words, the boundaries between a noun class prefix and a deverbal noun and those between a noun class and infinitive noun stem are the same.

<table>
<thead>
<tr>
<th>/ku₁u₂ka/ ‘prophesy’</th>
<th>ONSET</th>
<th>DEP (place)</th>
<th>CRISP EDGE σ</th>
<th>UNIQUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) [ku₁u₂ka]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) [ku₁?u₂ka]</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) [ku₁ju₂ka]</td>
<td>*!</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>(d) [ku₁ka]</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>(e) [ku₁wu₂ka]</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
Conclusion

This chapter has found out that the class 1 deverbal nouns and class 15 infinitives have an identical complex morphological structure because they display the morphological structure of a nominal and verbal construction. The major difference between these two construction is that deverbal nouns have a nominalising final vowel /-i/ or /-o/ where as the final vowel of class 15 infinitive nouns is /-a/. The other similarity between these constructions is in terms of their morpho- phonemic structure. The hiatus resolution strategy as a diagnostic tool has shown that hiatus that is created by morphological concatenation in both class 1 deverbal nouns and class 15 infinitives is resolved by the same strategy which is glide epenthesis. We recommend that there is need to use lexical phonology and morphology theory (Kipasky, 1982) examine the relationship between phonological and morphological word building processes. This is because the morphological and phonological interaction is partly responsible for the deletion and insertion of certain segments in a word.

References


