Nasal Assimilation in Shangwe Nasal-obstruent Clusters: An Optimality Theoretic Approach

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Abstract

The article investigates nasal-obstruent assimilation in Shangwe (a sub-dialect of the Korekore dialect cluster of the Shona language). Studies on the phonology of the Shona dialect (c.f. Fortune, 1972, 1980; Guthrie, 1948) cluster have tended to treat the behaviour of the nasal in sequences manifesting the pattern/NuOb/ as the same across the cluster. This article demonstrates that after Nasal-vowel deletion in Shangwe the nasal homorganically assimilates to the remaining obstruent that it precedes. Studies on the outstanding characteristics of the Shona dialect cluster have shown that the Shona dialect cluster has many idiosyncrasies. However no systematic and holistic study has been carried out on Shangwe. The research engages Optimality Theory (OT) to explore the nature of nasal- obstruent assimilation in Shangwe. Optimality Theory is used to account for the fact that differences in the ranking of universal constraints results in grammatical differences. The research is based on tape recorded interviews of Shangwe informants from Chief Nemangwe's area in Gokwe. The data was then transcribed and analysed.

Key words: Nasal- obstruent cluster, Assimilation, Dialect, Language varieties, Shangwe, Korekore, Shona, Optimality Theory

Introduction

This paper makes an Optimality theoretical (OT) approach to the exploration of the nasal- obstruent clusters[1] in Shangwe. Shangwe as a variety belongs to the Korekore dialect cluster, a group of dialects that Doke (1931a) refers to as

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[1]*Nasal- obstruent clusters refer to a group of adjacent sounds that constrains a nasal consonant followed by at least an oral consonant (Crystal, 1991).*

Northern Shona[2]. Doke (1931b), in his closer look at the phonetic features of the various Shona dialects, subdivides his data into Central Shona, which is Karanga, Zezuru, Manyika and Korekore and Eastern Shona, which is Ndau. Though Pongweni (1990) concedes that since Doke few have equalled, let alone surpassed his achievements, it should be appreciated that Doke does not make a detailed study of the individual sub- dialects. On top of that Pongweni (ibid) concedes that Shona dialects show great phonetic variation. The implication being that Shona dialects show much more intra-language variation than was originally captured by Doke (1931a) in his study of the Shona dialects. Shangwe as a sub- dialect is spoken in and around Gokwe, Guruve and Sanyati.

From a linguistic point of view, very little research has been carried out on the Korekore dialect cluster. This is a fact that can be partially explained by the history of literacy in Rhodesia. The missionaries through their efforts to come up with "Standard Shona orthography" had a considerable impact on the marginalisation of the Korekore dialect cluster. The history of Shona research and study can be historically traced to early missionary efforts in establishing schools around the country. Chimhundu (1992) observes that there were no missionary headquarters in the Korekore speaking area of Northern Zimbabwe. This negatively impacted on the study of the Korekore dialect cluster since the missionaries, as Chimhundu (ibid) notes, tended to concentrate on studying only those varieties that were immediately around their mission stations. It therefore followed that the missionaries who later formed a committee that worked with Doke in his unification efforts concentrated on only those varieties that they had carried out their researches on. This meant that during standardisation the Korekore dialect cluster was marginalised from the onset of the unification efforts. This is reinforced by Doke's (1931a) Recommendation Five (5), which states that Korekore words should be admitted 'sparingly' into the standard form. This can be attributed

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[2]*Shona is one of the national languages spoken in Zimbabwe. The five dialects of Shona are Korekore, Manyika, Karanga, Zezuru and Ndau.*

to either a lack of interest or an outright overlooking of this dialect cluster on Doke's part. The possibility of lack of interest can be captured from Doke's words as quoted by Herbert and Huffman (1994, p55) who say that,

> *...it is not our purpose to record all the dialects, or even languages, but to make reference to only the more important...*

However, debates can be raised on the meaning of 'important' in Doke's assertion. The implication is that Doke might not have seen the Korekore dialect cluster as having been of relevance in the formation of a standard Shona orthography. Obviously this greatly impacted on researches in Korekore dialect clusters and the general appreciation of Korekore and Shangwe. This perspective also negatively impacted on the research efforts on the Shona language.

Researches by Dembetembe (1974, 1987) on the Korekore dialect cluster merely focused on the syntax and morphology of "Three Korekore dialects" which are Chipuriro, Nyombwe and Urungwe and the Korekore verb. It is apparent from this that Dembetembe (ibid) only concentrated on syntax and morphology, while phonology as one of the important branches of linguistics is not explored. Still Shangwe as a variety is left out.

A number of scholars have conducted researches on the outstanding characteristics of a number of Shona dialects. Mkanganwi (2004) explored "The outstanding characteristics of Karanga", Mkanganwi (2004) examined the "Outstanding characteristics of Ndau" and Dembetembe (2004) worked on the "Outstanding characteristics of Korekore". Their studies enumerate those features they see as salient in the dialects they studied. Their works are also simply descriptive, without being informed by any particular theory. However, there are also researches on nasal assimilation in other Bantu languages. Ntlabezo (1998) worked on "Homorganic nasal assimilation in Xhosa", Nkuna (1998) examines "Tsonga nasal assimilation" from a feature geometrical approach and Radzhadzhi (2002) also did analyses of "Nasal assimilation and related process in Tshivenda". These works obviously show

different realisation of the nasal- obstruent clusters. As aptly noted by Mkanganwi (1975), nasal- obstruent clusters are not identical in the language group. This is further confirmed by Boersma, Dekkers and van de Weijer (2000, p1) who note that,

> *Many potentially universal statements about language are not always true: they are context- and language- dependent.*

These researches provide a basis and foundation on the understanding of nasal- obstruent clusters. However, most of these studies do not analyse nasal-obstruent clusters according to the provisions of Optimality Theory. Thus, carrying out dialectological researches from the provisions of this theory brings a new dimension.

Methods

The researchers employed a qualitative methodological approach in the study of nasal- obstruent clusters in Shangwe. Qualitative research provides information regarding individuals' values, beliefs, understandings, and interpretations at much greater detail compared to most quantitative research. Walliaman (2003, p227) rightly points out that 'subjective human feelings and emotions are difficult (or impossible) to quantify' and as such qualitative analytical methods account for 'soft' personal data. While this research will not be immersed in studying human feelings and emotions the crucial element is that it seeks to study human abilities which too are difficult to quantify hence the choice to have the qualitative method account for them. As this is an empirical study, the researchers employed empirical research designs, participatory paradigm and/ or working in situ (Mouton, 2001). Participatory paradigm or working in situ (working within the speech community) has the advantage of producing what Samarin (1967) calls a linguistically accurate corpus of data. This is definitely different from a case whereby informants will be isolated from their speech community and merely responding to what they will have been asked by the investigator. Working in situ or participatory paradigm has also the possibility of giving rise to the possibility of the

observance of some linguistic patterns and phenomena that will have been otherwise hard to pick had the investigator worked outside of the speech community. Taking after Crystal's (1991) view that if a language investigator is to carry out investigations in a relatively unknown variety, it is imperative that s/he records each and every sound, the researchers utilised a tape recorder to record what the informants said. The advantages of a tape recorder are well documented. From this, researchers collected data and made some generalisations on the nasal- obstruent clusters.

Researchers also employed a questionnaire to elicit the missing information on the generalisations. In drawing up the questionnaire, the researchers made use of an "Outline vocabulary for African languages" compiled by Malcom Gathrie (1948). This is a list of words that are frequently employed in everyday language use. This list of words helped in the provision of a large corpus of data that was used to illuminate the realisations of nasal- obstruent clusters in Shangwe. In coming up with this corpus, a purposive sampling method was used in the selection of informants. Considering that Gokwe area is inhabited by people who speak a number of varieties which include Ndebele, Tonga, Zezuru and Karanga, the researchers followed Samarin's (1967) recommendation that it is imperative for a language investigator to inquire from the community concerning those members who are most competent and proficient in the variety under investigation. Apart from that preference was also given to the older members of the speech community. This choice was made bearing in mind that most young speakers are likely to be school going where they are taught "standard Shona", which, as Jakaza (2012) points out, is predominantly Zezuru. Thus, there is the possible danger that the latter group of speakers will be heavily influenced by the Zezuru they are taught at school. This being the case, they may, consciously or unconsciously, give Zezuru data that they may mistakenly regard as Shangwe. Dembetembe (1974) adds another dimension to the possible implications of Zezuru on the young Shangwe speakers. He aptly notes a situation whereby young Shangwe speakers, because they are being taught that Zezuru is the "standard", despise their own 'language' and are in fact reluctant and ashamed of being identified with it, a situation that the investigators witnessed while staying in Gokwe.

Theoretical Foundations

The study is founded upon Optimality Theory (OT), a theory that "can be considered the single most important development in generative grammar" (Boersma, et al, 2000, p1). The theory significantly changed the approach in morph-phonological inquiry and is remarkable in bringing in a major shift in the way phonological analysis is carried out. It (OT) is a constraint based theory that postulates that a grammar can be characterised by ranking or ordering of a set of violable output (optimal) constrains. A constraint is a structural requirement that may be either satisfied or violated by an output form (Prince and Smolensky, 2004). Satisfacation of a constraint entails that the output form meets the structural requirements of the constraints. A violation, on the other hand, entails that an output form does not meet the structural requirements of the constraint. This assumption in OT is based on the 'formal correlate linguistic tendencies' exhibited in individual languages (Boersma, et al, 2000, p2). In McCarthy's (2002) words then, it is a theory of markedness. It makes a departure from the rule- based approaches. According to Gussenhoven and Jacobs (1998), a rule-based approach is the traditional approach whereby the phonological representation of a morpheme is changed in particular phonological contexts. For instance, the nasal consonant (N) changes in the environment of another consonant and becomes like that sound. This is exemplified in Katamba (1989, p126) by the homorganic nasal assimilation rules given below:

$$N \rightarrow \begin{matrix}[\pm ant]\\ [\pm cor]\\ [\pm back]\end{matrix} \Big/ \underline{\quad} \begin{matrix}[\pm ant]\\ [\pm cor]\\ [\pm back]\end{matrix}$$

Fig. 1: Homorganic nasal assimilation ruleIn a constraint based approach demands (constraints) are put on the surface forms. Any form that violates these constraints is dispreferred in favour of one that satisfies the constraints. However, it does not necessarily mean that a violation of a constraint results in a dispreferred output form (McCarthy, 2004) and only violating constraints do not lead to ungrammaticality as constraints are violable and strictly ranked

(Boersma, Dekkers and van de Weijer, 2000). An OT grammar, as it is given by Boersma, Dekkers and van de Weijer (2000), is given below:

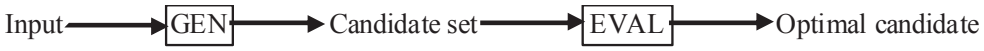

Fig. 2: OT grammar

What Figure 2 captures is that the starting point is the input; which are words in phonology and sentences in syntax. The Generator (**GEN) takes the input and generates the list of possible outputs or candidates.** The candidate set 'contains output structures' which are 'possible analysis for the input' (Boersma, et al, 2000). The candidate set is evaluated (**EVAL**) according to the rankings of the constraint inventory (**Con**) which is assumed to be universal. Constraint inventory (**Con**) constitutes of well- formedness constraints, faithfulness constraints, and feature identity constraints among others. An output form that do not violate, violate (*) lowly- ranked constraint or that do not fatally violate (*!) constraints is selected as the optimal candidate. This can be hypothetically exemplified below. Each asterisk (or star) represents one violation and an asterisk plus an exclamation mark indicates fatal violation. The point hand, which has been modified and adapted as -> because of typographical constraints, indicates the selected (optimal) form.

	CON_1	CON_2	CON_3
->A		*	*
B	*!		
C		**!	*
D		*	**!

Table 1: Candidate evaluation and selection

In table 1 above the candidate set with the output structures (A- D) are evaluated by ranked constraints CON_1 >> CON_2 >> CON_3 in this language. It can be observed that A is chosen as the optimal form. B is not selected because it has fatally violated (*!) the highest ranked constraint. However, though A and D violates (*) CON_2 C is not selected because it fatally violates (**!) this constraint. In the third and last constraint, $CON_{3,}$ D violates the constraint twice and the violation is fatal yet A violates the constraint only once showing why it is selected as the optimal candidate. Concrete examples showing constraint interaction and how candidates are selected as the optimal candidates are given in the following section as we will be analysing data from Shangwe. Taking from the theory's assumption that these constraint rankings define grammars of individual languages (Archangeli, 1997), it is our objective to define the nature of nasal- obstruent clusters in Shangwe.

Data analysis

The researchers are focusing on the phonological process that takes place after the deletion of the vowel segment /u/ found in the environment N-Obs whereby the nasal is a word initial segment and the segment that follows the vowel /u/ is an obstruent. This process, which usually happens in informal or fast speech, is by no means only peculiar to Shangwe. All the other Shona dialects manifest the same process. Consider examples 1 and 2 from Zezuru and Karanga, respectively:

1.	*Mukomana* 'boy'	*mkomana*
2.	*Mupako* 'lunch'	*mpako*

What is interesting to note from the examples above is the fact that after the vowel has been deleted the nasal does not change its place of articulation. It stays faithful to its place of articulation and is in no way affected by the place feature of the obstruent it precedes in the output form. This means that the general patterning in the other four Shona dialects is in such a way that after the vowel /u/ is deleted, the output form stays faithful to the input form in

so far as the place of articulation of the word-initial nasal segment is concerned. That is, faithfulness dominates phonological constraints in the four Shona dialects. More specifically IDENT (F) outranks phonological constraints such that the word-initial nasal consonant /m/ does not change its place feature and it stays labial regardless of the next obstruent that comes after it.

Shangwe presents a different kind of patterning to that exhibited in the other four Shona dialects. The word-initial nasal segment is affected by the place feature of the obstruent that it precedes. Consider the following Shangwe examples:

3.	*mukomana* 'boy'	*Kkomana*
4.	*musikana* 'girl'	*nsikana*
5.	*mupako* 'lunch'	*mpako*

The examples are typical of the phonological adjustments that input forms undergo in the Shangwe. They show that, in fast speech, the word-initial nasal is assimilating to the place of articulation feature of the obstruent that it precedes. This means that, for phonological reasons of articulatory economy, the word-initial nasal takes at the place feature of the obstruent so that both the nasal and the obstruent are articulated on the same place. From this process it is possible to postulate and formulate a constraint that demands the resultant word-initial nasal and obstruent segments to be articulated at the same place. This deviation from the input form is as a result of syntagmatic constraints which impose restriction on possible sound sequences, (Pulleyblank, 1997, p64). Such a group of constraints are generally referred to as IDENTICAL CLUSTER CONSTRAINTS. Identical cluster constraints are a group of constraints which place a high premium on homogeneity in adjacent segments. They can be manifested in four main ways. These are in terms of voicing (whereby adjacent segments must share the same voice feature), place (which demands the segments to be articulated at the same point), continuancy (which demands that the adjacent segments have the same specification on whether or not the airstream is totally stopped during their

articulation) and nasality (which demands that the segments are either all nasals or not). The Shangwe examples, given in (3) – (5) above, show that it is the place feature of the obstruent that takes precedence in defining the identity of segment clusters. As a result, it is IDENTICAL CLUSTER CONSTRAINT of place (henceforth referred to as ICC(PLACE) that is putting syntagmatic restriction in so far as the occurrence of the word-initial cluster after the deletion of the segment /u/. This means that it is the phonological constraint ICC(PLACE) which is ranked higher than faithfulness constraints in Shangwe. Since phonological adjustments in Shangwe entail both the deletion of the vowel segment and a subsequent change of place feature for the word-initial nasal it means that two particular faithfulness constraints are involved. Firstly, the grammar is allowing for phonological adjustments which entail the shortening of the input form. This means that MAX – IO is not highly ranked. MAX – IO is a faithfulness constraint that demands input segments to have corresponding ones in output forms. Thus, the deletion of segments is thus prohibited. Since, in the paper is specifically focusing on instances in which the vowel segment /u/ in fast speech, MAX-IO is realised as DEL-U. Secondly, the change of feature of the word-initial nasal to assimilate with the following obstruent also entails the low-ranking of IDENT(F). IDENT(F) demands that any specification for a feature of any segment in the input form must be preserved in its corresponding output form (Gussenhoven and Jacobs, 1998). Change of a feature is therefore prohibited.

Examples (3) – (5) above suggest the interaction of the three constraints in Shangwe grammar. The observable patterning in the above output forms in which the word-initial nasal assimilates the place feature of the following obstruent after the deletion of the /u/ in fast speech reveals a high-ranking of the markedness constraint ICC(PLACE) over the faithfulness constraints DEL-U and MAX-IO. Tableau 1 below accounts for how the nasal-obstruent clusters violate the faithfulness constraint IDENT(F) in order to respect the syntagmatic constraint ICC(PLACE). Tableau 1: ranking of ICC(PLACE) above IDENT(F)

/mukomana/	ICC(PLACE)	DEL-U	IDENT(F)
a. mukomana	*!	*	*
b. mkomana	*!		*
☞c. ?komana			*

From tableau 1 above, candidates (a) and (b) are non-optimal as they both fatally violate ICC(PLACE). Fatal violation of a constraint results from a violation of a highly-ranked constrained which then discounts it from selection as an optimal form. In fact, candidate (a) goes on to violate the other two constraints. This leaves candidate (c) as the optimal candidate due to the fact that it both violates the least number of constraints (one) and, most crucially, it does a better job of respecting the demands placed by ICC(PLACE). The same can be said of the output form /nsikana/ which can be accounted for by tableau 2 below:

Tableau 2: ranking of ICC(PLACE) above IDENT(F)

/musikana/	ICC(PLACE)obs	ICC(PLACE)nas	DEL-U	IDENT(F)
a. musikana	*!		*	*
b. mskana	*!			*
☞c. nsikana				*

What is important to appreciate from the data and analysis above is the fact that the assimilation of the place feature is regressive. That is, it is the obstruent that is influencing a change in the place feature of the nasal, which it precedes. This means that it is only the nasal that is changing in accordance to the place feature of the following obstruent segment. One cannot therefore expect, in Shangwe, the obstruent to take on the labial place feature of the word-initial nasal. Thus, the constraint ICC(PLACE) can be further specified on the basis of the segment that is determining the change of the place feature. The researchers thus distinguish two types of the constraint ICC(PLACE) – ICC(PLACE)nas and ICC(PLACE)obs. The former demands that it is the nasal

which determines the place feature of the cluster whilst it is the obstruent that determines the cluster feature. Since it is the obstruent that is causing the nasal to change its own place ICC(PLACE)obs outranks ICC(PLACE)nas. This is illustrated in tableau 3 below:

Tableau 3: ranking of ICC(PLACE)obs above ICC(PLACE)nas and IDENT(F)

/mukomana/	ICC(PLACE)obs	ICC(PLACE)nas	IDENT(F)	DEL-U
a. mukomana	*!	*		*
b. mkomana	*!	*		
c. ☞?komana		*	*	
d. mpomana	*!		*	

Candidates (a), (b) and (d) all fatally violate ICC(PLACE)obs. Candidate (a) is only satisfying the lowly-ranked IDENT(F) while violating the highly-ranked ICC(PLACE)obs. The cluster in candidate (b) is not homogeneous thereby violating the two ICC(PLACE) constraints. For candidate (d), it is the nasal which is determining the identity of the cluster thereby accounting for its fatal violation. Hence candidates (a), (b) and (d) are all discarded as non-optimal forms. Interestingly though, while candidate (d) seems to be respecting the syntagmatic requirement of homogeneity in the cluster, it is not chosen to be the optimal form. This can be accounted for by attending to the direction of the assimilation. The cluster might be exhibiting the same articulatory place feature but in this instance it is the nasal that is dictating the homogeneity. Thus, the segment /k/ in the input form changes to /p/ in response to the nasal /m/ such that both segments in the cluster become labial. However, the dominance of ICC(PLACE)OBS over ICC(PLACE)nas, means that it is candidate (c) that is selected as the optimal form as it is the obstruent and not the nasal that is giving the cluster its place identity. The cluster then becomes dorsal instead of labial.

Another interesting feature of nasal-obstruent cluster assimilation in Shangwe is the observable fact that it does not seem to matter whether the word

undergoing this phonological process is made up of only two syllables. Consider the examples below:

	Zezuru	*Shangwe*
6. *muti 'tree'*	*muti*	*nti*
7. *musha 'home'*	*musha*	*nsha*

Examples (6) and (7) above show the realisation of the same process in disyllabic words in both Zezuru and Shangwe. In the former, the deletion of /u/ does not take place whilst in the Shangwe instance the process does. This suggests that, in Zezuru, the deletion of the vowel segment /u/ in fast speech is governed by the length of the word. That is, deletion of /u/ does not take place in disyllabic words. The word has to have at least three syllables for segment deletion to take place. The researchers suggest that if deletion of the vowel /u/ is allowed to take place the resultant word will be made up of only one syllable. For example, /muti/ and /musha/ would be realised as monosyllabic /*nti/ and /*nsha/, respectively. However, this is not the case in Shangwe whereby deletion of the vowel /u/ takes place even in disyllabic words. This, therefore, means that in Shangwe it does not matter how short the word is. The deletion of /u/ is not constrained by the length of the word. It really does not matter whether the word is disyllabic or not. The researchers, following Harford (1999) propose the constraint MINPW which places demands on the length of words in surface forms. MINPW is used by the researchers to account for the realisations of monosyllabic optimal forms in Shangwe as opposed to Zezuru. This is as a result of the fact that Shangwe ranks MINPW lower than ICC(PLACE)obs as captured by tableau 4 below:

Tableau 4: ranking of ICC(PLACE)obs above ICC(PLACE)nas and IDENT(F)

/musha/	ICC(PLACE)obs	MINPW	IDENT(F)	DEL-U
a. musha	*!			*
b. msha	*!	*		
☞c. nsha		*	*	

Candidate (c) is chosen as the optimal form regardless of the fact that it violates MINPW. Candidate (a) does not violate this constraint but it crucially fails to observe ICC(PLACE)obs. Candidate (b) both violates MINPW and, most importantly, fatally violates ICC(PLACE)obs.

Conclusion

The paper set out to discuss the realisation of nasal-obstruent clusters formulated as a direct result of the deletion of the syllable-initial vowel /u/ . It was revealed that whilst in Zezuru there is only the deletion of the vowel /u/, in Shangwe the resulting nasal-obstruent cluster in the output form has to be homorganic to the place feature of the obstruent in the cluster. It was also revealed that the process of vowel deletion is not restricted by the length of the word in Shangwe. It was shown that these processes of homorganic assimilation in the nasal-obstruent cluster as well as the subsequent reduction in the length of the word are as a result of the high-ranking of ICC(PLACE)obs ahead of MINPW in Shangwe. This means that the grammars of Zezuru and Shangwe are different thereby implying that acquirers of the two dialects have two distinct constraint rankings.

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