JĘZYKOZNAWSTWO

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OPTIMALITY-THEORETIC APPROACH
TO THE SYLLABLE IN LARDIL

The aim of the present study is to examine selected aspects of the phonology of Lardil with the use of Optimality Theory (OT) pertaining to the syllable structure. Lardil, also known as Kunana, Ladil, Laierdila or Lardill, is the language used by fifty four speakers (mostly semi-speakers) of Mornington Island, located in the state of Queensland, Australia. This particular language has been chosen for the analysis as it undergoes a number of interesting phonological processes. While some of these processes can be explained by employing the OT mechanisms, others seem to indicate that this theory still lacks in providing exhaustive explanation of linguistic phenomena and thus should be expanded and/or modified. The datasets that are analysed have been extracted from the Lardil dictionary[1] and illustrate a number of characteristics of this nearly extinct aboriginal language of Northern Australia.

The rudiments of Optimality Theory

The theoretical framework used for the present analysis is Optimality Theory that is a constraint-based mapping. The major sources for the theory are Prince and

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1 Ken Hale, Ngakulmungan Kangka Leman, *Lardil dictionary: a vocabulary of the language of the Lardil people, Mornington Island, Gulf of Carpentaria, Queensland: with English-Lardil finder list* (Gununa, Queensland: Mornington Shire Council, 1997).

Smolensky[2], and McCarthy and Prince.[3] Let us use, however, Hammond's proposal[4] as the base for a very concise, though simplistic, overview of the constraint tableau.

Table 1

/input/	Constraint1	Constraint2
Output1		*
Output2	*!	

A pairing of underlying and surface forms is to be found to the left of the tableau. The *input* being the underlying form of the morpheme is always given in the slashes / / in the upper left corner. The surface forms, i.e. different possible outputs 1, 2, …, are to be found below the input, again to the left of the table. The constraints that are relevant for the analysis are given in the headings of the remaining columns (*Constraint1 Constraint2*) and are generated by 'Gen'. An asterisk (*) is used to indicate a constraint violation, an exclamation mark shows a crucial violation whereas the pointing finger/hand indicates the winning candidate.

For each underlying representation a number of output candidates are generated. These candidates are then evaluated by a choice of output constraints. Not all the constraints need to be satisfied. It should be borne in mind, however, that although the constraints are indeed violable, we would expect the winning (optimal) candidate to violate a minimal number of constraints, necessarily most low-ranked (i.e. this one which is placed to the right side of the chart.

Minimal word in Lardil

The minimal word in Lardil is bisyllabic[5] and each syllable requires an onset (a vowel peak). Therefore, Lardil accepts only the following pattern of a word/syllable: CV(C). CV(C). Consider the following tableaux presenting words *river* and *sea* respectively:

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2 Alan Prince, Paul Smolensky, *Optimality Theory: Constraint interaction in generative grammar. Technical Report No.2* (New Brunswick, 1993).

3 John McCarthy, Alan Prince, "Prosodic morphology", in: *Constraint interaction and satisfaction. Rutgers Technical Report TR-3* (New Brunswick, 1993).

4 Michael Hammond, *The phonology of English: A prosodic optimality-theoretic approach* (Oxford: Oxford University Press, 2003).

5 Ken Hale, "Deep and surface canonical disparities in relation to analysis and change: an Australian example", *Current Trends in Linguistics* 11 (1973), 412.

Table 2

/ketar/ + in	ONSET	MAXI-O
ke.ta.r-in		
ke.ta.-in	*!	*

Table 3

/mela/ +in	ONSET	MAXI-O
me.la.-in	*!	
me.la-n		*

We must bring in two constraints: ONSET i.e. all syllables must have onsets and MAXI-O i.e. the correspondence between the input and the output which defines that we are not allowed to delete anything from the input in order to form the output. It is important to keep the ranking of these constraints as the following: ONSET>>MAXI-O, whereby the ONSET constraint is more important to be satisfied than the MAXI-O constraint. Thus, we do not yield a complex structure of two consecutive vowels (e.g. *mela-in) which is disallowed in Lardil on the same grounds as a two-consonant cluster in a tautosyllabic environment. This is governed by a constraint which does not yet have to be introduced here, namely *COMPLEX. In the light of the tableaux above, it can be observed that the most important condition here is to obtain an onset even at the cost of deleting (or unparsing) a vowel, which would eventually violate the most highly ranked constraint. The vowel can be not parsed also owing to the fact that even if the word is devoid of it, it remains within the minimal word requirement of two moras as in Lardil only vowels are recognized as moraic.

At this point it is necessary to introduce another constraint operative in this language: CodaCond. This constraint limits the consonants which can be found in the codas of Lardil. In Lardil they may be either [-distributed] coronals or placeless nasals. According to the analysis in the tableaux below one can observe that CodaCond must be superior to all other constraints so that the coda consonant yielded is correct according to the phonology of Lardil. However, it should be mentioned that one may have to introduce another constraint FAITHOBSTR (an element that is an obstruent in the input remains an obstruent in the output; we probably need not add that a given obstruent must be [–distributed] as this is yielded by the CodaCond constraint). This constraint would prevent the output from having a final consonant that is not in concordance with the one found in the input. It will also favour the candidate that is, indeed, the one that is the uninflected nominative form of the given word. This is in order for candidates (especially the optimal candidate) to be as faithful to the input as possible.

Table 4

/jaɻpuṯ/	CodaCond	FAITHOBSTR	MAXI-O
/jaɻ.put/			*
/jaɻ.putj/	*!		*
/jaɻ.puṯ/	*!		
/jaɻ.pun/		*!	*

Table 5

/ŋam.piṯ/	CodaCond	FAITHOBSTR	MAXI-O
/ŋam.pit/			*
/ŋam.pij/	*!		*
/ŋam.piṯ/	*!		
/ŋam.pil/		*!	*

Table 6

/kal.tjiṯ/	CodaCond	FAITHOBSTR	MAXI-O
/kal.tjit/			*
/kal.tjiṯ/	*!		*
/kal.tjitj/	*!		
/kal.tjil/		*!	*

When one wants to obtain an uninflected nominative form from a future accusative and when the stem has 3 vowels (syllables), this will involve unparsing of the word-final vowel (see tableau for /jalulu/). One can observe that in this case it is favourable not to parse the final vowel rather than keep faithful to the output. However, in the previous example we were confronted with word, indeed, ending in vowels. This was possible due to the following ranking of constraints: BimorMin >>*VWORD>>MAXI-O. BimorMin stands for 'words must be minimally bimoraic' and *VWORDstands for 'words must not end in vowels'. Since we know that in the phonology of Lardil only vowels are moraic (short vowels carry one mora and long vowels carry two), it is indispensable for a word to have at least two vowels to constitute a minimal word in that language. To meet this requirement, we must place the BimorMin above any other constraints. Having done so, exempts us from the obligation to unparse the word final vowel in an example with the word /kela/:

Table 7

/jalulu/	*VWORD	CodaCond	ONSET	MAXI-O
ja.lul				*
ja.lu.lu	*!			

Table 8

/kela/	BIMORMIN	*V$_{WORD}$	CODACOND	ONSET	MAX$_{I-O}$
/ke.la/		*			
/kel/	*!				*

Table 9

/wanka/	BIMORMIN	*V$_{WORD}$	CODACOND	ONSET	MAX$_{I-O}$
/wan.ka/		*			
/wank/	*!		*		*

The word /kantukantu/ (red) will be given here as an example for the analysis of longer lexical items. If we accept the ranking from the previous set, we are bound to yield an output of /kantukant/ which CodaConddoes not seem to resolve. Therefore, it could be suggested that another constraint be introduced: *Complex. This would disallow any word-final consonant clusters and favour the candidate we are aiming at. By and large, it could also be claimed that the previously mentioned constraint CodaCond is amended and expanded. Not only could it limit which consonants can be found in the coda, but it could also state that there can only be one such consonant there. Under such circumstances the second tableau seems more appropriate.

Table 10

/kantukantu/	*Complex	BimorMin	*VWORD	CodaCond	ONSET	MAXI-O
kan.tu.kan						*
kan.tu.kan.tu			*!			
kan.tu.kant	*!					*

Table 11

/kantukantu/	BIMORMIN	*V$_{WORD}$	CODACOND	ONSET	MAX$_{I-O}$
kan.tu.kan					*
kan.tu.kan.tu		*!			
kan.tu.kant			*!		*

If we take the word for a 'wooden axe' /muŋkumuŋku/, it seems we yield two winning candidates that are very much different – one of them being the full form derived from a non-future accusative by removing the inflection marker, the other one having all unnecessary/impermissible segments deleted (unparsed).

Table 12

/muŋkumuŋku/	BimorMin	*VWORD	CodaCond	ONSET	MAXI-O
muŋ.ku.mu<ŋ.ku>		*?			***
muŋ.ku.muŋ.ku		*			
muŋ.ku.muŋk<u>			*!		*
muŋ.ku.muŋ<ku>			*!		**

An analysis of another example, /puʈuka/, leads us to a situation where a wrong candidate wins, even though it ends in a dorsal segment which is not allowed in the coda position.

Table 13

/puʈuka/	BimorMin	*VWORD	CodaCond	ONSET	MAXI-O
/puʈuka/		*			
/puʈuk/			*		*
/puʈu/		*			*
/puʈ/	*				*

As for the third and last example taken here to prove the inaccuracy of the rankings, it is worth looking at the word /ŋawuŋawu/.

Table 14

/ŋawuŋawu/	BimorMin	*VWORD	CodaCond	ONSET	MAXI-O
/ŋa.wu.ŋa.wu/		*			
/ŋa.wu.ŋaw/			*		*
/ŋa.wu.ŋa/		*			**
/ŋa.wuŋ/					***

In this case, the winning candidate is /ŋawuŋ/ which is perfectly all right with the coda requirements, nevertheless does not match the real life language situation. One could also try experimenting with a constraint pertaining to parsing/unparsing of certain elements which might help to yield slightly better outputs. However, it

seems that reranking constraints or adding some new ones does not help at all. In the above, what has been shown is a more orthodox approach to the OT. As it is a non-derivational approach, it does not allow us to yield a candidate that we would like to. This, as a result, brings us to a point where a need for further OT developments arises. The theory, as used in this study, seems to be lacking in some elements that could form substitutes for certain aspects of derivational phonology. In the very last data sets presented here, we confronted successive rule application that could not be carried out due to the underdevelopment of the theory. We could not have any kinds of intermediate levels that would allow us to move from one output to another via an in-between stage. Moreover, we could not see any history of the output – OT makes it a one-step process and so there is not any break-up of encoded processes involved.

Conclusions

Having provided a number of Optimality Theoretic analyses above, one can observe that this framework can explain a number of phonological features of Lardil. The minimal word in Lardil must always have an onset and this can be yielded by ranking the constraint ONSET (all syllables must have onsets) to the very left of our constraint scale. With regard to permissible codas, CodaCondition was employed as it allows yielding only such candidates which contain segments such as [-distributed] coronals or placeless nasals that are the only phonemes allowed in this position within the syllable. Moreover, as presented in the tableaux above, the phonology of Lardil makes use of yet another constraint that allows yielding words that are minimally bimoraic. Such a constraint always takes priority over any other so that the output candidates will comprise two short vowels. Nevertheless, the last three items have displayed a number of probems with Optimality Theoretic analyses of Lardil. First of all, as seen in the example of /muŋkumuŋku/, an OT approach yields two candidates based on the ranking that worked for previous candidates. In the case of /puʈuka/, the winning candidate is not the surfacing representation that the language tends to use on a regular basis. Finally, /ŋawuŋawu/ is yet another example where the winning candidate does not correspond to what users of Lardil would produce as their target forms. Taking all of the above into consideration, one may observe that although Optimality Theory leads to yielding a number of outputs that are, indeed, used in Lardil, it may also give some wrong candidates a priority over the ones which are produced in actual, everyday utterances. All in all, Optimality Theory still needs to be verified and expanded as it may not explain all the phonological processes we encounter in the languages of the world.

References

Ethnologue. Accessed 21.10.2017. https://www.ethnologue.com/language/lbz.

Hale, Ken. "Deep and surface canonical disparities in relation to analysis and change: an Australian example". *Current Trends in Linguistics* 11 (1973): 408–458.

Hale, Ken, Ngakulmungan Kangka Leman. *Lardil dictionary: a vocabulary of the language of the Lardil people, Mornington Island, Gulf of Carpentaria, Queensland: with English-Lardil finder list*. Gununa, Queensland: Mornington Shire Council, 1997.

Hammond, Michael. *The phonology of English: A prosodic optimality-theoretic approach*. Oxford: Oxford Univeristy Press, 2003.

McCarthy, John, Alan Prince. "Prosodic morphology". In: *Constraint interaction and satisfaction. Rutgers Technical Report TR-3*. New Brunswick: 1993.

Prince, Alan, Paul Smolensky. *Optimality Theory: Constraint interaction in generative grammar. Technical Report No.*2. New Brunswick: 1993.

Abstract

The aim of the study is to examine the structure of the syllable in Lardil, a North Australian language, in order to yield possible clusters as well as the minimal word in this language, based on data sets collected from the Lardil dictionary by Ken Hale. The methodology framework used for this study is Optimality Theory whose constraint-based mapping is employed to explain a number of phonological processes that this language undergoes, such as deleting impermissible segments, creating words that are bimoraic or syllables that end in permissible codas, i.e. comprising of [-distributed] obstruents. The results of the study show that Optimality Theory is not always successful at yielding candidates that the speakers of Lardil would produce and hence have displayed a number of problems with an Optimality-theoretic analysis of Lardil. The study shows that in certain cases the winning candidates are not the phonological realizations that everyday users of Lardil would produce themselves. Finally, in the analysis there have also been cases where there are two (contradicting) winning candidates. The conclusions prove that Optimality Theory is yet to be expanded and modified as the case of Lardil shows that it may lead to yielding candidates that are non-existent in a language.

Keywords: syllable, optimality theory, Lardil

SYLABA W JĘZYKU LARDIL W UJĘCIU TEORII OPTYMALNOŚCI

Abstrakt

Celem opisanych w artykule badań jest analiza sylaby w języku lardil, używanym przez mieszkańców północnej Australii, aby wykazać, jak wygląda struktura możliwych zbitek spółgłoskowych, jak również minimalne słowo w tym języku. Dane poddane analizie pochodzą ze słownika języka lardil przygotowanego przez Kena Hale. Metodologia badań odwołuje się do teorii optymalności, która poprzez zastosowanie rankingu ograniczeń wyjaśnia szereg procesów fonologicznych, które mają miejsce w języku. Procesy, które są analizowane w artykule to, m.in., tworzenie słów posiadających dwie mory lub redukcja takich spółgłosek w wygłosie sylaby, które nie spełniają zasad fonotaktyki języka lardil. Wyniki badań pokazują, że teoria optymalności nie zawsze w sposób adekwatny wyjaśnia działanie procesów fonologicznych w języku lardil. W badaniu napotkano zjawiska fonologiczne, które w wyniku analizy z zastosowaniem teorii optymalności, nie pozwalają sformułować jednoznacznej odpowiedzi jeśli chodzi o tzw. „kandydatów wygrywających". W kilku przypadkach zastosowana teoria udowadniała, że w języku lardil obowiązującą realizację fonologiczną stanowi „kandydat", który jest niezgodny z formą stosowaną przez rodzimych użytkowników tego języka. W innych przypadkach zaobserwowano, że teoria optymalności wskazuje na dwie przeciwstawne formy, które powinny obowiązywać w tym języku, podczas gdy rodzimi użytkownicy języka (biorąc za podstawę słownik języka lardil) stosują tylko jedną z tych realizacji fonologicznych. Wniosek z przeprowadzanego badania skłania do dalszych prac nad teorią optymalności polegającą na rozbudowie i/lub modyfikacji jej fundamentalnych zasad tak, aby mogła mieć zastosowanie do analizy szerszej liczby języków świata.

Słowa kluczowe: sylaba, teoria optymalności, lardil