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Analysis of Vanduul phonology

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ABSTRACT: This paper investigates the sound system of the fictional Vanduul language invented by Britton Watkins for the Star Citizen computer game. At the moment, there is no clear understanding about the language and there seems to be a need for more information among those who admire the game. The Vanduul phonology is reconstructed from Vanduul dialogue in a Youtube video using phonetic transcription and analysis. The phonological analysis discusses consonants, vowels, stress, phoneme frequencies and other features. Phonotactics and syllable structure are also analyzed. This paper offers a holistic interpretation of Vanduul phonology based on the findings.
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INTRODUCTION

ALTHOUGH CONFIRMED to be a real goal, little is know about the fictional Vanduul language from the Star Citizen computer game. Star Citizen is a space simulation game with a back story involving various alien cultures. Squadron 42 is a story-based single-player campaign which will include dialogue in the alien languages. A funding goal during the crowdfunding campaign states that there will be "distinctive and realistic alien languages", including the Vanduul language [1, 2].

The Vanduul are an alien species in the game's fictional universe. They are described as meritocratic and living in clans led by a chieftain [3]. Vanduul communication has at least three components: spoken words, sings for emphasis and bioluminescent color change based on mood [4]. This research concerns with the spoken language.

When it comes to phonetics, i.e. how the sounds are produced by individual Vanduul, it is clear that their mouth structure differs from that of the humans. In practice the actors speaking the words themselves are human.

What we must assume is that the created language approximates the phonetic capabilities of Vanduul physiology.

This research discusses the phonological properties of the language. It is in the interest of many players to understand the fictional alien cultures in the game. The goal is to reconstruct the phonological inventory of the language using the few sources that exist at this time, so that there is a reference point for those who are interested in Vanduul culture.

A satisfying reconstruction can be reached by using phonetic transcription and analysis [5]. Without much context we aim for a systematic transcription but acknowledge that with the material at hand there is room for error. This paper takes a broad and simple transcription approach because the goal is to get a general understanding about the phonology. Some discussion is devoted to the possible allophones. One last caveat about transcriber bias: the languages known by the listener might always affect the outcome of transcription.

This paper presents some background information, then shows the corpus and finally the phonological analysis and the obtained phonemic inventory.

KNOWN CORPUS

The Vanduul language was created for the game by constructed language hobbyist and professional Britton Watkins [6, 7], but there is very little information available about the actual language. Below are the few sources that I was able to find.

Writer's guide

The Writer's guide [3] gives us the pronunciation of the name Vanduul as /Van-DOOL/. This English pronunciation instruction would be [vænˈduːl] with stress on the second syllable, much like the word "shampoo". It is not known if the name itself is a word in the Vanduul language, although the ortography (⟨uu⟩ for [uː]) suggests that the word is not quite English either. For the uncertainty, I have not included this word in the analysis.

Youtube video

The analysis will focus on the Youtube video [4] that goes behind the scenes of Squadron 42 motion capture production. In the video actors Andy Serkis and Patrice Maiambana play their roles as the main antagonist *Thul'Óqquray* and the leader of the clan *Óqquray*. Although the video focuses on the motion capture, it also contains some Vanduul dialogue.

This video is the only available source about the pronunciation of the Vanduul language. However, we should be aware of the possible inaccurate pronunciation by the actors. In addition, we cannot be sure that the different

takes are official material because some of them might be changed or cut out of the final game.

In addition to the video itself, the names of the characters are given in Latin letter, which gives a hint about the ortography of the language.

Below, I have transcribed the Vanduul utterances from the video in International Phonetic Alphabet [8] with timestamps, speakers' names and a description about the scene.

3:00–3:03 Óqquray speaks as both characters look at the same direction.

['kurae ʃal'juveː]

It is not clear whether the syllable [ʃal] is an independent word or part of the following word.

3:03–3:08 Thul'Óqquray makes a circle from top to bottom with both hands and then turns to the other character. During the last word he points at himself with the right hand and then opens the hand towards the other character.

[ʒa'laθ ʔaq'qaθːonː 'minːaːː]

The last long [aː] is extra long has a creaky quality to it but I would suspect it is for dramatic purposes only.

3:28–3:32 Patrice Maiambana (Óqquray) is interviewed and he speaks in another language than English.

[iweːhahːihːohʃdavoːhpunahdoh]

I suspect this is just a humoristic impression of the language by the actor. The length of the continuous utterance is not in line with the other examples. This is also the only utterance with sounds [h] and [w]. For these reason, I have not included this line in the analysis.

3:38–3:42 Óqquray turns towards Thul'Óqquray and extends his left hand palm open.

['kai 'fisad 'jusa 'kujamˌlaχ↗nuːː]

Again, the last vowel is extra long and has a rising tone.

3:54–3:58 Thul'Óqquray looks up, speaks in a harsh tone and takes something from his side and tosses it to the ground.

[χeχoːldaː'vednaːː]

The vowel lengths are a bit dubious here. If the language has phonemic length, then these could be long but if not, then we just hear allophones. The last vowel is again extra long.

PHONOLOGY

It is quite straightforward to collect the different phonemes from the examples. As stated above, the humoristic impression is not included in the analysis. Phonemes [f], [ʃ], [ʒ] and [r] appear only once in the analyzed corpus. The sole glottal stop [ʔ] is at the beginning of a word before a vowel and is considered non-phonemic.

Consonants

	labial	alveoral	palatal	velar	uvular
stops		d		k	q
fricatives	f v	θ			χ
sibilants		s	ʃ ʒ		
nasals	m	n			
trill		r			
lateral appr.		l			
approximants			j		

Table 1: Consonant phonemes with IPA symbols.

Table 1 shows the 15 identified consonants. It is clear that the language does not have many stops as it lacks labial stops and unvoiced alveoral stop. However, the velar [k] and uvular [q] stops are unvoiced, which might suggest that the voicing of the alveoral stop [d] is allophonic. What is clear is the abundance of fricatives and sibilant fricatives. Most of the fricatives are unvoiced but the voiced ones [v], [ʒ] have unvoiced counterparts [f] and [ʃ]. The lack of velar fricative is raises doubts but it is also possible that the velar articulation is just allophonic to the uvular, although the uvular is probably attested in Latin ortography. There are two nasals but they might probably have velar allophonic variants. The trill sound [r] is very clearly pronounced in the source material. Lastly, the approximant sound [j] might just be a variation of the vowel sound [i]. At least three geminate consonants can be found, [qː], [θː] and [nː].

Vowels

Table 2 shows the vowels. This is the common five-vowel setup found in many natural languages. It seems that length is a phonemic feature, prob-

	front	back
close	i	u uː
mid	e eː	o oː
open	a aː	

Table 2: Vowel phonemes with IPA symbols.

ably indicated by acute accent in ortography, as seen in ⟨Óqquray⟩. There is no long [iː] in the corpus, but its existence has support since all the other vowels also have long counterparts. In addition to these, the diphthongs [ai] and [ae] can be heard in the dialogue. However, they might represent the same diphthong. We hear both of them in the dialogue and the ortography examples have ⟨ay⟩, which probably is the same diphthong.

Stress

Most of the words (6) are stressed on the first syllable. Penultimate (3 not counting if already counted as first) is also a possible place for stress. Only one multisyllabic word, [ʒaˈlaθ], is stressed on the last syllable. No clear rule can be formulated because, e.g., [ˈfisad] has similar syllable structure. There might be more support for penultimate stress for words with three or more syllables.

Phoneme frequencies

phoneme	a	n	u	l	aː	e	i	d	k	θ	χ	j
frequency	11	6	4	4	3	3	3	3	3	3	3	3

phoneme	q	v	s	m	o	eː	oː	uː	f	ʃ	ʒ	r
frequency	2	2	2	2	1	1	1	1	1	1	1	1

Table 3: Phoneme frequencies.

Table 3 shows how many times each of the identified phonemes appear in the corpus. Short and long vowels are treated independently but dipthongs not. Geminate consonants are counted as double. Clearly [a] is the most common phoneme and it gives the language a vowel-rich feel, followed by [n], which gets high ranking for the gemination in the corpus.The distribution of phonemes seems to follow a natural language distribution with few common phonemes and a long tail [9]. The vowel-to-consonant ratio is 28:37, or about 43:57.

Other features

It is unsure what the extra long vowels at the end of the utterances mean. My guess is that the creaky voice and rising tone are pragmatic markers. One possible purpose of the extra long vowel could be to mark the end of a prosodic unit.

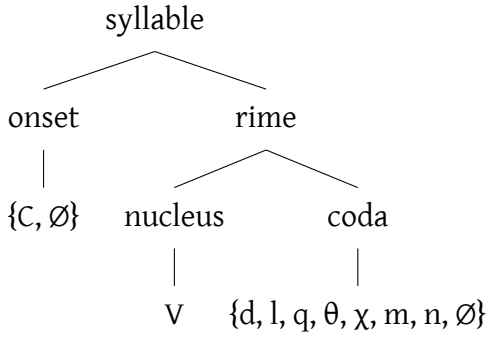
PHONOTACTICS

Syllable structure

There are two basic syllable structures CV and CVC (where C is a consonant and V is a vowel). In addition, one syllable is of the VC type with zero onset.

All the consonants can appear in the onset. In addition, the glottal stop [ʔ] may occur with zero onset when the word begins with a vowel. There seem to be no initial consonant clusters.The nucleus of a syllable consists of a vowel, long vowel or a diphthong. The coda seems to be optional. Acceptable coda consonants are [d], [l] (both twice) and [q], [θ], [χ], [m], [n]. Figure 1 shows the inferred syllable structure as a tree, where C is any consonant, V is any vowel and Ø means that this branch may be left empty.

Figure 1: Syllable structure.



Beginning of a word

The only vowel at the beginning of a word is [a]. It is not known whether the preceding glottal stop in phonemic, but I assume it is not. If we take into account the name ⟨Óqquray⟩, the we have also word-intial [o] or [oː].

Word-initial consonants are [k] (three times), [f], [ʃ], [ʒ], [χ], [m] and [j]. There could be another [j] if [juveː] is considered an independent word and [l] if [laχnuː]. It is curious that no alveoral phonemes appear at the beginning of a word. However, if we accept ⟨Thul'Óqquray⟩, then an intial [θ] is quite evident. All the articulation places covered, it might be safe to assume that any consonant can begin a word.

Medial clusters

Medial clusters in the corpus are [lj] (possibly), [ld], [ml], [χn], [dn]. In all the cases either [l] or a nasal sound is involved. One possible rule could be that clusters of the form lC, Cl and Cn are permitted.

Geminate [qː], [θː], [nː] also occur. Here we have stop, fricative and nasal gemination in alveoral and uvular places, so this phenomenon may be widely occurring in the language.

End of a word

Most of the words end in a vowel. The attested vowels are [a], [aː] (twice), [ae], [ai], [eː] and [uː]. Only [o] is missing, but it might be safe to assume that all the vowels can occur at the end of a word. If ⟨Óqquray⟩ is taken into account, we probably have another word-final [ai].

Only consonants that occur in word-final position are [d], [θ] and [n]. Perhaps the other alveoral consonants are also permitted in the final position. If we accept [ʃal] as an individual word, [l] would fit in this framework.

CONCLUSION

This paper presented a preliminary phonological analysis of the Vanduul language, which should be useful to anyone interested in the fictional universe of Star Citizen. We have now a basis upon which to build our knowledge about the Vanduul language in the future. The reconstructed phonology is one possible interpretation from the material that is available, and the small corpus is not comprehensive enough for a definitive analysis. In the future, we will probably get more material to work with and a guide directly from the creator of the language.

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