Coda Condition in the Buginese Language Based on Loanword Adaptation

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*The study of loanwords is an important aspect in the field of linguistics for understanding the interaction processes between different languages. Therefore, based on Optimality Theory (OT), there is a set of constraint hierarchies that must be adhered to ensure that loanwords can be assimilated. However, this raises a problem because the collision of these two languages in the analysis of OT would violate one of its fundamental principles, namely Parallelism. Hence, this study aims to identify the causes of the adaptation process in Buginese loanwords and analyze the loanword adaptation process in the language using OT without violating any fundamental principles of OT. Fieldwork was conducted in several Bugis settlements in Johor, such as Kampung Batu Hampar, Kampung Belokok, Kampung Sungai Kuali, Jelutong Laut, Parit Archong, Pekan Nenas, and Kampung Pasir Putih. Questionnaires and interviews were used to gather data on the desired loanwords. The study's analysis uses Correspondence-OO (Cor-OO) approach, and it finds that the process of syllable addition in Buginese loanwords, which occurs due to the adherence to syllable coda conditions that only allow the velar nasal consonant /ŋ/, glottal stop, and initial geminate consonants to be positioned at the coda. Based on the Cor-OO analysis, the set of constraints that must be adhered to in the assimilation of loanwords in Buginese is *IDENTICAL LEXICAL >> *SCHWA >> NO CODA >> *LONG VOWEL >> IDENT[F]-OO >> DEP-OO >> *GEM >> MAX-OO >> PARSE (mora). The study's results indicate the factors of syllable addition in the adaptation of Buginese loanwords, and at the same time, the OT analysis conducted does not violate the fundamental principles of OT. Thus, this study provides a deeper understanding of the loanword adaptation process in the context of the Buginese language and underscores the importance of considering phonology in linguistic analysis.*

Keywords: *Bugis, coda condition, minority, phonology, language*

1 Introduction

Based on previous studies such as Haugen (1953), Payne (2006), and Fromkin et al. (2007), word borrowing has been defined as a situation where the borrowing language has absorbed language items from another language into its own language items. Although there are variations in the categories of word borrowing, this study focuses on loanwords that involve phonological changes. In the phenomenon of language borrowing, linguistic changes, especially phonological changes, commonly occur. Fromkin et al. (2007) state that the pronunciation of words borrowed is typically modified to conform to the phonological rules of the borrowing language.

Furthermore, Uffmann (2013) states that when words are borrowed, they are often adjusted to fit the phonological system of the borrowing language, either segmentally by identifying the original phonemic categories to express the sound of the original form, and suprasegmentally, to ensure compatibility with the original phonotactics and syllable structure constraints. According to Optimality Theory, this adherence results in an output that satisfies all the phonological rules and can be used in the borrowing language. This implies that certain

constraints must be adhered to ensure that the loanwords can be assimilated into the borrowing language.

Referring to all explanations regarding loanwords, this study needs to face another problem in Optimality Theory (OT) which is the violation of a basic principle in OT. The principle in question is the principle of parallelism. This violation occurs because the OT analysis involving the collision of two languages can produce a set of hierarchical OT constraints. The fifth principle in OT, namely parallelism, does not allow this situation to occur. Therefore, this study will analyze the adaptation process of loanwords in the Bugis language without denying the principles in OT.

Since the Bugis community is a minority group in Malaysia, previous studies, such as those by Gérin (2005), Nguyen & Hamid (2017), Siebenhütter (2020), Sarifin & Sukimi (2019), Ismail (2011), and Mohamed & Yusoff (2010), suggest that minority communities tend to develop a new language identity to assimilate with the local population. This phenomenon is also evident in the Bugis community in Malaysia. The process of loanword absorption occurs in the Bugis language to ensure that the local community can understand their needs and preferences.

However, data obtained in this study shows that there is an adaptation process in the absorption of Bugis language loanwords. According to Uffmann (2013), when loanwords are incorporated into the borrowing language, they are typically adapted to fit the phonological system of that language. This adaptation occurs both segmentally, by matching the original phonemic categories to convey the sounds of the source language, and suprasegmentally, by aligning the loanwords with the phonotactic rules of the borrowing language.

For instance, in Malay, the lexical item *langit* 'sky' is pronounced as [laŋit]. In contrast, this lexical item is pronounced as [laŋi] 'sky' in the Bugis language. According to the data, the consonant /t/ is deleted compared to its Malay counterpart. However, in Malay, the vowel /i/ in the final syllable becomes a low vowel. This base form remains unchanged even when the lexical item receives a prefix. For example, when the prefix /me-/ is added to the lexical item /laŋit/ 'sky', it becomes [məlaŋit] 'sky high'.

At this stage, it is assumed that the Bugis language does not allow the consonant /t/ to be in the coda position of the syllable. However, more detailed discussions need to be conducted to ensure that this initial information can cover all aspects of the coda in the Bugis language. This is because, according to Uffmann (2007) in the discussion of phonological adaptation processes, each language has its own strategy in determining the output of loanwords. Therefore, are there other adaptation strategies besides deletion used to ensure that the loanwords can meet the form of the Bugis language phonological system?

At the same time, this study uses OT to analyze the adaptation process of loanwords in the Bugis language. However, to study loanwords in the Bugis language, this study suggests the use of Output-Output Correspondence (Cor-OO) to show data from a language outside of Input-Output Correspondence (Cor-IO) mapping. The use of Cor-OO in this study is intended to overcome the problem of violating one of the basic principles of OT, which is parallelism, that occurs in Cor-IO mapping. Benua (1997) states that the use of Cor-OO is intended to observe the phenomenon of loanword adaptation outside of Cor-IO mapping without violating any basic principles in OT. Here is the schema for absorbing loanwords in the Bugis language without using Cor-OO:

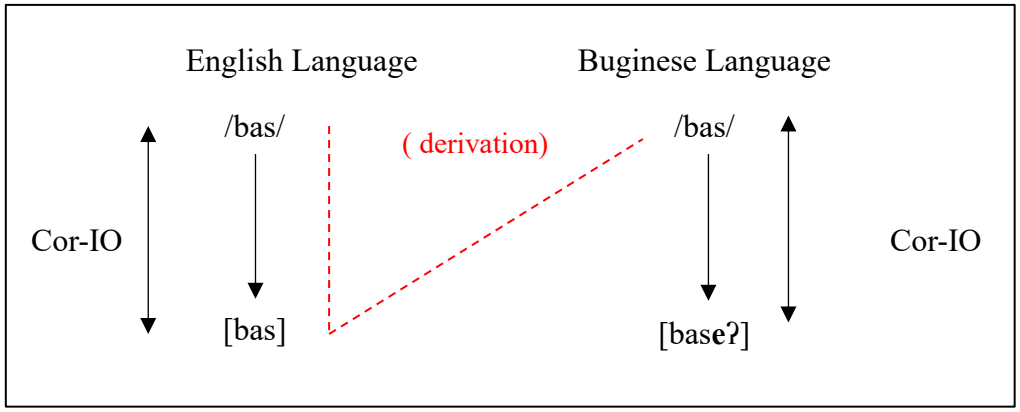

Figure 1: Schema of Loanword Absorption in the Bugis Language without Cor-OO

Figure 1 above shows the schema for absorbing the loanword /bas/ into the Bugis language without using the Cor-OO assessment. For example, the lexical item *basek* [basəʔ] 'bus' is absorbed from the English word "bus" [bas]. This phenomenon can also be observed in the data presented in Table 5, which is included in this study. If this output is shown, it differs from the source language output. If this phenomenon is shown using Cor-IO, the correlation between the two languages is inaccurate because it would involve tiered derivations and violate the concept of parallelism, among the five basic principles in OT. Therefore, this paper will discuss the factors that cause the adaptation process of loanwords in the Bugis language and analyze the constraint strategies used to ensure that the candidate output produced conforms to the phonological system of the Bugis language using OT (Prince & Smolensky 1993) with the Cor-OO approach (Benua 1997). At the same time, this paper will highlight the most suitable method to ensure that the issue of violating one of the principles of OT, namely parallelism, can be addressed without affecting the OT evaluation process.

2 The Bugis community and the phonemic inventory of the Bugis language

Makmur et. al. (2013) state that the Bugis community originates from South Sulawesi, Indonesia, and is one of the largest population groups in that region. According to Yusuf (2012), not many tribes or regions have a tradition of writing using their script. The Bugis people in South Sulawesi have used a script called Lontara. Using the Lontara script demonstrates that the Bugis community has its own distinct linguistic identity. Furthermore, Reid (1998) and Yusuf (2012) explain that although the Malay community had begun to adopt the Arabic-Malay script due to the influence of Islam, the Bugis community still maintains the use of their Lontara script.

There are two pieces of information obtained regarding the consonants in the Bugis language. However, both sources do not show any significant differences. Below is the list of consonants provided by Macknight (2012):

Table 1: The list of consonants provided by Macknight (2012)

	Occlusive		Nasal	fricative	lateral	trill
	voiceless	voiced				
Labial	p	b	m	w		
Dental	t	d	n	s	l	r
Palatal	c	j	ny	y		
Velar	k	g	ng			
glottal		,		h		

Chyba! Nenašiel sa žiaden zdroj odkazov. Table 1 shows that there are 18 consonants in the Bugis language. Meanwhile, the second source of information regarding Bugis consonants, based on Macknight (2012), indicates this number. However, according to Nurpahmi (2013), the Bugis language contains 21 consonants, as shown in Table 2 below:

Table 2: The list of consonants in the Bugis language according to Nurpahmi (2013)

Place of Articulation	**Bilabial**		**Labiodental**		**Interdental**		**Alveolar**		**Palatal**		**Velar**		**Glottal**
Manner of Articulation													
Stop	b	p					t	d			k	g	
Fricatives			f	v	θ	õ	s	z	ŝ	ž			h
Affricate									ĉ	j			
Nasal		m						n				ŋ	
Lateral								l					
Semivowel		w						r		y			

Table 2 shows the list of consonants in the Bugis language according to Nurpahmi (2013). Nurpahmi (2013) notes that the Bugis language does not have clusters of more than two consonants, whether in close transition or with intervention, but it does feature geminate (doubled) consonants, such as: bb, cc, dd, gg, and hh. Furthermore, in the discussions conducted by Nurpahmi (2013), he has listed 13 vowels found in the Bugis language, as shown in Table 3:

Table 3: Buginese language vowels (Nurphami 2013)

Height of Tongue	**Part of Tongue Involved**		
	Front	**Central**	**Back**
High	i: /peddi:/		u: /Bu:lu:/
	ɪ /Idi/	i /tega:ki/	u /a:lu/
Mid	e /ɛle/		o/olo/
		ə /makatə/	
	ɛ /ɛle/		
Low	a: /ma:nu/	ʌ /maegʌ/	ʌ / bo:la/

Chyba! Nenašiel sa žiaden zdroj odkazov. Table 3 above displays the 13 vowels found in the Bugis language. According to Nurphami (2013), the Bugis language does not possess the vowel /æ/, and thus this vowel is replaced with the vowel [e]. For example, /fæn/ and /væn/ are replaced by [pen] or [fen] and [ven], respectively. Additionally, Nurphami (2013) states that the Bugis language does not have short vowels; therefore, short vowels in this language are replaced with long vowels.

Apart from the information provided by Nurphami (2013) and Macknight (2012), Valls (2014) has also listed the consonant inventory found in the Bugis language. Based on the list provided, there are several consonants not listed by Nurphami (2013) and Macknight (2012)

that are included in the inventory and phonological information given by Valls (2014). Below is the list of consonant inventories according to Valls (2014):

Table 4: Buginese language consonants according to Valls (2014)

	Bilabial	Dental	Alveolar	Post alveolar	Palatal	Velar	Glottal
Plosive	p b	d	t		c ɟ	k g	ʔ
Nasal	m		n		ɲ	ŋ	
Trill			r				
Fricative		s		ʃ ʒ			h
Affricate							
Approximant					j	w	
Lateral approximant			l				

Table 4 above displays the list of consonants found in the Bugis language according to Valls (2014). In this study, the discussion refers to Valls (2014) findings, which represent the most recent research on the Bugis language. Valls (2014) study not only provides valuable insights into the linguistic characteristics of the Bugis language but also offers a more comprehensive and detailed inventory of consonants and vowels compared to previous works. This makes it a critical reference point for understanding the phonological aspects of the Bugis language in the current study. Overall, the list of consonants presented by Valls (2014) is not significantly different from those provided by Nurphami (2013) and Macknight (2012). However, there are a few consonants listed by Valls (2014) that are not present in the lists from Nurphami (2013) and Macknight (2012). These include /ʃ/, /ɟ/, and /ʒ/. Furthermore, Valls (2014) adds that there are 19 consonant sounds, two semi-consonants, and six vowels in the Bugis language. The consonant /h/ appears only in loanwords from Indonesian. Valls (2014) also states that the vowel system of Austronesian languages tends to be simple, and the Bugis language has only six vowels: /i/, /e/, /ə/, /u/, /o/, and /a/. All these vowels can undergo lengthening except for /ə/. In closed syllables, vowels are pronounced shorter, although the syllable remains heavy due to the presence of a coda.

According to Mohd Noor & Syed Jaafar (2022), the Bugis language shares similar syllable structures with the Malay language, specifically in terms of syllable patterns such as CV (Consonant – Vowel) and CVC (Consonant – Vowel – Consonant). This is supported by Valls (2014), who states that Bugis appears to share this syllable structure of CV as a main feature. Its roots are mainly bisyllabic. This similarity in syllable structure suggests a potential phonological alignment between the two languages. However, when delving deeper into the phonotactic rules of the Bugis language, Kawasaki (1998) points out that the Bugis language imposes specific constraints on which segments are permitted to occupy the coda position in a syllable. The segments that are allowed include the first segment resulting from the process of gemination, homorganic nasals, and the glottal stop /ʔ/. These constraints reflect the language's unique phonological rules governing syllable construction.

Further supporting this observation, Jaya (2019) and MacKnight (2012) highlight that the coda position in Bugis syllables is indeed restricted to a limited set of segments. According to their grammars, only specific segments such as vocalic elements, the glottal stop /ʔ/, and the velar nasal /ŋ/ are permitted in the end of syllable (for vowels) and coda position (for consonants). These restrictions underscore the phonological distinctiveness of the Bugis language and its adherence to a more constrained set of phonotactic rules compared to other languages. The alignment between these findings across multiple studies provides a strong

foundation for understanding the phonological behaviour of the Bugis language, particularly in the context of syllable structure and coda constraints.

3 Methodology

This study is qualitative, a term that refers to a complex and evolving research methodology. Data for this study were collected through various methods, including fieldwork and interviews using questionnaire instruments, word lists, and recording devices. The questionnaires and word lists were designed to gather information about the respondents' backgrounds and data on loanwords in the Bugis language. To ensure that both background information and study data were obtained, the prepared questionnaire was divided into two parts: Part A and Part B. Section A focuses on gathering information about the respondents' background, such as their name, age, origin, parental lineage, home language, and other relevant details. All of this information is necessary to ensure that the interviewed respondents meet the eligibility criteria.

Section B contains a word list used to collect data on loanwords in the Bugis language. The word list was selected based on the 100-word Swadesh list (1952) and translated into Malay. Although this study employs the Swadesh list (1952), it remains open to incorporating additional data beyond what is listed in the questionnaire. The word list method was conducted by interviewing respondents through the pronunciation of each word list given, which was transcribed into phonetic symbols.

The existence of the Bugis community can be traced to several settlements that still exist today. They are spread across several villages in the sub-districts in Johor such as Benut, Sungai Karang, Serkat, Ayer Masin, Ayer Baloi, Sungai Pinggan, Jeram Batu, Sungai Kluang, Minyak Beku, Sungai Punggur, Pengerang, Muar, Gelang Patah, and around Pekan Nenas. Several villages have a majority of Bugis residents. Thus, to collect primary data, several villages were visited during the field study, including Kampung Batu Hampar, Kampung Belokok, Kampung Sungai Kuali, Jelutong Laut, Parit Archong, and Pekan Nenas in Pontian, as well as Kampung Pasir Putih in Pasir Gudang, Johor.

This study focuses exclusively on the Bugis community that speaks the Wajo dialect. The Wajo dialect was chosen because, according to Ismail (2009), the majority of the Bugis community residing in the study area tends to use the Wajo dialect rather than the Bone dialect. Additionally, fieldwork results revealed that most of the primary data collected indicates that respondents speak the Wajo dialect. Based on the fieldwork findings, a total of 144 respondents from the Bugis community who speak the Wajo dialect were successfully selected. This selection ensures that the data collected is relevant and accurately reflects the use of the Wajo dialect within the Bugis community in the study area.

4 Analysis study

Based on the data obtained, the phonological process most evident in the absorption of loanwords in the Bugis language is the addition of syllables. However, before continuing the discussion, it is better to first present the data referred to. Here is the data:

Table 5: Data on loanwords in the Bugis language that have undergone a syllable addition process

Input (root)	Phonetic Representation	Output	Phonetic Representation	Etymology
senduk 'sladle'	[sən.duʔ]	sanderuk 'sadle'	[san.də.ruʔ]	Malay
masjid 'mosque'	[mas.d͡ʒid]	mɑsigi 'mosque'	[mɑ.si.g**i]**	Arab
kappal 'ship'	[kap.pal]	kappala 'ship'	[kap.pa.l**a]**	Tamil
sandal 'sandal'	[sɑ̃.dal]	sandala 'sandal'	[san.da.l**a]**	Old French
garfo 'fork'	[gar.fo]	gadeppuh 'fork'	[ga.**də**p.puh]	Dutch
bas 'bus'	[bas]	basek 'bus'	[ba.s**e**ʔ]	English
bicycle	[baɪ.sɪ.kl]	basikarak 'bicycle'	[ba.si.ka.r**a**ʔ]	French
changkir 'container'	[chaŋ.kir]	changkiri 'container'	[chaŋ.ki.r**i**]	Malay
baldi 'bucket'	[bal.di]	beladi 'bucket'	[bə.l**a.**di]	Malay
arnab 'rabbit'	[ar.nab]	arnabek 'rabbit'	[ar.na.b**e**ʔ]	Arab
manggis 'mangosteen'	[maŋ.gis]	manggisik 'mangosteen'	[maŋ.gi.s**i**ʔ]	Malay
anggur 'grape'	[aŋ.gur]	anggorok 'grape'	[aŋ.go.r**o**ʔ]	Persian
kipas 'fan'	[ki.pas]	kifasak 'fan'	[ki.fa.s**a**ʔ]	Malay
sabar 'patient'	[sa.bar]	sabbarak 'patient'	[sab.ba.r**a**ʔ]	Arab

Table 5 above displays data on loanwords in the Bugis language that have undergone a syllable addition process. According to Brasington (1997), there are various reasons why syllable addition or modification occurs during the absorption of loanwords. One of the reasons mentioned is the process of epenthesis or insertion in the adaptation of loanwords. This occurs due to the presence of consonant clusters that are not permissible within the phonological system of the borrowing language. As an alternative, vowel insertion occurs between these consonant clusters. Consequently, this adaptation process resolves issues with the structure of

loanwords by creating additional or new syllables where one of the consonants in the cluster can be moved to serve as either the onset or coda in the borrowed lexical items.

However, according to explanations provided by Jaya (2019) and MacKnight (2012), the process of syllable addition in the absorption of Bugis language loanwords occurs because only certain segments are allowed at the end of a syllable in Bugis. According to both authors, only a few segments are allowed in the syllable coda: vowel segments, the glottal stop /ʔ/, and the velar nasal /ŋ/. So, how does this syllable addition process aid in the adaptation of loanwords? To explain this, the lexical item /chaŋkir/ 'container' is used as an example. The lexical /chaŋkir/ 'container' is articulated as [chaŋkiri] 'container'. From this example, the velar nasal consonant /ŋ/ and consonant /r/ occupy the coda positions of the first and second syllables, respectively.

The velar nasal consonant /ŋ/ does not pose a problem in the absorption of loanwords in Bugis. However, issues arise with the consonant /r/ at the coda position of the second syllable. As explained by Brasington (1997), a result of the epenthesis process is the addition of a syllable in the absorption of loanwords. This process also occurs in the Bugis language, but the epenthesis here is not caused by consonant clusters but rather by the insertion of a vowel to alter the position of the consonant /r/. Based on the data /chaŋkir/ 'container', the vowel /i/ is inserted at the last syllable when absorbed into the Bugis language. As a result of this insertion, a new syllable is formed, causing the consonant /r/, which initially occupied the coda position of the second syllable, to become the onset consonant of the last syllable. Consequently, the output [chaŋkiri] 'container' is generated, which conforms to the Bugis phonological system as explained by Jaya (2019) and MacKnight (2012), where the velar nasal /ŋ/ occupies the coda of the first syllable, and the second and last syllables are occupied by the vowel segment /i/.

This research identifies an issue with the data in Table 5, such as [kap.pa.la] 'ship', [ga.dəp.puh] 'fork', and [sab.ba.raʔ] 'patient' where the consonants /b/ and /p/ appear in coda positions during the absorption of Bugis loanwords. Referring back to Jaya (2019) and MacKnight (2012), both consonants are not typically allowed at the coda position in the Bugis language. Based on the data, this occurs due to the process of gemination that ensures the loanwords can be absorbed. Therefore, there must be an explanation regarding the legitimacy of the presence of both consonants at the Bugis coda position, but explanations from Jaya (2019) and MacKnight (2012) do not provide any such information.

However, an explanation for this phenomenon has been provided by Kawasaki (1998). According to him, the Bugis language stipulates that only a few segments are allowed to occupy the coda position in a syllable. These segments include the first part resulting from the process of gemination, the homorganic nasal, and the glottal stop /ʔ/. Thus, it answers the question of how the consonants /b/ and /p/ can occupy the coda position in a syllable resulting from the absorption of Bugis language loanwords. The explanation is that the consonants /b/ and /p/ are the first parts of the consonants resulting from the gemination process. Although these consonants are neither nasal nor glottal stop consonants, their presence is permitted due to the gemination process affecting both consonants.

5 Cor-OO analysis

The discussion continues with an analysis of the absorption of loanwords in the Bugis language using Cor-OO. Based on the discussion in the introduction section, this study suggests using Cor-OO to address the issue of violating one of the five principles in OT, namely parallelism. To illustrate the issue of violating the parallelism principle, here is the schema for the absorption of loanwords in the Bugis language:

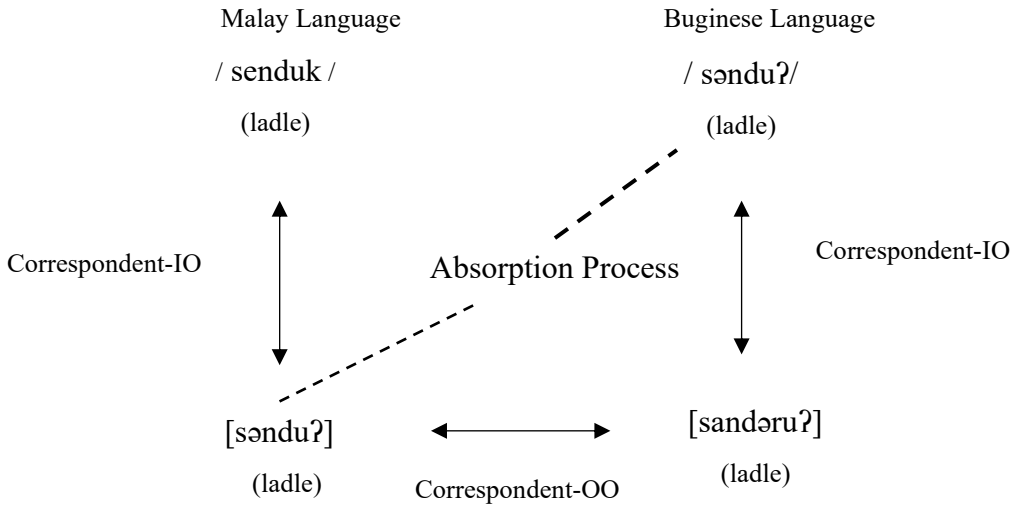

Figure 2: The schema for the absorption of the lexical loanword /senduk/

Figure 2 above illustrates the schema for the absorption of the lexical loanword /senduk/ 'ladle' in the Bugis language. Based on the figure, this Optimality Theory (OT) analysis involves two languages: the source language and Bugis. If the assessment is done via input-output (Cor-IO), it results in a tiered evaluation: first evaluating the input-output of the source language, followed by the input-output of the Bugis language. Therefore, by analyzing loanword data using Cor-OO, the analysis can be conducted outside of Cor-IO mapping without violating any fundamental principles of OT.

According to the OT evaluation, the first candidate generated is the output from the source language, [səndu?] 'ladle'. This candidate violates the constraints *IDENTICAL LEXICAL, *SCHWA, and NO CODA. Since *senduk* is lexically the same as the input, the candidate [səndu?] 'ladle' violates the *IDENTICAL LEXICAL constraint. The reason why the candidate [səndu?] 'ladle' violates the *SCHWA constraint is due to the presence of the schwa vowel /ə/ in the first syllable. The existence of two codas, one in the first syllable and one in the second, causes the candidate [səndu?] 'ladle' to violate the NO CODA constraint twice.

The next candidate is [sə:ndo?] 'ladle'. According to the OT analysis, this candidate violates the constraints *SCHWA, NO CODA, *LONG VOWEL, and IDENT[F]-OO. The presence of the schwa vowel /ə/ twice following the vowel lengthening process means the candidate [sə:ndo?] 'ladle' violates the *SCHWA constraint twice. Additionally, the candidate [sə:ndo?] 'ladle' also breaches the NO CODA constraint because of the presence of the consonant /n/ at the coda of the first syllable and the consonant /?/ at the coda of the second syllable, resulting in two violations of the NO CODA constraint. Furthermore, the candidate

[səːndoʔ] ‘ladle’ violates the *LONG VOWEL constraint due to the lengthening of the vowel /ə/ in the first syllable. As a result of the vowel /ə/ lengthening, the candidate [səːndoʔ] ‘ladle’ violates the IDENT[F]-OO constraint because the vowel lengthening that occurs due to the insertion of the vowel /ə/ in the first syllable, and at the same time the replacement of the vowel /u/ with the vowel /o/ in the second syllable, causes both segments /e/ and /o/ not to correspond with the input of this evaluation.

Finally, the candidate generated in this evaluation is [sandəruʔ] ‘ladle’. This candidate violates the constraints *SCHWA, NO CODA, IDENT[F]-OO, and DEP-OO. The presence of the schwa vowel /ə/ in the second syllable causes the candidate [sandəruʔ] ‘ladle’ to violate the *SCHWA constraint. Moreover, the candidate [sandəruʔ] ‘ladle’ also violates the NO CODA constraint due to the presence of two codas: one in the first syllable and one in the third. This results in the candidate [sandəruʔ] ‘ladle’ violating the NO CODA constraint twice. Regarding the IDENT[F]-OO constraint, the candidate [sandəruʔ] ‘ladle’ violates this constraint because the vowel /ə/ in the first syllable has been replaced with the vowel /a/ at the output stage. The violation of the DEP-OO constraint stems from the insertion of the vowel /ə/ in the second syllable and the trill consonant /r/ in the third syllable of the candidate, which does not exist at the input stage for both candidates.

At the same time, the candidate [sandəruʔ] ‘ladle’ also violates another constraint, the PARSE (Mora) constraint. In Bugis language, the lexical /sənduʔ/ ‘ladle’ is spoken as [sandəruʔ] ‘ladle’. Based on this candidate, the deletion at the coda of the second syllable, the stop consonant /ʔ/, causes a reduction in mora in the second syllable lexical when the syllable addition process occurs. The PARSE (Mora) constraint, highlighted by McCarthy & Prince (1995), mandates that each mora at the input stage must be parsed in the output prosodic structure. This means that no mora deletion is allowed at the prosodic output stage. Before analyzing this process, consider the relevant OT constraints on the derivation in (1).

(1) Relevant constraints:

a. **IDENT[F]-OO** (McCarthy & Prince, 1995)
Prohibits alteration to the value of feature F.

b. **NO CODA** (Prince & Smolensky, 1993)
Syllables must have no codas.

c. ***IDENTICAL LEXICAL**
The existence of two identical lexical items within the lexicon is not allowed.

d. ***SCHWA**
Does not allow the presence of the schwa vowel /ə/.

e. **DEP-OO** (McCarthy & Prince, 1995)
Segments existing in the morphological form must correspond with those in the derived form.

f. ***LONG VOWEL**
No long vowels allowed.

g. **PARSE (mora)** (McCarthy & Prince, 1995)
Every mora in the input stage must be parsed in the output prosodic structure.

Table 6: OT analysis for /sən duʔ/ ⟶ [san.də.ruʔ]

*IDENTICAL LEXICAL>>*SCHWA>>NOCODA>>*LONG VOWEL>>IDENT[F]-OO>>DEP-OO>>PARSE (mora)

	/sən duʔ/	*IDENTICAL LEXICAL	*SCHWA	NOCODA	*LONG VOWEL	IDENT[F]-OO	DEP-OO	PARSE (mora)
	a. sə:n doʔ		**	**	*!	*		
	b. sən duʔ	*!	*	**				
☞	c. san.də.ruʔ		*	**		*	**	*

Based on Table 6 candidate (c) has been successfully produced as the most optimal candidate. From the table, all candidates violate the *SCHWA constraint due to the presence of the schwa vowel in the lexical items, and they all also violate the NO CODA constraint twice due to the presence of a coda in both the first and the last syllables. Candidate (c) is tied with candidate (a) because it also violates the IDENT[F]-OO constraint. Candidate (c) emerges as the most optimal because it fails on lighter constraints compared to candidates (a) and (b). The first candidate to be eliminated in this evaluation is candidate (b). Like the other source language output candidates, candidate (b) cannot be produced as the optimal candidate because it violates the heaviest constraint in the table, *IDENTICAL LEXICAL. The second candidate to be eliminated in this evaluation is candidate (a), which fails under a lighter constraint compared to candidate (b), namely *LONG VOWEL. The results of this evaluation show that the set of constraints generated in the TO analysis for the absorption of loanwords in the Bugis language is *IDENTICAL LEXICAL >> *SCHWA >> NO CODA >> *LONG VOWEL >> IDENT[F]-OO >> DEP-OO >> PARSE (mora).

6 Coda conditions in the Bugis language

Upon further examination of the explanations Jaya (2019) and MacKnight (2012) provided, there are specific conditions for the coda position in the Bugis language. This is supported by the analysis of loanwords that have been absorbed into Bugis. However, the discussions by Jaya (2019) and MacKnight (2012) indicate that there is information that needs updating. According to MacKnight (2012), only the velar nasal /ŋ/ and the glottal stop /ʔ/ are permitted in the syllable coda position. This suggests that MacKnight (2012) emphasizes only two consonants that can occupy the coda position.

Additional information was obtained when referring to the study conducted by Jaya (2019). According to Jaya (2019), the Bugis language has three types of sounds at the end of a word: vowel sounds, the consonant /ʔ/, and the consonant /ŋ/. This explanation aligns with the

study described by MacKnight (2012). According to Jaya (2019), vowels can also reside at the end of a syllable. This is supported by data showing that several words have vowel segments in the final syllable position, consistent with Jaya's (2019) statement.

Nevertheless, data indicates that consonants other than the glottal stop /ʔ/ and velar nasal /ŋ/ can be found in the coda position. For example, the lexical items [təllo], [bassi], [rəbba], [manəttu], [sabbaraʔ], [sikkuʔ], [səttuŋ], [golla], and [kappala] are examples that have undergone gemination. According to this data, the consonants /l/, /s/, /b/, /t/, /k/, and /p/ have occupied the coda position of the syllable. Yet, all these consonants are not listed by Jaya (2019) and MacKnight (2012) as being permitted in the coda position. This raises questions about how all these consonants are exempted from the coda position.

Based on discussions from Kawasaki (1998), the Bugis language also allows for the presence of certain consonants in the coda that are the first in the process of gemination, the homorganic nasal, and the glottal stop /ʔ/. As illustrated by the previous examples, the consonants that occupy the coda position are the first consonants in the process of gemination. Therefore, these consonants are allowed to be in the coda position. Through the absorption of loanwords, this gemination process also produces a syllable form that complies with the Bugis language system, ensuring that the lexical form of the loanword meets the established phonological form.

In summary, this examination highlights that various conditions and clarifications regarding the coda specifications in the Bugis language are pivotal. This understanding helps ensure that the phonological integration of loanwords adheres to the intrinsic structural norms of the Bugis language, thereby maintaining linguistic consistency and functionality.

The discussion highlights that various insights have been gathered concerning the coda conditions in the Bugis language. The information from Kawasaki (1998) provided additional details about the segments that can occupy the final position, specifically the first consonant in the process of gemination. Overall, from the analysis of the adaptation process of loanwords, it can be stated that the Bugis language indeed has specific coda conditions that must be adhered to, and these conditions significantly impact the process of loanword absorption into Bugis. According to the data obtained, compliance with these coda conditions affects the lexical form of the loanwords being integrated into the Bugis language. Generally, the analysis of the loanword adaptation process based on Cor-OO finds that the coda conditions to be adhered to in the absorption of loanwords into Bugis language include only the glottal stop consonant /ʔ/, the velar nasal /ŋ/, and the first consonant of gemination processes as allowed in the coda position as stated by MacKnight (2012) and Kawasaki (1998). At the same time, apart from the consonant segments, this study also finds that vowel segments are permitted to occupy the final position of words, aligning with the statement from Jaya (2019).

These coda conditions are also evident based on the presence of constraints in the Optimality Theory (OT) analysis process, particularly the NO CODA constraint highlighted by Prince & Smolensky (1993). As previously explained, this constraint stipulates that no segment is allowed at the coda position. According to Kawasaki (1998), the NO CODA constraint is the strongest compared to other NO CODA constraints. Furthermore, Kawasaki (1998) mentions that this NO CODA constraint indicates that several languages have established conditions for the coda in their linguistic systems. This strengthens the assertion that the Bugis language has indeed set conditions for the existence of segments at the coda position of each syllable.

Based on the Cor-OO analysis conducted, the NO CODA constraint ranks third after the *IDENTICAL LEXICAL and *SCHWA constraints. The strategy seen in the use of this constraint in the absorption of loanwords into the Bugis language is to prevent candidates that

have a coda, thus giving room to candidates that do not have a coda. As a result, candidates meeting this constraint's requirements can proceed to further evaluation. Therefore, in the aspect of the Bugis language, loanword lexical items that possess a coda are blocked using this NO CODA constraint. However, this is not problematic because vowel segments are allowed to appear at the end of the syllable in terms of syllable structure. This alignment with the coda rules ensures that the phonological integrity of the Bugis language is maintained while accommodating the phonetic aspects of the loanwords.

7 Conclusion

Overall, this study finds that there is an addition of syllables occurring in the absorption of loanwords into the Bugis language. Detailed investigation reveals that the presence of syllable addition in this absorption process is due to adherence to the coda conditions of the Bugis language. The research indicates that to ensure loanwords can be integrated into the Bugis language, any lexical item that includes segments other than vowel segments, glottal stops /ʔ/, velar nasals /ŋ/, and the first consonant of gemination processes are not allowed at the end of a word. Therefore, this addition of syllables occurs to shift consonants that are not permitted to become the onset in the following syllable.

Based on the data obtained, the glottal stop /ʔ/ is a consonant frequently used in occupying the coda position of syllables. For example, the lexical /bas/, as explained in the previous paragraph, underwent a syllable addition process. As a result, the consonant /s/ in the syllable coda was moved to the next syllable to become an onset. This confirms that the process of syllable addition is driven by the need to comply with coda conditions. This aligns with the views explained by Jaya (2019), MacKnight (2012), and Kawasaki (1998), which state that only the glottal stop /ʔ/, velar nasal /ŋ/, and the first consonant of gemination are permitted in the syllable coda position.

At the same time, this study also uses OT with the Cor-OO approach to identify the constraints that must be adhered to produce the most optimal candidate. The OT analysis finds that the absorption of loanwords into the Bugis language must follow a set of constraints that accommodates all processes of loanword absorption in the Bugis language, namely *IDENTICAL LEXICAL >> *SCHWA >> NO CODA >> *LONG VOWEL >> IDENT[F]-OO >> DEP-OO >> PARSE (mora). This indicates that by using the Cor-OO approach in examining the coda condition found in the Bugis language, the issue of derivation can be resolved, and the OT evaluation conducted does not violate any of the main principles of OT.

This discussion aligns with previous studies such as Smith (2006), Kawahara (2006), Kawahara (2008), Kenstowicz (2003), and McCarthy & Prince (1995), which state that using Cor-OO ensures a comprehensive evaluation without going through derivation processes, which are the primary cause of violations of the principle of parallelism in OT. Also, Cor-OO focuses on maintaining consistency between new forms (such as loanwords) and existing forms within a language’s lexicon. This theory is crucial in explaining why adapted loanwords often resemble native words in terms of phonological structure. This makes the discussion about the coda condition in the Bugis language clearer based on the loanword adaptation process.

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