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SYLLABLE STRUCTURE IN SETSWANA PERSONAL NAMES

The study analyses the characteristics of syllables in personal names of the Setswana (Tswana) language (Sotho subgroup of the Bantu languages, Southern Africa). The authors focus on 1,001 most frequent names extracted from a dataset of 1,093,265 names using Wordsmith Tools. Of all the studied names, 55.5% are male, while 40.2% are female and 4.3% — unisex names. Most Setswana names have three syllables followed by those with four syllables (more than 70% of the studied personal names are either three or four syllable names), five syllable names are the third most common, while six syllable names are rare in Setswana. The study reveals that in female names, the first and penultimate (perceptually most prominent) syllables statistically more often end in front vowels, while in male names, in the same positions, back vowels are more frequent. At the same time, the last phoneme in most female names is a back vowel, while most of male names end in front vowels. Female names also more often terminate in syllabic constants compared to male names. All this suggests that in Setswana, there are distinct patterns for male and female names, which means that Setswana speakers are phonologically aware of the relations between the gender of a person and the phonological form of his or her name. These patterns found in Setswana are compared to what is known about the syllable structure of personal names in English and French. The results demonstrate that the phonological patterns in Setswana personal names may display sound symbolism.

Key words: Setswana (Tswana); anthroponomy; ethnonym; naming; syllable structure; sound symbolism; phonological typology

1. Introduction

Setswana personal names are an essential element of Batswana culture. They are more than tools of reference, but rather function as memory triggers that remind the giver and family of a significant event that occurred around the time of birth of the bearer [Ramaeba & Otlogetswe, 2021]. They are a key window into understanding the people's culture, their values and history. As products of a dynamic society, when carefully investigated, they could reveal mental, social, historical and cultural factors that influence naming patterns of Batswana.

It is the desire of every parent to give their children a name that will allow them to fare well in the society. Parents consciously or unconsciously give their boy child a masculine name and a girl child a feminine name as dictated by the culture of the society they live in. This is because as part of a people's culture, a name is one's identity, and it is important to give a child a name that will allow him or her to identify with a certain gender and associated gender roles.

A name therefore ultimately influences how a name bearer perceives himself or herself physically [Hensley & Spencer, 1985; Hassebrauck, 1988; Erwin, 1993; Zwebner et al., 2017; Hartung, 2018] and socially [Busse & Seraydarian, 1979; Gebauer et al., 2012]. People associate themselves with things that are connected to their names, and the perceptions they evoke might impact their behavior and life choices such as career and place to live. Pelham, Mirenberg, and Jones [2002] found that people with the names *Dennis* and *Denise* more often choose dentistry as their professional sphere and those named *Louis* are more likely to reside in St Louis. Likewise, an inverse in names commonly given to males and females may influence one's behavior. Boys who were given names normally given to girls were found to be disruptive in school class lessons [Figlio, 2007].

Not only does a name help the name bearer identify with a particular gender, but it allows people to guess the gender of the name bearer without any physical encounter. A person's name is usually the first information that people receive about an individual; therefore, it may positively or negatively influence perceptions and impressions that people have about the name bearer. It has been reported that personal names have an influence on inferences made about the personality of the name bearer such as trustworthiness, obedience, caring, intelligence, responsibility, friendliness and others [Leirer et al., 1982; Mehrabian & Piercy, 1993; Mehrabian, 2001]. Negative names evoke negative impressions about the name bearer which in turn may lead to discrimination, prejudice, neglect, rejection, and ostracism [Nisbett & Ross, 1980; Kruglanski & Ajzen, 1983; Erwin, 1993; Gebauer et al., 2012].

The negative treatment of a person caused by a negative name is likely to have long term negative psychological and social effects which could lead to negative life outcomes [Williams, 2009; Gebauer et al., 2012]. Rejection and devaluation have been shown to be associated with poor academic performance [Cutrona et al., 1994],

bad life choices such as smoking [Borrell et al., 2010; DeWall & Pond, 2011] and ultimately low self-esteem [Leary & Baumeister, 2000; Leary, Twenge & Quinlivan, 2006]. In light of this, the phonetic characteristics of names may reveal the perceptual relations of the biological and social characteristics linked to each gender through sound symbolism [Cassidy et al., 1999; Sidhu & Pexman, 2015; Suire et al., 2019]. In this study, we test if this applies to Setswana personal names through the investigation of their syllabic structure.

Traditional grammarians have considered arbitrariness of a language (no intrinsic relationship between word form and meaning) as the fundamental defining attribute of human communication [Saussure, 1915]. However, research on personal names in English, Cantonese, French, Setswana and other languages [Sidhu & Pexman, 2015; Pitcher et al., 2013; Cassidy et al., 1999; Cutler et al., 1990; Slater & Feinman, 1985; Sullivan & Kang, 2019; Suire et al., 2019; Ramaeba et al., 2020] has revealed systematic differences in the phonological structure of male and female names. The phonological structural differences may aid in assigning a name to a specific gender.

The body of research on the phonological analysis of names is principally based on English names and very little has been attempted on other languages. The current study aims at bridging this gap in the literature. A small-scale analysis, both in terms of the data (66 twin names) and scope, on the number of syllables in Setswana twin names has been undertaken by Ramaeba, Sebina, and Lopang [2020]. An in-depth analysis with a large dataset of Setswana personal names syllables was deemed necessary. This is why this study considers a larger dataset of 1,001 names.

Previous studies have reported that female names in general have more syllables than male names [Slater & Feinman, 1985; Cutler et al., 1990; Sullivan & Kang, 2019; Suire et al., 2019; Ramaeba et al., 2020] and that each gender has a preference for certain types of syllables such as strong or weak initial or final syllables, and open or close syllables [Slater & Feinman, 1985; Cutler et al., 1990; Sullivan & Kang, 2019; Suire et al., 2019]. Slater and Feinman [1985] investigated the number of phonemes and syllables in male and female names and found out that North American female names have more syllables and phonemes than males. Measuring the number of syllables and the number of phones provided great insights since the number of phonemes do not always correlate with the number of syllables especially in English. An in-depth investigation of the length of male and female names is therefore better carried out by measuring these two qualities separately.

In spite of Slater and Feinman's [1985] finding, later studies that compared the length of male and female personal names disregarded the number of phonemes and examined the number of syllables only. Cutler, McQueen, and Robinson [1990] reported that English female names are longer than male names with the male names significantly associated with monosyllabic names although some three to five syllable names also occur. Male and female bisyllabic names did not produce a significant

difference. Ramaeba, Sebina, and Lopang [2020] also found that Setswana female names of twins have more syllables than male anthroponyms used to name twins. They, however, came to a different conclusion than Cutler et al. [1990], on the proportion of syllables in male and female names. They reported that Setswana twin names had more bi-syllabic and tri-syllabic male names than female names. Similar to Cutler, McQueen, and Robinson, they found that female names more frequently had four and five syllables. Even though there are differences in the proportion of syllables in the male and female names, male names are associated with fewer syllables compared to female names in both Setswana and English. It is worth noting that statistical analysis tools were not employed in [Ramaeba et al., 2020].

Sullivan and Kang [2019] took a different approach in analyzing syllables in English and French personal names. They asked English native speakers to classify nonce names consisting of sounds found in English and French according to gender, depending on the number of syllables. The number of syllables was statistically significant in the respondents' attributing the nonce names as male or female. Names with more syllables were rated as female and those with fewer syllables as male. This finding suggests that English speakers have productive knowledge of the phonological patterns which they used to identify a name with a specific gender.

Previous studies did not offer any explanation why female names are longer than male names except to claim that certain longer female names are derived from male names [Cutler et al., 1990]. This is because some derived English female names are a result of an addition of a suffix to male names as in *Edwina* from *Edwin*, *Roberta* from *Robert* and *Geraldine* from *Gerald*. While in Setswana there are feminine nouns that are derived from masculine nouns through the addition of a suffix such as *-gadi* as in *kgosigadi* 'female chief', from *kgosi* 'chief, king', this phenomenon is rare. Even in [Ibid.], derived female names make just a fraction of the names analyzed. The authors report that the analysis of solely original (underived) female names still produced significant results. Therefore, derived names as such are not an explanation why female names are longer than male names.

Other than just investigating the number of syllables each gender name has, some studies have examined the syllable structures, in terms of strong and weak syllables, and in terms of open and closed ones. Slater and Feinman [1985] observed that female names prefer initial weak syllables and have more open syllables than male names. Cutler, McQueen, and Robinson's [1990] findings are consistent with those of Slater and Feinman [1985] who found that 95% of male names begin with a strong syllable compared to female names. Cutler, McQueen, and Robinson [1990] point out that even though female names have fewer initial strong syllables compared to male names, the number of female names that have initial strong syllables is high at 75%. They attributed the bias for strong initial syllable to the structure of the English vocabulary which comprises primarily of words beginning with a strong syllable. Listeners choose to segment speech at the onset of strong initial syllables rather than at the onset of a weak

syllable as it aids in the comprehension of speech [Cutler et al., 1990]. It is not surprising that the same trend of initial strong syllable is noticed in English names because names are part of the vocabulary of a language. Despite that, this does not explain why stressed initial syllables are high in male names compared to female names. The answer to this could lie in the stereotypes the society has about men and women. Males are stereotypically big and strong while females are perceived as small and weak. These stereotypical labels given to males and females might have influenced the assigning of strong initial syllables to males and weak initial names to females.

Unlike English, in French the final syllable is the strong syllable as it is the syllable that is stressed and thus perceptually predominant. Suire et al. [2019] found a sex-bias in the final syllable of French names where the final syllable in male names was associated with low frequency phonemes such as /o/ and female names high frequency phonemes like /i/. Different from English and French, the strong syllable in Setswana is the penultimate syllable. Stress in Setswana is manifested in the lengthening of the penultimate syllable [Hyman, 2009; Sebina et al., 2019]. It will be interesting to find out if the patterns observed in English and French are reflected in Setswana penultimate syllable as well as in the first and final syllables even though these are not prominent in Setswana.

Previous Setswana names studies have investigated names from a broad socio-semantic perspective. Some of the studies have preoccupied themselves with meaning of names in social contexts by attempting to determine what names mean and why certain personal names were given [Mathangwane & Gardner, 1998; Otlogetswe, 2018; 2019; Ramaeba & Otlogetswe, 2021]; some have looked at gender issues in naming patterns [Rapoo, 2002]. In this paper, instead of focusing on the semantics of names and their social function, we adopt a more phonological approach.

This study examines the use, frequency and distribution of syllables and phonemes in Setswana personal names. Moreover, the study tests if the syllable in Setswana personal names may “predict” gender. Sound symbolism has been found in the first syllable of English first names [Pitcher et al., 2013; Cutler et al., 1990] and final syllable of French first names [Suire et al., 2019; Sullivan & Kang, 2019] where lexical stress falls respectively. However, sound symbolism has never been investigated in the penultimate syllable to the best knowledge of the researchers. The current study extends the findings of English and French by testing sound symbolism in the penultimate syllable of Setswana personal names, the perceptually prominent syllable in Setswana. The study further investigates sound symbolism in the first and final syllables of Setswana personal names to establish if they are in line with that of English and French in predicting gender even though these syllables are not perceptually prominent in Setswana. If it mirrors previous studies, this might suggest cross culture generalizability and further suggest that sound symbolism of gender is not necessarily determined by perceptual prominence of a syllable. In so doing, the current study contributes to the field of sound symbolism.

This paper attempts to answer the following questions:

1. What kinds of syllables are frequent in Setswana personal names?
2. Is there a correlation between the frequency of syllables and phonemes in Setswana personal names?
3. Which terminal phoneme is prevalent in the first, penultimate and final syllable of Setswana personal names?
4. In what ways, in terms of terminal phonemes, are syllabic consonants distributed in the first, penultimate and final syllable of Setswana personal names?
5. In what ways do the syllables in Setswana personal names show gender sound symbolism?

In [Otlogetswe, 2017], it was shown that the Setswana syllable can belong to one of the three structural types.

1. A CV-type, where a consonantal onset occupies the initial position in the syllable before a vowel nucleus. Orthographically, this single phonological consonantal position may be composed of a single orthographical character consonant, digraph, trigraph or quadgraph as in Table 1.

Table 1

Setswana syllables

Type	Orthographic form	Phonetic transcription
Single consonant onset	<i>ba, ga, na, sa, le, fa</i>	ba, ga, na, sa, li, fa
Digraph onset	<i>tša, tša, kga, pha, nga, nya</i>	tša, tša, q ^h a, p ^h a, ŋa, ŋa
Trigraph onset	<i>tlha, tshe, tšhu, kgwa</i>	t ^h l ^h a, ts ^h ɪ, tʃ ^h u, q ^h wa
Quadgraph onset	<i>tlhwa, tshwe, tšhwu</i>	t ^h l ^h wa, ts ^h wɪ, tʃ ^h wu

2. A V-type constituted by a single vowel, for instance /ɛ/ in *tshwaela* /tʃ^hwàèlà/ ‘comment’.

3. A C-type represented by a single syllabic consonant that most often precedes a CV-type syllable with the same initial consonant, especially if this is /m/, /n/, /ŋ/, /ɲ/, /l/, or /r/, like in words such as in *mme* /m̩-mí/ ‘but’, *nna* /n̩-ná/ ‘me’, *sello* /s̩-l-lò/ ‘cry’, and *rre* /r̩-ré/ ‘father’, while the syllabic /ŋ/ occurs before other velar consonants or at word final position as in *mang* ‘who’, *nngate* /ŋ-ŋá-tè/ ‘throw at me’ and *nkatle* /ŋ-kà-tlé/ ‘kiss me’. The syllabic /ɲ/ only occurs before a similar palatal consonant as in *nyale* /ɲ-ɲá-lè/ ‘marry me’. All the syllabic consonants can occur in word-initial and word-mid positions and never in word-final position with the exception of syllabic /ŋ/ which can occur in word-initial, word-mid, and word-final positions.

We will also briefly discuss the inventory of Setswana vowels and consonants since it has a bearing on what a syllable is. Setswana has 28 phonemic consonants [Batibo, 2013; DALL, 12] as shown in Table 2.

Table 2

The consonant inventory of Setswana

		Labial	Alveolar		Post alveolar	Palatal	Velar	Uvular	Glottal
			Central	Lateral					
NASAL		m	N			ɲ	ŋ		
PLOSIVE	Unaspirated	p b	t d				k		
	Aspirated	p ^h	t ^h				k ^h	q ^h	
AFFRICATE	Unaspirated		ts	tʃ	ʃ ʒ				
	Aspirated		ts ^h	tʃ ^h	ʃ ^h				
FRICATIVE		F	s		ʃ			χ	h
Trill			r						
Approximant		w		l		j			

Setswana has seven vowels: /i/, /ɪ/, /ɛ/, /o/, /ɔ/, /u/, /a/ [DALL, 17]. They are represented in Table 3.

Table 3

Setswana vowels

Height	Localization	
	Front	Back
Close	i	u
Half-close	ɪ	ʊ
Half-Open	ɛ	ɔ
Open	a	

Orthographically, Setswana does not mark a distinction between /ɛ/ and /ɪ/. Both sounds are represented by <e>. Additionally, the language does not mark a distinction between /ʊ/ and /ɔ/. They are both orthographically represented by <o>. In this study, we chose to work with transcribed data so that the /ɛ/ and /ɪ/ and /ʊ/ and /ɔ/ could be accounted for separately.

2. Methodology

For this study, the *Botswana Names Corpus* (BNC) was used [Otlogetswe, 2018]. The names for the corpus were collected from different sources including university graduation lists, class lists, examination result lists for both primary and secondary

(junior and secondary school) downloaded from the Botswana Ministry of Education website [BME] and others scanned and transcribed from the Botswana Examinations Council collection. The corpus contains 1,093,265 distinct personal names. By names we are making no distinction between first names, middle names, and surnames (in Setswana, there are no specific family names, the function of a surname is usually fulfilled by a grandfather or a great grandfather's first name). In our qualitative analysis of Setswana names, there appears to be no compelling argument to treat first names differently from surnames since surnames started off at some historical moment as someone's first name. Since in this paper we are not studying differences and semantics of surnames, first or middle names, we have considered all names in our analysis.

The processing of data was conducted using WordSmith Tools version 7 [Scott, 2004]. The software was used to extract the most frequent 1,001 names for the study. Since the study focuses on Setswana names, all English and names in other African languages, such as Kalanga and Xhosa, were excluded so that the list comprises only 1,001 Setswana names. After the most frequent 1,001 names had been selected, they were transcribed phonemically by two Setswana native speakers using the International Phonetic Alphabet. In case of encountering different versions in the transcription of names, other sources such as the Setswana monolingual dictionary [Otlogetswe, 2012] were consulted. Each name's syllable boundary was marked. Such mark-up included the delineation of syllabic consonants. A count of number of syllables per word was generated. The Statistical Package for the Social Sciences (SPSS) and MS Excel were used to analyze data. Each name was also tagged with a gender marker of Male (M), Female (F) or Unisex (U).

It is important to admit that the gender classifications are complex. There are names which are exclusively male names such as *Kgosi*, *Mosimanegape*, and *Mogotsakgotla*. Most of these names reflect specific gender roles, such as the position of a *kgosi* 'chief, king', and gender markers such as a *-kgotla* [Otlogetswe, 2018]. There are also names which are predominantly male though they are occasionally given to some females. In this study, those names are all classified as male names. We also have exclusively female names such as *Sethunya*, *Segametsi*, and *Dineo*. Such names are never given to males. However, there are some predominately female names which are occasionally given to boys, such as *Goitseone*, *Masego*, and *Boitumelo*. All these names in this study are classified as female names. The labels Male (M) and Female (F) are therefore better understood as meaning *predominantly* male and *predominantly* female. Names classified as unisex are few in Setswana. Such names include for instance *Atang*, *Tirelo*, and *Tuelo*.

3. Results

3.1. Syllable length and gender distribution

Our initial observations revealed that the retrieved most frequent 1,001 names comprised more male names than female and unisex names. Of all the names studied,

55.5% of them were male, while 40.2% were female and 4.3% — unisex names. The high frequency of male names may be attributed to the fact that the data included both first names and surnames. In Setswana, all surnames follow a patriarchal lineage. They were at some point in history a certain male person's first name. Since the data comprises surnames for both males and females, this explains why the data contains more male names than female ones. Table 4 presents an analysis of names by number of syllables and gender distribution.

Table 4

Gender and syllable frequency

	Female	Male	Unisex	Total
2 syllables	31	67	2	100
3 syllables	112	269	28	409
4 syllables	142	147	13	302
5 syllables	108	59	0	167
6 syllables	9	14	0	20
Total	402	556	43	1,001

Table 4 reveals that Setswana does not have monosyllabic names. Unlike English which has common monosyllabic names such as *Anne*, *Beth*, *Cole*, and *John*, Setswana lacks such units. The Setswana names with the least number of syllables are disyllabic. Table 4 and Figure 4 show that most Setswana names have three syllables followed by those with four syllables. More than 70% of personal names are either three or four syllable names. Five syllable names are the third most common while six syllable names are rare in Setswana. The names with six syllables are more often male than female. However, on average female names have more syllables compared to male names because six syllable names are few in Setswana.

Female names ($N = 402$) were associated with a high number of syllables, $M = 3.88$ ($SD = .97$). In comparison, male names ($N = 556$) were associated with a smaller number of syllables $M = 3.44$ ($SD = .92$). To test the hypothesis that female names were associated with a statistically significantly different mean of the number of syllables in names, an independent samples t -test was performed. Levene's F test, $F(956) = 0.28$, $p = .599$ showed no violations. The independent samples t -test was associated with a statistically significant effect $t(956) = 7.26$, $p < 0.01$. Therefore, female names were associated with a statistically significantly larger mean number of syllables than male names. Having established that female names have more syllables than male names, it was necessary to determine which type of syllables (i.e., 2 syllables, 3 syllables, etc.) are prevalent in which gender and if the mean difference was statistically significant. As a group, male names statistically significantly contained more two-syllable

units $M = .12$ ($SD = .362$); $t(956) = 2.19$, $p < 0.03$, and three-syllable units $M = .48$ ($SD = .500$); $t(965) = 6.43$, $p < 0.01$, than female names $M = .08$ ($SD = .267$); $M = 28$ ($SD = .449$) respectively. Female names statistically significantly displayed more four syllables $M = .35$ ($SD = .478$); $t(956) = -2.76$, $p < 0.007$ and five syllables $M = .27$ ($SD = .445$); $t(965) = 6.78$, $p < 0.01$, than male names $M = .27$ ($SD = .443$); $M = 11$ ($SD = .308$) respectively. As mentioned above, six-syllable names are mostly male, but these are not statistically significant.

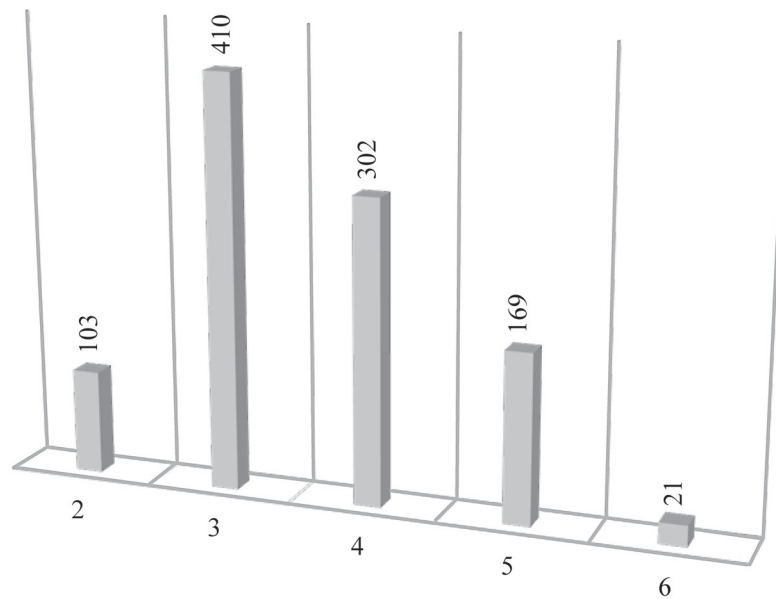


Fig. 1. Comparative frequency of two- to six-syllable names

Fig. 1 indicates that most syllables terminate in the vowels /a/ and /ɪ/. The rare vowel is the back close vowel /u/. Concerning syllabic consonants, the velar nasal /ŋ/ is the most frequent. Its frequency is higher than that of /m/ and /n/ combined. This in part because unlike other syllabic consonants this consonant can occur in word final positions.

3.2. The first syllable final phoneme in Setswana personal names

The study also investigated the first syllable final phoneme in Setswana personal names, which revealed that the back close vowel /ʊ/ is the most prevalent first syllable final phoneme and the syllabic consonant velar nasal /ŋ/ is the least frequent (see Fig. 2). A comparison of gender names showed that female names statistically more often end the first syllable in front vowels /i/, /ɪ/, /e/, $M = .37$ ($SD = .48$), $t(956) = 3.79$, $p < 0.01$,

than male names, $M = .26$ ($SD = .44$). In male names, the first syllable statistically more often terminate in back vowels /ɔ/, /ʊ/, /u/, $M = .44$ ($SD = .50$), $t(956) = -2.52$, $p < 0.01$, than in female names, $M = .36$ ($SD = .48$). Syllabic nasal consonants are not statistically significant.

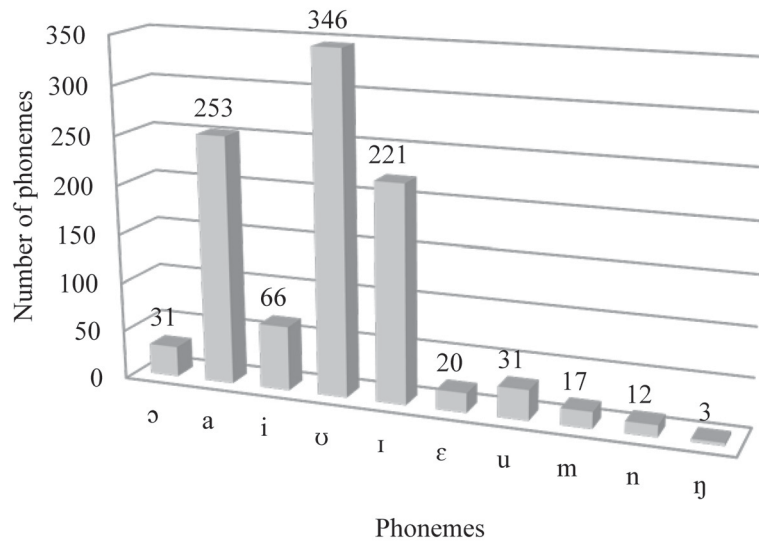


Fig. 2. The terminal phoneme of the initial syllable

3.3. The penultimate syllable terminal phonemes

The study further investigated the penultimate syllable terminal phonemes and found that the Setswana personal names penultimate syllables frequently end with the open central vowel /a/ while the least frequent phoneme is the syllabic consonant velar nasal /ŋ/ (Fig. 3). A comparison showed that at the end of the penultimate syllable, female names tend to have front vowels /i/, /ɪ/, /ε/, $M = .49$ ($SD = .51$), $t(956) = 1.71$, $p < 0.05$, for male names these sounds in the same position are less frequent, $M = .42$ ($SD = .49$). The back vowels did not show statistically significant results; however, the back vowels mean for male names is higher than that of female names at $M = .25$ and $M = .21$ respectively. Nasal consonants do not display any statistically significant results.

3.4. The last syllable final phoneme

An investigation of the last syllable final phoneme of the names indicated that the front close vowel /ɪ/ is the most frequent final phoneme in Setswana personal names while the back close vowel /u/ is the least frequent (see Fig. 4). A comparison of female and male names indicated that female names more often end in back vowels /ɔ/, /ʊ/, /u/, $M = .34$ ($SD = .47$), $t(956) = 3.32$, $p < 0.01$, than male names, $M = .24$ ($SD = .43$). Most

male names terminate in front vowels /i/, /ɪ/, /ε/, $M = .56$ ($SD = .49$), $t(956) = -3.93$, $p < 0.01$, as opposed to female names, $M = .44$ ($SD = .49$). Female names more often end in syllabic nasal consonants /m/, /n/, /ŋ/, $M = .17$ ($SD = .38$), $t(956) = 4.21$, $p < 0.01$, than male names, $M = .08$ ($SD = .27$). Generally, female names statistically display more syllabic nasals, $M = .28$ ($SD = .483$), $t(956) = -3.73$, $p < 0.01$, than male names, $M = .18$ ($SD = .404$). Of these syllabic nasals, the statistically significant one is /ŋ/ with $t(956) = -4.09$, $p < 0.01$.

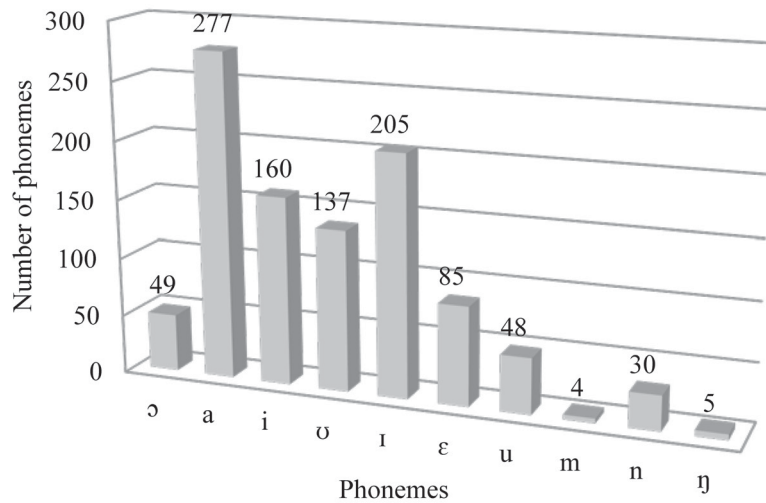


Fig. 3. The terminal phoneme of the penultimate syllable

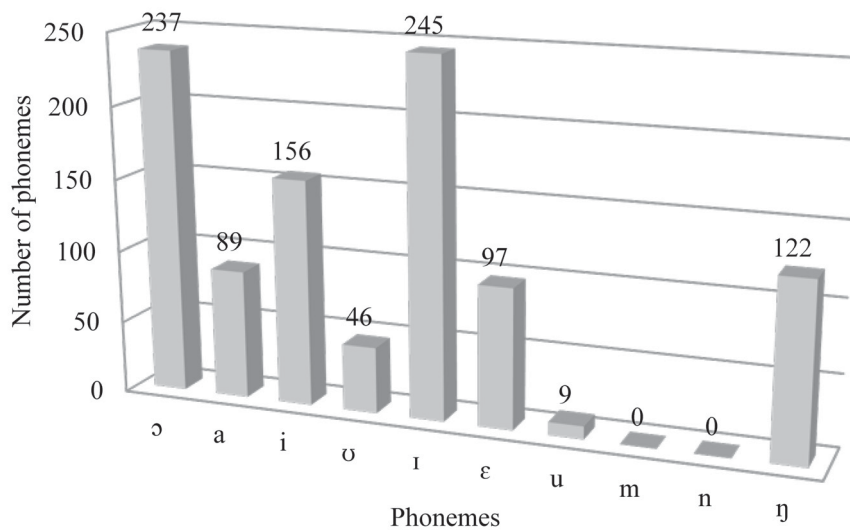


Fig. 4. The terminal phoneme of the final syllable

3.5. The number of phonemes in Setswana personal names

Additionally, the study investigated the number of phonemes in a name to determine if there was a correlation with the number of syllables in Setswana personal names. The results indicated a statistically significant positive correlation of $p < 0.01$. The results show that female names have a larger mean of phonemes, $M = 6.98$ ($SD = 1.7$), compared to male names which show a smaller mean of phonemes, $M = 6.41$ ($SD = 1.6$). The independent samples t -test showed a statistically significant effect $t(956) = 5.18$, $p < 0.01$.

4. Discussion

The results show that three-syllable units and the open central vowel /a/ are the most frequent in Setswana personal names respectively. The frequency of the open central vowel /a/ reflects the structure of the Setswana vocabulary, the phoneme /a/ being predominant in Setswana words [Batibo, 2013]. We are not aware of research showing the frequency of trisyllables in the vocabulary of Setswana, however, typologically the frequency of trisyllable names may indicate to the predominance of trisyllabic appellatives in Setswana vocabulary — a similar finding is observed in English where monosyllabic names and strong initial syllable names are more frequent, which is in line with the syllable structure of English common nouns [Slater & Feinman, 1985; Cutler et al., 1990].

The results further show that Setswana personal names display a gender difference in the distribution of syllables. We found that female names have more syllables, more phonemes, more frequently terminate the initial syllable with front vowels, the final syllable with back vowels and the penultimate syllable with front vowels than male names. Regarding syllabic consonants, female names more often terminate with syllabic constants compared to male names. The results of this study mirror previous research in terms of the number of syllables [Ramaeba et al., 2020; Cutler et al., 1990; Slater & Feinman, 1985; Suire et al., 2019], number of phonemes [Slater & Feinman, 1985] and initial and final syllable terminal phonemes [Cutler et al., 1990; Slater & Feinman, 1985; Suire et al., 2019]. These specific phonological elements in Setswana are thus in line with what have been observed in other languages. This fact might mean that speakers are able to apply similar phonological cues for these particular phonological elements in different languages regardless of phonological differences. This, in turn, yields that language is not arbitrary as it was initially considered, that there is a connection between the sound structure of a word and the image it induces in the mind [Svantesson, 2017] which ultimately result in the meaning associated with the name. The implication of the findings is that sound symbolism in these specific phonological elements may be universal.

It is not clear why female names have more syllables and more phonemes than male names across cultures. While there is a tendency to form female names from male

names such as *Georgina* from *George*, *Charlene* from *Charles*, these make a small set of popular names in English [Cutler et al., 1990] and are rare in Setswana. Among the most popular Setswana names studied in this research there were no female names derived from male names.

The distribution of syllables between genders in Setswana personal names differs from that of English names. In Setswana, most two- and three-syllable names are male while most four- and five-syllable names are female and six-syllables have been observed only among male names though they did not produce a statistically significant result. Setswana does not have monosyllabic names. English male names have more monosyllabic units and less three to five syllables, while female names have more three to five syllables [Slater & Feinman, 1985; Cutler et al., 1990]. Disyllabic names are not significant in English. These differences are partly due to the differences in the phonology of the languages. One other plausible answer for the difference in syllables and phonemes distribution in gender names is the word structure of a language. The ideal structure of English words is that they have few syllables and comparatively few phonemes. The majority of English words are monosyllabic with not more than four phonemes.

Similar to English names which pattern according to the phonological form of the English vocabulary, it is not surprising that syllables in Setswana personal names frequently end in the open central vowel /a/ because it is the most frequent phoneme in Setswana [Batibo, 2013]. However, a comparison of the first, penultimate and final syllables show that the open central vowel /a/ is the prevalent final phoneme in the penultimate syllable of Setswana personal names. This finding mirrors that of English and French names. English vocabulary comprises words which begin with a strong/stressed syllable [Cutler & Carter, 1987; Cutler et al., 1990]. As a result, English names follow the pattern where most names begin with a strong stressed syllable.

In French, the final syllable is the perceptually predominant one. Therefore, Suire et al. [2019] noticed sex-bias sound symbolism in the final syllable of French names. In Setswana, stress is manifested in the lengthening of the penultimate syllable vowel [Hyman, 2009; Sebina et al., 2019]. The penultimate syllable is therefore, perceptually dominant. It is befitting that the open central vowel /a/ is the most frequent penultimate syllable terminal phoneme in Setswana personal names similar to the patterning observed in English and French name's first and final syllables respectively.

Even though the first and final syllables did not reflect word productivity of Setswana, the first and the final syllable have shown sex-biasness in terms of the terminal phonemes in these syllables. The first syllable in female names frequently ended in front vowels while the male names ended in back vowels. Studies have shown that female names frequently have front vowels /i/, /ɪ/, /e/, while back vowels /ɔ/, /ʊ/, /u/, are dominant in male names [Pitcher et al., 2013; Cutler et al., 1990; Suire et al., 2019; Ramaeba et al., 2020]. The frequency of front vowels and back vowels in female names and male names respectively may be explained by the sound symbolism patterns

where high frequency front vowels and low frequency back vowels give an impression of smallness and largeness correspondingly [Suire et al., 2019; Cutler et al., 1990; Pitcher et al., 2013]. Smallness and largeness are labels that are stereotypically associated with females and males respectively. Although one could expect that the penultimate syllable as the dominant syllable will exhibit size dimorphism in both genders through front and back vowels, the penultimate syllable results turn out to be confusing as they show size dimorphism in female names only where the most frequent phonemes are front vowels while the back vowels were not statistically significant.

The final phoneme of the final syllable did not produce results that are similar to previous studies in terms of size dimorphism [Suire et al., 2019] because the female names tend to terminate in back vowels while male names end in front vowels. We notice a reverse in the first and final syllable results. A similar finding where there is an inverse in size dimorphism is by Suire et al. [Ibid.] who reported that voiceless fricatives were prevalent in the final syllable of male French names and voiced plosives in the first syllable of female French names: “A possible explanation is that these consonantal patterns may perceptually compensate for each other, by which the presence in masculine names of voiceless fricatives in the last stressed syllable is perceptually counterbalanced by the presence of voiced consonants in the unstressed one” [Ibid., 12].

The same explanation can be applied to the results of the present study where front vowels are prevalent in female names and back vowels in male names in the first syllable. We see the opposite results in the final syllable where back vowels are frequent in female names and front vowels prevalent in male names.

In line with the size dimorphism it is surprising that in female names final syllables are represented by syllabic nasal consonants (/m/, /n/, /ŋ/) more frequently than in male names. Syllabic nasal consonants are voiced and thus are produced with the vocal chords vibrating. The vibration of the vocal chords result in voiced phonemes sounding hard, while voiceless sounds which do not involve the vibration of vocal chords sound soft [Slepian & Galinsky, 2016]. These auditory qualities of hard voiced phonemes and soft voiceless phonemes are stereotypical attributes of masculinity and femininity respectively: males are said to be strong and hard while females are seen as soft and tender. The expectation was for the syllabic nasal consonants to be dominant in male names.

Nonetheless, these results are in accordance with results observed by Suire et al. [2019] who reported that voiceless fricatives were dominant in the final syllable of French male names. It is believed that vowels and consonants correspond to different physical attributes; while vowels are associated with body size, consonants are related to other qualities such as speed or shape [Berlin, 2004]. Nielsen and Rendall [2013] concur; they found that sonorant consonants and rounded vowels were associated with rounded objects. Therefore, the frequency of syllabic nasal consonants (which are sonorants) as the terminal phoneme of female names may have nothing to do with size dimorphism and everything to do with the shape of females: women are more likely to be described as having a round shape compared to men.

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СТРУКТУРА СЛОГА В ЛИЧНЫХ ИМЕНАХ ЯЗЫКА СЕТСВАНА

В статье анализируется структура слога в самых частотных личных именах языка тсвана (бантоидный язык сото-тсванской подгруппы, Южная Африка). Данные извлекались из корпуса, состоящего из 1 093 265 имен, с помощью WordSmith Tools. Для анализа отобрано 1 001 наиболее популярное имя. Корпус содержит 55,5 % мужских, 40,2 % женских и 4,3 % имен, которые носят как мужчины, так и женщины. Большинство имен тсвана состоят из трех слогов, на втором месте — четырехсложные имена (вместе трех- и четырехсложные имена составляют более 70 % всех изученных имен), пятисложные имена занимают третье место по распространенности, тогда как шестисложные имена встречаются редко. Исследование показало, что в женских именах первый и предпоследний (ударный, а значит, перцептивно наиболее значимый) слоги чаще оканчиваются на гласные переднего ряда, а в мужских именах в тех же позициях чаще встречаются гласные заднего ряда. При этом в большинстве женских имен последней фонемой является гласная заднего ряда, тогда как большинство мужских имен кончаются на гласные переднего ряда. Женские имена чаще, нежели мужские, оканчиваются на слоговой согласный. В языке тсвана существуют разные фонетические модели для мужских и женских имен, т. е. носители языка интуитивно осознают соотношение между полом человека и фонологической формой его имени. Закономерности, обнаруженные при анализе имен тсвана, сравниваются с тем, что известно о слоговой структуре личных имен в английском и французском языках. Результаты показывают, что фонологические паттерны мужских и женских имен тсвана могут быть носителями звуковой символики.

К л ю ч е в ы е с л о в а: сетсвана (тсвана); антропонимия; этнонимия; именование; структура слога; фонетический символизм; фонологическая типология

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