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# Vowels sex-based sound symbolism in Setswana personal names: first and last names.

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Traditionally it was believed that language was arbitrary; that is there was no association between the word and the form it signifies. However, later research has shown that some phonemes naturally have features associated with the meaning they express thereby supporting iconicity. This study investigates sound symbolism in Setswana personal names with a particular focus on vowels. It analyses a corpus of 958 names and the results show that female names statistically significantly preferred front vowels, and lax vowels and generally have more vowels than male names. Male names favoured tense vowels, but back vowels did not produce a significant result. Across languages, female names tend to have more front vowels whereas males have more back vowels. While the results of the study demonstrated sex-biased size dimorphism, the non-significant back vowels in male names reject the possibility of vowels sex-biased size dimorphism universality. The study concluded that vowel sound symbolism in gender names is not universal; it depends on the phonology of the language as well as the naming culture of that society. The results of the study offer a great avenue for similar research in other languages especially lax and tense vowels which have not been widely researched.

**Keywords**: sound symbolism, Setswana, vowels, gender, anthroponym, ethnonym, naming

## 1. Introduction

**1.1 Sound symbolism.** Sound symbolism also referred to as iconicity or phonetic symbolism (these terms are used homogenously in this paper), is a linguistic concept in which the sound of a word may provide clues about its meaning and has been in existence since immemorial. Sapir (1929) coined the term after he established that there is some association between certain sounds (forms) and certain meanings. Although Sapir may be regarded as the pioneer of this linguistic theory, other individuals have made similar arguments to his, the likes of philosopher Plato (Sedley 2003), and poet Alexandra Pope (1775). In the dialogues of Cratylus (Sedley 2003), Plato debates whether language is an arbitrary sign or whether there is an inherent association between the word and what it signifies. While Plato seems unsure of the sounds and meaning association, in the admonition of Alexandra Pope (1775), Pope reinforces the idea that there is an intrinsic relationship between the sound of a word and its meaning. However, even with Pope's affirmation, the deliberations were far from over. Some later scholars (De Saussure 1916, Hockett 1960) were of the view that there was no association between the form or sound of the word and its meaning. There is nothing in the way the word is articulated, sounds, or its orthography that resembles the meaning it signifies. The existence of homophones such as air-heir, which have different spellings but the same pronunciation, homonyms like bark-bark with the same spelling but different meaning, and synonyms such as happy-joy with different spelling and pronunciation but the same meaning, solidified the argument that language is arbitrary. That is, there is no particular reason why objects are assigned the names they have; it is just a matter of agreement among the speakers of a language. The object table could have been easily named bed or chair. The arbitrariness of language became

the standard by which human language is distinguished from animal communication. Animal communication is not arbitrary in the sense that it is not conditioned by geography such as the social and natural environment.

The proponents of arbitrariness of language unheeded onomatopoeic words such as *ring*, and *sizzle* that phonetically imitate the sound they represent. Similarly, ideophones like *boom*, and *bang* which evoke sensory perceptions of sight, taste, touch, smell, and hearing were disregarded. The existence of onomatopoeic words and ideophones in the language cannot be overlooked, it should be considered consequential. Other than onomatopoeia and ideophones, research has demonstrated that some phonemes innately have features associated with the meaning they convey. The Bouba-kiki effect (Lockwood & Dingemanse 2015; Kohler 1929) is a famous example of sound symbolism that has been employed across cultures (Bremner et al. 2013), with participants of different ages (Maurer et al. 2006) in multiple contexts (Lockwood & Dingemanse 2015; Westbury 2005).

The Bouba-kiki effect entails presenting participants with two objects one round and one angular. The participants were told that one is *bouba* and the other *kiki*. They were asked to match the objects to these labels. Most of the participants tended to match the round object with *bouba* while jagged shaped objects were assigned the label *kiki*. The sound symbolism is not only restricted to the bouba-kiki effect but there is also evidence that it encompasses other phonetic elements of the language where some phonemes are associated with certain kinds of meaning. Regarding vowels, Neilsen and Readall (2013) reported that rounded vowels (/u/-two; /ɔ/-raw) were associated with rounded objects while unrounded vowels (/i/ -see; /e/- they) were associated with angular objects. Lowrey and Shrum (2007) explored the front (/i/) /back vowel (/ɔ/-raw) effect. The results showed that front vowel sounds conveyed attribute qualities of fastness, sharpness, cleanness, crispness, and smallness while the back vowel sounds were associated with opposite qualities.

This embracing of sound symbolism demonstrates that researchers have regarded Alexandra Pope's (1775) and Sapir's (1929) call for the non-arbitrariness of language as they have realised that it is more prevalent than it was previously thought. However, it is worth noting that their argument does not overrule the existence of arbitrariness of language. The apparent thing to note is that language is a system that is both arbitrary and non-arbitrary. The two should be seen as co-existing in a language rather than as independent entities of a language. The idea of sound symbolism is explored in multiple disciplines like business (Wu et al. 2013, Lowrey & Shrum 2007; Yorkston & Menon 2004) in fiction character names (Miyakoda & Oshita 2019), in anthroponyms (He 2020; Pitcher et al. 2013; Sullivan & Kang 2019; Wing Yan Wong & Kang 2019; Culter et al. 1990) and so on. Of particular interest to the present study is sound symbolism, with a focus on anthroponyms.

**1.2 Sound symbolism in anthroponym.** Studies on sound symbolism in anthroponyms have demonstrated some systematic phonological patterns of correlation between personal names and gender. The studies found that front vowels are more common in female names than males' while males have more back vowels compared to female names and that male names tend to have nasal vowels compared to female names (Sullivan & Kang 2019; Wing Yan Wong & Kang 2019; Pitcher et al. 2013; Culter et al. 1990; Slater & Feinman 1985;). Ramaeba, Sebina, and Lopang (2020) established that Setswana female twin names have more front vowels compared to male twin names which have more back vowels. Similarly, Culter et al. (1990) found that English female names regularly have front vowels while English male names have back vowels. He (2020) established that American female names have more vowels than male names.

According to Culter et al. (1990), a possible explanation for these differences between female names and male names is due to the semantic and sociological concepts. Culter et al. (1990) are of

the view that the frequency of the front vowels (/i/) in female names is because of their connotation with smallness, sharpness and brightness. Ethological theory has also been cited as the reason for this connotation. Suire et al. (2019) study on French names and Pitcher et al. (2013) investigation of English first names credit the difference between male and female names to size dimorphism. Size dimorphism finds its roots in motivational structural rules theory (Morton 1977). The motivational structural rules theory states that animals use low-pitched vocalization when they aim to be dominant and high-pitched vocalization when the goal is to be submissive (Morton 1977). The concept of this theory was extended to human beings in the frequency code theory (Ohala 1984), which states that adult males have large vocal apparatus (larynx and vocal cords) which ultimately results in low-pitched, low-frequency voice resonance while females have small vocal apparatus which produce high pitched, high-frequency voice resonance.

The low-pitched, low-frequency sounds are associated with dominance, aggressiveness, and threat whereas, the high-pitched, high-frequency sounds give an impression of subordinate, submissive, and meek (Pitcher et al. 2013). These qualities play a major role in intra-sexual selections where large, dominant, and aggression in males, give an impression of strength and masculinity thus protection and so desirable in men (Pisanski et al. 2014; Xu et al. 2013; Pisanski & Rendall 2011). In contrast, the high-pitched, high-frequency female voice is perceived as feminine, small, and more attractive to men (Xu et al. 2013; Puts et al. 2012, 2011, 2010, 2007, 2006; Jones et al. 2010; Collins & Missing 2003). In human speech, vowel production depends on the shape and size of the vocal tract to alter the frequencies and dispersion of formants (spectral peaks) and thus vowel identity (Taylor 2010; Fitch 2007; Titze 1998, 1989). High front vowels /i, e/ have high formants and high frequency while low back vowels /a, o/ have low formants and low frequency (Suire et al, 2019; Pitcher et al. 2013).

The formant height and frequency are correlated with body size. Low formants that have a low frequency are associated with large body size, whereas high formants with a high frequency are indicative of small body size (Suire et al. 2019; Pitcher et al. 2013). This is because lower frequency vocalizations typically originate from larger vocal apparatus and thus larger individuals while higher frequency vocalizations exhibit the opposite (Taylor 2010; Fitch 2007; Titze 1998, 1989). As a result, lower frequencies (back vowels) are associated with larger vocalizers who are perceived to be strong and dominant. These are labels society gives to males. Similarly, higher frequencies (front vowels) are interrelated to small vocalizers who are seen to be weak, subordinate, and submissive. These are stereotypes of females. Largeness and smallness are desirable qualities for males and females respectively. Taller, muscular men and smaller (subordinate and submissive), women are considered attractive (Pitcher et al. 2013; Cutler et al. 1990). These perceived masculinity and femininity attributes may determine the naming of a child.

The low/high frequency in the vowels of the final syllable, which is the perceptually prominent syllable in French, depicted sex-biased size dimorphism because the final syllable of male names was mostly likely to have low-frequency vowels /o/, /ã/ while in female names it was the high-frequency vowels /i/, /e/ (Suire et al. 2019). Likewise, Pitcher et al (2013) found sex-biased size dimorphism in the first syllable of English words, where low-frequency back vowels and high-frequency front vowels are dominant in male and female names correspondingly.

Pitcher et al. (2013) are of the view that in general, there is a preference for male names to have large sounding phonemes like the back vowels /a/, /o/ whereas female names have small sounding phonemes such as the front vowels /i, e/. While the idea of large-sounding phonemes by Pitcher et al. (2013) is plausible, it is misinforming as phonemes cannot sound large. Phonemes are abstract phonetic elements; they cannot be heard and consequently cannot be described as large sounding.

What could be described as large-sounding are phones as they are concrete phonetic entities that are what people hear. Even so, phones cannot be described as large-sounding. A sound is not large sounding, it is loud and high-pitched. Similarly, phones are not small sounding but are less loud, low, toned down, low pitched, and soft. The appropriate non-misleading terms to use is the low/high formant, low/high frequency vowels/phonemes.

The frequency of back vowels in male names and front vowels in female names is also reported by Sullivan and Kang (2019) and Wing Yan Wong and Kang (2019). Sullivan and Kang (2019) further state that male names have more nasal vowels than female names. Sullivan and Kang (2019) investigated sound symbolism of gender in English and French-given names. However, they took a different approach from that of Slater and Feinman (1985); Culter et al. (1990), Pitcher et al. (2013), and Suire et al (2019). Instead of analysing the phonological patterns of existing names, Sullivan and Kang (2019) had participants perform a name gendering task where they rated the gender of males and females biased nonce names according to back vowels, front vowels, and nasal vowels. They reported that female-biased names were given more female ratings compared to male-biased names. They concluded that speakers productively know the correlation between gender names and sound symbolism. While this is true for female-biased nonce names the fact that male-biased names were given less rating raises questions. This finding seems to contradict Culter et al. (1990) finding that male names are more consistent than female names. According to Culter et al. (1990, p 480), male names are consistent because 'the nine popular-name lists of fifty male and fifty female entries each, contained 196 different female names but only 145 male names. Six male names-John, James, Robert, Richard, William, David occurred on every list, and another three - Paul, Anthony, Thomas - on eight; but no female name occurred on every list.' Given Culter et al. (1990), the expectation is that male-biased names will receive more ratings as they are more consistent than female names. These contradicting results are important to the field as these show that there are cross-linguistic differences regarding gender names and sound symbolism. Therefore, it is imperative to explore gender names and sound symbolism in different languages to establish if sound gender biases are universal in personal names. This is what the present study aims to do with a particular focus on vowels.

**1.3 The present study.** The current study examines the association between gender names and vowel sound symbolism in Setswana anthropony. Setswana is a Bantu language spoken in Botswana. It is the national language of Botswana and an official language in Botswana and South Africa. As with other African languages, names in Setswana are a vehicle through which the socio-cultural information is transmitted. Names are sensitive linguistic elements because there are a lot of emotions involved in the naming of a child (Ramaeba & Mathangwane 2015). Therefore, Setswana personal names are carefully selected as they communicate important information about the family tradition, their religion, and conditions surrounding the birth of a child. It will be interesting to find out if the distribution of vowels in Setswana personal names predicts the gender of the name bearer. This is the objective of the current study.

Even though research on language and gender names is abound, less attention is paid to the phonological differences in gender names. Even more under-researched are gender names and iconicity in other languages other than European languages with the English language being the most researched. The limitation of the literature may make it impossible to make any claims of the universality of sound symbolism in gender names. The present study aims at bridging this gap. The study, consequently, contributes to the comprehension of the sociological and psychological underpinnings of phonetic symbolism in gender names. In so doing, the current study contributes

positively to the field of iconicity in gender names. Furthermore, the study seeks to establish if the low-frequency back vowels and high-frequency front vowels in Setswana personal names determine masculinity and femininity respectively. Moreover, the present study tests sex-biased iconicity in lax and tense vowels in Setswana personal names, an analysis that has not been done in sex-biased sound symbolism to the best knowledge of the researchers. Different from previous studies which studied only first names, the current study does not make a distinction between first names and last names because a family name was at some point in time someone's first name. While the study does not distinguish first names from surnames the inclusion of surnames provides important information on the Setswana naming trends over a long period. The present study adopts the sound symbolism theoretical concept. The current study answers the following research questions:

1. To what extent do vowels in Setswana personal names predict gender?
2. In what ways do the vowels in Setswana personal names differ from findings of previous studies in predicting gender?

The study hypothesises that the distribution of vowels in Setswana personal names will predict gender. However, the distribution of vowels in Setswana personal names will differ from previous studies on gender names and phonetic symbolism because the Setswana phonology is different from the phonology of reported languages. The study further hypothesises that vowels in Setswana personal names will show gender-predicting patterns which have not been reported in previous studies.

**1.4 Vowels in Setswana.** Vowels are important in gender names and iconicity research. Setswana has seven basic vowels (/ɪ, i, ɛ, a, ɔ, ʊ, u/), spelled orthographically as [i, u, e, a, o, ê, ô] respectively (DALL 1999, p17). Recent literature does not conform to the use of the circumflex thus causing confusion between /ɪ/ and /ɛ/ which are both orthographically represented by <e>. as well as between /ʊ/ and /ɔ/ both represented by <o> orthographically. It is important to note that Setswana has syllabic consonants such as /m/, /n/, /ŋ/, /ɲ/, /l/, or /r/, in words such as in mme /m̀-mí / 'but', nna /ǹ-ná/ 'me', sello /sì -l-lɔ̀ / 'cry', and rre /r-rɛ̌ / 'father', while the syllabic /ŋ/ occurs before other velar consonants or at word final position as in mang 'who', nngate /ŋ-ŋá-tɛ̀ / 'throw at me' and nkatle / ŋ̀ -kà-tɬɛ́ / 'kiss me'. The syllabic /ɲ/ only occurs before a similar palatal consonant as in nnyale /ɲ-ɲá-lɛ̀ / 'marry me'. All the syllabic consonants can occur in word-initial and word-mid positions and never in word-final position except syllabic /ŋ/ which can occur in word-initial, word-mid, and word-final positions (Sebina & Otlogetswe 2023, p180).

Tense vowels in Setswana are /i, u/ while lax vowels are /ɪ, ʊ/.

| **Height** | **Localisation** | |
|---|---|---|
| | Front | Back |
| Close | i | u |
| Half-close | ɪ | ʊ |
| Half-Open | ɛ | ɔ |
| Open | a | |

Table 1. Setswana vowels chart.

## 2. Methodology

The present study used a Botswana Names Corpus (Otlogetswe, 2018) which comprises 1,093,265 names. The names were collected from several sources which include primary and secondary school examination results, university graduation lists, and class lists. The corpus was processed using Wordsmith Tools version 7 (Scott. 2019). WordSmith Tools is textual analysis software for measuring word frequencies, concordances, and keyness measures. The software was used to generate the most frequent 1001 names for the study. The 1001 names include first names, middle names, and last names. The study considered all types of names equally since all surnames were at some point someone's first name. The top 1001 names were cleaned by removing all non-Setswana names since the study concerns itself with Setswana names only. The names were then classified based on whether they were male or female. Setswana has exclusively male names such as *kgotla* (traditional law court) and exclusively female names such as *Seyanokeng* (one who goes to the river). These names are classified according to their exclusivity in the present study. Setswana also has names that though predominantly male or predominantly female, are occasionally given to either sex. These names have been classified according to their predominance in the present study. Setswana also has purely unisex names such as *Kabo (to gift*). Purely unisex names were excluded from the present study. After data cleaning, the 1001 names list was reduced to 958.
Two Setswana native speakers phonemically transcribed the names using the International Phonetic Alphabet. The Statistical Package for the Social Sciences (SPSS) version 26 and Excel were used to further analyse the data. The study employed descriptive and inferential statistical procedures in the analysis of data. (For more details on the methodology see Sebina & Otlogetswe 2023).

## 3. Results

The results indicate a vowel sex-biased sound symbolism in Setswana personal names. Female names were statistically significantly associated with more vowels $M$ =3.60 ($SD$ = .919); $t(956)$ = -5.53, $p$< 0.01 than male names $M$ =3.26 ($SD$ = 0.930). As a group female names were statistically significantly associated with front vowels $M$ =1.66 ($SD$ = 1.16); $t(956)$ = -4.04, $p$< 0.01 compared to male names $M$ =1.39 ($SD$ = 0.95). Moreover, female names statistically significantly showed a preference for lax vowels (/ɪ/, /ʊ/) $M$ =1.61 ($SD$ = 1.202); $t(956)$ = -3.29, $p$< 0.01 than male names $M$ =1.06 ($SD$ = 1.063). Male names were statistically significantly associated with high tense vowels (/i/, /u/) $M$ =0.63 ($SD$ = 0.684); $t(956)$ = 1.872, $p$< 0.05 than female names $M$ =0.55 ($SD$ = 0.666). The back vowels did not produce a statistically significant result. All back vowels in Setswana are rounded therefore rounded vowels were not statistically significant. The most frequent vowel in Setswana gender names is the central vowel /a/ while the least frequent is the /u/. A comparison of these vowels in male and female names did not produce a statistically significant result. The central vowel is the only low vowel in Setswana.

Figure 1: The Mean of total vowels for males and females.

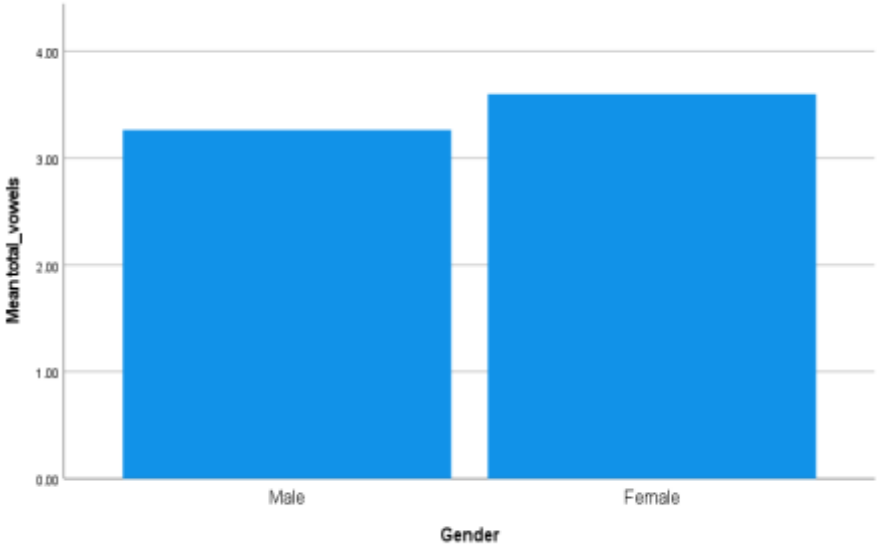



Figure 2: The Mean of high tense vowels in male and female personal names.

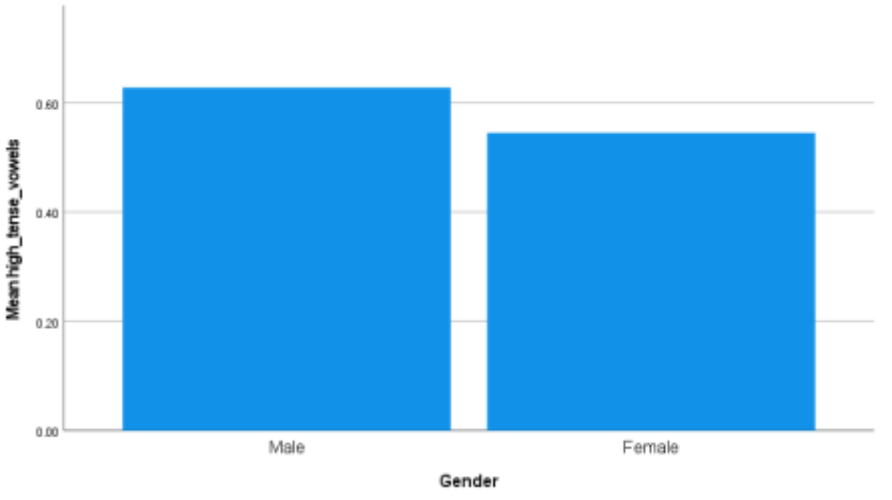


Figure 3: The Mean of lax vowels in male and female Setswana personal names.

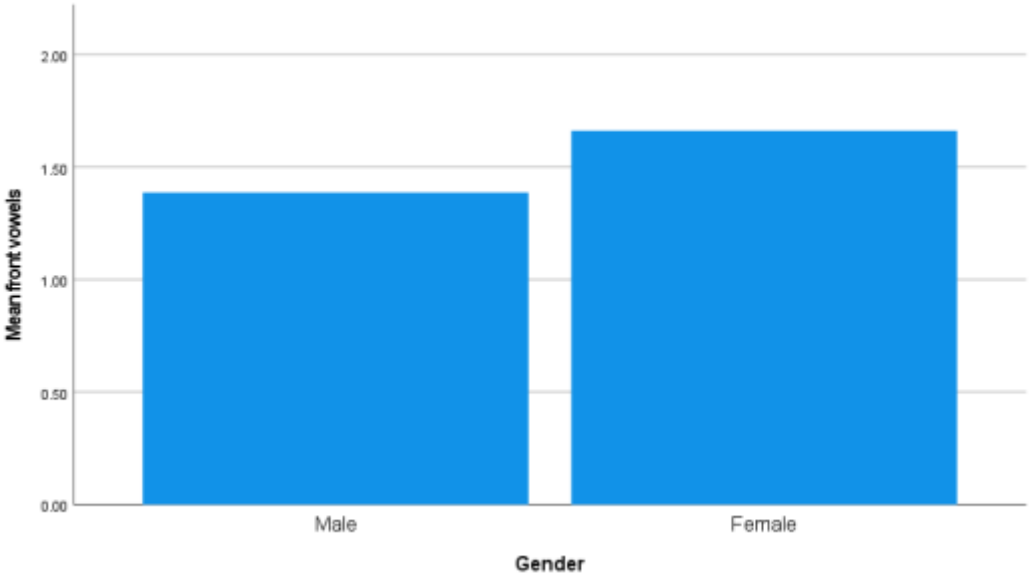



Figure 4 front vowels

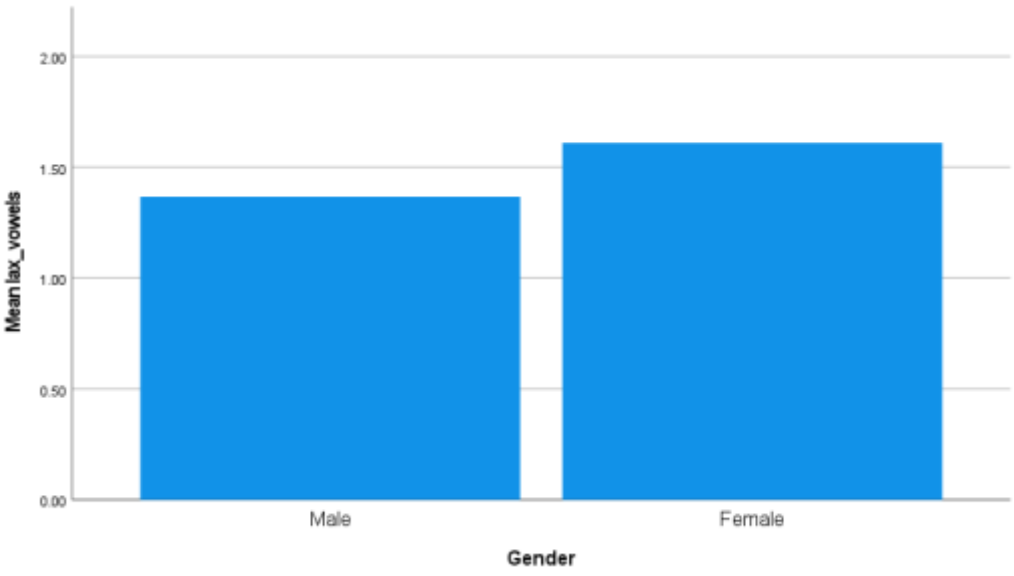
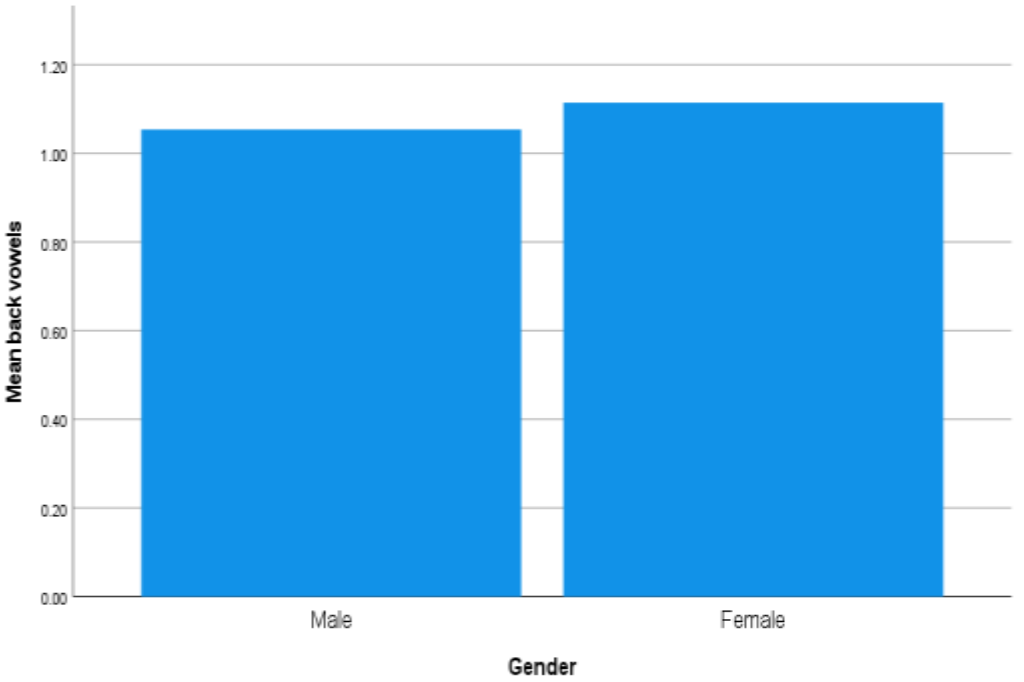


Figure 5: Mean back vowels




## 4. Discussion

The study investigated sound symbolism in Setswana personal names. The findings of the present study show that there is a correlation between gender names and sound symbolism. Female names show bias towards high-frequency front vowels as well as lax vowels while high tense vowels are frequent in male names. In so doing the results of the current study show that vowels in Setswana personal names may predict gender. Surprisingly the back vowels did not pattern in the expected direction because it did not produce a statistically significant result. The expectation was that the back vowels would show a statistically significant result in male names as reported in previous studies (Pitcher, et al. 2013; Culter et al. 1990; Slater & Feinman 1985). This finding may put doubt on whether the data show evidence for sex dimorphism or, more generally, a gender-binary make-up. However, the frequency of front vowels in female names and that of tense vowels and lax vowels in male names may support sex dimorphism in the present study.

A similar sex-biased sound symbolism in terms of high-frequency front vowels is reported by (Sullivan & Kang 2019; Suire et al. 2019; Pitcher, et al. 2013; Culter et al. 1990; Slater & Feinman 1985). The high frequency of front vowels in female names may indicate that Setswana follows sex size dimorphism observed in human body size (Puts et al. 2012; Cassidy et al. 1999).

The tendency for female names to prefer front vowels is correlated with their body size (Suire et al. 2019; Pitcher et al. 2013; Culter et al. 1990). According to Pitcher et al. (2013), smaller, slimmer women are considered more attractive to men and are believed to be highly fertile (Stulp et al. 2012; Jasieńska et al. 2004). It is worth noting that the sexual size dimorphism could be culture-specific. While slimmer females are considered attractive in the Western culture, in the Setswana

culture, bigger, voluptuous women are more desirable. There is a similar perception of attractiveness in the Zulu culture of South Africa where fuller women are considered attractive because fatness is a symbol of wealth, good living, and good health (Tovée et al. 2006).

The bigger female phenomenon has found support in fecundity, the physiological possibility for a woman to carry children. In mammal sexual reproductive relationships, bigger females are preferable because more space is required to store eggs than it is to store sperm, and the larger the body the more eggs are produced thus increasing the chances of reproduction (Andersson 1994). The frequency of front vowels in Setswana female names might have nothing to do with smallness in terms of body weight but everything to do with age. Generally, in the Setswana culture a woman younger than a man is preferred in a sexual relationship. The Setswana culture shuns a love relationship where the woman is older than the man as such these kinds of relationships rarely existed in the olden days. If they existed, it would be a situation where the woman did not disclose her real age. However, this was unusual because most marriages were arranged between families who knew each other very well.

In Setswana, a woman younger than a man in age is perceived as small in authority and social status. This might be due in part to Setswana using the same term (*monnye*-small/young) to refer to both occurrences, there is no distinction made between the two words. It is worth noting that nowadays there are instances of love relationships where the woman is older than the man. Even in this kind of relationship, a woman is still perceived as small. This is because society has been socialized in a culture where a woman is considered small since in the past younger women whose age was correlated with smallness were desired in a sexual relationship. This has now been applied to all love relationships regardless of whether the woman is older than the man. The perception of women being small in the Setswana culture is correlated with submissiveness. This is in line with the frequency code theory; men and women do not assume equal roles in a love relationship (Ohala 1984). Men assume an upper dominant role while women are expected to assume a weak, small role equivalent to that of a child. In fact, in the Setswana culture when a man is asked 'how are the children?' the children include the mother of the children or the wife. However, when a woman is asked the same question, it does not include the husband or father of the children.

There is an observed contradiction in the result of the study regarding sex-biased size dimorphism. Even though size dimorphism in terms of weight might not necessarily apply in Setswana culture, the finding of tense vowels and lax vowels continues to support size dimorphism about height. Tense vowels are long in duration while lax vowels are short (Roach 2009). The bias in female names towards lax vowels which are short and in male names of tense vowels which are long is correlated with the femininity and masculinity of the name bearer. In most cases, shorter women are regarded as more attractive and more fecund compared to taller women (Stulp et al. 2012). Conversely, taller men are considered more powerful and attractive (Buunk et al. 2008; Pawlowski & Jasieńska 2005) as well as being highly fertile compared to shorter men (Stulp et al. 2012; Pawlowski et al. 2000).

The speaker's voice has specific properties that can be used by listeners to identify the attributes of the speaker (Puts et al. 2012, 2011, 2010, 2007, 2006; Feinberg et al. 2008; Varosanec-Skaric 1999; Van Dommelen & Moxness 1995; Childers & Wu 1991; Bennett & Montero-Diaz 1982). It is interesting to note that the high formant frequency vowels common in female names (Ramaeba et al. 2020; Suire et al. 2019; Pitcher et al. 2013; Culter et al. 1990) are high-pitched therefore, loud. Loudness is a personality attribute associated mostly with women, a characteristic which is frown upon.

The expression: “He is a loud man,” does not exist. Certainly, I have never heard anyone say it. A man may occasionally speak loudly. Traditionally, though, loud is a thing that certain women *are*, rather than something they do. Loud is a word we attach exclusively to women, often alongside the word “lairy”. (The Guardian 2018, para. 4).

The frequency of vowels as voiced phonemes in female names goes against the findings of Slepian and Galinsky (2016) who established that voiced phonemes that sound hard and voiceless phonemes that sound soft were common in male names and female names respectively. They concluded that the findings depicted the stereotypical characteristics of strong, tough males and soft, tender females. Slepian and Galinsky's (2016) results echo Pitcher et al. (2013) who found that male names are biased towards large-sounding phonemes while small-sounding phonemes are common in female names. The frequency of vowels in Setswana anthroponomy gender names might mean that in the Setswana culture females are considered strong and tough. These strong and tough traits might not necessarily be physical but mental or emotional. This is demonstrated by the Setswana proverb *mma ngwana o tshwara thipa ka kwa bogaleng* translated ‘a mother holds the sharp end of the knife.’ A mother here is used as a general term for women. The proverb emphasizes the bravery and kindness of women. A woman will put up with danger, blame, and misfortune to protect someone she cares about.

The results of the lax vowels and tense vowels frequent in female and male names respectively are confusing as they contradict the results of overall vowels. Tense vowels are articulated with greater muscular energy while lax vowels are produced with relatively loose muscles (Roach 2009). The articulation of tense vowels and lax vowels has a muscular effect like that of voiced and voiceless phonemes. The articulation of both tense vowels and voiced phonemes requires more muscular energy compared to producing lax vowels and voiceless phonemes. The expectation was for the results to pattern similar to vowels with tense vowels significant in female names and lax vowels in male names. Nonetheless, the result of tense and lax vowels in terms of muscular state pattern is similar to Slepian and Galinsky (2016) and Pitcher et al. (2013).

## 5. Conclusion

The study has demonstrated sex-biased sound symbolism in the Setswana anthroponym through vowels. Female names have shown preference for front vowels, lax vowels and overall have more vowels than male names. Conversely, tense vowels are dominant in male names. However, unlike previous studies where back vowels were prevalent in male names, they did not produce a statistically significant result. Therefore, the results of the present study do not offer a possibility for the universality of vowel sound symbolism in predicting the sex of a name bearer. Nonetheless, the results provide a prospect for the interrogation of other phonemes such as the consonants to determine if the findings are in line with that of previous studies. An investigation of voiced and voiceless sounds as well as velar sounds in Setswana personal names and comparing the results to that of vowels and back vowels in the present study will provide valuable information on size dimorphism. The results also provide a perfect avenue for similar research in other languages.

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