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COMPARISON OF VOWEL CONTENT RATES OF IGBO AND SOME OTHER LANGUAGE WORDS AND EXPRESSIONS OF EQUIVALENT MEANING: AN EXPLORATORY INTRODUCTION TO QUANTITATIVE STUDY OF IGBO LANGUAGE

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NTULEKỌRỊTA KA NDỊNA ỤDAUME IGBO NA OKWU ASỤSỤ NDỊ ỌZỌ NA NGOSIPỤTA NAHỌTA DỊ KA IBE YA SI ADỊ: NNYOCHAPỤTA NKỌWA N'EBE ỌMỤMỤ KWỌNTITATIV ASỤSỤ IGBO

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ABSTRACT: *This paper proposes, develops, presents and illustrates an exploratory method for possible use in the promotion of quantitative research, teaching and study of Igbo language, culture and concepts. In particular the paper proposes, develops, presents and illustrates vowel content rates defined as the number of vowels per unit of the number of letters in Igbo language words or expressions with the vowel contents rates of words or expressions of equivalent meaning in any other language of research interest. A test statistic is also developed for use in testing the null hypothesis that vowel content rate of Igbo language words and expressions do not differ from vowel content rate of words and expressions of equivalent meaning in some other language of interest. The proposed method is illustrated with some sample data on matched pairs of Igbo and English word names that are equivalently used as names of human body parts in the two languages. Analysis of these data show that, at least for human body parts, vowel content rates of Igbo word names are on the average significantly higher than vowel content rates with the corresponding English Language word names that are also used as names of the same human body parts.*

KEYWORDS: Vowel, Ratio, Language, Human, Comparison, Quantitative

ỤMỊEDEMEDE: *Akwụkwọ a na-atụpụta, wulite, gosipụta ma zipụta usoro nkọwa e nwereike were wee kwalite nchọcha kwọntitativ, nkuzi na ọmụmụ asụsụ Igbo, omenaala na atụtụ. Tụmadị akwụkwọ a na-atụpụta, wulite, gosipụta ma zipụta ndịna ụdaume si adị dịka ụdaume ole otu isi mkpụrụedemede ole dị na mkpụrọokwu asụsụ Igbo maọbụ iji mkpụrụokwu ndịna ụdaume si adị egosipụta maọbụ ngosipụta nghọta asụsụ ọbụla e nwere mmasị dị ka ibe ya. A na-awụlitekwa nwale nchọpụta niihi iji ya nwachapụta haịpotesis efu na ndịna ụdaume ka mkpụrụokwu asụsụ Igbo si adị na nzipụta apụghị iche n'ebe ndịna ụdaume mkpụrụokwu si adị na nzipụta nghọta asụsụ ọbụla enwere mmasị dị ka ibe ya. Eji ụfọdụ ụsa a chịkọbara na ndoko aha mkpụrụokwu Igbo na Bekee dị ka ibe ya nke e ji mee aha akụkụ ahụ mmadụ n'asụsụ abụọ ndị a wee zipụta usoro ntụpụta. Nkọwada ụsa ndị a gosipụtara na n'akụkụ ahụ mmadụ, ndịna ụdaume aha mkpụrụokwu Igbo nọ n'ogo doro anya karịa ndịna ụdaume tinyere aha mkpụrụokwu asụsụ Bekee dakọrịta ọnụ nke e jikwa eme aha akụkụ ahụ mmadụ.*

Ọkpụrụkpụ Okwu: Ụdaume, Rechio, Asụsụ, Mmadu, Ntulekọrịta, Kwọntitativ.

INTRODUCTION

It is noteworthy that not much, if any, work has hitherto been undertaken to develop quantitative methods for use in the teaching, research and study of Igbo language and concepts quantitatively. Such quantitative methods would enable a researcher to for instance, estimate indices and strength of similarity or association between Igbo words and expressions in meaning. They will also enable comparisons of the relative frequencies of use of some elements of Igbo language such as the articles, verbs, adverbs adjectives, pronouns etc, used in Igbo language both by themselves as well as by various authors and subject areas.

It would also then be possible to compare quantitatively the vowel, consonant, verb, adverb, adjective etc. content rates of Igbo words and expressions with the content rates of similar concepts of equivalent meaning in other languages.

Additionally, quantitative study of Igbo language and expressions would enable one more easily classify Igbo language words and expressions in terms of number of Igbo letters or alphabets in the word or expression and the number of vowel or consonant in the words, thereby enabling one classify Igbo words and expressions as, for instance null-vowel, uni-vowel, bi-vowel, tri-vowel or poly-vowel as an innovation in Igbo language concepts. Use of quantitative methods in the study of Igbo language would also enable more systematic study of the determining factors, trends and rates of infusion and borrowing of foreign words, expressions and concepts into Igbo language and culture thereby enabling formulation of structured models of Igbo language growth and expansion.

This paper proposes to develop and explore methods for the study of Igbo language quantitatively, which with appropriate modification may be used and applied in the study of some of the research areas in Igbo language raised above.

NKỌWA

Ọ kwesiri ịmata na ọ nweghị nnukwu ihe, ma ọ bụrụ na o nwere, ọrụ a rụgoro iwulite usoro kwọntitativ niihi iji ya kụzie, mee nchọcha ma mee ọmụmụ n'asụsụ Igbo na atụtụ n'ụzọ kwesiri. Ụdị usoro kwọntitativ a ga-enyere nwanchọcha aka ọmụmaatụ, ikwu ole ọ dị ya ka indicis na ike nyiri maọbụ nkwụkwụ dị n'etiti okwu Igbo na nzipụta na nghọta. Ha ga-enyere ntụlikọrịta frekwencis matụtara nke e ji ụfọdụ mperimpe asụsụ Igbo eme dịka aatịkụl, ngwaa, omekangwaa, nkọwa, nnọchiaha dịrị gawa, nke na ha ma ndị odee dị icheiche nakwa amụmamụ ji mere ihe.

Ọ ga-adịkwazị mfe ịtụlekọrịta ụdaume, mgbochiume, ngwaa, omekangwaa, nkọwa dịrị gawa, n'ụzọ kwesiri. Ndịna okwu Igbo si adị na nzipụta gụnyere ka ndịna nyiri nghọta dị ka ibe ya n'asụsụ ndị ọzọ si adị.

Tinyere na ọmụmụ buru ibu asụsụ Igbo na ngosipụta ga-enyere aka idoko okwu asụsụ Igbo otu mgbe na nzipụta n'ụdị mkpụrụedemede Igbo ole maọbụ mkpụrụabịdịị n'ime okwu maọbụ nzipụta nakwa mkpụrụ ole ụdaume maọbụ mgbochiume dị n'okwu nke ga-enwe ike nyere aka idoko okwu Igbo na nzipụta dịka ọmụmaatụ, ụdaume-efu, ụdaume-otu, ụdaume-abụọ, ụdaume-atọ maọbụ ụdaume-buru ibu dịka mgbanwe isiokwu asụsụ Igbo. Igbaso usoro kwọntitativ n'ọmụmụ asụsụ Igbo ga-anabata ọtụtụ ọmụmụ dị obosara nke isi sekpụ ntị (Igbojinweaka na Dorgu, 2015), ihe na ewu na ka ihe si abata na ịwebata okwu ndị Bekee, nzipụta na isiokwu n'ime asụsụ Igbo na omenaala nke ga-enyere oghere iguzobe ọtụtụ asụsụ Igbo edoziri nke ọma na mmụba ya.

Akwụkwọ a chọrọ iwulite na ime njem nchọpụta usoro maka ọmụmụ asụsụ Igbo dị mma, nke a ga-enwe ike ịnomiri n'usoro kwesirị ma tinye ya n'ọrụ n'ọmụmụ akụkụ ụfọdụ nchọcha asụsụ Igbo a rụgoro aka.

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PROPOSED METHOD

Suppose a researcher collects or obtains a random sample of n pairs of Igbo and some other language words that are the same or equivalent in meaning.

Let (n_{i1}, n_{i2}) be the number of letters in the i^{th} pair of Igbo and some other language words of equivalent meaning, and let (x_i, y_i) be the corresponding number of vowels in the i^{th} pair of Igbo and some other language words of equivalent meaning for i = 1,2,…,n.

Let $p_{i1} = \frac{x_i}{n_{i1}}$; $p_{i2} = \frac{y_i}{n_{i2}}$ … (1)

for $i = 1, 2, \ldots \ldots \ldots \ldots n.$

Note that n_{i1} is the length, in terms of the number of alphabets making up the i^{th} Igbo word or expression of interest and n_{i2} is the length of some other language word or expression used as equivalent word in meaning for the i^{th} Igbo language word or expression of interest for i = 1,2,…,n

Now define

$$U_i = \begin{cases} 1, if\ p_{i1} > p_{i2} \\ 0, if\ p_{i1} = p_{i2} \\ -1, if p_{i1} < p_{i2} \end{cases} \quad \ldots \quad (2)$$

If $i = 1, 2, \ldots, n$

Let

$$\pi^+ = P(U_i = 1);\ \pi^o = P(U_i = 0);\ \pi^- = P(U_i = -1) \quad \ldots \quad (3)$$

Where $\pi^+ + \pi^o + \pi^- = 1$ . . . (4)

Let $W = \sum_{i=1}^{n} U_i$ . . . (5)

It can be shown that the mean or expected value and variance of U_i are respectively (Oyeka and Nwankwo, 2015).

USORO NCHỌRỌ NWULITE

Ka x_i nọchite ole ụdaume dị n'okwu Igbo maọbụ nzipụta nke nwere mmasị na ka y_i nọchite ole ụdaume dị n'okwu dị ka ibe ya maọbụ nzipụta nke x_i n'asụsụ bekee

Ka $P_{i1} = \frac{X_i}{n_{i1}}$ na $P_{i2} = \frac{Y_i}{n_{i2}}$ … (1)

Nke i = 1,2, …, n

Ebe n_{i1} bụ ike, n'ụdị mkparụabịdịị ole guzobere i th okwu Igbo maọbụ nzipụta nwere mmasị na n_{i2} bụ ogologo okwu asụsụ Bekee maọbụ nzipụta nọchirianya nyiri nke ith okwu Igbo maọbụ nzipụta nwere mmasị.

Kọwaa Ugbua

$$U_i = \begin{cases} 1, ma\ ọ\ bụrụ\ na\ P_{i1} > P_{i2} \\ 0, ma\ ọ\ bụrụ\ na\ P_{i1} = P_{i2} \\ -1, ma\ ụ\ bụrụ\ na\ P_{i1} < P_{i2} \end{cases} \quad \ldots (2)$$

Ma ọ bụrụ na i = 1, 2 …, n

Ka

$$\pi^+ = p\ (U_i = 1);\ \pi^o = P(U_i = 0);\ \pi^- = P(U_i = -1) \quad \ldots \quad (3)$$

Ebe

$$\pi^+ + \pi^o + \pi^- = 1 \quad \ldots \quad (4)$$

Ka

$$W = \sum_{i=1}^{n} U_i \quad \ldots \quad (5)$$

A ga-egosipụta na miin maọbụ ụsa atụrụanya na ndagharị nke U_i dị n'ụdị ha (Meyer, 1974; Oyeka and Nwankwo, 2015).

$E(U_i) = \pi^+ - \pi^-; var(u_i)$

$= \pi^+ + \pi^- - (\pi^+ - \pi^-)^2$ . . . (6)

Similarly, the mean or expected value and variance of W are respectively.

$E(W) = n(\pi^+ - \pi^-); var(W)$

$= n(\pi^+ + \pi^- - (\pi^+ - \pi^-)^2)$ . . (7)

Now for any matched pair of Igbo language and some other language word or expression of equivalent meaning, π^+, π^0 and π^- are respectively the proportion of these pairs in which vowel content rate of Igbo words or expressions are larger equal to, or smaller than the vowel content rates of the corresponding word or expression of some other language words or expression of equivalent meaning in the matched pairs.

It can be shown that their sample estimates are respectively (Oyeka and Nwankwo, 2015)

$$\hat{\pi}^+ = p^+ = \frac{f^+}{n};\ \hat{\pi}^0 = p^0 = \frac{f^0}{n};\ \hat{\pi}^- = p^- = \frac{f^-}{n} \quad \ldots (8)$$

Where f^+, f^0 and f^- are respectively the number of matched pairs of Igbo and some other language words or expressions of equivalent meaning in which vowel content rates of Igbo word or expressions are larger, equal to or smaller than vowel content rates of the corresponding words or expressions of some other language, word or expression. In other words, f^+, f^0 and f^- are respectively the number of 1's, 0's and -1's in the frequency distribution of the n values of these numbers in U_i, for i =1, 2, …, n.

The estimated number of matched pairs of Igbo language and some other language words or expressions of equivalent meaning in which the vowel content rate of Igbo language word or expression are larger, less the number of such matched pairs in which these rates are smaller than the vowel contents rates of corresponding some other language word or expression of equivalent meaning is (Meyer, 1974; Oyeka and Nwankwo, 2015)

$E(U_i) = \pi^+ - \pi^-; var\ (U_i)$

$= \pi^+ + \pi^- - (\pi^+ - \pi^-)^2$ … (6)

Na nyirita, miin maọbụ ụsụ atụrụanya na ndagharị nke W dị n'ụdị ha.

$E(W) = n(\pi^+ - \pi^-); var(W)$

$= n\ (\pi^+ + \pi^- - (\pi^+\pi^-)^2)$ … (7)

Ugbua, maka ndoko asụsụ Igbo abụọ ọbụla na okwu asụsụ ụfọdụga maọbụ nzipụta nghọta dị ka ibe ya, π^+, π^o na π^- dị n'ụdị ha nyere abụọ ndị a nke ndịna ụdaume okwu Igbo si adị maọbụ nzipụta nyekwara otu ihe karịrị maọbụ pekarịrị ndịna ụdaume si adị okwu metụtara maọbụ nzipụta okwu asụsụ ụfọdụ maọbụ nzipụta nghọta dị ka ibe ya n'ime ndoko abụọ a.

A ga-egosipụta na ihe a tụrụanya na nsere dị n'ụdị a (Oyeka na Nwankwo, 2015)

$$\pi^+ = p^+ = \frac{f^+}{n}; \pi^o = P^o = \frac{f^o}{n};\ \pi^- = P^- = \frac{f^-}{n} \ldots (8)$$

Ebe f^+, f^o na f^- dị n'ụdị ndoko okwu abụọ Igbo na ụfọdụ okwu asụsụ ndị ọzọ maọbụ nzipụta nghọta dị ka ibe ya nke ndịna ụdaume okwu Igbo si adị maọbụ nzipụta bụ karịrị, nyere maọbụ pekarịrị ka ndịna ụdaume si adị nke okwu dakọrịtara maọbụ nzipụta ụfọdụ asụsụ ndị ọzọ, okwu maọbụ nzipụta. N'okwu ọzọ, f^+, f^o na f^- dị n'ụdị ọnụọgụgụ 1's, 0's na -1's n'ime usoro nkesa njirimara ọnụọgụgụ ndị a n'ime U_i, nke i = 1,2 ……., n.

Ndoko asụsụ Igbo gbara mkpị mkpụrụ ole a tụrụanya na ụfọdụ okwu asụsụ ndị ọzọga maọbụ nzipụta nke ndịna ụdaume asụsụ Igbo si adị maọbụ nzipụta bụkarịrị, pekarịrị ọnụọgụgụ ụdị gbara mkpị nke reet a pekarịrị reet ndina ụdaume ụfọdụ okwu asụsụ dabara maọbụ nzipụta nghọta dị ka ibe ya dị (Meyer, 1974; Oyeka and Nwankwo, 2015)

$$W = n\,(\pi^+ - \pi^-) = n(p^+ - p^-) = f^+ - f^- \ldots (9)$$

If in the population of these matched pairs of Igbo language and some other language words or expressions, of equivalent meaning are equal, then the expected value of the difference between these vowel contents rates would be zero. Thus, the null hypothesis that may be tested for the population of the differences in rates is that

$$H_o : \pi^+ - \pi^- = 0 \quad \text{Versus} \quad H_1 : \pi^+ - \pi^- \neq 0 \ldots (10)$$

The null hypothesis, H_o of equation (10), is tested using the Chi-Square test statistic

$$\chi^2 = \frac{W^2}{var(W)} = \frac{n(\hat{\pi}^+ - \hat{\pi}^-)^2}{\hat{\pi}^+ + \hat{\pi}^- - (\hat{\pi}^+ - \hat{\pi}^-)^2}$$

$$= \frac{(f^+ - f^-)^2}{f^+ + f^-} - \frac{(f^+ - f^-)^2}{n} \quad \ldots \quad (11)$$

The null hypothesis H_o is rejected at the α level of significance if the calculated chi-square value is at least equal to the already tabulated chi-square value with 1 degree of freedom (Larson,1974), that is if

$$\chi^2 \geq \chi^2_{(1-\propto:1)} \quad \ldots \quad (12)$$

otherwise the null hypothesis is accepted.

ILLUSTRATIVE EXAMPLE

A researcher is interested in comparing the vowel content rate of Igbo language names of human body parts with the vowel content rate of the same human body parts names in English language. She collected a random sample of the names of 17 human body parts in both Igbo and English languages obtaining the following results

$$W = n\,(\pi^+ - \pi^-) = n(p^+ - p^-) = f^+ - f^- \ldots (9)$$

Ọ bụrụ na ndịkọta ọnụọgụ asụsụ Igbo ndị a gbara nkpị na ụfọdụ okwu asụsụ ndị ọzọ maọbụ nzipụtara, ya bụ na ndịiche dị n'etiti. Ụsa a tụrụ anya na reet ndịna ụdaume ga-abụ efu. Ya bụ, haịpotesis efu nke e nwere ike ị nwale maka reet ndịiche nchịkọta ọnụọgụ bụ

$$H_o : \pi^+ - \pi^- = 0 \text{ Versus } : \pi^+ - \pi^- \neq 0 \ldots (10)$$

E ji statistik nwale Chi-Square a nwale haịpotesis efu nke ikwueshọn 10.

$$\chi^2 = \frac{W^2}{var(W)} = \frac{n(\hat{\pi}^+ - \hat{\pi}^-)^2}{\hat{\pi}^+ + \hat{\pi}^- - (\hat{\pi}^+ - \hat{\pi}^-)^2}$$

$$= \frac{(f^+ - f^-)^2}{f^+ + f^-} - \frac{(f^+ - f^-)^2}{n} \quad \ldots \quad (11)$$

A na-agba haịpotesis efu H_o ikwueshọn 10 alụkwaghị m ma ọ bụrụ na o pekatampe ogo mpụtara a gbakọrọ Chi-square bụ otu ihe nye Chi-square edokogolarịị site n'otu digrii mnwereonwe (Larson, 1974) n'ebe ogo mpụtara

$$\chi^2 \geq \chi^2_{(1-\propto:1)} \quad \ldots \quad (12)$$

ị mara na-anabatara haịpotesis efu ahụ.

ỌMỤMAATỤ NGOSIPỤTA

Nwanchọcha nwere mmasị ịtụlekọrịta reet ndịna ụdaume nke aha dị n'asụsụ Igbo, akụkụ ahụ mmadụ na reet ndịna ụdaume otu akụkụ ahụ mmadụ asụsụ Bekee. Ọ wee chikọba ụsa site na nsere aha iri na asaa akụkụ ahụ mmadụ n'Igbo na asụsụ Bekee wee nweta ụsa ndị a

Table 1: Human Body Parts in Both Igbo And English Languages

S/N (i)	Igbo Name	English Name
1	Isi	head
2	Ile	tongue
3	Imi	nose
4	Ara	breast
5	Ntị	ear
6	Afo	stomach
7	anya	eye
8	Aka	hand
9	Ụkwụ	leg
10	mkpịsịaka	finger
11	mkpisiukwu	toe
12	obo-aka	palm
13	Iru	face
14	onụ	mouth
15	Onu	neck
16	Azụ	back
17	mgbili afọ	intestine

Table 2: Computation of Proportion of Vowels in Igbo and Corresponding English Words for Various Parts of the Body

S\N (i)	n_{i1} (No of letters in Igbo word)	x_i (No of vowels in Igbo word)	$p_{i1} = x_i/n_i$ (Proportion of vowels in Igbo word)	n_{i2} (No of letters in English word)	y_{i2} (No of vowels in English word)	$p_{i2} = y_{i1}/n_{i2}$ (Proportion of vowels in English word)	U_i
1	3	2	0.67	4	2	0.50	1
2	3	2	0.67	6	3	0.50	1
3	3	2	0.67	4	2	0.50	1
4	3	2	0.67	6	2	0,33	1
5	3	1	0.33	3	2	0.67	-1
6	3	2	0.67	7	2	0.29	1
7	4	2	0.50	3	2	0.67	-1
8	3	2	0.67	4	1	0.25	1
9	4	2	0.50	3	1	0.33	1
10	9	4	0.44	6	2	0.33	1
11	10	4	0.40	3	2	0.67	-1
12	6	4	0.67	4	1	0.25	1
13	3	2	0.67	4	2	0.50	1
14	3	2	0.67	5	2	0.40	1
15	3	2	0.67	4	1	0.25	1
16	3	2	0.67	4	1	0.25	1
17	9	4	0.44	9	4	0.44	0
Total	**75(n_1)**	**41(x_1)**	**0.55($\hat{\pi}_1$=p_1)**	**79(n_2)**	**32(x_2)**	**0.41($\hat{\pi}_2$ = p_2)**	
						f^+= 13	
						f^0 = 1	
						f^- = 3	

To answer the research question, we apply equation (1) to the above sample data to obtain values of U_i and other statistics, shown in table 2.

From the last column of table 2 we have that the total number of pairs of Igbo and English language words of equivalent meaning in which vowel content rates of Igbo language words are larger, scored 1, equal to, scored 0, or smaller, scored -1 than the vowel content rate of the corresponding English language words of equivalent meaning are respectively $f^+ = 13;\ f^0 = 1;\ and\ f^- = 3$ so that the relative performance of Igbo language words to English Language words of equivalent meaning in terms of vowel content rates is

$$w = f^+ - f^- = 13 - 3 = 10$$

And from equation 8 we have that

$$\hat{\pi}^+ = \frac{f^+}{n} = \frac{13}{17} = 0.76, \qquad \hat{\pi}^0 = \frac{f^0}{n} = \frac{1}{17}$$

$$= 0.06 \quad and \quad \hat{\pi}^- = \frac{f^-}{n} = \frac{3}{17} = 0.18$$

Now to test the null hypothesis that H_o of equation 10 that the difference in verbal content rates between Igbo and English Language words used as names of the same human body parts are the same, we have from equation 11 that

$$\chi^2 = \frac{(13-3)^2}{(13+3)} - \frac{(13-3)^2}{17} = 0.368$$ (p - Value = 0.0000)

Which with 1 degree of freedom (Larson, 1974) is statistically significant, indicating that vowel content rates of Igbo words are much higher than vowel content rates of English Language words that are equivalently used as names of human body parts in the two languages?

In fact, the present data of names of human body parts show that the vowel content rate of Igbo word names is 0.55 while the vowel content rate for the equivalent word names in English language is only about 0.40. Thus, based on at least the

Iji zaa afụfụ nchọcha, a ga-agbaso ikwueshọn (1) nyere nsere nchọcha dị n'elu iji chọpụta ụsa U_i na statistiks ndị ọzọ. E gosipụtara na tabul (1) nke ikwueshọn (1) maka akụkụ ahụ mmadụ na statistiks ndị ọzọ

Site na kolum Ikpeazụ tabul 1, anyị nweere na nchịkọta ọnụọgụ Igbo gbara mkpị na okwu asụsụ Bekee nwere nghọta dịka ibe ya nke reet ndịna ụdaume okwu asụsụ Igbo bukarịrị, nwetara 1, nyere, nwetara 0, maọbụ pekarịrị, nwetara -1 karịa reet ndịna ụdaume okwu asụsụ Bekee dakọrịtara n'ụdị ọ kwesiri $f^+ = 13;\ f^o = 1;\ \ f^- = 3$ nke meziri mgbali okwu asụsụ Igbo nye okwu asụsụ bekee nghọta dịka ibe ya n'ụdị reet ndịna ụdaume bụ

W=$f^+ - f^- = 13 - 3 = 10$ $\hat{\pi}^+ = \frac{f^+}{n} = \frac{13}{17} =$ 0.76, $\hat{\pi}^0 = \frac{f^0}{n} = \frac{1}{17}$

$= 0.06 \quad and \quad \hat{\pi}^- = \frac{f^-}{n} = \frac{3}{17} = 0.18$

Ugbua, nịnwale haipothesis efu nke ikwueshon 10, na reet ndịna ụdaume nke aha akụkụ ahụ mmadụ na reet ndịna ụdaume otu akụkụ ahụ mmadụ ahụ nasụsụ Bekee anyi nwere, site na ikwueshon 11 na

$$\chi^2 = \frac{(13-3)^2}{(13+3)} - \frac{(13-3)^2}{17} = 0.368$$ (p - Value = 0.0000)

Nke na nnwereonwe digrii 1 gosiri na reet ndina ụdaume okwu Igbo karịrị reet ndịna okwu ụdaume asụsụ Bekee na nkwupụta pụrụ iche nke dịka ibe ya ejikwa enye akụkụ ahụ mmadụ aha n'asụsụ abụọ a.

N'atụfụghị oge, ụsa ugbua nke aha akụkụ ahụ mmadụ gosiri na reet ndịna ụdaume aha okwu Igbo bụ 0.55, maọbụ pacent iri ise na ise ebe reet ndịna ụdaume okwu dị ka ibe ya n'asụsụ Igbo dị naanị 0.40 maọbụ pacent iri anọ. Nke gbadoro ụkwụ na o pekata mpe ụsa ugbua n'akụkụ ahụ

present data on human body parts it can be concluded that the number of vowels per word length in Igbo language words or the so-called word length is about 37.5% higher than the number of vowels per word length in English language words that may be equivalently used as names of human body parts.

SUMMARY AND CONCLUSION

This paper has presented and discussed an exploratory method for possible use to promote quantitative research, teaching, and study of Igbo language, culture and concepts.

In particular this paper has presented a method for use in the comparison of vowel contents in terms of the number of vowels per unit of the number of letters in Igbo language words or expressions with the vowel content rate of words and expressions of equivalent meaning in any other language of research interest.

A test statistic has also been developed for use in testing any desired null hypothesis including the null hypothesis that vowel content rate of Igbo language words or expressions do not differ from vowel content rate of words or expressions of equivalent meaning in some other language of research interest.

The illustrative data of names of human body parts that were used showed that vowel content rates of Igbo language word names are on the average higher than the corresponding rates for English language word names that are equivalently used as names of human body parts.

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mmadụ na nchịkọta ga-enweike ịsị na ọnụọgụ ụdaume dịka mkpụrụabịdịị ole n'okwu asụsụ Igbo maọbụ n'ogologo akọwara ji 37.5% karịa ọnụọgụ ụdaume dịika ogologo okwu dị n'okwu asụsụ Igbo nke e nwere ike ijikwa mee aha akụkụ ahụ mmadụ.

NCHỊKỌTA NA MMECHI

Akwụkwọ a egosipụtala ma kọwakwa a ụzọ nnyochami nke e nwere ike iji kwalite nchọcha kwọntitativ nkuzi na ọmụmụ asụsụ Igbo, omenaala na isiokwu.

N'ịrụtụ aka, akwụkwọ a, e gosipụtara ụzọ a ga-eji n'ime ntụlekọrịta ndịna ụdaume dị ka ọnụọgụ ụdaume si dị n'isi na mkpụrụabịdịị okwu asụsụ Igbo maọbụ nzipụta site na reet ndịna okwu ụdaume na nzipụta nghọta dị ka ibe ya na nchọcha ọbụla nwere mmasị.

E zipụtara nnwale statistiks maka iji ya nwalee haịpothesis ọbụla e nwere mmasị gụnyere haịpothesis efu na reet ndịna ụdaume okwu asụsụ Igbo maọbụ nzipụta adighị iche n'ebe reet okwu ndịna ụdaume maọbụ nzipụta nghọta okwu dịka ibe ya na nchọcha asụsụ ndị ọzọ nwere mmasị nọ.

Ụsa nzipụta aha akụkụ ahụ mmadụ nke e weere gosipụtara na reet ndịna ụdaume aha okwu asụsụ Igbo karịrị ndakọrịta reet okwu aha asụsụ Bekee nke dị ka ibe ya mekwara ka aha akụkụ ahụ mmadụ.

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