Analysing Adult Igbo Second Language Phonology

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It has been reiterated that the core of applied linguistic endeavour is teaching and research directed towards the development of effective second language programme (Oluikpe, 2007). As part of language programme evaluation, error analysis is an effective diagnostic tool for charting second language learning programme. The study, in trying to emphasize the role of applied linguistics in second language education, employs the error analysis model as an analytical tool in the examination of second language data. The aim is to develop an effective means of ascertaining learner’s progress in learning and consequently chart the direction of effective second language learning. Due to the primacy of speech sound analysis to the overall development of second language programme at all levels of learning, the focus of the study is on phonological data. Findings reveal that learners process phonological data manifesting as errors as guides in their progress to the target language. The result of the study indicates similarity with findings in studies in mode of acquisition and developmental patterns in other languages while also comparing favourably with findings in child language acquisition studies. The conclusion points to a common universal developmental pattern in language acquisition embodying both first and second language modes.

1. Introduction

The study of the error patterns of the language learner no doubt provides a strong input to the development of adequate second language programme. The Igbo second language programme, popularly known as the Igbo L2 programme, together with similar programmes in its other contemporary Nigerian languages, is widely run in colleges of education in the country. As part of the nation’s language development programme as enshrined in the National Policy on Education (NPE), it is directed towards teaching the Nigerian non native Igbo speakers to, according to Bello (1991), teach their own people Igbo. It is reasoned that since Igbo teachers, even for the first speakers in both primary and secondary schools are not enough, it will be more expedient to raise a generation of native Nigerians of other tongues at the Nigerian Certificate in Education (NCE) level to teach their own people the language at both primary and secondary school levels.

As far as one knows, research in the phonological patterns of Igbo second language learners, even with its rich gains on the development of second language programme, has been less explored. This is the aspect taken up in this paper: to examine the phonological patterns of adult second language learners of Igbo with the aim of ascertaining whether or not they differ from those attested universal principles of modification strategies observed with language acquisitions generally. The paper is divided into four major parts: the introduction, including the conceptual basis of the study, the review of related literature including a description of the methodology adopted, the analyses and interpretation of data, and lastly the conclusion.
2. Applied Linguistics and its Enterprises

Some of the challenges associated with Igbo second language learning programme includes having a total grasp of the linguistic processing involved in the learning process. Applied linguistics provides the platform for the study of second language acquisition processes. Thus, Oluikpe (2007) describes applied linguistics as concerned

“… with those parts of the total language teaching operation in which decisions are made in the light of knowledge of the nature of language (linguistics), how it is learned (psycholinguistics) and its use in the society (sociolinguistics)...

Decisions are to be made in second language teaching operation in the light of the knowledge of the nature of the language and its learning and use in the society; all which contribute to a second language program that is appropriately designed. Effective second language learning program results from inputs from learners’ interlanguage (IL) data obtained from such a language. Selinker (1972) defines interlanguage as the stage of mastery of the new (target) language where learners develop new codes; their own intermediate language between the source language and the target language.

Two theoretical views have been in contention on the best way of discovering the extent of language competence of the learner through his interlanguage in the field of applied linguistics. The earlier approach to this examination have been to employ a contrastive technique which makes an a priori prediction on the types of errors a learner in a given language is bound to make and sets out measures to avoid them. Drawing from the audio-lingual method of language teaching, the approach aims at accuracy using direct method and pattern drill as techniques. Its approach to language teaching is to predict wrong transfers from mother tongue which, according to this approach, is inhibitive to the perfection or performance in the target language.

Acquisition\(^1\) is a widely used term in second language research to reflect the view of second language processes as following the same pattern as the first, as is portrayed by Dulay and Burt (1974), Ravem (1974) and most pungently, in Richards (1974). Thus the term, Second Language Acquisition (SLA) is a popular area of investigation in applied linguistics.

Therefore, language teachers should, on the onset of language teaching, develop syllabus to avoid such transfers. To do this needed a contrastive analysis of the two languages involved - the language of the learner; the source language, and the language being learnt by the learner; the target language –forms the diagnostic tool.

Overtimes, the shortcomings of this tool began to manifest. Scholars (such as Jain, 1974) show that language acquisition follows a common universal developmental pattern embodying both first and second language. The claim is anchored on the fact that a child (or a language learner for that matter) has an innate knowledge of the linguistic universals which accounts for the rapidity of his language acquisition. In his argument, Chomsky (1959) submits that language acquisition is innate and invariant in human being, and is not an inherited property. At the right age, normal children start making attempt at language. It is not bequeathed to them. Human beings are also capable of making novel utterances which are judged correct by them and the native speakers. This general disposition to language facilities is called the Language Universal, and is part of the Universal Grammar (UG). To Chomsky (1959) therefore, a contrastive analysis
to predict errors looked upon as inhibitive to the target language is wrong. Errors themselves are facilitative and form a diagnosis of the learner’s progress in the target language, and it is bound to occur. Mackey (1966) in his critique of the prediction of mistakes in anticipation has queried:

Since any one who has taught a language can predict from experience the sort of mistake his students are likely to make a posteriori, is he the wiser for the a priori and less reliable predictions which the linguist makes on the basis of a differential analysis?

He remarks that many mistakes of the learners at the threshold of language learning actually have no parallel in the source language but simply an extension of the target language to areas they do not apply. At other time it may be a confusion of new materials with parts of the language not deeply enough ingrained. Other factors include habit already formed by the language learner in acquiring the new language; a new code between the source language and the target language, later variously termed “idiosyncratic Dialect” (Corder, 1971), “Approximative Language” (Nemser, 1971) and “Interlanguage” (Selinker, 1972). Chomsky (1959) thus recommends the application of Error Analysis (ES) rather, as a tool for ascertaining the learner’s level of mastery and progress in the new language. This tool will also be useful in applying a remedial program on the learner. The Learner’s idiosyncratic dialect involves three stages as hypothesized by this school called the mentalist model. First, there is the pre-systematic stage where learner makes guesses and attempts at language items. Second, there is the systematic stage where the learner develops a language of his own - an intermediate language between the source language and the target language. The last stage is the post systematic stage where the learner comes to realize his mistakes and attempts to correct them.

Error analysis as a tool could be used either for developmental or remedial purposes. The developmental purpose forms input for syllabus development and text book writing while remedial purpose will be for instant classroom activities. The recent approach has been to work towards using the Error Analysis (EA) to examine learner’s outputs as facilitative and an evidence of universal developmental processes, carried out on a variety of source and target languages. The aim is to arrive at an explanatory account of second language (SL) grammar (see Sato, 1984).

Considerably, less data of this type have been available in Igbo despite volumes of output in the Euro-American languages (see Akpan, 2004) and the fact that a lot of studies have been carried out on the Igbo second language programme since its implementation. The present study is an attempt to study the phonological output of adult learners’ Igbo speech through the Error Analysis. The aim is to see whether there are cross-linguistic generalizations about the underlying structures and functions common to second language learning or acquisition across languages. Error Analysis as a linguistic technique studies how learners manage their errors as a measure of their progress in the target language.
3. Studies in Interlanguage (IL) Phonology

Studies on inter-language (IL) phonology abound in many languages – Sato 1984 (for Vietnamese), Hodne 1985 (for Polish), Dickerson and Dickerson 1977 (for Japanese), including Yoruba, nearer home (Oyebade, 1990 and Salami, 1999). Apart from Ojukwu (1995) the researcher is not aware of comparable study in Igbo phonological development.

As reported by Sato (1984) most earlier studies on the phonological aspects of second language (L2) acquisition was conducted through the contrastive framework of analysis. Common assumption was that phonological processing (errors) was largely affected by language transfers (see also, Ioup, 1984). However, Tarone’s (1980) study, attempts to show that inter-language phonology may be influenced by factors other than language transfer. She presents evidence to prove that the tendency to produce open (CV) syllables appear to operate as a process independent of language transfer. Taking up from Oller’s (1974) contention that epenthesis and consistent deletion of consonants are characteristics of IL speech, Tarone (1980) hypothesizes that the tendencies might be explained by the universal preference for the open syllable structure. To determine this, the interlanguage of English learners with varieties of first language backgrounds, (two Cantonese, two Koreans and two Portuguese) are examined. These languages have relatively the same complex syllable structures as those appearing in English. The aim is to observe the process of breaking those structures into simpler open syllables as they speak the interlanguage as would in their languages. This would provide clear evidence that some processes other than language transfer are operating.

The majority of the syllable structure errors identified are attributed to language transfer, but for each learner there are a number of syllable structures which are not attributed to transfer. Tarone (1980) thus concludes that such errors seem to be due to a preference to open (CV) syllable operating as a process independent of language transfer in influencing the syllable structure of the interlanguage phonology.

Sato (1984) challenges Tarone’s (1978, 1980) claim of universal tendency for open vowel syllable preference in influencing the syllable structure of the interlanguage phonology. Rather, she uses data to corroborate the claim that first language (L1) transfer manifests itself not only in terms of contrast in L1 and L2 consonant cluster inventory but also in terms of cluster position preferences. In Sato’s (1984) study the specific question is whether an open syllable preference can be identified in Vietnamese-English IL which has predominantly closed syllable preference.

Using two Vietnamese brothers of ten and twelve years old respectively who recently arrived USA, with relatively low comprehension in English, data for the study are obtained through weekly audio-taping. The task consists of unstructured informal spontaneous conversation from which the data are eventually isolated after transcription. Results indicate that first language transfers emerge as the dominant process influencing syllable structure in interlanguage phonology. Specifically, L1 transfer is reflected in Vietnamese-English IL as: (1) a preference for the closed syllable in the modification of English syllable-final consonant clusters, (2) greater difficulty in the production of final than initial cluster, and (3) negligible use of epenthesis as a syllable modification strategy. Sato (1984) interprets the results as evidence against the hypothesized universal preference for CV-syllable and the hypothesized prevalence of epenthesis as a syllable modification strategy in IL speech.
However, Hodne (1985) in her own study takes another look at whether a preference for the open syllable appears to influence syllable structure without input from language transfer. Specifically Hodne (1985) seeks to further the investigation into the direction in which target language syllable structure is modified. The primary question for investigation is if evidence in support of the hypothesized universal preference for the open CV syllable can be found in the pronunciation of consonant clusters in the interlanguage of learners whose native languages feature the same consonant clusters and similar syllable structures as English. The assumption is that with so large number of equivalent consonant clusters in the two languages - English and Polish, native speakers of Polish would be less likely than other language groups to have pronunciation problems in consonant clusters in English.

Hodne (1985) studies two adult Polish emigrants with five and twenty two month’s exposure to English respectively in USA. Data are obtained through a picture-description task. Although some of her findings points to modifications towards open CV syllable patterns, she sees them as being less categorical than those obtained by Tarone (1980). Based on the results, Hodne (1985) concludes that the pattern of modification found might best be analyzed not in terms of process unique to interlanguage phonology, but rather in terms of a universal pattern of glottalization and epenthesis found in the speech of persons experiencing stress, whether they are speaking in their native language or in a second language. Thus study on the nature of phonological development among L2 learners based on syllable modification structures remains inconclusive.

Nearer home the focus of IL phonology takes a broader scope than the modification of syllable structures. Onidare (1985) conducts a study on the phonological development of a Yoruba child. Using Halliday’s Functional model, he examines the acquisition of Yoruba in its social contest by identifying and evaluating the roles of the different participants in the interactive process of acquisition. He identifies the following phonemes / r, l, ʃ, s, gb / as being substituted with the phonemes / j, t, b / respectively. However, the study falls short of explaining the linguistic developmental motivations for the processes.

Salami (1999) is concerned with describing the processes going on in the acquisition of Yoruba language and to determine whether they differ from the attested universal principles within the natural phonological framework. Salami (1999) focuses on identifying the errors as phonological rules or systematic routines the child adopts for reducing the complexity of adult words to a pronounceable level. In a longitudinal study of his daughter, he obtains and analyses data that reveal processes grouped into the two constraints of systemic simplification and structural simplification. Under systemic simplification which refers to substitution with a preferred consonant segment, the following phonological processes are identified: stopping – where labio-dental fricatives / f / is realised as alveolar stop / t / and the velar stop / k / and the alveolar palatal / ʃ / realized with the alveolar stop / t /; fronting where velars / k, g, ƞ / and alveolar-palatals / ʃ, Ʒ, ʧ, dƷ / become alveolar / t, d, n / and / t, d, ts, s, z / respectively, and gliding – where liquids / r / is realised variably as approximants / w / and / j / Under structural simplification representing modification for a preferred syllable structures, the following processes show up: reduplication – manifesting in typical two-syllable structure of the pattern CVCV; syllable deletion – involving the simplification of multisyllable words;
assimilatory processes such as consonant harmony – where phonetic features are shared by two or more consonant in the child’s target syllables or words. Variability is also noted as the child’s phonological features. In this process, the child tends to often show a variety of productions for the same word whereby older and newer forms may appear and disappear at any time. The study concludes that there exists common attested natural universal tendency in child’s phonological development where, for example, /r/ is realized as /w/. Such a pattern is explained as a linguistic preference for substituting [+labial] for [+coronal]. The study demonstrates that outputs in developmental phonology are underlain by the modification of speech in line with some general natural principles. Salami (1999) defines phonological processing as a mental operation that applies in speech to substitute for a class of sounds or sound sequences presenting difficulty to the speech capacity of the individual, an alternative class identical but lacking the difficult property.

Ojukwu’s (2007) study is on the continuant and non-continuant distinctions in Igbo child phonology among Igbo children between the age three and half to four years. The class of continuants specifically chosen for the study is the fricatives while for the non-continuants, nasals and plosives were chosen. Using the statistical tool of standard deviation (SD) in his analysis, he calculates the overall average correct calculation (mean) of the subjects in each of the sound classes and then determines the extent to which they deviate from this mean. He finds that the non-continuants have a higher mean than the continuants. He concludes that between three and half years and four and a half, the Igbo child has acquired more of non-continuants than the continuants in his speech repertoire. The continuants were the same class of sound the child avoided for stops in Salami’s (1999) study.

Significant in the Nigerian studies is the evasion of focus on second Nigerian languages IL pattern, but rather focuses on child first language phonological development. The relatively scarce documentation on similar studies on adult second language learners of Nigerian languages restates our claim of underdevelopment of the second language program in the Nigerian languages, especially Igbo. The present study has the same aim as Salami’s (1999); to establish and characterize the phonological processing characteristic of the learners in the acquisition of Igbo language as L2 and determine whether they correlate with attested universal principles. However, while Salami’s (1999) is a longitudinal study of a child’s phonology, this study adopts a cross sectional approach on adult learners’ non-native language.

3.1 The Phonology of the Source Languages
The source languages involved in this study are Bette, Ejagham, Bekwara, Bokyi, Ishibori and Tiv. The first five languages are among the group Essien (1982) has described as the upper cross languages. These languages have not received much description in the literature. However a heuristic analysis indicates very close phonological similarities; having relatively the same common complex syllable structures, hence the high rate of mutual intelligibility among speakers. The sixth one is from Benue State and maintains spatial contiguity with majority of the other languages. Closed syllable structure seems to be a Phonological feature cutting across the languages as the following reveal:
Ejagham (Egbe, 2004)
- Òbúk: monkey
- Njòk: elephant
- Ayìp: water
- Èyúk: hear
- ¶tóß: according

Bokyi (Tawo-Asu, 1977)
- Bakut: oil
- Babeb: lust
- Abip: hailstone
- Bât: accuse falsely
- Dap: warm

Bette/Bekwara (Undie, 2001)
- Abep: name of a stream
- Kekib: a kind of reptile
- Kanakel: groundnut
- Kufel: moon
- Ukyeb: male/husband

Ishibori
- Akpak: proper name

Literature in Tiv lexical inventory could not be accessed for this study but it is easy to discern a common pattern of syllable ending as the above. Added to this feature is a remarkable nasalization observed in the speeches of a Tiv speaker especially in word-ending positions. Furthermore, Undie (2001) observes for Bette, an all-vowel-initial word formation with the exception of / k /, / s /, / b /, / h /, and / l / that can also be at word initial position. There is also the absence of the palatal fricative / ð / in its phonetic inventory. Bette also manifests some form of consonant cluster which seems to portray / l / as the sole second consonant as illustrated in the following words picked from Undie’s (2001) data:

- Iglaba: wooden bed
- Ugble: family archive for war-related endeavours
- Ibli: a proper name

Bette and Bokyi display a lot of palatalization and labialization as in the following:

**Bette:**
- Li gye: let’s go

**Bokyi**
- Tyem: clear
- Kabyi: dog
- Dyibyi: cold
Labialization

Bette
- Bewhu: oil
- Kubwo: hand
- Ukwuo: chicken

Bokyì
- Bwop: pick up
- Chwáp: help
- Fwoo: test

Tonally, Ejagham manifests three tone patterns of high, low and mid. On the other hands, Bokyì is said to maintain four tone patterns (Tawo-Asu, 1977) which are the high tone, the low tone, the rising tone and the falling tone.

Though these languages are the native languages of the learners, it is arguably the English language (the Pidgin form) that most often forms their first language backgrounds. This situation arises because speakers of these languages live in areas with many other small native languages competing in the same entity either in communities, local government areas or States, thereby necessitating English as the lingua franca and major medium of communication from speakers’ birth.

4. Methodology

Igbo speeches of eighteen adult learners were elicited from a picture-description task. They are the second year students of Igbo language as a second language popularly referred to as L2 students in the Igbo Department of the Federal College of Education Obudu. The small size of the class prompted the researcher to include all the members in the study.

The Instrument for data collection comprises a picture-description task. The task involves describing the activities going on in a 1996 Olympic Games Coca-Cola calendar. In the calendar, there are drawings of athletes in nine different games round a Coca-Cola gold plaque. The subjects are asked to describe in as many sentences as possible in Igbo the activities going on in the various scenes. During the recordings, each subject had a session with the researcher in his office. The subject sits close to the researcher facing the wall where the calendar is hung. He or she describes the scenes in the pictures in Igbo as the recording goes on. If he or she stops talking for a long time the researcher, through cues or questions, prompts him or her to verbalize. Each session lasts for a maximum of twenty minutes.

From the data collected the phonological aspect of the outputs were sorted and isolated for this study.

5. Analyses

The phonological data isolated from the output are grouped into the following phonological processing:
Vowel Raise
Consonant Substitution
Glottalized substitution
Assimilation
Non-realization of Harmonization
Vowel lengthening
Tonal modification
Consonant clustering

The general observations emerging from the findings include the difference in phonetic behaviour between the English sound system and the Igbo sound system. While in Igbo, each phoneme is phonetically distinctive from the other and is pronounced as it occurs in its orthographic representation, in English one phoneme (especially vowel) can be variously realized phonetically, or different vowel phonemes can realize a given sound or phonetic form. Thus, in Igbo there is a matching between a given phoneme and its sound or phonetic realization unlike in English.

Secondly, Igbo is characterized as open (CV) syllable structure language. This accounts for the absence of epenthetic vowel in the learners’ processing. Furthermore, the subjects at each recording rendered similar errors as represented by the tokens.

The presentation of data and the discussions of the phonological processing involved follow in the sections below:

i. Vowel Raise
Data for vowel raise are grouped into the following:

<table>
<thead>
<tr>
<th>Learners’ output</th>
<th>Target form</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  nè-ɛkpo</td>
<td>nà-akpọ</td>
<td>‘is calling’</td>
</tr>
<tr>
<td>2  ákị</td>
<td>áka</td>
<td>‘hand’</td>
</tr>
<tr>
<td>3  nọ ni ya</td>
<td>nọ na ya</td>
<td>‘is in it’</td>
</tr>
<tr>
<td>4  dịịrị</td>
<td>dere</td>
<td>‘wrote’</td>
</tr>
</tbody>
</table>

As Data 1- 4 shows, vowel raise involves preference for high vowels in the phonemic repertoires of the learners. In Data 1 - 4 indicating the vowel processing, Item 1 nè-ɛkpo, manifests in the subjects modifying the low vowel / a/ to the higher mid vowel [ɛ]. Furthermore the half-open back rounded vowel / ọ/ is modified to half-closed centralized vowel / o/ upper in the chart at the final syllable of -akpọ. In Data 2 and 3 of the same group, / a / is substituted by the high vowel [i] in akj and -ni- respectively. In Data 4 the mid central vowel, / e / in dere is also replaced by the high vowel [i] as in dịịrị. One would be tempted to interpret Data 2 and 3 as normal in fast speech production in Igbo. However the discrete manner in which the elicited data were rendered give them out as interlanguage rather than a speech style.
ii. Consonant Substitutions

Consonant substitution occurs where the learner prefers to substitute for a class of sound presenting difficulty, an alternative class identical but lacking the difficulty property. Such preferences are recorded in the learner’s data, as follows:

<table>
<thead>
<tr>
<th>Learners’ output</th>
<th>Target form</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Yånúwári</td>
<td>Jénuwári</td>
<td>‘January’</td>
</tr>
<tr>
<td>6 Ò nwèka</td>
<td>Ò nwèkwa</td>
<td>‘there also exists’</td>
</tr>
<tr>
<td>7 nà-alỊwụ</td>
<td>nà- ańụ</td>
<td>‘is drinking’</td>
</tr>
<tr>
<td>8 nà-etíye</td>
<td>nà-etinyé</td>
<td>‘is putting’</td>
</tr>
<tr>
<td>9 ńdị ózókpa</td>
<td>ńdị ózókwa</td>
<td>‘other people too’</td>
</tr>
</tbody>
</table>

As Data 5 – 9 illustrate, consonant phonemes presenting difficulties to the learners are approximated to the next similar but easier to articulate phonemes.

Salami (1999) shows that in early language acquisition certain consonants are realized as some other consonants sharing similar characteristics such as same points or nearest same points of articulation in their efforts to simplify inputs. This processing is also reflected in the subjects’ production of consonants in the language as shown in Data 5 – 9. In Data 5 the voiced palatal affricate /ʤ/ in January is realized as the palatal approximant [j] in Yånúwári. In Data 6 the labialized velar plosive /kw/ in nwèkwa is modified by substituting it with the easier articulated velar plosive / k / as in nwèka, while the velar nasal /ŋ/ in -ańụ in Data 7 is modified to the labialized velar nasal /ŋ/ in nà-ançaụ. In Data 8 the palatal nasal /ɲ/ in etinye is modified to the palatal approximant / j / as in étiye while in Data 9 the labialized velar plosive /kw/ in ózókwa is modified to labial-velar plosive / kp / in ózókpa (see Mbah and Mbah, 2000: 44 – 45 for the phonetic distinction between / kp / and / kw /). Notice that in Data 6 and 9 where the labialized velar stop /kw/ is modified to other approximations, such substitutes are plosives: velar plosive / k / in 6 and labial-velar plosive / kp / in 9, all of which are easier in articulation than their target forms. This bears out Salami’s (1999) claim that plosives are part of consonants that are acquired earlier than other consonants as reflected in child’s early acquisition of such words as ‘papa’, etc. It is also confirmed by Ojukwu’s (1995) study which demonstrates that children acquire non-continuant sounds, mostly plosive stops, earlier than other sounds.

iii. Glottalized Substitutions

Elision is a well attested phonological process which mostly applies exclusively to consonants in Igbo. Mbah and Mbah (2000:81) attribute the exclusion of vowel in this process to their attested central position in the peak of pronunciation of syllables and other syllable-bearing units in the language. The processing embarked by the subjects begins with lenition that leads to elision where the already weak sonorant sounds in the consonantal strength hierarchy (see Udoh, 2003: 607) are elided. However a somewhat glottalized sound is substituted in place of the elided consonant in a process similar to
what Udoh (2003) remarks as ‘ghost consonant’ represented in Data 10 – 12 with apostrophes:

<table>
<thead>
<tr>
<th>Learners’ outputs</th>
<th>Target forms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 áka’a</td>
<td>áka yá</td>
<td>‘her/his/its hand’</td>
</tr>
<tr>
<td>11 à` į́</td>
<td>ànyį́</td>
<td>‘we’</td>
</tr>
<tr>
<td>12 We`é</td>
<td>wèré</td>
<td>‘take’</td>
</tr>
</tbody>
</table>

In Data 10 – 12 subjects modify sonorant consonants - / y/ in áka yá, /ny/ in ànyį́ and /r/ in wèré, by the above described processes to áka’a in 10, à` į́ in 11 and wè`é in 12. This attests to the universal pattern of glottalization earlier reported by Hodne (1985) in the review as portraying a universal pattern in the speeches of learners experiencing stress.

iv. Assimilations
Learner modified phonological structures in terms of assimilation as in Data 13 and 14 below:

<table>
<thead>
<tr>
<th>Learners’ outputs</th>
<th>Target forms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 ǹká à</td>
<td>ǹké à</td>
<td>‘this one’</td>
</tr>
<tr>
<td>14 kọò</td>
<td>kùó</td>
<td>‘knock’</td>
</tr>
</tbody>
</table>

In Data 13 and 14 the mid vowel / e / and the half-open back vowel / ū / assimilate to the following low vowels / a / and / ọ / respectively.

v. Non-realization of Harmonization
Learners show non-realization of vowel harmonization patterns in their outputs, as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15 á dère</td>
<td>é dère</td>
<td>‘it is written’</td>
</tr>
<tr>
<td>16 ásèrese</td>
<td>ésèrese</td>
<td>‘drawing’</td>
</tr>
<tr>
<td>17 á jì</td>
<td>é jì</td>
<td>‘3s hold’</td>
</tr>
</tbody>
</table>

In the data 15 – 17, the phonological processing involved is that of modification of the advanced tongue root vowels to the retracted tongue root unrounded vowel either at the word initial position when followed by voiced consonants as in Data 15 - 17, or when following voiceless stops as in Data 13 and 14. Igbo vowel inventory groups into two phonotactic constraint of vowel harmony: the retracted tongue root – / a į́ ọ́ ū / and the advanced tongue root - / i e o u / . The advanced tongue root vowels are modified to retracted tongue roots in the learners’ data. Data 15-17 seem to occur independent of any conditioning factor. We cannot find a convincing motivation for this other than to rely
on the fact that since both consonants and vowels are voiced, it may also be that the learners are deferring to such other phonemic harmony constraint within what Maduka-Durunze’s (1996:66) refers to as ‘Consonant harmony’ rule:

Consonant melody (harmony), in clear cases of morphemically non-derived simple words, often obeys the harmony rule such that voiced consonants are in construction with equally voiced consonant just as voiceless consonants go with voiceless consonants.

The vowels in construction with the voiced consonants in the data are, by feature matrix, voiced. However, even with that, judging from the fact that the constructions are morphemically non-derived, this explanation becomes weakened. The best is to invoke Emenanjo’s (1978: 7) explanation that it could be the effect of the neutral nature of the sound /a/ described as being in the pendulum between the retracted tongue root and the advanced tongue root vowels.

vi. Vowel Lengthening

The process represented here involves multiple phonological processing such as modifications by vowel raise and lengthening, as follows:

<table>
<thead>
<tr>
<th>Learners’ Output</th>
<th>Target forms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 dje</td>
<td>dêre</td>
<td>‘wrote’</td>
</tr>
<tr>
<td>19 dêrêê</td>
<td>dêre</td>
<td>‘wrote’</td>
</tr>
</tbody>
</table>

The modification in Data 18 begins with the substitution of the mid vowel /e/ in /dêre/ with the high vowel /i/, realizing /dje/. The second modification is the lengthening of the initial vowel in /dje/ to /dêrêê/ obviously in their observation of inflection. Data 19 presents the same form of modification as 18 in /dêre/. However, while there is no modification in terms of vowel raise in the root, the syllable of the suffix is lengthened perhaps as another instance of the observation of inflection.

vii. Tonal Modifications

Ladefoged (1975) defines tone in a language as the use of pitch level to distinguish contrastively between items within the lexicon of a given language. In agreement with this definition, Eka (2004) also notes that most African languages are tonal. Thus subjects, based on their native language backgrounds, are not encountering tones for the first time as it has been attested in the various languages. However, the data recorded some modifications that are tonal in nature suggesting learners’ dealing of the data on its own term, as follows:

<table>
<thead>
<tr>
<th>Learners’ Output</th>
<th>Target Forms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 áfọ</td>
<td>áfọ</td>
<td>‘year’</td>
</tr>
<tr>
<td>21 wèrè</td>
<td>wèrère</td>
<td>‘took’</td>
</tr>
<tr>
<td>22 Mbụ</td>
<td>mbụ</td>
<td>‘one’</td>
</tr>
<tr>
<td>23 ńke ńno</td>
<td>ńké ńnọ</td>
<td>‘the fourth one’</td>
</tr>
</tbody>
</table>
As shown in Data 20 – 23, tones were wrongly rendered. However, the data show the acquisition of only the High and the Low tones while the more grammatical Down-step tones were not observed. However incidence of correct realization of some tones were also prevalent leading to the suggestion that modifications are usually replete with variability which Akpan (2004) refers to as point of continuity and discontinuity where certain phonemes (segmental or non-segmental) appear in the learner’s inventory, and disappear later.

vii. Consonant Clustering
Instance of clustering of consonants is also observed, as follows:

<table>
<thead>
<tr>
<th>Learners’ Outputs</th>
<th>Target Forms</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>ọ̀brábrà</td>
<td>ọ̀baráọ̀bara</td>
<td>‘bloody/red’</td>
</tr>
</tbody>
</table>

Data 24 though appearing only once, represents consonant clustering in the subjects’ outputs. Igbo syllable structure does not permit consonant cluster; a pattern characteristic of many African languages. In the literature, preference for open syllable structure is associated with alternate language acquisition as a universal process of simplification (see Tarone, 1978, 1980 and Hodney, 1985). However, in this instance, the data shows the learners employing the reverse; that is, a simplification by open syllable reduction strategy which results in clustering of consonants.

4. Interpretation
In the foregoing, six phonological processing or modifications has been observed to characterize the Igbo outputs of the group of learners studied. They include Vowel raise, Consonant substitution, Glottalized substitution, Assimilation, Non-realization of harmony, vowel lengthening, tonal modification and consonant clustering. Just as in other studies (see Salami, 1999 and Akpan, 2004), fronting of phonemes appears as the most prominent phonological modification embarked by this set of Igbo learners. Fronting to plosive and high front vowel is very frequent and it is reasoned (see Salami, 1999) that it is because they have been attested as universally predominant with early language acquisition device. Substitution occurs to extend the language rules to where it does not apply. In such instances, it seems that the learners are aiming at the lenition of the already weak (sonorant) sounds which in the process gets deleted. Preference for pharyngealized unrounded vowels occurring in the Non-realization of harmony, apart from the few instances of vowel harmony constraint, operated without any mitigating influence by surrounding entities. Perhaps this is part of the variability in language acquisition observed by scholars to be prevalent at this level (see Tarone 1985, for example). On the other hands, it could be the effect of the neutral nature of the sound /a/ described as being in the pendulum between the pharyngealized and non-pharyngealized vowels (Emenanjo, 1978:7). Vowel lengthening can be compared to vowel ephenthesis in the Indo-European languages in occurring as “a process of movement towards a universal open-syllable” (Tarone, 1980) reported to be an essential feature of language acquisition. Since tone is part of some African languages phonemic inventory, the modification of tones in the data implies another instance of variability in the learners’ language outputs as in most other cases these tones are correctly rendered. The most
interesting modification embarked by the subjects is consonant clustering where the learners’ ingenious uses of the process were recorded. In the process, syllables are reduced as part of simplification.

5. Conclusions

The phonological modifications or processing identified among Igbo learners and characterized in the foregoing show comparable trends in studies conducted in other languages (see Tarone, 1980; Hodney, 1985; Ojukwu, 1995; Salami, 1999; Akpan, 2004; etc.). It bears out the fact that phonological modifications or processing are the same and are products of efforts to learn Igbo on its terms independent of language transfer. What the learners have done as stated by Salami (1999) is a natural universal tendency towards simplification of language data in getting over the task of language learning. The findings and conclusions compare with other characteristics observed in child language acquisition in universal grammar and confirm that adults follow the same patterns in learning a new language. Such findings place error analysis in Applied Linguistics as the anchorage of any design of second language programme. The study shows the great potentials it has for the development of second language teaching and learning programme in Igbo.
References


