

## INHERENT VOWEL NASALITY IN ÉSÀN: EMERGING ISSUES

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### Abstract

Significant vowel nasality is attested in some Proto Edoid languages. This phenomenon has attracted research interest in the past. Although Éśàn features these nasal vowel segments, further studies on their nature in the language are rare. The goal of this study is to examine some existing proposals that exist about these segments and determine their phonemic status. The study also seeks to further investigate the source of the nasality on these speech sounds, which are also referred to as inherent nasal vowels. Data for this study were mostly lexicon-based. The SIL Comparative African Word List was the guiding instrument for the elicitation of the corpus, which was transcribed in the International Phonetic Alphabet (IPA) format. Secondary data were sourced from previous works relevant to this study. Available data were subjected to the tenets of Classical Phonemics and Auto-segmental phonology. Data analysis confirmed that of the 7 Éśàn vowel segments - /i, e, ε, a, u, o, ɔ / - 5 are inherently nasal and phonemic - /ĩ, ě, ẽ, ã, ũ, ɔ̃ / . This same set of 5 vowels has allophonic status as nasalised vowels in the language - [ĩ, ě, ẽ, ã, ũ, ɔ̃] . The study improved on earlier reconstruction efforts, which traced the source of this nasality on Éśàn nasal vowels to an extinct nasal segment [N]. It proposes a place-based reconstructed segment [RN] to account for the specific source of this nasal feature. This study would serve as a basis for further research on the inherent nasal vowels and enhance the documentation of Éśàn.

**Keywords:** Edoid, Éśàn, nasality, phonemics, reconstruction, vowel segments.

### Ómí ébè

À miènn ìkpé ọ́tá ihúé ọ̀sùèlìn, ní é sí ọ̀wàlàn, bhí úrú Èdó èsò. Ígùèsé èsò hí kà guánọ́ ọ́tọ́ ọ̀nì èmwọn ná, bhí èghé nì ọ́ gbé rà. Àrẹ̀ miènn ghè Éśàn mwọn éni ìkpé ọ́tá ihúé ọ̀wàlàn ná, à bhásé mòbó fẹ̀ ọ́tọ́ ọ̀nì èmwọn ọ́nà fọ́. Ọ̀nì íwéná ébè ná á hó ná rẹ̀ gúnọ́ ọ́tọ́ èbì à ká tá bhí ọ̀nì èmwọn ná. Ọ̀ì yẹ̀ fẹ̀ ghé ébè zélé éni ìkpé ọ́tá ná kien ìkpé ọ́tá ihùè. À yẹ̀ hò ná guánọ́ ọ́tọ́ ọ̀wàlàn nì éni ìkpé ọ́tá ihúé zéré, àkhà ré èlè tá ọ́tá èsò. Ọ́tá Éśàn nè búbùn, èlè á fẹ̀ ghé rẹ̀ guánọ́ ọ́tọ́ éni èmwọn ná rẹ̀bhé. Úkpì ébè ná tí ọ̀lẹ̀ SIL Comparative African Word List, ní á ló rẹ̀ lù íwéná ébè bí ọ́nà ná gbén nà, ọ̀lẹ̀ á ló rẹ̀ hánọ́ ọ́tá Éśàn nè búbùn, nì á rẹ̀ lù ọ̀nì íwéná ébè ná. Á ná hì gbéné ìkpé ọ́tá nì á hánọ́ bhí úgbéné ná tí ọ̀lẹ̀ International Phonetic Alphabet (IPA), ní á ló rẹ̀ gbéné ìkpé ọ́tá úrú rẹ̀bhé ní ázẹ̀ bhí àgbòn. À yẹ̀ rẹ̀ ébè úghè èvà – Classical Phonemics bí Auto-segmental phonology - rẹ̀ fẹ̀ éni ìkpé ọ́tá ghélé. Ènì ùfẹ̀ghé ná rẹ̀bhé rẹ̀ má ghé, éni ìkpé ọ́tá ihúé ná - /ĩ, ě, ẽ, ã, ũ, ɔ̃ / - sì ọ̀wàlàn bhí úrú Éśàn bí íbó élé nè hí yì ìkpé ọ́tá ihùè - /ĩ, e, ε, a, u, o, ɔ / . Sòkpán, ìkpé ọ́tá ihúé ọ̀sùèlìn - [ĩ, ě, ẽ, ã, ũ, ɔ̃] – ní ìkpé ọ́tá ihúé ọ̀sùèlìn rẹ̀ égbè só bhí èké ọ́tá, hí sí ọ̀wàlàn. Ọ̀nà há hí rẹ̀ lèn ghé ìkpé ọ́tá ọ̀sùèlìn, nì é hí yì ìkpé ọ́tá ihùè bí ìkpé ọ́tá ihúé ọ̀sùèlìn nì ìkpé ọ́tá ihúé ọ̀sùèlìn rẹ̀ égbè só, nò hí sí ọ̀wàlàn, ábọ́ èvà élè khín bhí ìkpé ọ́tá ọ̀wàlàn, ná tíé élè allophone. Ọ̀nì íwéná ébè ná, ọ́ hí lù gbérá éni ákà lù, bhí égbé ọ̀nì èmwọn ná. Ọ́ fẹ̀ kéré ghé, ìkpé ọ́tá ọ̀sùèlìn, ná hí yẹ̀ ló bhí úrú Éśàn, èlè sí èmwọn ihùè éni ìkpé ọ́tá égbè. Ọ̀nì íwéná ná dọ́ dè bá éni ákà gbéné dè sú èmwọn ìkpé ọ́tá ihúé ọ̀sùèlìn, né sí ọ̀wàlàn. Ọ́ á yẹ̀ rẹ̀ úrú Éśàn nì á gbénen kien ébá sáábọ́ lù ọ̀sì èsì.

**Ókpétà:** Èdó, Éśàn, ìkpé ọ́tá ihùè, ìkpé ọ́tá ọ̀wàlàn, ìkpé ọ́tá ọ̀sùèlìn, íwéná ébè

### 1. Introduction<sup>1</sup>

The nature of a set of vowel sounds which feature in the phonemic inventory of Éśàn, has, at various times, attracted the attention of some linguists. The Éśàn segments which are

<sup>1</sup> This paper is an 'off shoot' of an ongoing project on a proposed Éśàn Dictionary with English translations. The project was funded by TETFund Institutional Based Research Fund (Years 2023-2024 batch 19).

referred to as ‘inherent nasal vowels’ include /ĩ, ẽ, ã, ũ, ɔ̃/. These vowel segments contrast with their oral counterparts /i, ɛ, a, u, ɔ/ as well as /e, o/. Interestingly, the latter set of vowels have neither nasal or nasalised counterparts. Earlier mentions of this exclusive behaviour of /e, o/ have rarely provided any clear explanations for this occurrence. However, Aziza’s (2008) submission would seem to proffer both a historical and phonological explanation for this occurrence. The study which focused on Urhobo, a South West Edoid language (SWE), states that most Proto-Edoid (PE) languages, which includes Èsàn, feature synchronic vowel systems comprising seven surface vowels – [i, e, ɛ, a, u, o, ɔ]. It states that the behaviour of some of these vowels especially [e, ɛ, o], is at variance with expected vowel behaviour, a phenomenon which is an indication that there may be abstract underlying vowels /ɪ, ʊ, ə/, which have merged with the former. The work lists the Proto-Edoid vowels as /i, ɪ, e, ɛ, ə, a, ɔ, o, u, ʊ/. Thus [ɪ e] become [e], /ʊ, o/ become [o] and /ə, ɛ/ become [ɛ] and probably [a]. A smaller vowel inventory in any member of this group, like Èsàn, is said to be a reduction which is a result from this merging of some vowels with others within this vowel system. By acoustic testing, Lindau (1975) identified two common patterns of vowel merging - /ɪ/ merging with /e/ for acoustic reasons and /ʊ/ with /o/ for structural pressure. This occurrence is recorded to have resulted in an earlier nine-vowel system becoming a seven-vowel system. According to Fulop et al (1998), of the Edoid languages, only Degema still has contrasts involving all ten identified Edoid vowels.

The special nature of these inherently nasal vowel segments is attributed to two phonological indices. The first index is that these vowel segments do not occur in the environment of nasal segments within the utterances in which they occur. Secondly, these nasal vowels are contrastive, making them phonemic. The consistent display of this articulatory characteristic featured by these vowel segments over time would seem to be the source of their description as being ‘inherently nasal’, a description which has inadvertently become their identity. The adoption of this terminology is due to the difficulty in providing a clear physiological justification for their nasal manner of articulation, as is done for nasal consonants and nasalised vowels. One of the earliest mentions of the set of vowel segments which form the focus of this paper, is Elugbe (1973). In that work, this phenomenon of ‘inherent nasality’ of vowel segments is described as “...significant nasalisation...”. He states categorically that of all the vowels featured by the affected languages, only the vowel segments [e, o] are left unaffected by this nasal phenomenon. His use of the term ‘significant’ also suggests that these vowel segments /ĩ, ẽ, ã, ũ, ɔ̃/ contrastive in the languages just like their oral counterparts, /i, ɛ, a, u, ɔ/. In other words, these ‘nasalised’ vowel segments are semantically significant when paired in utterances with their oral vowel counterparts. Further on this subject, Elugbe (1989:116) states:

Nasalization in the modern Edoid languages is often traceable to PE -mh- and -nh-, i.e. -C<sub>2</sub>- nasals, which have been lost. But there are also cases where synchronic nasalization is not traceable to PE lenis nasals in -C<sub>2</sub>- or any other position. It is for such cases that significant nasalization is postulated, giving us CV and CVV examples in the 1973 work.

In his submission, Elugbe succinctly distinguishes between the nasalisation of vowel segments which occurs as a result of the process of assimilation from nasal consonants physically juxtaposed to them, and vowel nasalisation which are not physically traceable to any visible nasal consonants in the environment of the nasalised segments. According to him, the phenomenon of ‘significant nasalization’ was revisited in Elugbe and Williamson (1977). The work traces the source of significant nasalisation of V segments in PE to a ‘...pre- or early Proto-Edoid form in which a velar nasal -C<sub>2</sub>- [ŋ] occurred. He however modifies this position in his 1989 work, where he postulates an N for a PE rather than a pre-PE stage.

The impetus for this study is the incisiveness of the existence of this set of vowel segments in Èsàn<sup>2</sup> as exhibited in an on-going project on the writing of an Èsàn Dictionary with English translations. These segments have been found to also exhibit certain other

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<sup>2</sup> Èsàn is a member of the Proto North Central Edoid (PNCE) phylum of Elugbe’s Proto Edoid group of languages. Other members of that branch include Èdo, the dialect cluster of Ora-Emai-Iuleha, Yekhee, Uneme and Ghotuo. Elugbe describes Èdó, Èsàn and Ora – Emai – Iuleha as “... the languages of the Central plains, where there is relative homogeneity”. Although his comparative work of Edoid languages includes Èsàn, he states categorically as follows: “I have unfortunately no data on Esan though I have read Akpamu’s (1971) phonology of one of the Esan dialects.” Osiruemu (2010) states that, the absence of illustrations from Èsàn in that work is obviously a result of the dearth of data on the language at that time.

characteristics, about which some assertions have been made. Some of these views include a total acceptance of their existence as autonomous phonemes of the Èdoid languages (Elugbe 1973, Ejele 1982, 1986, 1994, 2003, Kamelu 2003, Ikoyo-Eweto, 2010, Osiruemu 2011). Other studies align with the proposal that the nasal feature of these vowels is traceable to the influence of nasal consonants which have gone extinct in the host languages. This position led (Elugbe and Williamson 1977, Elugbe 1989, Osiruemu 2011), to reconstruct the probable nasal environment for these 'inherent nasal vowels. Ugorji C.U.C. (2025, by personal interaction) however argues that these nasal vowels cannot be ascribed the status of 'phoneme' in their host languages, due to the non-fulfilment of certain distributional conditions. This study therefore sets out to examine the features and arguments which have trailed the existence of these significant nasal vowels in Èsàn. It seeks to close existing gaps in previous and on-going debates about these vowel segments by providing linguistic justification for their status as autonomous vowel phonemes in the language.

Analyses of data in this study were conducted within two linguistic theories. These are Classical Phonemics and the Auto-segmental theory. The justification for these choices lay in the bidirectional goals of this study. On the one hand, the study seeks to provide empirical evidence to prove that the nasal segments under focus have phonemic status. Classical Phonemics is the foremost theory employed for the identification of the phonemic status of the speech sounds of any given language. A second goal of this study is to expose the nature of the nasal feature of these vowel segments with a view to identifying its source. The Auto-segmental phonology provides a guide as an adequate phonological theory for understanding and tracing the behaviour of prosodic features of speech segments, one of which is that of nasality. Some tenets of these theories, which are relevant to this study, are presented as follows.

Classical Phonemics has its foundations in the works of Sapir (1925), Swadesh (1934), Twaddell (1935), Trubetzkoy (1939), Block (1941), Hockett (1942), Pike (1947b), Harris (1951, 1954), among others. The theory has as its main focus, the establishment of the phonemes of a given language.

This role of classical phonemics is particularly crucial to linguistics study because establishing the phonemes of any language is the primary relevant criterium for any structural linguistic analysis. The central focus within Classical phonemics was therefore to develop the steps and principles for discovering that group of sounds that may constitute the phonemic inventory of any language. Classical phonemics provides the terms for analysing new data provided by phonetics. It deals with how to discover the significant sounds of a language. The speech sounds of a language are therefore organised into structural units called phonemes, with each having different forms called allophones. Methods in phonemic analysis are guided by the five principles of contrast, complementarity, phonetic similarity, pattern congruity and economy.

By the principle of contrast, when two speech sounds can be substituted one with the other and vice versa and such substitution leads to a difference in meaning, they are said to be contrastive and are therefore considered different phonemes of the language. However, where such substitution does not result in a difference in meaning, the sounds are said to be in free variation. This latter occurrence suggests that such speech sounds are allophones or different realisations of one and the same phoneme. The principle of contrast is the basic notion of phonemic analysis and the primary basis on which phonemic systems are set up for languages.

When two speech sounds do not occur in the same environment, they are said to be in complementary distribution or mutually exclusive. This quality implies that the sounds in question are allophones of a given phoneme. The principle of phonetic similarity holds that phones which can be said to be allophones of the same phoneme are those which share a number of phonetic features or characteristics. For instance, the speech sounds [p, b] are phonetically similar because they share place and manner of articulation features, as both are bilabial plosives. They only differ in their voicing features – the former being voiceless and the latter voiced. Further descriptive evidence may show that they are allophones of the same phoneme in a given language.

Pattern congruity refers to the organisation or patterning of speech sounds in a given language. This factor includes the fact that their distribution, relative to other speech sounds within an utterance, may be predictable. The principle of economy favours a smaller number

of phonemes as members of the phonemic inventory of a given language. An analysis which identifies a total of 25 (twenty-five) phonemes in a language, therefore, may be preferable to one which identifies 27 (twenty-seven) phonemes. In the ranking of these five principles of phonemic analysis, those of contrast, complementarity, phonetic similarity and pattern congruity take precedence over that of economy.

The Auto-segmental framework of phonological analysis credited to Goldsmith (1976), proposes a more adequate characterisation of phonetic and phonological representation of language than its preceding counterpart of generative phonology (Chomsky and Halle, 1968). The preference for this framework is based on the premise that it was primarily created to account for the behaviour of prosodic features, one of which is the nasal phenomenon. The proposals of the theory which are relevant to this study include its postulation that the features of a segment (which are claimed to be bundled together in matrices, by the tenets of generative phonology) and the segment, do not always function together as a unit. The fact that in some languages, certain features are often retained after the deletion of the segments which they were supposedly a part of, is well known and demonstrated in this work. Similarly, the phenomenon of de-syllabification which may result from phonological processes such as glide formation and vowel elision, permits the retention of de-segmentalised phonetic units in a following vowel segment. As a further explanation of this occurrence, the tonal or nasal features which may co-occur with the elided vowel segment remain within the utterance and keep 'floating' until they get linked or 'hook' unto another tone bearing unit (TBU) or nasality bearing unit (NBU) in that environment. These occurrences substantiate the postulation that features are independent of the segments which bear them. This quality attests to the autonomy of prosodic features, which is a cardinal tenet of the auto-segmental theory (see 3.1.1, figure II). The strength of this theory lies in the clarity it provides for understanding the behaviour of prosodic features in language processing, as described in the current description of the nasal vowels in Èsàn.

## 2. Basic concepts

The two primary linguistic units into which speech may be analysed are those of segment and prosody. A linguistic unit may therefore be described as 'segmental' or 'prosodic'. Speech segments may be defined as those elements of an utterance that may be identified as separable units. These elements are in turn separable into the two main groups - consonant and vowel sounds. Egbokhare (1998) states that the consonant sounds are those which are produced with some obstruction of the free flow of air in the vocal tract. This obstruction, which may be partial or total, is often a function of the activities of the speech organs. The vowel sounds, on the other hand, are those units of speech, during whose production, the flow or movement of air in the vocal tract is without obstruction.

Prosodic elements of speech are linguistic units that affect the voice quality of an utterance. This element comprises two groups – the syllabic and pitch qualities. The syllabic element of prosody separates an utterance into naturally pronounceable units called syllables. A simple definition of the syllable is that which describes it as a unit of speech which can be produced in one breath. This definition is in line with Williamson (1995) which states that "...a syllable is the smallest unit of language which can be pronounced". Each syllable of a word usually begins and ends with a pause. Thus, the Èsàn word **ébàlè** is analysed as a three-syllable word - [é. bà. lè] 'food'. Pitch is defined as the perceptual correlate of the rate of vibration of the vocal cords per second (Egbokhare 1998). A high frequency of vocal cords vibration is perceived as high pitch [ʔ] while a low frequency is perceived as low pitch [ʘ]. Egbokhare explains that pitch is actually present in voiced segments only and continually changes in speech with the dynamics of voice production. Speech thereby acquires a melodic pattern due to these fluctuations, resulting in speech melody. The latter is sometimes distinctive, or indicative of a particular mood or grammatical structure. In some languages, the distinctive status of speech melody makes it necessary to define it as a part of grammatical structure. Intonation, Tone and Stress phenomena, are identified as realisations of pitch. When pitch is indicative of a particular mood of a sentence, it is referred to as intonation. English (a stress-timed language), employs the rising [↗], falling [↘], rising-falling [↗↘] and falling-rising

[↘↗] intonation patterns to signify questions, statements, certainty and doubt respectively. Tone is contrastive pitch, where speech melody is clearly defined as a property of the word. In a tone language, a change in pitch most often results in a change in the

meaning of a word. Most African languages, including the Edoid group, fall into this category of languages. Pike (1947a: 8) defines a tone language as one “...having lexically significant contrastive, but relative pitch on each syllable”. By this definition, a tone language must employ pitch as part of its lexical structure, and different pitch levels must contrast. The latter include but may not be restricted to the high [ˈ] low [ˉ] mid [ˊ] and the rising [ˊˈ] and falling [ˊˉ] contour tones.

The phonemic status of any unit of speech is determined by its linguistic role or function in an utterance. Yuka and Ikoyo-Eweto (2022) explains that this function concerns the ability of the said unit to cause a difference in the meaning of speech. Therefore, when the use of a linguistic unit causes a change in the meaning of utterances, it is said to be a phoneme of the language in which it occurs otherwise, it is a different realisation of a phoneme or a redundant speech sound. The linguistic theory within which the phonemic status of speech sounds of a given language is determined is Classical Phonemics.

The term ‘nasal’, primarily refers to one amongst other manners of articulation. The category of stop speech sounds include those which are not prolonged, e.g. [p, b, t, d] (plosive) and those during whose production, the airstream escapes through the nasal cavity with blockage of the oral passage e. g. [m, n, ɲ, ŋ] (nasal). The latter is the manner of articulation of particular interest and focus in this study. Yul-Ifode (2008) explains that with this manner of articulation, the airstream, which is prevented from going out through the mouth by complete obstruction, is diverted through the nose with the lowering of the velum. Therefore, it is the absence of velic closure that is responsible for this nasal quality. Osiruemu (2011) states that the nasal phenomenon in speech production is dynamic due to its dual characteristic. This description refers to the fact that nasality may be both phonemic and allophonic in some languages. It states further that, like some other language-specific phenomena, if the nasal phenomenon is not rightly understood, it could render communication, which is the major goal of language use, ineffective. Ésàn is one language in which the nasal phenomenon exhibits this unique status. For the purpose of the present study, it is necessary to make a distinction between ‘nasal’ and ‘nasalised’ segments. These two manifestations of the nasal phenomenon may be understood as follows:

To qualify as a nasal sound, a speech segment should possess all its attributes

of articulation. These include the presence of the following articulatory conditions:

- a. A stricture of complete closure where there is a total obstruction of the air passage at the time of articulation.
- b. The absence of velic closure, where the velum is lowered to enable the airstream to escape through the nasal cavity.

In Ésàn, the speech sounds which completely fulfil the aforementioned conditions include all the nasal consonants of the language - [m, ɱ, n, ɲ] (Yuka and Ikoyo-Eweto, 2022). Since these segments are nasals from their point of articulation and have fulfilled the conditions specified for the articulation of nasals, these segments are often described as ‘inherently nasal segments’. Illustrations of the occurrences of these nasals in the language are provided in (1).

|        |           |         |                     |
|--------|-----------|---------|---------------------|
| (1) i. | [mù]      | mun     | carry               |
| ii.    | [ómò]     | omọ     | child               |
| iii.   | [mɛ̃]     | mwẹn    | good                |
| iv.    | [úmɛ̃lɛ̃] | umwẹlẹn | salt                |
| v.     | [nà̀nò]   | nanon   | lick                |
| vi.    | [nɛ̃]     | nẹn     | defecate            |
| vii.   | [ɲǎ̃yǎ̃]  | nyaghan | tear (cloth, paper) |
| viii.  | [ɲɛ̃]     | nyẹn    | cook                |

On the other hand, nasalised speech sounds assimilate or acquire nasality from inherently nasal segments to which they are juxtaposed in an utterance. This description suggests that for these ‘nasalised’ segments, the nasal phenomenon is a result of the assimilation of the nasal feature by the affected segment. Hyman (1975) states that one primary condition for

determining nasalisation in a segment is the possibility of establishing the “directionality for nasal spreading”. In other words, if the nasal quality of a segment can be traced to its immediate environment, that segment is ‘nasalised’, not ‘inherently’ nasal. Data presented in (2) illustrate the presence of the nasalised segments - [ĩ, ẽ, ã, ũ, ỹ] in Ésàn.

|     |       |         |        |                   |
|-----|-------|---------|--------|-------------------|
| (2) | i.    | [àmẽ]   | amẹ    | water             |
|     | ii.   | [âṁẽ]   | amwẹn  | wife              |
|     | iii.  | [kpàṅĩ] | kpanọn | get up            |
|     | iv.   | [sàṅĩ]  | sanọn  | to pop            |
|     | v.    | [mũdǰá] | mundia | stand             |
|     | vi.   | [áṅĩ]   | anyọn  | wine              |
|     | vii.  | [hàṅĩ]  | hanọn  | select            |
|     | viii. | [fàṅĩ]  | fanọn  | untie             |
|     | ix.   | [nẽ]    | nẹn    | defecate          |
|     | x.    | [nàṅĩ]  | nanọn  | lick(with tongue) |
|     | xi.   | [mĩlĩ]  | minlọ  | swallow           |

The data in 2 demonstrate that the nasalised vowel segment marked with the tilde [~] are flanked either to the right, left or both sides by nasal segments. By the principles of phonological analysis, their acquired nasal feature is traceable to the nasal environment which surrounds them by their juxtaposition to these inherently nasal segments. Osiruemu (2011) states that in Ésàn, it is vowel rather than consonant segments that are nasalised and that they usually acquire nasality in a nasal environment barring the segments [e, o]. By auto-segmental tenets, the nasal feature, like other supra-segmental phenomena, is autonomous and may not be effaced with the deletion of the segment which bore it. Rather, this nasal feature, which hitherto was a feature of the deleted segment, remains and floats until it relinks to the next available Nasality Bearing Unit (NBU).

Osiruemu (2010) identifies 28 consonant speech sounds across the 12 varieties of of Ésàn. This finding is confirmed in Yuka & Ikoyo-Eweto (2022). The consonant sounds comprise 18 voiced [b, d, g, gb, β, v, z, ɟ, ɲ, m, n, ɲ, l, r, j, w] and 10 voiceless [p, t, k, kp, h, f, s, ʃ, x, tʃ] speech sounds. 12 vowel speech sounds are postulated for Ésàn (Ejele 1994, Osiruemu 2010, Yuka & Ikoyo-Eweto 2022). The vowel sounds, which are all voiced, comprise seven oral [i, e, ɛ, a, u, o, ɔ] and five nasal sounds [ĩ, ẽ, ã, ũ, ỹ]. Although Ejele proposes 25 consonant phonemes for Ésàn, Osiruemu’s and Yuka & Ikoyo-Eweto’s input of 26 phonemes are adopted in this study because their postulations are based on 12 Ésàn varieties (Osiruemu 2010, Ikoyo-Eweto and Jamgbadi 2012), a value which earlier efforts do not possess. Following Ejele (1984), Okojie and Ejele (1987) and Yuka and Ikoyo-Eweto, (2022), all 12 attested vowel sounds in Ésàn are phonemic. The language thereby features a total of 38 phonemes. These phonemes and their orthographic representations are presented in Table (1).

| Table (1) | Phoneme | Alphabet | Phoneme | Alphabet |    |
|-----------|---------|----------|---------|----------|----|
| 1.        | /i/     | i        | 20.     | /g/      | g  |
| 2.        | /ĩ/     | in       | 21.     | /kp/     | kp |
| 3.        | /e/     | e        | 22.     | /gb/     | gb |
| 4.        | /ɛ/     | ẹ        | 23.     | /β/      | bh |
| 5.        | / ẽ/    | ẹn       | 24.     | /s/      | s  |
| 6.        | /u /    | u        | 25.     | /z/      | z  |
| 7.        | /ũ/     | un       | 26.     | /ʃ/      | sh |
| 8.        | /o/     | o        | 27.     | /x/      | kh |
| 9.        | /ɔ/     | ọ        | 28.     | /ʎ/      | gh |
| 10.       | /õ/     | ọn       | 29.     | /h/      | h  |
| 11.       | /a/     | a        | 30.     | /tʃ/     | ch |
| 12.       | /ã/     | an       | 31.     | /ɖʒ/     | j  |
| 13.       | /p/     | p        | 32.     | /m/      | m  |
| 14.       | /b/     | b        | 33.     | //n/     | n  |

|     |     |   |     |     |    |
|-----|-----|---|-----|-----|----|
| 15. | /f/ | f | 34. | /ɲ/ | ny |
| 16. | /v/ | v | 35. | /l/ | l  |
| 17. | /t/ | t | 36. | /r/ | r  |
| 18. | /d/ | d | 37. | /j/ | y  |
| 19. | /k/ | k | 38. | /w/ | w  |

(Yuka and Ikoyo-Eweto, 2022:44)

In a study of nasal vowels in Èsàn, Osiruemu (2011) proposed a reappraisal of their sources of nasality. Her treatment of the phenomenon, though similar in concept to that of Elugbe and Williamson (1977), takes a step further to reconstruct the probable sources of the nasal quality of these vowel segments. The goal of the study was to re-evaluate the prevailing status of the segments as inherent nasals. Other previous works on Èsàn include Ejele (1982 & 1986) which are studies of the sound system of the language, and tense in Èsàn respectively. Osiruemu (2005 & 2010) examine tone and the dialects of Èsàn respectively. Specifically, the former studies tone and syntax in Èsàn and identifies various modifications of tonal patterns in the lexicon of the language while the latter examines varieties of Èsàn with the goal of identifying the dialects of the language. The work, further identifies the possible earliest varieties of Èsàn. Ejele & Okojie (1987) proposes an orthography of Èsàn while Ikoyo-Eweto (2013) is a critique of the proposed Èsàn orthography. It identifies its strengths and weaknesses and recommends revisions that could make the writing system more representative of the language. Yuka & Ikoyo-Eweto (2022) is a pioneering effort at documenting a systematic description of Èsàn.

Nasal vowels are also attested in Èdó (Melzian 1937, Agheyisi 1986, Omozuwa, 2010). In a phonemic analysis of the Èdó vowel system, Omozuwa identifies seven oral /i, ɛ, a, u, ɔ/ and five nasal /ĩ, ě, ã, ũ, ỹ/ vowels, making a total of twelve vowel segments. In his words, “The twelve vowel sounds are phonemic since they contrast in minimal pairs of words...”. Some illustrations of the phonemic status of the vowel sounds as illustrated from that study include the illustrations in ( 3).

- (3)
- a. /i/ and /ĩ/
 

|       |        |       |             |
|-------|--------|-------|-------------|
| [sì]  | smoke  | [sĩ]  | filter (vb) |
| [ìkí] | a coil | [ĩkĩ] | loin        |
  - b. /ɛ/ and /ẽ/
 

|       |          |       |         |
|-------|----------|-------|---------|
| [àzé] | election | [àzẽ] | witch   |
| [vè]  | belch    | [vẽ]  | wrestle |
  - c. /a/ and /ã /
 

|        |      |        |            |
|--------|------|--------|------------|
| [kpă]  | lift | [kpă]  | pluck      |
| [ókpá] | one  | [ókpá] | dish/plate |
  - d. / u / and / ũ /
 

|       |            |       |              |
|-------|------------|-------|--------------|
| [fù]  | be calm    | [fũ]  | waste        |
| [ikù] | refuse (n) | [ikũ] | ante-chamber |
  - e. /ɔ/ and / ỹ /
 

|       |            |       |                 |
|-------|------------|-------|-----------------|
| [òxò] | strictness | [óxỹ] | quarrel         |
| [hǒ]  | wash       | [hỹ]  | build up wealth |
- (Omozuwa 2010:168-169)

From the Èdó data presented in (3) the identified nasal vowels in the language are shown to be phonemic in Èdó as they fulfil classical phonemic provisions for acquiring that status. Omozuwa states further that the contrast between oral and nasal vowels is made solely in the environment of oral consonants. This observation raises unanswered questions about the source of nasality of the nasal vowels in Èdó. He however does not proffer any answers to that question in the work. He also notes that a nasal consonant cannot occur in word initial position in the language.

Schaefer (1997) identifies seven “simple” vowels for Emai - [i, e, ε, u, o, ɔ, a]. He states that each of these vowels has a lengthened counterpart - [i:, e:, ε:, u:, o:, ɔ:, a:]. According to him, barring the vowel sounds [e, o], all short and long vowels are nasalized in the language- [ĩ, ẽ, ã, ũ, ỹ, ẽ:, ã:, ũ:, ỹ:]. However, only the short-nasalized vowel sounds and their oral counterparts would seem to be contrastive in the language. Schaefer and Egbokhare (1999) identifies 12 phonemic vowels for Emai. The system comprises seven oral and five nasal segments as earlier proposed by Schaefer. They state that “At the half-close positions- [e, o]- there is no contrast between oral and nasal vowels. Emai orthography adopts the use of the letter ‘n’ as a marker for vowel nasality. Data illustrating contrast of these vowel phonemes are presented in (4).

|     |    |            |              |                                      |           |
|-----|----|------------|--------------|--------------------------------------|-----------|
| (4) | a. | <b>si</b>  | to pull      | <b>sin</b>                           | to deny   |
|     | b. | <b>sẹ</b>  | to be enough | <b>sen</b>                           | to pierce |
|     | c. | <b>khu</b> | to chase     | <b>khun</b>                          | to bundle |
|     | d. | <b>họ</b>  | to slaughter | <b>on</b>                            | to hear   |
|     | e. | <b>sa</b>  | to shoot     | <b>san</b>                           | to jump   |
|     |    |            |              | <b>(Schaefer and Egbokhare 1999)</b> |           |

As with Omozuwa for Èdó, reviewed literature showed no recorded attempt by these authors to seek the source of the quality on the phonemic vowel segments in the language. The sources of nasal feature on the nasalised vowel sounds, which have no phonemic status in Èsà, Èdó and Emai, were easily traceable to the nasal consonant segments in their environments, whereas that on the phonemic nasal vowels remained mostly unidentified over time. The present study seeks to probe this question further and proffer a possibility of identifying the source of the nasality of Èsà nasal vowels.

Data for this study were obtained from both primary and secondary sources. Primary data comprised the body of data sourced for work on the on-going Èsà Dictionary with English translation. These data, which are basically lexicon-based, are extracts from folk tales and storytelling sessions, songs and poems rendered by L1 speakers of Èsà. These informants were 24 in number, comprising 12 males and 12 females from 12 varieties of Èsà. These Èsà varieties include Ekpoma (Ekuma), Ewatto (Ebhoatto), Igueben, Ilushi, Irrua (Urua), Ogwa, Orhordua, Ubiaja (Ubiaza), Udo, Ugbegun, Ugboha, and Uromi (Uromwun) (Ikoyo-Eweto, 2010). One male and one female within the age range 50-years and above were selected from speech communities where each Èsà variety was spoken. The gender/age-range choices were made to ensure a balance in speaker population and competence value of data collected. Other indices for selecting informants included the period of time they had lived in the speech communities, which should be most of their lifetime. The selected Informants had little or no formal education. The SIL Comparative African Word List (Snider & Roberts, 2006) was the guiding instrument for the elicitation of corpus. Appropriate audio-visual recorders were employed as instruments for the initial recoding of corpus. The latter were subsequently documented using the proposed Èsà orthography. Secondary data were sourced from previous works relevant to this study. The methodological approaches employed for the analysis of available data was both the qualitative and quantitative phonological method. These preference weres informed by the focus of the study which concerns patterns and variations in the identified speech sounds as well as their, frequency of occurrence and distribution in the language.

### 3. The Nasal phenomenon and Èsàn vowel segments - a dual linguistic role

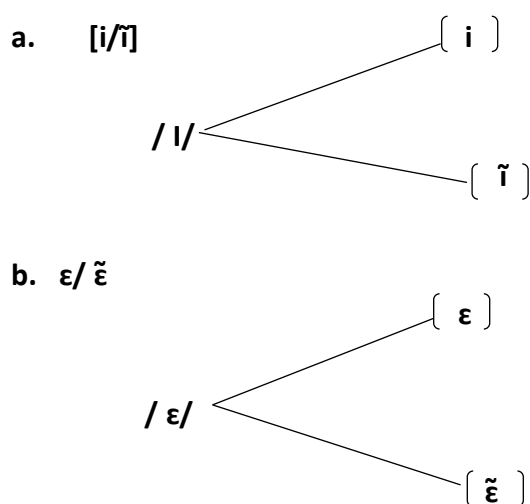
Available data show that five of the seven oral Èsàn vowel segments exhibit a dual linguistic nature. This duality may be identified in as follows.

1. The five oral vowels [i, ε, a, u, ɔ] are usually nasalised in the environment of nasal consonants in the language. Earlier studies of this occurrence have proven beyond doubt that it is a result of the assimilation of the nasal feature from neighbouring consonant segments. In this role, these segments are referred to as nasalised and do not possess phonemic status. In other words, as nasalised vowels, they do not distinguish meaning between utterances. Thus, these vowel segments have two statuses – as oral vowels and as nasalised segments. It is worthy of note that whereas the oral and the nasal vowels of Èsàn are phonemic in the language, the nasalised counterparts, whose nasality are physically traceable to their environment, do not have phonemic status. Specifically speaking, while oral vowel segments are contrastive in Èsàn, their nasalised counterparts do not have phonemic status. We make this assertion based on the observation that utterances which feature nasalised vowel segments, show no change in their meanings when produced without the nasal feature. This occurrence is illustrated in (5).

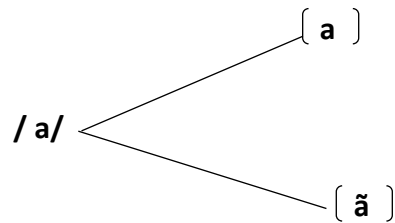
|        | without nasalisation |       | with nasalisation |         |             |
|--------|----------------------|-------|-------------------|---------|-------------|
| (5) i. | [nò]                 | nọ    | [nỗ]              | nọn     | to grind    |
| ii.    | [kpànú]              | kpanọ | [kpànỗ]           | kpanọn  | get up      |
| iii.   | [mù]                 | mu    | [mỗ]              | mun     | to carry    |
| iv.    | [sànú]               | sano  | [sànỗ]            | sano    | to pop      |
| v.     | [mùdjà]              | mudia | [mỗdjà]           | mudian  | stand       |
| vi.    | [nèjè]               | nyeyẹ | [nỗjè]            | nyenyẹn | to compress |
| vii.   | [mà]                 | mwa   | [mỗ]              | mwan    | to measure  |
| viii.  | [àmè]                | amẹ   | [àmỗ]             | amẹn    | water       |
| ix.    | [éjà]                | enya  | [éjỗ]             | enyan   | yam         |

Technically speaking therefore, by the tenets of classical phonemics, the oral and nasalised vowel sounds of Èsàn would seem to occur in free variation as their distributional characteristic does not cause a difference in the meaning of the utterances in which they occur. By this quality, they are considered allophones of the same phoneme. This occurrence is represented in Figure (1).

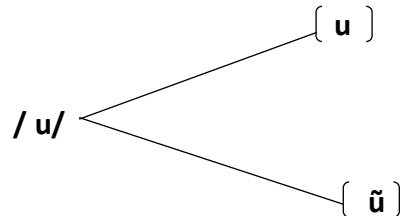
Figure (1)



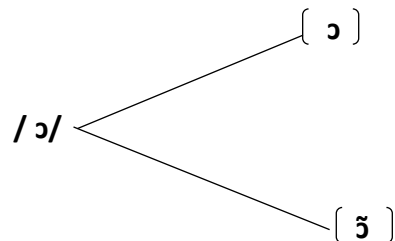
c. a/ã



d. u/ũ



e. ɔ/õ



By the analysis presented in Figure (I) the segments /i, ɛ, a, u, ɔ/ are phonemes of Ésàn, while their allophonic counterparts are the nasalised vowels [ĩ, ẽ, ã, ũ, õ]. An attempt at placing them in minimal pairs showed no difference in the meanings of the words in which they occurred.

2. A second characteristic of the vowel segments of Ésàn is that they also display the nasal phenomenon. They are not usually referred to as nasalised vowels, obviously due to the fact that their nasality cannot be readily traced to any nasal segment in their environment. Their inherent features have earned them the description 'nasal vowels'.

An attempt is made in the following sub section to conduct a reconstruction of the probable segment as the source of nasality of these vowels, as suggested in earlier studies. The occurrence of these segments in Ésàn utterances are presented in (6A) and (6B).

|         |         |          |                 |         |      |     |                |
|---------|---------|----------|-----------------|---------|------|-----|----------------|
| (6A) i. | [ákògǎ] | akogan   | bat             | (6B) i. | [bǎ] | ban | pull off cover |
| ii.     | [èyǎyǎ] | eghoghon | joy             | ii.     | [sǎ] | san | jump           |
| iii.    | [ùxǎ]   | ùkhon    | navel           | iii.    | [bũ] | bun | plenty         |
| iv.     | [ékěhě] | ékehèn   | cough           | iv.     | [bĩ] | bin | break          |
| v.      | [ígě]   | igèn     | feather         | v.      | [tĩ] | tin | fly (vb)       |
| vi.     | [àkǎ]   | akon     | teeth           | vi.     | [tẽ] | tèn | press down     |
| vii.    | [эгě]   | egèn     | groin           | vii.    | [sẽ] | sèn | sieve          |
| viii.   | [íkǎ]   | ikpin    | boa constrictor |         |      |     |                |
| ix.     | [òkũ]   | okun     | sea             |         |      |     |                |

This set of vowels are termed 'inherently nasal' because although they occur in the environment of oral consonants, their nasal status is what brings about difference in meaning between the words in which they occur and those words which have their oral counterparts.

### 3.1 Reconstructing the sources of Èsàn vowel nasality

The proposal that an extinct nasal segment is the source of the nasality of Edoid contrastive nasal vowels had been made in earlier studies (Elugbe 1973, 1989, Elugbe and Williamson 1977). Osiruemu (2011) takes this hypothesis a step further for Èsàn by proposing a velar nasal as the source of this phenomenon for the set of data available at that time. Concerning this set of data (see (6A i - ix), the work states:

Previous works on Èsàn attest to its possession of the bilabial [m], alveolar [n], labio-dental [ɱ] and palato-alveolar [ɲ] nasal phones.... It is on this ground that the suspicion of the previous possession of the velar nasal phone [ŋ] is built. Couple with the fact that its place of articulation precedes that of the palato-alveolar nasal [ɲ], our position is strengthened by the occurrence of the velar stop phones [g, k, ɣ, x]...these nasal vowels are preceded by velar sounds. This environment suggests that the nasality of these vowels is traceable to the velar nasal sound [ŋ] which, as argued earlier, may have at some time been in use in Èsàn.

(Osiruemu 2011:325)

On the basis of the preceding arguments, Osiruemu proposes the earlier forms of the identified data as shown in (7A).

|      |       |         |   |           |                 |
|------|-------|---------|---|-----------|-----------------|
| (7A) | i.    | /ákògǎ/ | → | [ákògán]  | bat             |
|      | ii.   | /èyǒyǒ/ | → | [èyòŋyòŋ] | joy             |
|      | iii.  | /ùxǒ/   | → | [ùxòŋ]    | navel           |
|      | iv.   | /ékèhě/ | → | [ékèŋhèŋ] | cough           |
|      | v.    | /ígě/   | → | [ígèŋ]    | feather         |
|      | vi.   | /àkǒ/   | → | [àkòŋ]    | teeth           |
|      | vii.  | /ègě/   | → | [ègeŋ]    | groin           |
|      | viii. | /íkpi/  | → | [íkpiŋ]   | boa constrictor |
|      | ix.   | /òkú/   | → | [òkúŋ]    | sea             |

(Osiruemu 2011: 325)

In the light of the evidence proffered by Osiruemu, it would seem more natural to adopt the position that the velar nasal sound [ŋ] was at some time a member of the Èsàn sound system. The argument is that this sound was preceded by the oral vowels, which assimilated the nasal feature from the latter. However, by auto-segmental tenets, even though this sound became extinct over time, the nasal quality remained stable and began to be seen as an integral part of these vowel segments, especially as there was no physical explanation for their nature. The present study takes this hypothesis of reconstruction further, by making a more encompassing proposal to account for the nasal vowels of the language which are preceded by nasal segments produced at places of articulation other than the velar (see data (6B i-vii). In this regard, we make the following proposals:

- The nasality of all nasal vowels in the language may be sourced from an underlying extinct nasal consonant [N].
- The place of articulation of the surface/physical realisation of each [N] of a nasal vowel is determined by that of the consonant segment which precedes it. This reconstructed [N] may be identified with the label [RN].

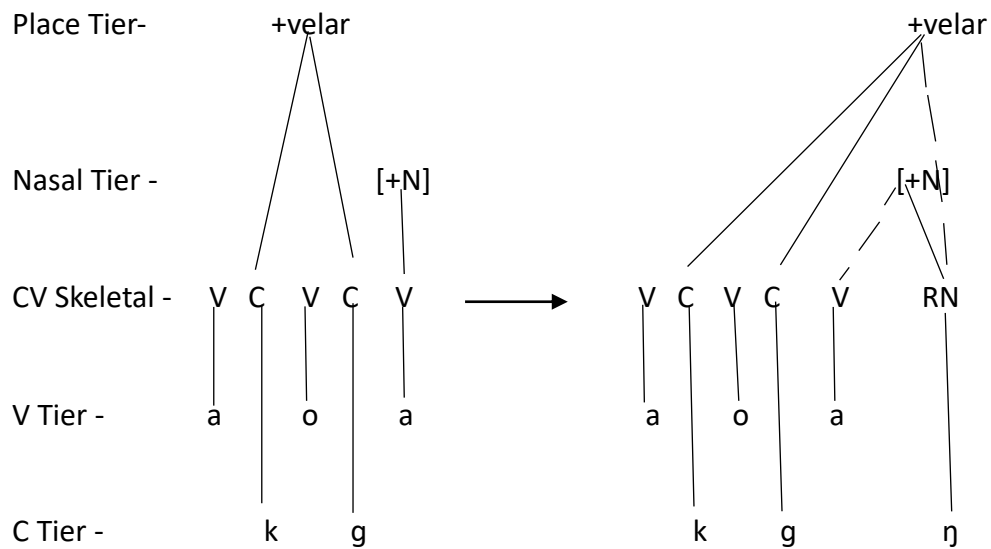
From the foregoing presentation, the nasal vowels in the following utterances (6B i-vii) may be reconstructed as shown in (7B i-vii)

|         |               |       |       |                |
|---------|---------------|-------|-------|----------------|
| (7B) i. | /bǎ/ bilabial | [m] → | [bàm] | pull off cover |
| ii.     | /sǎ/ nasal    | [n] → | [sàn] | jump           |
| iii.    | /bũ/ bilabial | [m] → | [bùm] | be plentiful   |
| iv.     | /bĩ/ bilabial | [m] → | [bìm] | break          |
| v.      | /tĩ/ alveolar | [n] → | [tìn] | fly (vb)       |
| vii.    | /tẽ/ alveolar | [n] → | [tèn] | press down     |
| viii.   | /sẽ/ alveolar | [n] → | [sèn] | sieve (vb)     |

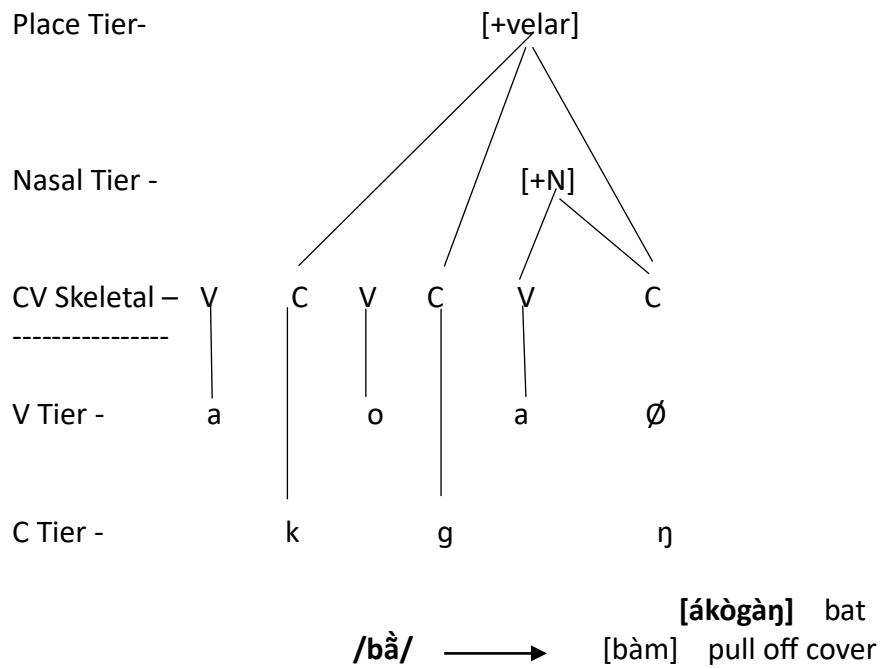
An [RN] will take the place of articulation of the preceding consonant segment. Thus [m] for bilabial, [n] for alveolar and [ŋ] for velar. This occurrence is represented in auto-segmental tradition in (Figure II).

(Figure II) /ákògǎ/ → [ákògàŋ] bat

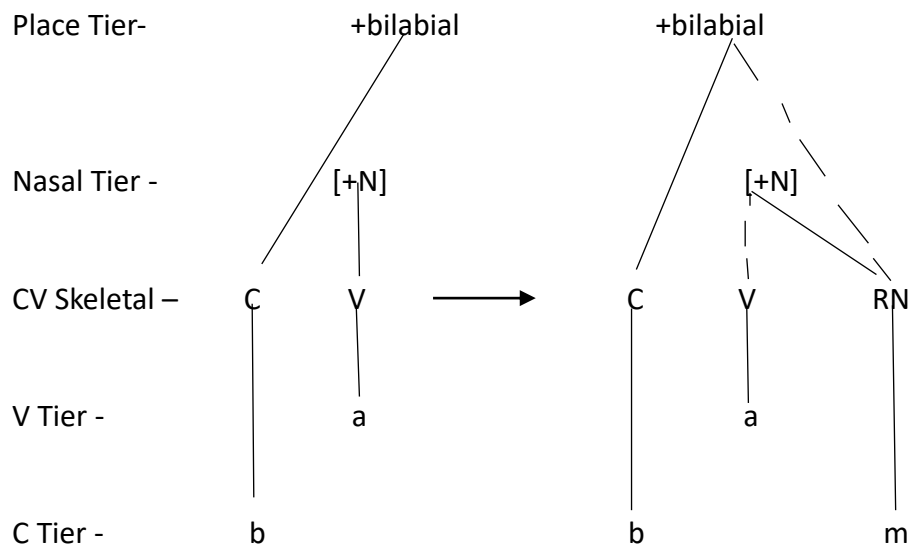
**a. Underlying representation**



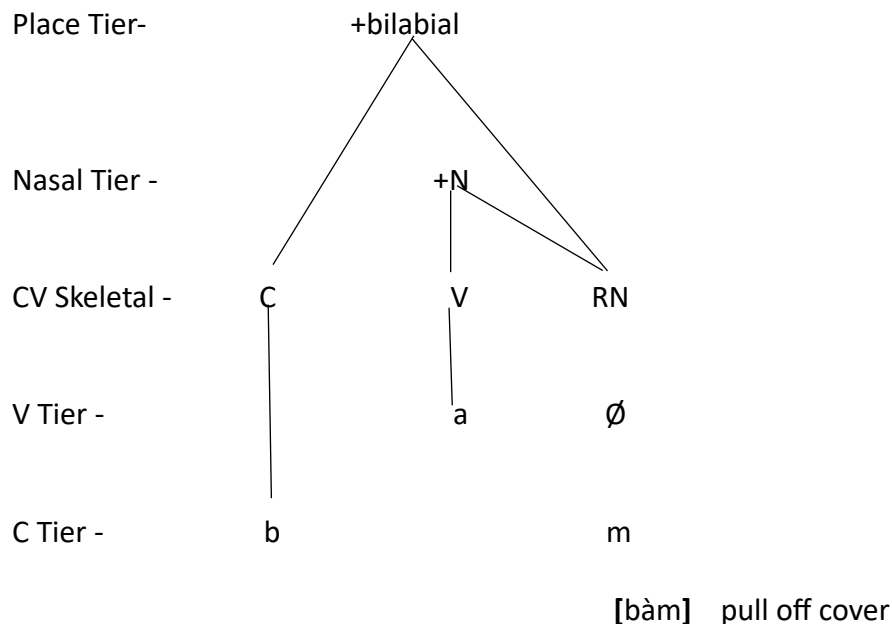
## b. Surface phonetic realisation



## a. Underlying representation



### b. Surface phonetic realisation



The analysis in (Figure II) shows that the source of nasality for these vowel segments is a nasal consonant which copies the place of articulation of the consonant segment preceding the nasal vowel. This nasal consonant which is purportedly extinct, becomes the Reconstructed Nasal consonant (RN). Despite the extinction of this nasal consonant [Ø], its nasal feature [+N] is shown to remain stable and hooks unto the next available nasality bearing unit (NBU). The emerging nasal vowel has come to be described as “inherently nasal” due to the non-visibility of a physiological explanation for its nasality.

### 3.2 The Phonemic status of É̀sàn nasal vowels

Ésàn nasal vowels possess phonemic status, a quality confirmed by the tenets of Classical Phonemics. This occurrence is illustrated in ( 8).

|     |       |             |           |              |             |            |                        |
|-----|-------|-------------|-----------|--------------|-------------|------------|------------------------|
| (8) | i.    | <b>[bì]</b> | <b>bi</b> | vomit        | <b>[bǐ]</b> | <b>bin</b> | to break               |
|     | ii.   | <b>[tì]</b> | <b>ti</b> | boil         | <b>[tǐ]</b> | <b>tin</b> | fly (vb)               |
|     | iii.  | <b>[tê]</b> | <b>tẹ</b> | immoral      | <b>[tế]</b> | <b>tẹn</b> | press down             |
|     | iv.   | <b>[sè]</b> | <b>sẹ</b> | sufficient   | <b>[sế]</b> | <b>sẹn</b> | sieve                  |
|     | v.    | <b>[bà]</b> | <b>ba</b> | immerse      | <b>[bã]</b> | <b>ban</b> | pull off cover         |
|     | vi.   | <b>[sà]</b> | <b>sa</b> | fetch/draw   | <b>[sã]</b> | <b>san</b> | jump                   |
|     | vii.  | <b>[bù]</b> | <b>bu</b> | go to meet   | <b>[bủ]</b> | <b>bun</b> | plenty                 |
|     | viii. | <b>[sù]</b> | <b>su</b> | escort(vb)   | <b>[sủ]</b> | <b>sun</b> | slimy/starchy          |
|     | ix.   | <b>[tò]</b> | <b>tọ</b> | to live long | <b>[tỗ]</b> | <b>tọn</b> | roast                  |
|     | x.    | <b>[lò]</b> | <b>lọ</b> | to be tender | <b>[lỗ]</b> | <b>lọn</b> | put liquid in a bottle |
|     | xi.   | <b>[vè]</b> | <b>vẹ</b> | swell        | <b>[vế]</b> | <b>vẹn</b> | swear/kindle (of fire) |
|     | xii.  | <b>[dà]</b> | <b>da</b> | drink(wine)  | <b>[dã]</b> | <b>dan</b> | wrestle                |
|     | xiii. | <b>[tà]</b> | <b>ta</b> | speak        | <b>[tã]</b> | <b>tan</b> | tall                   |

Data in (8) show that the nasal vowels and their oral counterparts, contrast in utterances in which they occur in minimal pairs in É̀sàn. They are thereby phonemes of the language and may be represented as / i, ɛ, a, u, ɔ, ĩ, ẽ, ã, õ, ɔ̃ /. The minimal pair testing takes precedence over all others, and is the 'litmus test' for identifying the phonemes of a given language.

### 3.3 Distribution questions of Èsàn nasal vowels

It has been suggested that the probability of the contrastive nasal vowel segments - also referred to in the literature as significant or inherent nasal vowels - not occurring at the initial position of utterances may fault or detract from their establishment as phonemes in the languages in which they occur (Ugorgi 2025...by personal interaction). Our position concerning this proposal is that the argument is unfounded and unsustainable. The tests for identifying the functional speech sounds of a given language as specified in the tenets of classical phonemics are clearly stated and yet to be faulted. The proviso of word initial occurrence of segments as test for phonemic status, is not established for classical phonemics although distributional characteristics may be indicated. Although Omozuwa (2010) states categorically for Èdo "...that a nasal vowel cannot occur at word initial position", this observation did not affect or nullify his analysis of the vowel segments under focus as phonemes in the language. Moreover, Omozuwa's observation is probably language specific as the same position may not be held for Èsàn. The proposal in question is further weakened because available data shows that Èsàn features some of these nasal vowels in word initial position. Illustrations of this occurrence are presented in (9).

- (9) i. / ẽ / ẹn cook (vb)      Ọnĩ ókwô ẹn ébálé ìnòdẹ  
that woman cook past food yesterday  
The woman cooked food yesterday
- ii. / ẽ / ẹn yes      ùwẹ lé ébàlẹ fô ó. ẹn  
you eat food finish()pst  
Have you finished eating? Yes
- iii. / ẽ / ẹn Is that so?      Ẹkpá òsì ìme úlù ǎ. ẹn  
bag poss. Me lost fut.  
My bag is missing. Is that so?
- iv. / ẽ / ọn drink (water, medicine) Ọfùré ọn àmẹ fò  
Ọfùré drink water finish  
Ofure has finished drinking water
- v. / ǫwǫ / ọwọn honey      ọwọn ghàlán  
honey expensive  
Honey is expensive.
- vi. / íẹlẹ / íẹlẹn experience/existence Bé á tié ọná bhí íẹlẹn.  
what they call this in existence  
What type of experience is this?
- vii. / ǐhù # ẹlò / ǐhwẹnlò eyelashes      Ọlẹ há gbẹ íhwẹnlò  
lashes + eye she tns beat eyelashes  
She is blinking her eyelashes
- viii. / ǎ / ǎn Yes? (used in response to a call) Ọfùré. ǎn  
Ofure. Yes?

Not many illustrations of these occurrences could be found from available data. Although as stated earlier, word initial occurrence is not a paramount determinant of phonemic status, it is worthy of note that the nasal vowels fulfil this condition. More of such occurrences may yet emerge in future efforts, given a broader data base.

#### 4. Conclusion

This study, examined a group of vowel segments, commonly referred to in the literature as 'inherent nasal vowels. These segments include /ĩ, ẽ, ã, ũ, ɔ̃/ in contradistinction to their oral counterparts /i, e, a, u, ɔ/. The motivation for the study included the various postulations that have been proffered about the linguistic characteristics of this group of vowel segments over time. The goal of this study was to close the gaps arising from concerns about the nasal status of these vowel segments and to improve on earlier efforts and proposals about the sources of their nasality. The work shows that like some Proto North Central Edoid (PNCE) languages, É̀sà̀n features these vowel segments which are identified as nasal vowels. The characteristics of this group of vowel differentiates them both physiologically and functionally from the set called nasalised vowels. The empirical justification for the difference in the description of these two sets of vowel segments is that while the nasal quality of the nasalised group is physiologically traceable to its immediate environment, the same may not be achievable for the nasal vowels, even though their articulatory processes are similar. For this reason, the latter are commonly referred to in the literature as 'inherently nasal', just like their consonantal counterparts.

The study confirmed that, like their oral counterparts, the nasal vowels are functional in É̀sà̀n. This fact implies that these vowel segments are contrastive, causing a change in meaning in utterances in the language. This observation is mostly confirmed proven by the fact that they occur in minimal pairs with the oral vowel set. The work improved on previous efforts which reconstructed a specific nasal consonant [ŋ] as the probable (extinct) source of the nasal quality of this set of vowel sounds. The improvement proffered in this study included identifying the reconstructed segment as RN (Reconstructed Nasal) - a reconstructed archi-phoneme. The study also extends this reconstruction effort to include other influencing nasal segment categories in É̀sà̀n. It copiously demonstrated these processes within the ambit of auto-segmental phonology and proposed a reconstruction formula and analysis for the possibility of tracing and identifying the influencing nasal consonant of nasal vowels in a given language. Further studies on the nature of these nasal vowels may yet provide new information about them. This work contributes to available literature on the nature of vowel segments in Edoid languages. The findings from the study would add value to documentation efforts of É̀sà̀n.

#### References

- Agheyisi, R. N. (1986). *Edo English Dictionary*. Benin: Ethiop Publishing Company.
- Asiza, R. O. (2008). Neutralization of contrast in the vowel system of Urhobo. *Studies in African Linguistics*. Vol 37(1): 1-20
- Bloch, B. (1941). Phonemic overlapping. *American Speech* 16:278-284.
- Chomsky, N. & Halle, M. 1968. *The sound patterns of English*. New York, Evanston, London:Harper and Row.
- Egbokhare, F.O. (1990). *A phonology of Emai*. University of Ibadan: Unpublished Ph.D. Thesis.
- Egbokhare, F.O. (1998). *Introductory phonetics: a course book on articulatory phonetics* Nigeria: Quasar and language solutions.
- Ejele, P. E. (1982). *Towards a phonology of Esan*. Unpublished M. A. Thesis. London: University College, London.
- Ejele, P. E. (1986). *Transitivity, Tense and Aspect*. Unpublished PH. D. Thesis, UCL: University of London.
- Ejele, P. E. (1994). Liquid elision in word-final syllables in Esan. *Journal of West African Languages*. 1: 68-76.
- Ejele, P. E. (2000). The Syntax and Semantics of Tense Markers in Esan. *Journal of West African Languages*. 1:85-95.
- Ejele, P. E. (2003). Contour tones in Esan. Ndimelo, O. Ed. *Four decades in the study of languages in Nigeria: A Festschrift for K. Williamson*. Aba: National Institute for Nigerian Languages. 633-644.
- Ejele, P. E. (1994). The Semantic Input of Serial Verb Constructions in

- Communication. *Journal of Nigerian Language Studies (NILAS)*. 2:60-68.
- Elugbe, B. O. (1973). *A Comparative Edo Phonology*. University of Ibadan: Unpublished Ph. D. Thesis
- Elugbe, B. (1989). *Comparative Edoid: Phonology and lexicon*. Delta Series 6. Port Harcourt: University of Port Harcourt Press.
- Elugbe, B. O. & Williamson, K. (1977). Reconstructing Nasals in Proto-Benue-Kwa. Juillard, Ed. *Linguistic studies offered to Joseph Greenberg*. 2:333-363. Saratoga, Calif: Anna Libri.
- Fulop, S. A. et al (1998). "An acoustic study of the tongue root contrast in Degema vowels. *Phonetica*. 55: 80-98.
- Goldsmith J.A. 1976a. *Autosegmental phonology*. Indiana: Indiana University Linguistics Club.
- Harris, Z. S. (1951). *Methods in structural linguistics*. Chicago: University of Chicago Press.
- Harris, Z. S. (1954). Distributional structure. *Word* 10: 146-162.
- Hockett, C. F. (1942). A system of descriptive phonology. *Language*. 18: 3-21.
- Hyman, L. M. (1975). *Phonology: Theory and Analysis*. New York: Holt, Rinehart and Winston.
- Melzian, H. 1937. *A Concise Dictionary of the Bini Language of Southern Nigeria*. London: Kegan & Co., LTD.
- Ikoye-Eweto, E. O. (2016). A proposed order of historical emergence of Esan Speech Varieties. *Dialectologia et Geo-linguistica. Journal of the International Society for Dialectology and Geolinguistics*. 24:145-156.
- Ikoye-Eweto, E. O. (2013). The Proposed Esan Orthography: Critique and Resolutions. *Research in African Languages and Linguistics*. 12: 95 – 107.
- Ikoye-Eweto, E. O. (2010). *A Structural Dialectology of Esan*. University of Ibadan: Unpublished Ph. D. Thesis.
- Ikoye-Eweto, E. O. & E. I. Jamgbadi (2012). Esan Dialects. *Iroro: Journal of Arts*. Vol. 15, N0s. 1&2. Faculty of Arts: Ambrose Alli University.
- Kamelu, M. C. (2003). Nasality in Esan: An Auto-segmental Analysis. In Ozo-Mekure N. ed. *Four Decades in the Study of Languages and Linguistics in Nigeria: A Festschrift for Kay Williamson*. Aba: National Institute for Nigerian Languages.
- Lindau, M. (1975). Features for vowels. *UCLA Working Papers in Phonetics*. 30:16-21.
- Okojie, G. C. & P. E. Ejele (1987). Esan Orthography. Agheyisi, R. N. Ed. *Orthographies of Nigerian Languages*. Manual IV.
- Osiruemu, E. O. (2010). *A Structural Dialectology of Esan*. University of Ibadan: Unpublished Ph. D. Thesis.
- Omozuwa, V. E. (2010). *Edo Phonetics and Phonology*. Nigeria: Ambik Press.
- Osiruemu, E. O. (2011). A Re-appraisal of Nasal Vowels in Esan. *Journal of the Linguistic Association of Nigeria*. Volume 14, II. Port Harcourt: University of Port Harcourt.
- Osiruemu, E. O. (2005). Tone and Grammar in Esan. University of Ibadan: Unpublished M. A. Project.
- Pike, K. L. (1947a). Grammatical prerequisites to phonemic analysis. *Word* 3(3): 155-172.
- Pike, K. L. (1947b). *PHONEMICS: A Technique for Reducing Speech to Writing*. Ann Arbor: The University of Michigan Press.
- Sapir, E. (1925). Sound patterns in language. *Language* 1: 37-51
- Shaefer, R. P. (1987). An Initial Orthography and Lexicon for Emai: An Edoid Language of Nigeria. Lewis, M. & K. Williams. Ed. *Studies in African Grammatical Systems*. USA: Indiana University Linguistics club.
- Shaefer, R. P. & Egbokhare, F. O. (1999). Eds. *Oral Tradition Narratives of the Emai People*. Vol. 5. Hamburg-London: LIT VERLAG Münster.
- Swadesh, M. (1934). The phonemic principle. *Language*. 10:117-125.
- Trubetzkoy, N. (1939). *Grundzuge der phonologie*. Prague: Vandenhoeck & Ruprecht [English translation (1969) by C. A. M. Baltaxe, *Principles of phonology*. Berkeley: University of California Press].
- Snider, K. & J. Roberts (2006). SIL Comparative African Word List (SILCAWL). SIL International.
- Twaddell, W. F. (1935). On defining the phoneme. *Language* 11 (1), 5-62.
- Williamson, K. (1965). *A grammar of Kolokuma Dialect of Ijo*. Cambridge University Press.
- Yuka, L. C. & E. O. Ikoye-Eweto (2022). *An Introduction to Esàn Grammar*. Benin: The University of Benin Press.
- Yul-Ifode, S. (2008). *Basic Phonetics*. Port Harcourt: University of Port Harcourt Press.