



## ENGLISH PHONOLOGICAL OPERATIONS: A STUDY OF RULE INTERACTIONS

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### Cite this article:

Amadi-Nna H.N., Ngulube I.E. (2024), English Phonological Operations: A Study of Rule Interactions. International Journal of Literature, Language and Linguistics 7(1), 1-48. DOI: 10.52589/IJLLL-TD0JP8VB

### Manuscript History

Received: 17 Oct 2023

Accepted: 3 Dec 2023

Published: 7 Jan 2024

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**ABSTRACT:** *This study focuses on English phonological operations with emphasis on rule interaction, rule ordering, bleeding, and feeding. It is a study in rule-governed phonological description. The method adopted for analysis is the descriptive survey approach. The theoretical framework adopted is Noam Chomsky's generative phonology. The finding is that phonological descriptive generalization is best done by rules rather than by phonemic analysis. This study recommends that the study of phonetics and phonology in Nigerian universities should focus more on practical exposure using laboratory instruments; laboratory exercises in conversational English using relevant phonological materials (tapes, records, video films, among others.), distinctive features, and rule writing approach for the advanced students are recommended.*

**KEYWORDS:** English Phonological, Interaction, Rule Ordering, Bleeding, Feeding.



## INTRODUCTION

Can we really talk about ‘feeding and bleeding’ in phonological operations in English without initiating a discourse on the concept of language generally, and the English language with its interesting historicity in Nigeria?

There is no gainsaying that language forms an integral part of any human society, hence its history is as old as man himself. Studies into the origin of language have, no doubt, generated quite a lot of controversy leading to the emergence of different schools of thought or theories on the origin of language. Nwala (8) observes that these different schools of thought have been broadly categorized into two otherwise known as “the divine and the speculative theories”. While the exponents of the divine theory, for instance, hold that language is a gift of ‘nature’ perhaps given by a supernatural being, the exponents of the speculative theory felt that language manifested through a constant successive developmental history. The summary of the claim of the speculative theory is that since language is the manipulation of sound, the developmental stages of man (presumably from the apes) have facilitated the development and emergence of language (Nwala 9).

Various schools of thought, no doubt, exist under the speculative theory. One of the most preponderant and astute voices in this school include Otto Jespersen who as cited in Yule (1) observed thus: “the genesis of language is not to be sought in the prosaic, but in the poetic side of life; the source of speech is not gloomy seriousness, but merry play and youthful hilarity....” Thomas Cooley, in a similar vein, identified what he described as the ‘Bow-wow’ theory which claim that language began with proto-humans who invented words by echoing the sounds in nature; the ‘Pooh-Pooh’ theory which asserts that language began with exclamation; the ‘Ding-Dong’ theory which claim that the first sound of the first language had mystical significance; and finally, the ‘Yo-he-ho’ theory which posits that the chants and grant of workers came to be vocal representation of their work. It is, however, in the concluding opinion of Cooley that said, “human language is so old that nobody really knows where it came from” (3). Similarly, from all the different opinions on the origin of language, Nwala also concludes by observing that all the theories of the origin of language are ‘assumptive and conjectural,’ “neither the divine nor the speculative has empirical proof” (10). Osisanwo (2), however, contends that “the most popular view of the emergence of language is the divine source” which according to Yule (1) holds that God created Adam, gave him the ability to speak and ‘whatsoever Adam called every living creature, that was the name thereof’ (Gen. 2v19).

Our interest here is in some of the opinions on the origin of language that relate its emergence to the formation of sounds which constitutes part of the major concerns of this research - phonology and the role of phonological operations. The whole essence of language is communication. All the effort of linguists, philosophers, and other relevant scholars in knowing about the emergence of language is all a response to man’s inquiry or search on how communication began among humans. Understanding a language presupposes understanding the pronunciation, and perhaps, spellings of the words of that language. Cruttenden explicates that the term ‘pronunciation’ covers both phonetics and phonemics, and further encompasses the prosody of English, i.e., suprasegmental which operate on longer stretches of utterances than sounds or phonemes. Prosody, in his words, “deals with how words and sentences are accented, and how pitch, loudness and length work to produce rhythm and intonation” (4).



There is no doubt that one of the major distinguishing characteristics between man and the animals is the inherent ability of man to communicate intelligibly with their fellow humans. As Ndimele puts it, “language is the means by which human beings affect communication”, and communication involves the exchange of ideas, feelings, thoughts, emotions, among others between individuals” (2, 10). The importance of communication therefore cannot be over-emphasized in any human society as it is an essential instrument both to formulate and disseminate the goals of an organization and to articulate plans for the realization of the same. Language has been observed to be essentially a communication system. In the terse summation of Adetugbo in Uzoezie (1), “it is language that defines man’s humanity”. The relationship between language and communication has been observed to be complementary one as Agava (16) succinctly puts it, “... while language itself is an organized system of communication; communication is language in action.”

In the considered opinion of Osisanwo (1), the word ‘language’ cannot be restricted to a definition, having been subjected to different definitions based on different schools of thought, some considered deficient, while some others quite holistic and relevant for our study today. For instance, one of the most comprehensive and relevant definitions of language, according to Osisanwo is that postulated by Gimsom (98) who describes language as: ‘...a system of conventional symbols used for communication by a whole community, the pattern of conventions covers a system of significant sound units, the inflection and the arrangement of words and the association of meaning with words’ (4-5).

And very similar to that is also the definition by Osisanwo who describes language thus: “language is human vocal noise or the arbitrary graphic representation of this noise, used systematically and conventionally by members of a speech community for purposes of communication” (1-2). Noteworthy in the two definitions above is the common use of the similar salient expressions: ‘...vocal noise or the arbitrary graphic representation of this noise’, on one hand, and, on the other, ‘a system of conventional symbols used for communication’ which vividly point to the realities of the two types of human language: spoken and written, but of these two, spoken is reported to be more archaic while the written language is relatively new. Nwala (18) observed that “it was the curiosity of man to conquer and develop the environment that led to the evolution of written language”. He reports that the development of the writing system is one of the greatest achievements of man, especially given the fact that written items ‘transverse space, time and culture’.

Sampson (19) in Agbedo defined a writing system as “a given set of writing marks together with a particular set of conventions for their use...” This definition gives credence to the fact that language is conventional, the property of a society as enshrined or acceptable in their cultural norms. Here, we are basically concerned with the phenomenon of medium of language, as Abercrombie had rightly argued that “The best way introducing the subject of phonology, and of making clear what it deals with, is to draw attention between language and medium”, noting further that as soon as we make explicit this identity lying behind the complete difference, we would recognize, in effect, that “the piece of spoken English and the piece of written English are the same language embodied in different mediums, one medium consisting of shapes, the other of noises” (1).

The relationship that should exist between these two mediums of the same language (in this context the English language) constitutes the crux of this scholarly peregrination. Basically, when we talk about, for instance, the role of phonological operations such as feeding and



bleeding in rule interaction and ordering as a means of representing English based phonological processes and their generalization in the effective teaching and learning of the English language, we are concerned with the use of a writing system that has gained acceptability using certain linguistic symbols to represent certain sounds in the effective teaching and learning of the English sound system. At this level, we are dealing with just an aspect of the grammar of the language, that is, phonetics and phonology, which should form part of the inherent conscious or unconscious ability of a speaker of a language, technically referred to as competence in Chomsky's theory of generative grammar.

Radford from this viewpoint of psychological construct also sees grammar in this context as a mentalist description of the linguistic competence of a native speaker of a language both in understanding and speaking the language. According to Clark and Yallop (401) in subservience to the Chomskyan generative phonology, orthodox generative phonology is part of a model of language also modeled after 'linguistic competence' which proposes that "underlying representations are converted into surface representations by the application of rules". The model shows phonology as a component supported by a syntactic component that generates grammatical sequences of the language. Thus, grammar, in the considered opinion of Clark and Yallop (401) in one sense of the word is competence represented as rules. They cited Chomsky who had explicated that the grammar is internalized by speakers, constructed from data in the process of acquisition, and used in linguistic performance (8-10). It is therefore our opinion that it would be in the interest of both the teacher and learners/ would-be learners of the English language to internalize the sound structure of the English words for effective performance and communication skills. For instance, how do we account for the difference in the pronunciation and meaning of the following similar orthographic words: (i) bow (n.) (a sort of weapon) and (ii) bow (v) (a mark of respect by kneeling)? There is no doubt that it is only in the knowledge of the internal phonetic structure (represented by phonemes) of the two similar words in spelling above that would go a long way in achieving both the psychological and semantic import of the speaker to the hearer. Hence, following the phonetic data of the two words, it is instructive to pronounce them as follows: (i) bow (n.) /bəʊ/ and (ii) bow (v.) /baʊ/, signifying different semantic implicatures as well.

Since phonology is the level of linguistics that deals with how sounds are used in a particular language to convey meaning (Adesanya 29), a brief history of the English Language would be quite didactic and remarkable here. The English language is a language of the Indo-European family of languages. As Ogu (10) rightly observed, "the history of the English language begins at the close of the 5<sup>th</sup> century with the invasions of Britain by three groups of Germanic people from northern Europe: The Angles, the Saxons, and the Jutes". Ogun and Etim (3) in their observation posits that "... English developed consequent upon the fusion of the languages of the migrant tribes and a minimal input from local primitive tribes but with more of Angle contents". Similarly, Ngulube (76) remarked that "English was an immigrant language to Britain, where it developed and spread to other parts of the world. The history of the English language did not begin on the continent where English speakers once lived, but in the British isle, where they finally settled". Furthermore, Ngulube (76), warns that the history of the English language can be traced back to the 5<sup>th</sup> century A.D upon the invasion of the British Isles by the earlier identified Germanic tribes. The English language indeed has had a checkered history having been transplanted from its native soil of England to other parts of the world including Nigeria.



The English language, over the years, has gained a global status as an international language only second to Chinese and Spanish regarding number of speakers but tops the league in terms of geographical spread. Ngulube (4) citing Quirk, for instance, observes that the total number of speakers of English could be estimated at 700 million, out of which about 300 million are L<sub>1</sub>, 300 million as L<sub>2</sub> and the rest 100 million are speakers of English as a foreign language. Nigeria incidentally falls into the second category that have or use the English language as a second language. It is also quite significant to note that a more current report has it that there is, however, about 1.3 billion English Language speakers all over the world today. Of that figure, the USA is reported to rank first with 297.4 million English speakers. Africa has about 236.4 million English speaking population with Nigeria topping the list with 111 million English speakers as their L<sub>2</sub> (Babbel USA - YouTube, 2020).

The English language, no doubt, today plays a multifaceted role in the global economy ranging from being the language of business and commerce, politics, lingua franca, administration, amongst others. There is no doubt that it is due to this linguistic relevance of the English language that Samarin (34) describes it as ‘universal language’ as against just being an international language. Ngulube (75) has observed that an examination of the origin and history of the English language would help establish a strong reason for the study of the use of English.

In Nigeria, the emergence of the English language in our socio-economic, political, and linguistic milieu is that of a child of circumstance, as Uzoezie (162) rightly puts it: “like the name ‘Nigeria’ the English language is a borrowed gown and one of the inheritances of colonial experience”. The English language in Nigeria today given its avalanche linguistic functions has assumed the status of a lingua franca, performing the function of an official language, the language of education or instruction, and above all, that of a unifying or socializing function in a multilingual setting such as Nigeria with between 394 (Opara 8) and 450 (Ngulube 476) indigenous languages.

In its status globally, and in Nigeria in particular, it becomes more imperative that users of English as second language begin to learn more about all the aspects of the language to gain more competence, as a foremost linguistic scholar, Roman Jakobson (56) had rightly observed that “Effective communication processes must be achieved by maintaining the morphology, syntax, semantic and *phonological ideas of language*”. (Emphasis added). Without undermining the relevance of other aspects of the English language or other levels of language expression, my emphasis here is on the enhancement of good knowledge of phonological analysis, rule writing, rule ordering, rule interpretation, and rule interaction, among others. Skills arising from the knowledge of phonological generalization will aid learners of the Received Pronunciation manifestation of excellent knowledge of English that utilizes the full elements of the different levels of language development to achieve good communication.

A speaker’s pronunciation even in the old Jewish tradition in Bible days is believed to be a first impression marker (Cf. Judges 12v6). Lending credence to this biblical allusion that bothers on the Gileadites’ correct pronunciation of ‘shibboleth’ as against the wrong pronunciation ‘shibboleth’ produce by their Ephraimites brothers, Abercrombie (6) sees pronunciation as an ‘audible gesture’, and as such both “... carry signs which reveal personal characteristics of the writer or speaker”. Pronunciation, in fact, can be regarded as a major intelligibility marker for any user of a language. In other words, a person is readily judged or assessed by the way he expresses himself. The essence of language is fully manifested through the verbal articulation



of sounds. Proper pronunciation of words in any language is very critical in creating a good communication situation as well as in the preservation of that language.

It is, however, noteworthy here that when we talk about pronunciation we are certainly not necessarily concerned about accent, as Roach (13) rightly observes that “languages have different accents: they are pronounced differently by people from different geographical places; from different social classes, of different ages and educational backgrounds”. Roach further explains that differences between accents are of two main sorts: “Phonetic and phonological”. When two accents differ from each other only phonetically, we find the same set of phonemes in both accents, but some or all the phonemes are realized differently. There may also be differences in stress or intonation, but not as would cause a change in meaning” (161).

Abercrombie (7-8) also submits that the word ‘accent’ in its popular sense is usually used to refer to regional indices. He goes on to identify some other forms such as status and idiosyncratic indices that may characterize accents. From the foregoing, it will surmise us to say that an African or Nigerian (Igbo, Hausa, Eleme, Efik, Yoruba, among others) accent is of no consequence in pronunciation provided meaning is not inhibited. Linguists have argued that the African accent or any other, for that matter, is not inferior to the British standard English accent. This is because the elements that make for the standardization of any language or dialect include, ‘mutual intelligibility’, a feature possessed by most English dialects of the world, as Adesanya (26) has appropriately observed, “Languages however are actually intelligible to their users: otherwise, they will not qualify as language”.

Earlier studies have been carried out in the quest to explore the challenges of phonological processes as it affects pronunciation for the effective teaching and learning of the English language in Nigerian schools, more precisely, Rivers State Schools. Various approaches, no doubt, have also been adopted by most of these researchers, yet the intrinsic cul de sac inhibiting improvement of our students in the areas of phonological analysis, rule writing, rule ordering, rule interpretation, and rule interaction remains prevalent. Part of the major problems confronting our linguistic milieu in the context of this discourse is the dearth of trained teachers as Clark and Yallop had evidently observed,

Nevertheless, the study of phonetics and phonology is certainly relevant to questions of phonological operations; it is probably fair to say, for example, that many teachers responsible for introducing children to spoken English in English-speaking countries are insufficiently informed about actual pronunciations and often fail to appreciate the reasons for some of the problems experienced by children, such as confusion in orthography. (6)

It is therefore the effort of this study to further strengthen the frontiers of solution to the pedagogical and phonological difficulties or challenges confronting the learner of English and his understanding of English phonological operations.

The overall drive for this study is to investigate English phonological operations in the light of good knowledge of phonological analysis, rule writing, rule ordering, rule interpretation, and rule interaction in order to achieve good standard English pronunciation from the learners’ perspective, on one hand, and on the other, those of the teachers in the effective teaching of phonetics and phonology, with special emphasis on pronunciation, spelling, and many more.

There is no doubt that quite a lot of research has been done in this area, seeking a solution to the ubiquitous challenges of enhancing the study of English segments among English learners



in Rivers State given the importance and relevance of this aspect of the English language amongst students. It is, however, rather unfortunate to observe that not quite a lot seems to have been achieved hence this further study.

Citing Richards and Renandya, Thomas Farrel (145) had recently suggested that grammar is too important to be ignored by language teachers and that “without a good knowledge of grammar, learners’ language development will be severely constrained”. He argued that the issue today is not whether grammar should be taught; rather the issue is how to teach it in its most effective way: inductively or deductively. Farrel further maintains that knowledge of these two main approaches to the teaching of English grammar, will be sufficient for you to survive teaching during your first years.

As Jenkins in Asiki (16) pointed out, phonological problems are the most prevalent causes of bad communication situations. Affirming that, Fraser (20) also opined that for one to be able to speak English, several elements are involved: vocabulary, grammar, pragmatics, and phonology, but, however, highlighted phonology to be “...by far, the most important...” and by implication phonological operations.

M.A.K Halliday in Kamalu (70) describes language as a social semiotics in which case he fundamentally views language as a strategic meaning-making resource in a socio-cultural context. Hence, since phonetics studies the characteristics and potential utility of human voice and is concerned with the study of the basic substance of language, it should be noted, as Kamalu (106) well observed that “human language is clearly more than isolated sounds in the sense that it displays patterns”. Crystal and Davy (17-18) in a similar view, talking about sounds and letters of English, noted that each human language selects only a few of all the sounds and shapes available and these selected few sounds and shapes are used in predictable (understandable meaningful patterns) and limited numbers of combinations to build up larger units such as words and sentences. They maintain that these sounds and letters of English have clearly definable form and function, and their systematicness may be formalized in rules.

Even from the literary perspective, Leech and Short (132) argue that the treatment of the phonological potentials of the written word cannot be ignored even though a written text may not possess a phonological level of style distinctly. Ogunsi (29) similarly corroborates this by saying that “phonologically, the analysis of language at this level involves the basic sound units such as the combination of sounds, stress, tone, and patterns of intonation. Furthermore, it is at this level that we consider the possible syllable structure of a particular language and the various ways in which syllables can be combined”.

The foregoing on the phonetic/phonological relevance of language from both the linguistic and literary perspectives underscore the significance of this study as one that would not only treat phonological operations in English but the role of rules in the overall architecture of English phonology. Moreso, given the fact that certain English words often are not usually pronounced the same way they are spelt, or even spelt the same way they are pronounced, raises more concerns to the language teacher to endeavor to employ better strategies to make the L<sub>2</sub> learner have an improved understanding on how to differentiate between vowel and consonant sounds as they appear in different words in contexts.

The study therefore would help both the students as L<sub>2</sub> learners of the English Language and the teachers to identify possible areas of pitfalls and challenges in phonologically related or



associated communication problems as to correcting them or improving on them. The study would, to a large extent, reduce the problem or difficulty in sound identification and articulation.

## LITERATURE REVIEW

### *Phonetics*

The term 'phonetics', according to *ODE*, is derived from the Greek word 'phonetikos' referring to the study of speech sounds. Uzoezie (29) citing Ladefoged (1) observes that "Phonetics is concerned with describing the speech sounds that occur in the languages of the world. We want to know what these sounds are, how they fall into patterns and how they change in different circumstances". Nwala (40) noted that phonetics "is the study of speech sound production, perception and description". This definition suggests a compartment of three branches of phonetics viewed as follows. (i) *Articulatory phonetics* which is the branch that describes and analyzes speech production in terms of stating the manner of articulation, place/point of articulation and the state of the glottis. (ii) *Acoustic phonetics* which studies the physical properties or characteristics of speech sounds. This is considered in terms of the description of the nature of the air movement from the mouth of the speaker to the ear of the hearer in the form of a wave. (iii) *Auditory phonetics* is an aspect of phonetics that deals with the perception of speech sound. This is considered in relation to the interpretation the hearer receives from the emitted speech sound of a speaker. Akmajian et al (366) in their own alternative description refers to this as "The Message Model" for human communication. Tomori (13), however, observes that "Phonetics is the study of the nature and production of sounds whether or not they are sounds used in any language". It is equally interesting to note that phonetics has gained prominence even among the legal practitioners, hence modern linguists' application of the term forensic phonetics, which according to Yule (41) "has application in legal cases involving speaker identification and the analysis of recorded utterances".

In sum, as Ladefoged (6) had rightly observed, "speech is not a static process, but an active one, and it is clear that many properties cannot be understood unless we examine their dynamic aspects", so my interest in this study is basically on the aspect of articulatory phonetics to examine the dynamism of the speech sound mechanism of the English language and how they can be taught or learned effectively in our schools using rule to represent the sounds.

### *Phonology*

In seeking to differentiate between phonetics and phonology, Cruttenden (3) observes that "the PHONETICS of a language concerns the concrete characteristics (articulatory, acoustic, auditory) of the sound used in languages, while PHONOLOGY concerns how sounds function in a systematic way in a particular language". Hence, we can define phonology as the study of speech sounds of a particular language together with their functions within the sound system of that language. Akmajian (109) says "phonology is the sub-field of linguistics that studies the structure and systemic patterning of sounds in human language". He observes that phonology can be viewed in two ways: (i) to refer to a description of the sounds of a particular language and the rules governing the distribution of those sounds, hence we can talk about the phonology of English, German, or any other language, (ii) to refer to that part of the general





theory of human language that is concerned with the universal properties of natural language sound systems (i.e. properties reflected in many, if not all, human languages).

Sommerstein (77) in distinguishing between phonetics and phonology sums up by stating that phonology begins where phonetics leaves off. For instance, while phonetics is observed not to recognize the distinctiveness of sounds, phonology does. In other words, at the phonetic level, the minimum unit of a sound is the phone (i.e., the physical sound), but in phonology, the minimum unit of any sound is the phoneme. This is also why Cruttenden (3-4) has observed that the traditional approach to phonology is through PHONEMICS which analyzes the stream of speech into a sequence of contrastive segments, 'contrastive' here meaning 'contrasting with other segments which might change the meaning'. He maintains that the phonemic system of a language is relatable to the writing system, which of course, forms part of the major concerns of this study.

### *Phonemes*

It has been established that phonetics studies all the sounds in human languages, while phonology performs a kind of investigative function into the use and patterning of those sounds in any language. The phoneme is therefore at the center of the phonological analysis or investigation, and therefore has been defined, according to Tomori (14) as "an abstraction meant to account for the smallest functional unit of the phonological system of a language". Roach simply sees phonemes as "a small number of regularly used sounds (vowels and consonants)" in any language. He argues that "because of the notoriously confusing nature of English spelling, it is particularly important to learn to think of English pronunciation in terms of phonemes rather than letters of the alphabet" (2).

According to Lyons (84), phonemes are usually described or defined with reference to two principal criteria: (a) phonetic similarity and (b) distribution. We should understand that phonetic resemblance or similarity in simple terms refers to (manner and place of articulation) and distribution (the condition under which the phones adjudged similarly operate, and with other phones). Phones that are free in alternation or in complementary distribution are said to be 'allophones' of the same phoneme. Nwala (63-4) sees phonemes in complementary distribution as 'mutually exclusive' (i.e., where one occurs, the other cannot). These, for instance, include aspirated sounds of /p<sup>h</sup>/, /k<sup>h</sup>/, /t<sup>h</sup>/ and their non-aspirated counterparts /p/, /k/, /t/ in which case, the aspirated normally appear word initially while the non-aspirated counterparts occur elsewhere.

Phonemes can also be discussed in terms of being variants or alternatives, and this is usually a situation where one phoneme can be used as a substitute for another phoneme in the same environment without altering or changing the meaning of words involved. For instance, the phonemes /aɪ/ and /i:/ can be used as variants in the pronunciation at the beginning of the English word 'either' without changing its meanings. This is also possible in some other languages like Igbo in words like 'afia' or 'ahia' [/f/, /h/] meaning market. There are two broad descriptive ways or levels for the phonemes, and these include 'segmental phonemes' (e.g., /p/ as in 'pill' and /b/ as in 'bill') and 'suprasegmental phonemes' (intonation structures like stress and pitch). In other words, phonemes distinguish between two words (as segmental phonemes) and account for the combinatory abilities of these phonemes to form words/syllables, stress, and intonation patterns (as suprasegmental phonemes).



### ***Phonotactics***

Yule (57) sees phonotactics as involving minimal sets which allows us to see that there are indeed definite patterns to the types of sound combinations permitted in a language. Ngulube (19) simply describes phonotactics as the study of “the way in which sounds can combine in a language and in the analysis of syllable structure”. In other words, phonotactics is a term technically used to cover the constraints governing sound patterning and combination in a language. For instance, Ngulube (13) observes with the Eleme language, “All consonants occur as C<sub>1</sub> except the alveolar approximant r, which occurs only in C<sub>2</sub> position and the glottal stop [ʔ], which is optional in C<sub>1</sub> position”, an indication that the phonotactics of the Eleme language disallows consonant segments in Coda (i.e., final) position. The same rule applies to the English language which, for instance, allows such patterning as a minimal pair: /pig/, /rig/, and so on. and minimal set: feat, fit, fat, fate, fought, foot, among others respectively, but disallows such patterning as ‘rgi’, ‘igp’ or ‘faet’, ‘fti’, ‘fta’ respectively, as these set could not be regarded as possessing any semantic implication in English. In this direction, Cruttenden (253) also observes thus “long vowels and diphthong do not precede final /ŋ/; /e, æ, ʌ, ɒ / do not occur finally.... Initially, /ŋ/ does not occur; no combinations are possible with /tʃ, dʒ, ð, z/; /r, j, w/ can occur in clusters only as the non-initial element.”

### ***Vowel and Consonant Sequencing***

These are terms technically used to refer to the coming together of two or more vowels or consonants i.e., one following the other in sequence in a linguistic utterance. For instance, the English consonant sequencing permits clusters at the initial, medial and end positions as in climb, drastic, fifth, among others. O’Connor (64) observes that this accounts for the difficulty with some speakers whose languages either do not have consonant sequencing at all or have only few and very short ones e.g., the Mandarin, Swahili, Yoruba, and so on. On the other hand, vowel sequencing, as O’Connor (87) further suggests requires that “when one vowel (or diphthong) follows another you should pronounce each one quite normally but with a smooth glide between them”.

The observation of Akmajian (103) is noteworthy here that, “every language has its own set of conditions on consonant sequencing. When a word is borrowed into one language from another, the borrowed word is often restructured to conform to the sequencing conditions in the borrowing language”. It is therefore imperative that a teacher or learner of the English language as a second language must have this understanding that the English language is a language replete with many borrowed languages ranging from Arabia to Zamora, but which have been restructured to fit into the phonotactics of the English language. This means that certain words, for instance, should not be made or be influenced by the pronunciation and spellings of the original language.

In the context of this review, much time has been taken to explicitly define and explicate certain fundamental technical phonological terms. This is aimed at providing a ‘soft landing’ (safe position) to the teacher and L<sub>2</sub> learner of the English language in their bid to use the phonetic/phonemic transcription process to teach or learn the English language better.



## Features

Features are components or characteristic properties of segments. For instance, [p], [t] and [k] share features of [+voiceless], [+aspiration] (word-initial) and [+plosiveness]; these contrast with other segments which are not voiceless, aspirated, or plosive. English vowel and consonant phonemes may be specified in terms of a set of features. Phoneticians agree that phonetic features are limited in number and languages pick disparate combinations to set up their phoneme systems. Humans have similar articulatory and auditory competence, i.e., the capacity to produce and use speech sounds drawn from the set of features is pre-determined by our physiological constraints (Anderson 84; Katamba 89). Although Bloomfield (26) accepts that phonetically phoneme can be decomposed into more basic particles, he held the notion that the phoneme is the atomic, basic phonologically apropos particles.

First, this view of phoneme is indefensible because cross-linguistic evidence evinces that the ‘phonological behavior’ of phonemes is attributed to the phonetic features, which it is composed of. Second, this perception of phonemes as ‘unanalysable units’ restricts our ability to account for the assimilatory processes – specifically *spreading*, whereas accepting ‘feature approach’ licenses us to shed light on the internal structure of a segment (Katamba 89). Third, from the various phonological processes observed universally, evidence abound that phonemes are not ‘bundles of unordered, unstructured phonetic properties.’ Distinctive features can be ordered linearly within a single morpheme.

Historically, distinctive feature theory has its provenance in the work of Trubetzkoy and Jakobson. Roman Jakobson during the Nazis occupation of Czechoslovakia moved to New York and later to Harvard where he presented some of the ideas of the Prague school. Trubetzkoy focused on devising a typological means of specifying phonemic contrast. He compared the sound systems of different languages with a view of establishing that there is a limited set of features which phoneme inventories can be made of. Whereas his attention was fixed on phonological typology, Jakobson et al. unswervingly investigated cross-linguistic oppositions.

First, Jakobson focal tenet is that while languages evince an almost limitless number of phonetic variations, ‘the range of phonemically contrasting features is severely restricted’ by universal principles. He proposed twelve acoustically elucidated distinctive features that occur universally. These exclude prosodic features (tone or stress) that are linked with the entire syllable or lexical item. The Second tenet is that the presence of one opposition in a language rule out the existence of another opposition. Third, Jakobson (52) posited that features are binary with either presence (+) or absence (-) of a specific feature. His critics accept that binarism is sufficient where two-tier opposition exists but is useless when a ternary or multivalued opposition is involved.

Ladefoged and Venneman are some of those who oppose binarism in favor of ‘gradual opposition’ or ‘multivalued oppositions.’ Katamba has argued that the dominant view among phonologists is that of ‘binary distinctive features.’ The Achilles heel of Jakobson features became obvious in the 1950s and 1960s. First, the model was charged with parsimoniously i.e., being too scanty to account for all the phonological contrasts that occur universally. Second, some of its features were ambiguous, for instance, the feature [Grave] could acoustically elucidate either labial or velar articulation. Due to these shortfalls, Chomsky, and Halle (168) in *Sound Pattern of English* proposed a revision of the theory of distinctive features. First,



acoustically elucidated phonological features were replaced with articulatory correlated sets of features. Second, the number of binary features increased momentarily. Features are used in phonological rules in keeping with the tenets of generative phonology. Features can be acoustic, articulatory, perceptual, distinctive, cover or abstract.

### Theoretical Framework

This section deals with which approach to phonology is best suited for this study. Two considerations come to mind, the nature and peculiarity of this study and which phonological approach represents an influential alternative to the phonemic view of previous studies. We shall adopt the Generative Approach to Phonology.

Current literature reports that the 1960s saw increasing discontent with orthodox phonemics in North America. A series of publications by Halle, a vigorous attack by Chomsky and structuralist linguistics in general, a book by Postal, and a large-scale treatment of English phonology jointly authored by Chomsky and Halle marked the emergence of generative phonology as a new theory and framework of description.

Halle had been involved in research and publication on phonological features or components and went on to devote attention to the function of features within phonological systems. In assessing phonological description – and particularly in formulating phonological rules – Halle argued that plausible general rules were better expressed in terms of features. A Phonological process whereby all plosives are voiced between vowels is a plausible rule: it is known to operate in some languages, and it seems to reflect a probable pattern of voicing assimilation. It is a more likely rule than one which says, for example, that [p] is voiced only between [a] and [u], [t] is voiced only between [u] and [i], and [k] is voiced only between [e] and [o].

Most phoneticians and phonologists readily agree that there are normal tendencies in speech and that certain processes seem more common or more plausible than others – although their universality should not be exaggerated. Halle's point, however, concerns description and explanation: when expressed in segments, plausible rules do not necessarily appear simpler. Two rules suggested here might appear as follows:

- a.  $\left( \begin{array}{cc} [p] \blacktriangleright & [b] \\ [t] \blacktriangledown & [d] \\ [k] \blacktriangledown & [g] \end{array} \right)$  between  $\left\{ \begin{array}{c} [i] \\ [e] \\ [a] \\ [o] \\ [u] \end{array} \right\}$  and  $\left\{ \begin{array}{c} [i] \\ [e] \\ [a] \\ [o] \\ [u] \end{array} \right\}$
- b.  $\begin{array}{cc} [p] \blacktriangledown & [b] \\ [t] \blacktriangledown & [d] \\ [k] \blacktriangledown & [g] \end{array}$  between [a] and [u]  
between [u] and [i]  
between [e] [o]

Of course, the data in (a) above can be expressed as a general statement, such as any voiceless plosive is voiced intervocalically. In this wording, it is the use of features (voiceless, plosive, among others) that captures the generality of the rule. If we adopt the same style with (b), our use of features now makes the rule much more cumbersome than (a): a voiceless bilabial



plosive is voiced between a low vowel and a high vowel and a high front vowel; and a voiceless velar plosive is voiced between a mid-front vowel and a mid-back vowel.

This, according to Halle, is precisely what we want – the more plausible general rule looks simpler, the less plausible looks more complex. In other words, phonological description should employ feature-based rules as a proper means of reflecting the complexity of the description. This does not mean, of course, that rules such as (b) are said to be impossible, only that they are far less likely than rules such as (a) and that it is therefore proper to signal their complexity.

The use of rules and features as elements of phonological description meant that the concept of the phoneme was under threat. Indeed, Halle claimed that the phoneme was often a hindrance to description. In his treatment of Russian phonology, he cited an example which has been quoted in current literature repeatedly (ad nauseam, according to Summerstein 116). In brief, Halle points out that there is a general rule in Russia that an obstruent (plosive or fricative) is voiced when preceding a voiced obstruent. Thus, a word-final voiceless plosive will be voiced if the following word begins with a voiced plosive: [t] + [b] is pronounced as [d] + [b], [p] + [g] as [b] + [g], and so on. Now, in orthodox phonemic terms Russia has distinct voiced and voiceless plosive phonemes. We find, for instance, /bil/ ‘was’ versus /pil/ ‘blaze, glow’, /djenj/ ‘day’ versus /tjenj/ ‘shade, shadow’, as minimal pairs. But Russia does not have voiced and voiceless affricates as separate phonemes: there is no phonemic contrast between [tʃ] and [dʒ], and the voiced affricates are simply allophones of their voiceless counterparts. Hence, in a phonemic account, when a word-final /t/ is voiced preceding a voiced obstruent, we are dealing with the substitution of /d/ for /t/, of one phoneme for another. On the other hand, when a word-final /ts/ affricate is voiced in the same context, /ts/ is realized as its voiced allophone [dʒ]. But, Halle argues, the phenomenon of voicing assimilation in Russia is surely a single process, and not one of phonemic substitution in some cases and allophonic conditioning in others. We should be suspicious of a framework of description which leads us to an awkward account of such an apparently straightforward phenomenon. We ought to be able to say that Russia simply has a phonological rule that obstruents are voiced when preceding voiced obstruents.

Postal (36-7) gives another example designed to undermine the centrality of the phoneme. In Mohawk, it can happen that /t/ or /k/ precedes /j/ across morpheme boundary, but both sequences are realized as /dʒ/. Postal argues that it should be legitimate to say that [dʒ] is derived, by rule, from two different sources, namely /tj/ and /kj/. This, of course makes [dʒ] phonologically ambiguous, in violation of the biuniqueness principle. And it is not clear how a phoneme account can satisfactorily avoid this violation. It would be possible to say that [dʒ] unambiguously represents /tj/ and that /kj/ becomes /tj/ by morphophonemic rule, but Postal points to the arbitrariness of this decision. Why doesn't [dʒ] realize /kj/, with /tj/ becoming /kj/ by morphophonemic rule? Postal's solution, in the spirit of generative phonology, is to dispense with the phonemic level and morphophonemic rules altogether. If we regard /tj/ and /kj/ as rather deeper or more abstract than a phoneme transcription, then we can state relatively neat and general phonological rules which derive the phonetic forms from these underlying representations.

Arguments of this kind led generative phonologists to abandon the concepts of phoneme and allophone, and to talk in terms of a relatively abstract or morphophonemic underlying, level of phonological representation from which the phonetic output could be derived by application of a set of phonological rules. The elaboration of this new conception of phonology was part of



the development of the transformational-generative theory of language in general, pioneered by Noam Chomsky. Although he is sometimes thought of as a grammarian with a particular interest in syntax, Chomsky himself contributed to the development of generative phonology. His current issue in linguistic theory is generally critical of modern linguistics: the nineteenth century narrowed the scope of linguistics to the study of inventory of elements (22), and de Saussure and 'structural linguistics' were preoccupied with 'systems of elements rather than the systems of rules which were the focus of attention in traditional grammar' (23). Against this background, he dismisses much of modern phonology as 'taxonomic phonemics', having referred to 'a curious and rather extreme contemporary view to the effect that true linguistic science must necessarily be a kind of pre-Darwinian taxonomy concerned solely with the collection and classification of countless specimens' (25). He criticizes in detail (75-95) the 'taxonomic' phonologists' concern with segmentation, contrast, distribution, and biuniqueness and puts forward the view that phonological description is not based on 'analytic procedures of segmentation and classification' (95) but is rather a matter of constructing the set of rules that constitute the phonological component of a grammar. It is this argument that informs this study to examine some set of rules that can account for the phonology of the English language.

### **Empirical Literature**

There are several studies that have direct relevance to this work. The first is Donwa-Ifode's paper on 'Glide formation, Assimilation and Contraction: A reassessment evidence from Isoko', published in *Journal of West African Languages: XV 2*, 41-55. This study suggests that the process of assimilation applies vacuously or is opaque where V1 and V2 are identical and that after assimilation of V1 to V2 the realized V2V2 optionally contracts into V2. Besides, it is not pellucid if the length of the vowel after contraction is the same as that of the vowels on either side of the boundary. According to Donwa-Ifode (97), phonetic evidence suggests that the length of V3 is not the same as that of either V1 or V2. It is mid-way between that of a single short vowel and that of a sequence of two vowels. Thus, if elision were postulated, she would be wrongly claiming by the process that the length of the vowel here is the same as that of a single short vowel. The contraction process therefore more accurately represents the phonetic facts. This study, though focused on phonological processes, is silent on rule interaction and ordering in Isoko.

The second empirical study that has direct bearing on this work is Ikoro's *The Kana Language*, published by Leiden CNWS publications. The focus of this study is to describe, analyze and distinguish the major phonological processes identified in kana. Phonological processes are alterations that sounds undergo when juxtaposed within larger units such as morphemes or at morpheme boundaries, that is structural adjustments sounds undergo in environments. There are two broad divisions identified in this work: segmental and phonological processes. The processes are purely synchronic, with highlights on some diachronic processes on the basis of correspondence observed. Identified in this study are aphaeresis, apocope, liaison, glide formation, elision, assimilation, contraction, epenthesis, deletion, nasal and tonal stability, lenition versus fortition.

The discussion of phonological processes affecting vowels attempted here highlights the functional unity of phonological rules that are driven by the enforcement of Kana syllable templates. The phonological operations discussed here are the different repair strategies which Kana adopts to attain the output goals enforced by the templates. This reoccurrence of a



common output factor which guides different rules, without being explicitly stated in the rules, is called conspiracy.

The third work that has direct bearing on this topic is Ngulube's *Eleme Phonology* published by the Linguistic Association of Nigeria. In his study of phonological operations in Eleme, Ngulube (200) demonstrated that phonological processes are common in Eleme, but the specific dimension each process takes differs as are the structural conditions, direction, and ordering. He posits that phonological processes such as glide formation, elision, assimilation and contraction, which vowels undergo in a sequence within stem or across boundaries, are determined by the kind of sequences and the grammatical relation between the juxtaposed morphemes. The pattern of operation of these processes is of particular interest for typological and theoretical reasons such as the interplay of syntactic relations in the applications of phonological processes, and rule ordering.

Most importantly, Ngulube argues for the necessity of separating the process of vowel contraction from elision. Both processes have often particularly amongst linguists investigating Nigerian languages been either treated as alternate terms referring to the same set of segmental changes or used in some rather confusing manner. The processes so far identified reflect the ongoing changes in the language, morpho-syntactically and phonologically motivated.

A vital publication that is most relevant to this study is Kiparsky's *Linguistic Universals and Language Change*. Kiparsky's discussion of feeding and bleeding, in Russia, was in a historical context. He observes that over time 'rules tend to shift into the order which allows their fullest utilization in the grammar' (200), and he quotes instances and languages in which rules have evidently been reordered in line with this tendency. In other words, historical development of languages seemed to favor feeding and eliminating bleeding.

Another empirical study with historical tendencies is that by Harris (73) who noted that in a study of the Spanish language, rules tend to shift into the order that favors paradigmatic uniformity, that is, rules will occur in whatever order reduces irregularity in the morphology of the language. In Spanish, some verb paradigms are not regular: note the alternation of c and g in

hacer	[aθer]	to do
hago	[aγo]	I do
hacemos	[aθemos]	we do

Nonuniform paradigms such as these are, as Harris puts it, a 'vanishingly small minority of Spanish verbs', and it seems that many verbs which once had variable stems have been made regular by the reordering of rules. The stem-final consonant of cocer 'to cook', for instance, must once have appeared as an affricate in some forms of the verb and as a velar plosive in others. In modern Spanish, however, the stems end consistently in [θ] or [s] and it is possible to explain this regularization as the result of reversing the order of two rules.

Another seminal work is that by Anderson (208), who points out that natural principles may conflict with each other. He points to the *self-preservation of rules*, noting that counter-bleeding may be natural where bleeding order would mean that the first rule is lost from the



language. He concluded that rules which appear formerly unrelated may nevertheless serve a common functional target, such as elimination of consonant clusters, preservation of distinctiveness or maintenance of a generalized stress pattern. Having examined the relevant empirical literature in phonological operation, we observed that nothing has been done in rule interaction, talk less of feeding and bleeding as it affects the overall architecture of English phonological operations. This is a justification for undertaking this study.

## METHODOLOGY

This section deals with research design, population of the study, sample and sampling techniques, sources of data, data collection and analyses. The data elicited are used by the researcher to meet the objectives of this study.

According to Ngulube ‘a design is the blueprint or layout of the research’ (25) which determines the type of observation and the type of statistics to use. A research design determines the nature and scope of the study being carried out or proposed. It has to do with the development of strategies for finding solutions to the investigated problem.

Wali identifies several types of research designs basically classified into two major groups referred to as experimental and non-experimental designs, but for the purposes of this study, the researcher has chosen the survey design found under the non-experimental design which according to Wali (50-1) involves subjects and conditions ‘studied in their natural environments without manipulating or control of the prevailing situation existing at the time of research’. As expressed by Borg and Gall, Ezewu and Ukwuije and Nworgu in Wali (51), the survey design has two basic classifications which include (i) classification based on the procedure, or instrument used in data collection and (ii) classification based on the purpose the survey intends to achieve. The researcher intends to employ both classes of survey design and make explicit and appropriate use of relevant aspects of both designs. The research would be descriptive in nature as it would examine several case studies on English phonological operations, with special interest on rule interaction, feeding and bleeding.

The research is a survey, which according to Ndiyo cited in Asiki (16) is an “inquiry into the status quo” of a population, situation, or concept. This is usually done with the use of questionnaires. Ndiyo’s view was that a survey is ‘more realistic than the experiment’ because the survey examines the population in their natural state or environment. Wali (64) defines population in this context as ‘the set representing all measurements of interest to the researcher’. Ngulube (53) citing Ezewu et al also defined population in this context as “members of a well-defined class, people, objects, or events”. This goes to suggest that population defines the limits within which the research findings are applicable and generalizable. Wali (64) identifies two classes of population: (i) accessible population and (ii) target population. And since it is almost impossible to investigate the population which according to Wali (64) is regarded as target population, this research, therefore, would examine a maximum total of two hundred and forty (240) persons (the accessible population) of senior secondary school students and secondary school teachers of English language in Rivers State.

The research is not, however, intended to control the population's behavior towards the subject matter but to observe them in their natural state or environment; how they articulate connected English speech sounds without any external or artificial influence or control. It would also seek





the viewpoint of the population in seeking ways to tackle the challenge of English pronunciation among ESL learners in Rivers State schools.

Wali (64) sees the sample as 'a portion of the population that is used for the study'. The research would take a sample size of 40 persons (20 students and 20 teachers) from the selected schools in Rivers State and the selection of these participants would follow the simple random sampling, which according to Ngulube (53) is "a method of selecting a sample from a population so that each member of the population has an equal and independent chance of being selected". The names of the schools are Comprehensive Secondary School, Ogbogu, Government Secondary School, Obite, Government Secondary School, Obigwe, Community Secondary School, Akabuka, Idu Comprehensive High School, Idu Obosiukwu, Community Secondary School, Obagi, Community Secondary School, Ndoni, Egbema Government School, Okwuzi, and Community Secondary School, Aggah.

The nature of data collection is both primary and secondary. The primary data constitutes information obtained through recording, observation, and interrogation of the population in their natural environments. On the other hand, the secondary data is made up of the viewpoints of other researchers that had been previously conducted in this area and utilized, and accordingly acknowledged in this study. In other words, the secondary sources include data from textbooks, unpublished theses, and online materials.

The instruments adopted for this research for collection of data are natural observation, recording and interrogation of the respondents. All observations would be done in the natural environment of the population (the school and classroom setting). The observation would take both forms of participants and non-participant observations. Ngulube (73) has stated that "a participant observer is involved in the situation or the setting in which the observation is taking place...while 'the non-participant observer' is not a part of the group or situation". The recorded data is in the form of a recorded conversation with the respondents. The researcher will transcribe the data into text analysis to be able to analyze the connected speeches and observe the phonological operations, and possible rule interaction and ordering in the overall architecture of English phonological processes.

This study would adopt descriptive analysis, which according to Wali (53), is the term given to the analysis of data that helps to describe the status of events or facts about a given population. Descriptive analysis is useful as it can be used to present the summary of a group of data by using a combination of tabular description (table), graphical description (graphs and charts) and statistical commentary (discussion of results), percentages and descriptive statistics.

In this study, the findings obtained would lead us into generalizing about the population from which the samples were drawn.

## DATA ANALYSIS

I have to [aɪ hæv tə]. → [aɪ hæf tə]

good + s	/gʊdz/
not yet	[nɒt jət]
could you	[kʊdzu]



Phonological processes are those changes which segments undergo that result in the various phonetic realizations of underlying phonological segments. In other words, phonological processes are ‘changes sounds undergo when they occur in company in any language’ (Uozie 114). These changes are triggered by combinations of sounds into morphemes, or morphemes into words or other larger units. Changes also occur if segments are juxtaposed at morpheme boundaries. What this implies is that changes occur due to the environment in which a segment (or segments) occurs, for instance, word-initial, word-medial, and word-final positions or the relationship of a segment with a stressed vowel. These changes are because of the effort of the speech apparatus to ease pronunciation difficulties. Therefore, sound qualities occurring in adjacent environments shed into each other, sometimes extra sound segments are introduced to break vowel or consonant clusters, and at other times certain sounds are dropped altogether. These changes are classified into assimilatory and non-assimilatory processes.

Phonological processes are phonetically motivated mental substitutions which apply to enhance some phonetic property of an individual speech sound or to make sequences of segments easier to articulate. These processes are universal since they resolve articulatory and perceptual difficulties (Donegan 22). Having said that these processes are cross linguistics in application, one must also note that a particular process may not apply in a particular language or may apply in different languages in different forms with different degrees of exactitude. Schane (74) organizes phonological processes into four categories which are assimilation, syllable structure, weakening/strengthening and neutralization. But Robert W. Murray (25) states that there are three types of sound changes: sequential change, segmental change, and auditory based change.

The data (Set 1) above delineates assimilation as a phonological process in which a segment changes to resemble its neighbor more closely. It further evinces that assimilation could be restricted, that is the assimilated segment takes on some, but not all, of the characteristics of the conditioning segment. It also could be non-restricted if the segment becomes identical with the conditioning segment.

A significant difference in natural connection speech is the way that sounds belonging to one word can cause changes in sounds belonging to neighboring words. Roach (110) calls this difference an instance of assimilation. Assimilation is something which varies in extent according to speaking rate and style. It is more likely to be found in rapid, casual speech and less likely in slow, careful speech. Sometimes the difference caused by assimilation is very noticeable, and sometimes it is very slight. Assimilation occurs when two consonants are juxtaposed at the word boundary.

Assimilation is patterned; therefore, the direction, contiguity and the extent should be taken into consideration. Assimilation could be progressive, regressive, bidirectional, or reciprocal. In data set 1, if  $c^f$  changes to become like  $c^l$  in some way, then the assimilation is called regressive (the phoneme that comes first is affected by the one that comes after it; that is the features of one phoneme are anticipated in the articulation of the preceding phoneme. This is illustrated using the English expression in data set 1 replicated here for ease of reference:

I have to [aɪ hæv tʊ]. → [aɪ hæf tʊ]

The final fricative [v] which is voiced becomes voiceless [f] because of the following [t] which is a voiceless alveolar plosive. Here  $c^l$  changes to become like  $c^f$ , then the assimilation is called



progressive. In other words, one phoneme markedly influences the following phoneme. In this type of assimilation, the conditioning segment or sound occurs before the assimilated segment or sound. Another example in data set 1 is good + s /gudz/. In this example, the second segment /s/, which is a voiceless alveolar fricative, is influenced by /d/, a voiced alveolar sound. It is assimilated and changes to its voiced counterpart. This example is what is sometimes called coalescence, or coalescent assimilation; a final t, d and an initial j following often combine to form tʃ, dʒ so that ‘not yet’ is pronounced not ʃet and ‘could you’ is kudʒu.

## Data Set 2

‘that person’	[dæp pɜ:sn]		
‘that man’	[dæp mæn]		
‘meat pie’	[mi:p paɪ]		
‘that thing’	[dæt̪ θɪŋ],		
‘cut through’	[kʌt̪ θru:]		
‘that case’	[dæk keɪs]		
‘bright color’	[braɪk kʌlə].		
‘bump’	[bʌmp]		
‘hunt’	[hʌnt]		
‘bank	[bæŋk]		
‘Cats’	[kæts]	vs	‘dogs’ [dɒgz],
‘Jumps’	[dʒʌmps]	vs	‘runs’ [rʌnz]
‘pats’	[pæts]	vs	‘pans’ [pæmz]
‘good boy’	[gʊb bɔɪ]		
‘bad thing’	[bæd̪ θɪŋ]		
card game	[ka:g geɪn]		
‘green paper	[gri:m peɪpə]		
‘this shoe’	[ðɪʃ fu:]		
‘those years’	[ðəʊz jɪəz].		

The main differences between consonants are of three types: differences in place of articulation, differences in manner of articulation and differences in voicing. In parallel with



this, we can identify assimilation of place, of manner and of voicing in consonants. The following examples evince the three types as set out in data set 2.

(i) Assimilation of place is most clearly observable in some cases where a final consonant ( $c^f$ ) with alveolar place of articulation is followed by an initial consonant ( $c^1$ ) with a place of articulation that is not alveolar. For example, (a) the final consonant in ‘that [ðæt] is alveolar t. In rapid, casual speech the t will become p before a bilabial consonant, as in: ‘that person’ [dæp pɜ:sn], ‘that man’ [dæp mæn] and ‘meat pie’ [mi:p paɪ] (b) Before a dental consonant, t will change to a dental plosive, for which the phonetic symbol is  $t̪$  as in: ‘that thing’ [dæ $t̪$  θɪŋ], and ‘cut through’ [kʌ $t̪$  θru:]. (c) Before a velar consonant, the t will become k, as in: ‘that case’ [dæk keɪs] and ‘bright colour’ [braɪk kʌlə].

In similar contexts, d would become b,  $d̪$  and g, respectively, and n would become m,  $n̪$  and ŋ; examples of this would be: ‘good boy’ [gʊb bɔɪ], ‘bad thing’ [bæ $d̪$  θɪŋ], ‘card game [ka:g geɪm] and ‘green paper [gri:m peɪpə]. However, the same is not true of the other alveolar consonants: s and z behave differently, the only noticeable change being that s becomes  $ʃ$ , and z become  $ʒ$  when followed by  $ʃ$  or j, as in: ‘this shoe’ [ðɪʃ ʃu:] and ‘those years’ [ðəʊ $ʒ$  jɪəz]. It is important to note that the consonants that have undergone assimilation have not disappeared; in the above examples, the duration of the consonants remains what one would expect for a two-consonant cluster. Assimilation of place is only noticeable in this regressive assimilation of alveolar consonants.

(ii) Assimilation of manner is only found in the most rapid and casual speech; the tendency is again for regressive assimilation and the change in manner is most likely to be towards an ‘easier’ consonant one which makes less obstruction to the airflow. It is observed in our data set 2 where a final plosive becomes a fricative or nasal e.g., ‘that side’ [ðæs saɪd]; ‘good night’ [gʊn naɪt].

(iii) Assimilation of voice is also found as in ‘cheese’ [tʃi: z] becomes more like s when it occurs in ‘cheesecake’ [tʃi: skeɪk]. Assimilation is also possible across morpheme boundaries and to some extent also within the morpheme. Note that if in a syllable-final consonant cluster a nasal consonant precedes a plosive or a fricative in the same morpheme, then the place of articulation of the nasal is always determined by the place of articulation of the other consonant, thus: ‘bump’ (bʌmp); ‘hunt’ [hʌnt]; bank [bæŋk]. The English plural suffix or possessive suffix illustrates this: ‘Cats’ [kæts] vs ‘dogs’ [dɒgz], ‘Jumps’ [dʒʌmps] vs ‘runs’ [rʌnz] and ‘pats’ [pæts] vs ‘pam’s’ [pæmz].

Schane (73) says that in the process of secondary articulation the features of a vowel may be extended to a consonant. While Yul-Ifode (153) posits ‘by anticipating the features of a following vowel, a consonant may acquire certain values of the vowel’.

### Data Set 3

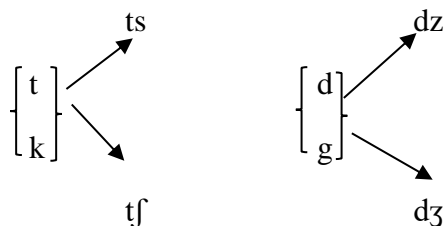
Peel [p<sup>j</sup>i:l]

Pure [p<sup>j</sup>ʊə]

This data evinces that palatalization very often occurs because of coarticulation when a sound with an anterior primary articulation is pronounced adjacent to a palatal consonant such as [j] or a high front vowel such as [i], this he illustrated using:



Our data provides another insight into palatalization – the effect that front vowels and palatal glide [j] typically have a velar, alveolar, and dental stops, making their place of articulation more palatal. If you compare the pronunciation of *keep* as opposed to *cot*, you notice that the pronunciation of [k] in *keep* is much more palatal than in *cot* due to the influence of [i]. Palatalization is often the first step in affrication, a change in which palatalized stops become affricate, either [ts] or [tʃ] if the original stop was voiceless, or [dz] or [dʒ] if the original stop was voiced. This is illustrated with the schema below.



#### Data Set 4

goose            geese

mouse            mice

Although assimilation is probably most common in the case of adjacent segments, it can also apply at a distance. A case in point is umlaut, the effect a vowel or sometimes a glide in one syllable can have on the vowel of another syllable, usually a preceding one. Umlaut resulting in the front rounded vowels [y] and [ø] played an important role in Old English and is the source of irregular plurals such as *goose* / *geese* and *mouse* / *mice* in Modern English.

The plural of the pre-old English words *gōs* ‘goose’ and *mūs* ‘mouse’ was formed by adding a suffix – [i]. As a result, the umlaut of the vowel in the preceding syllable occurred in the plural forms but not in the singular forms. By early Old English, the suffix [-i] has been lost in a separate change, leaving the umlauted vowel as the marker of the plural form. Subsequent changes included the de-rounding of the umlauted vowels [y] and [ø] yielding [i] and [e] respectively by Middle English.

#### Data Set 6

king [kɪŋ]      vs.      kill [kɪl]

Data set 6 elucidates this concept as a situation where the features of a consonant are superimposed on a vowel. The specific vowel thus modified is usually allophonic. The data explains this process as occurring when a vowel precedes a nasal consonant, there is the tendency for the vowel to become nasalized. Nasalization occurs because of a vowel occurring before a nasal consonant, which does not happen if the sound after the vowel is not a nasal.

It is common in English for consonant clusters to agree in voicing. This is illustrated in plural endings, third person singular and past tense agreeing in voicing with preceding consonants. Thus [s] and [t] occur after voiceless consonants while [z] and [d] occur after voiced consonants.



### Data Set 7

cups	/kʌps/
cubs	/kʌbz/
pats	/pæts/
pads	/pædz/

This type of assimilation is also observed in the case of nasal consonants which become homorganic with the following consonant by adopting the same place of articulation; this is common with the English negative prefix 'in-' as in Data set 8.

### Data Set 8

impossible	/ɪmpɒsəbl/
inadvisable	/ɪnədvaɪzəbl/
imbalance	/ɪmbæləns/
intolerance	/ɪntələrəns/

### Data Set 9

potato	[p <sup>h</sup> ˈteɪtəʊ]
tomato	t <sup>h</sup> `ma: təʊ]
canary	[k <sup>h</sup> ˌneəri]
perhaps	[p <sup>h</sup> hæps]
today	[t <sup>h</sup> deɪ]
'tonight'	[tʌɪt]
'police'	[pɒlɪ: s]
'correct'	[kɹekt]
'George the sixth's throne'	[dʒɔ: dʒ ðə sɪksθs θrəʊn]
Simplified as	[sɪksθrəʊn] or [sɪksrəʊn]
'acts'	[aks]
'looked back'	[lʊk bæk]
'scripts'	[skrɪps]
'lots of them'	[lɒts ə ðəm]
'waste of money'	[weɪst ə mʌni]



Under certain circumstances, sounds disappear. One might express this in more technical language by saying that in certain circumstances a phoneme is realized as zero or have zero realization or is deleted. This is illustrated in data set 9 above: (i) Loss of weak vowel after p, t, k. In words like ‘potato’, ‘tomato’, ‘canary’, ‘perhaps’, ‘today’, the vowel in the first syllable may disappear, the aspiration of the initial plosive takes up the whole of the middle portion of the syllable, resulting in these pronunciation: (i) [p<sup>h</sup>ˈteɪtəʊ, t<sup>h</sup>ˈmɑːtəʊ, k<sup>h</sup>ˌneəri, p<sup>h</sup>ˈhæps, t<sup>h</sup>deɪ]. (ii) Weak vowel + n, l, r becomes syllabic consonant as in ‘tonight’ [tʌɪt], ‘police’ and [pɒliːs] and correct [kɹekt]. (iii) Avoidance of complex consonant clusters: ‘George the sixth’s throne’ [dʒoː dʒ ðə sɪksθs θrəʊn] Simplified = [sɪksθrəʊn] or [sɪksrəʊn]. (iv) In clusters of three plosives or two plosives plus a fricative, the middle plosive may disappear, so that the following pronunciations result: ‘acts’ [aks]; ‘looked back’ [lʊk bæk], scripts [skɪps]. (v) Loss of final v in ‘of’ before consonants, for example: ‘lots of them’ [lɒts ə ðəm] and ‘waste of money’ [weɪst ə mʌni]. Syncope is the elision of an unstressed noun prefixes in word-initial position, especially following a verb stem, as in data set 11:

### Data Set 10

[k] nife	nife /naɪf/
[a] cute	→ cute /kju:t/
[a] mend	→ mend /mend/
[e] scape	→ scape + goat = scapegoat

The term is also used to refer to the deletion of a vowel within a word; it is often contrasted with aphaeresis and apocope. Examples include the modern British pronunciation of such words as secretary /ˈsekɹɪtri/, where American English has /ˈsekɹɪteri/. Some writers extend the notion to include internal consonant deletion. Apocope is the elision of a vowel in word-final position. Ngulube (226) illustrates this concept using Latin and French examples to illustrate this concept.

### Data Set 11

Latin	French	English
Cura	cure	cure
Ornare	ornier	decorate

Contraction is the merging of two forms at morpheme or word boundary. It is also the elision of sounds in a connected speech. (i) *Had, would*, spelt ‘**d**’ pronounce **d** (after vowels), **əd** (after consonants), (ii) *Is, has* spelt ‘**s**’ pronounced **s** (after fortis consonants), **z** (after lenis consonants), except that after **s z ʃ ʒ tʃ dʒ** ‘is’ is pronounced **ɪz** and ‘has’ is pronounced **əz** in contracted form; (iii) *Will* spelt ‘**ll**’, pronounced **l** (after vowels) **l̩** (after consonants); (iv) *Have* spelt ‘**ve**’, pronounced **v** (after vowels), **əv** (after consonants). (v) *Not* spelt **n’t**, pronounced **nt** (after vowels), **nt̩** (after consonants). There are also vowel changes associated with **n’t** (e.g. *can* [kæn]; *can’t* [ka:nt]; *do* [duː]; *don’t* [dəʊnt]; *shall* [ʃæl]; *shan’t* [ʃa:nt]; (vi) *are* spelt ‘**re**’, pronounced ə after vowels, usually with some change in the preceding vowel (e.g. *you* [juː]; *you’re* [juə] or [jəː], *we* [wiː]; *we’re* [wɪə], *they* [ðeɪ]; *they’re* [ðeə]).



Coalescence is a term used to refer to the coming together of linguistic units which were originally distinguishable. This process is common with allophones of the same phoneme or with different phonemes and different morphemes. Crystal argues that most cases of /ʒ/ in Modern English are the result of coalescence of /z/ and /j/ as in the words *occasion*, *measure*; in words like *formation*, one could analyze the affix as a coalescence of the morphemes *-ate* + *-tion*. Other terms employed for the same process are syncretism, merger, fusion, and neutralization.

We link words together in several ways. The most familiar case is the use of linking **r**, the phoneme **r** does not occur in syllable-final position in BBC accent, but when the spelling of a word suggests a final **r**, and a word beginning with a vowel follows, the usual pronunciation is to pronounce with **r**. For example: *here* [hɪə] vs. *here are* [hɪərə]; *four* [fɔ:] vs. *four eggs* [fɔ:regz]. BBC speakers often use **r** in a similar way to link words ending with a vowel, even when there is no *justification* from the spelling, as in data set 11:

### Data Set 12

<i>formula A</i>	[f ɔ:mjələreɪ]
<i>Australia all out</i>	[ɔstreɪlɪə ɔ:l aʊt]
<i>Media event</i>	[mi:diə ɪvent].

### Data Set 13

my turn	[maɪ tɜ: n]
might rain	[maɪt reɪn]
my train	[maɪ treɪn]
all that I'm after today	[ɔ:l ðæt æm a: ftə təɪ]
all the time after today	[ɔ:l ðə taɪm a: ftə tədəɪ]
tray lending	[treɪ lendɪŋ]
trail ending	[treɪ endɪŋ]
keep sticking	[ki: p stɪkɪŋ]
keeps ticking	[ki: ps tɪkɪŋ]

Data set 13 proves 'linking **r**' and 'intrusive **r**' as special cases of juncture; consider the relationship between adjacent sounds as in: my turn [maɪ tɜ: n]; we know that the sounds **m** and **aɪ**, **t** and **ɜ:**, and **ɜ:** and **n** are closely linked. The problem lies in deciding what the relationship is between **aɪ** and **t**. English speakers will normally distinguish [maɪ tɜ:n] from [maɪt ɜ:n]. How, this is because the **t** is fully aspirated word-initially but not word finally.

Secondly, the diphthong **aɪ** is shorter in *might*. The position of the word boundary has some effect on the realization of the **t** phoneme. Many ingenious minimal pairs occur in our data and





show the significance of juncture, a few of which are given below: (a) *Might rain* [maɪt reɪn] [r voiced when initial in *rain*, aɪ shortened], vs. *my train* [maɪ treɪn] [r voiceless following t in *train*, aɪ longer]. (b) *All that I'm after today* [ɔ:l ðət æm a: ftə təɪ] (t relatively unaspirated when final in *that*); *All the time after today* [ɔ:l ðə taɪm a: ftə tədeɪ] (t aspirated when initial in *time*). (c). *Tray lending* (treɪ lendɪŋ) (clear l initial in *lending*), *Trail ending* [treɪ endɪŋ] (dark l final in *trail*). (d) *Keep sticking* [ki: p stɪkɪŋ] (t unaspirated after s) and *Keeps ticking* [ki: ps tɪkɪŋ] (t aspirated in *ticking*).

Liaison is a term that refers 'to a type of transition between sounds, where a sound is introduced at the end of a word if the following syllable has no onset. It is heard in English where a 'linking /r/' is often found in words ending with an r in the spelling, when they occur before words beginning with a vowel' Crystal, (280). The word *here* /hɪə/ is realized as /hɪər/ in the phrase *here are*.

Epenthesis term refers to a type of intrusion, where an extra sound has been inserted in a word. In other words, this is the addition of one or more sounds to a word, especially to the interior of a word. Epenthesis may be divided into two types: prothesis and anaptyxis. Epenthetic sounds are well attested in both historical change and connected speech, as in incredible [ɪŋk<sup>ə</sup>redɪbl]. Data set 14 states that epenthesis involves the insertion of a consonant or vowel into a particular environment. In some cases, epenthesis results from the anticipation of an upcoming sound.

#### Data Set 14

Old English	Middle English	Modern English
Ganra [VnrV>VndrV]	gandra	'gander'
Simle [VmlV>VmbIV]	simble	'always'
æmtig [VmtV>VmptV]	æmptig	'empty'

The above data suggests that the epenthetic [d], [b], or [p] has the place of articulation of the preceding nasal but agrees with the following segment in terms of voice and nasality. The epenthetic segment therefore serves as a bridge for the transition between the segments on either side as the data set 15 below illustrates.

#### Data Set 15

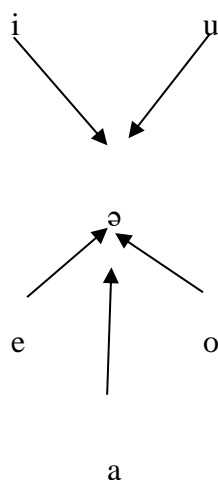
[m]	[b]	[l]	[m]	[p]	[t]
Labial labial		nonlabial	labial	labial	nonlabial
nasal	nonnasal	nonnasal	nasal	nonnasal	nonnasal
voiced	voiced	voiced	voiced	voiceless	voiceless

In other cases, vowel epenthesis serves to break up a sequence of sounds that would otherwise be difficult to pronounce or even inconsistent with the phonotactic patterns of the language. Ngulube argues that some English speakers avoid [ol] clusters by inserting an epenthetic [ə] in their pronunciation of words such as ath[ə]lete.



Both vowels and consonants are also susceptible to outright deletion as well as in various weakening processes. We will first treat the effects of these processes on vowels and then turn to their effects on consonants. Vowel deletion commonly involves a word-final (apocope) or a word-initial (syncope).

A vowel in an unstressed syllable is particularly susceptible to deletion, especially when a neighboring syllable is stressed. Vowel deletion is commonly preceded diachronically by vowel reduction, in which a full vowel is reduced to a schwa-like vowel (i.e., short, central [ə]). Vowel reduction typically affects short vowels in unstressed syllables and may affect all or only a subset of the full vowels, as illustrated below.



#### ***Data Set 16***

Old English	Middle English	Modern English
stenas [a]	stones [ə]	stones Ø
stanes [e]	stones [ə]	stones Ø

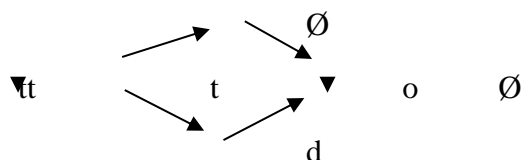
#### ***Data Set 17***

Old English	Middle English	Modern English
nama [a]	name [ə]	name Ø
talu [u]	tale [ə]	tale Ø

This is a term used for a very common sound change. For example, the word initial cluster [kn] was found in Old and Middle English, in the spelling of such words as knight, knit, and knee, but the [k] was subsequently lost, giving us our modern pronunciation. Just as vowel reduction can be identified as a weakening process since it presents an intermediate step on the pathway from a full vowel to deletion of the vowel, so too can pathways of consonant weakening be identified. The scale of consonantal strength can be helpful in identifying cases of weakening. It should be noted that geminate consonants are stronger than their non geminate counterparts.



The data suggest that geminates eventually degeminate, stops through frication become fricative. Weakening can ultimately result in the deletion of the consonant. Consonants are particularly subject to weakening between vowels as in:



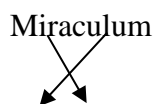
Lenition is a term used in referring to a weakening in the overall strength of a sound, whether diachronically or synchronically. The opposite of lenition is fortition. Technically, it is a change from a stop to a fricative, a fricative to an approximant, a voiceless sound to a voiced sound, or a sound being reduced (lenite) to zero. Crystal provides a Welsh example *pen* ‘head’ is realized as *ben* ‘his head’. Fortition is a strengthening in the overall force of a sound, whether diachronically or synchronically. Technically, fortition involves the change from a fricative to a stop, an approximant to a fricative, or a voiced to a voiceless sound. The devoicing of final obstruent in German is an example of fortition.

This refers to ‘alteration in the normal sequence of elements in a sentence’. This involves primarily sounds, but sometimes syllables, words, or other units are also involved. Metatheses are well attested in Old English, as in *brid* becoming *bird*. They also appear in performance errors in such tongue slips as *aks* for *ask*, or in the phenomenon of ‘spoonerism’ where *the dear old queen* is realized as *the queer old dean*. Other examples are:

#### Data Set 18

Old English	Middle English	Modern English
wæps	wæsp	‘wasp’
þrida	þirda	‘third’

Metathesis at a distance is found in the change from Latin *miraculum* ‘miracle’ to Spanish *Milagro*, in which [r] and [l] have changed places although they were not adjacent.



milagro

This is a relatively common type of weakening that typically involves the change of [z] or [r]. Often rhotacism is preceded by a stage involving [s] to [z]. Within the Germanic family of languages, for instance, [s] first became [z] in a particular environment between vowels. This [z] remained in Gothic but became [r] in other Germanic languages such as English, German, and Swedish, as in:

**Data Set 19**

Gothic	English	German	Swedish
maize	more	mehr	mera
diuzam	deer	tier	djur
huzd	hoard	hort	-----

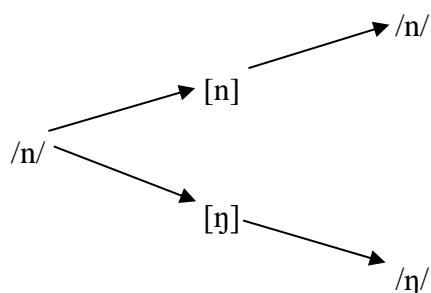
In Modern English, rhotacism is the source of the alternation between [z] and [r] in *was* and *were*. The [r] resulted from earlier [z], which was originally intervocalic.

Sometimes sound change can lead to changes in a language's phonological system by adding, eliminating, or rearranging phonemes. Such phonological change can split, mergers, or shifts. The data in set 23 evinces that in a phonological split, allophones of the same phoneme come to contrast with each other due to the loss of the conditioning environment, with the result that one or more new phonemes are created. The English phoneme /ŋ/ was the result of a phonological split.

**Data Set 20**

Original phonemic form	/sing/	
Original phonetic form	/sɪŋg/	
Deletion of [g]	/sɪŋg/ ▼	[sɪŋ]
New phonemic form	/sɪŋ/	

Originally, [ŋ] was simply the allophone of /n/ that appeared before a velar consonant. During the Middle English, consonant deletion resulted in the loss of [g] in word-final position after a nasal consonant, leaving [ŋ] as the final sounds in words such as *sing*. The loss of the [g] in words created minimal pairs such as *sin* [sɪn] and *sing* [sɪŋ], in which there is a contrast between /n/ and /ŋ/. This example represents a typical phonological split. When the conditioning environment of an allophone variant of a phoneme is lost through sound change, the allophone is no longer predictable and thus it becomes phonemic. The original phoneme /n/ splits into two phonemes, /n/ and /ŋ/.





In a phonological merger, two or more phonemes collapse into one, thereby reducing the number of phonemes in the language.



A phonological shift is a change in which a series of phonemes is systematically modified so that their organization with respect to each other is altered. A well-known example of such a change is called the **Great English Vowel Shift**. Beginning in the Middle English period and continuing into the eighteenth century, the language underwent a series of modifications (a massive sound change) to the long vowels. The long vowels shifted upwards; that is, a vowel that used to be pronounced in one place in the mouth would be pronounced in a different place, higher up in the mouth. The Great Vowel Shift has had long-term implications for, among other things, orthography, the teaching of reading, and the understanding of any English language text written before or during the shift. It occurred in eight steps; it is important to note that each step did not happen overnight.

Step 1: i and o drop and become əɪ and əʊ

Step 2: e and o move up, becoming i and u

Step 3: a move forward æ

Step 4: ε becomes e, ɔ becomes o

Step 5: æ moves up to ε

Step 6: e moves up to i, a new e was created in step 4, now that e moves up to i

Step 7: ε moves up to e. The new ε created in step 5 now moves up.

Step 8: əɪ and əʊ drop to aɪ and aʊ.

Having presented the possible phonological processes in English as a background to studying rule interaction, with special focus on bleeding and feeding in phonological operations in English, we shall now turn to rule notation and rule writing and ordering.

## DISCUSSION

Here, we posit rules of the nature  $A \rightarrow B / C \_ D$  before going on to more complex phonological processes rules. An example of a rule is obstruent become voiced in an environment of a voiced segment. This rule may be presented using *SPE* features as:

$[-\text{sonorant}] \rightarrow [+ \text{voiced}] / [+ \text{voiced}] \_$



This rule statement above is that a non-sonorant segment becomes voiced in an environment of a voiced segment. The slash indicates that what comes after is a description of the environment while the bar on the line evinces the place of the affected segment. If a particular feature is not mentioned, it is assumed to be intact. For example, a voiceless bilabial plosive is realized as a voiced bilabial plosive, and a voiceless velar fricative is realized as voiced velar fricative, among others. Incompatibilities are common because of the binary nature of features; for instance, a vowel that is [+ high] is at the same time [- low]. This need not be stated in the rule. Compare the next two rules noting the differences in the environments.

$$[-\text{sonorant}] \rightarrow [+ \text{voiced}] / [+ \text{voiced}] \_\_\_ [+ \text{voiced}]$$

$$[-\text{sonorant}] \rightarrow [+ \text{voiced}] / \_\_\_ [+ \text{voiced}]$$

The rule below states that consonants are realized as voiceless morpheme final.

$$[+\text{consonantal}] \rightarrow [- \text{voiced}] / \_\_\_ \#$$

The next rule states that vowels are realized as high when they occur word final.

$$[+ \text{syllabic}] \blacktriangledown \quad [+ \text{high}] / \_\_\_ \#\#.$$

Our data suggests that some boundaries are implied by others. In other words, a rule that applies in the context - # will also apply in the context - ## or # # #'. Another convention employs + for a morpheme boundary and # for a word boundary. A rule such as a vowel is nasalized before a word-final nasal segment involves several segments and a boundary symbol as in:

$$\left( \begin{array}{l} + \text{syllabic} \\ -\text{consonantal} \end{array} \right) \rightarrow [+ \text{nasal}] / \_\_\_ [+ \text{nasal}] \#\#$$

Another rule states that an obstruent is voiced if it occurs between a word-initial nasal consonant and a vowel, as in:

$$[- \text{sonorant}] \rightarrow [+ \text{voiced}] / \#\# \left( \begin{array}{l} + \text{cons} \\ + \text{nas} \end{array} \right) \_\_\_ \left( \begin{array}{l} + \text{syll} \\ - \text{cons} \end{array} \right)$$

A rule that states that an obstruent is voiced if it occurs word-final in a verb, the environment is carrying lexical and syntactic information as in:

$$[- \text{sonorant}] \rightarrow [+ \text{voiced}] / \_\_\_ \# \# \text{ }^{\text{verb}}$$

No symbol is available for syllable boundary, therefore philologist recourse to using an 'open' or 'close' syllable as the case might be. But recently Clark et al. (133) used the dollar sign \$ to indicate syllable boundary. A rule that states that a consonant is voiced intervocally could be represented with C and V:



$$C \rightarrow [+ \text{voiced}] / V \_ \_ V$$

A representation like  $i \rightarrow e / \_ \_ r C$  is informal and needs working out the features of  $i$ ,  $e$ ,  $r$  and  $C$ . The symbol  $\emptyset$  represents zero, it is used in rules that involves deletion, epenthesis and insertion, an example is a rule that states that a vowel is deleted word-final after a vowel, as in:

$$V \rightarrow \emptyset // V \_ \_ \# \#$$

Another rule of this kind is the consonant [t] is inserted between [n] and [s], as in:

$$\emptyset \rightarrow t / n \_ \_ s$$

Note that  $\emptyset$  does not appear in the description of the environment. This is because irrelevant components of the environment are simply omitted (Clark et al., 134). We use dots or uppercase letters (such as X, Y, Z, W) to indicate the presence of segments in a rule. This is illustrated with a rule that states a vowel is deleted before a verb root-final consonant.

$$V \rightarrow \emptyset / \_ \_ C]^{root} \dots]^{verb}$$

or

$$V \rightarrow \emptyset / \_ \_ C^{root} X]^{verb}$$

The dots or X simply announces that the root will carry a suffix or an auxiliary element, which is hosted within the verb. It is expected that boundaries be included if a verb or root appears in the rule, alternatively use the opening and closing brackets. We present an example here: The rule states that within a verb, a suffix of the shape CV loses its vowel if it follows a vowel and stands word final.

$$V \rightarrow \emptyset // V + C \_ \_ \# \#]^{verb}$$

A second rule states that a schwa is inserted between two consonants at the end of a word, where the second consonant is a sonorant, e.g., [lm] becomes [ləm], [gl] becomes [gəl]; the rule is formulated so as not to apply across a word boundary, i.e., the two consonants must be within the same word. The next three rules will help anchor the concepts we are discussing. The next rule states within a verb, a stem-final vowel is elided if it occurs before another vowel.

$$V \rightarrow \emptyset / [X \_ \_ ]^{stem} V Y^{verb}$$

This is followed by a rule which states that within a verb, a nonhigh vowel is low if it precedes a low vowel which is both stem-final and before another vowel.

$$\left( \begin{array}{c} \text{ } \\ \text{V} \\ \text{ } \end{array} \right) \quad \left( \begin{array}{c} \cdot \\ \text{V} \\ \text{ } \end{array} \right)$$

-high  $\rightarrow$  [+low] / + low <sup>stem V...</sup> <sub>verb</sub>

Besides, our data evinces a rule which states that a velar consonant is elided before the plural suffix.



$$\left( \begin{array}{l} + \text{consonantal} \\ + \text{high} \\ -\text{Coronal} \end{array} \right) \rightarrow \emptyset / \_ + [\text{PLURAL}]$$

We now turn to some complex rules of the nature CAD → CBD that show up in our data, these rules are occasioned by processes such as coalescence and metathesis. We illustrate this with a process where vowel coalescence with a nasal consonant realizing a nasalized vowel, as in: [an] → [ã]. The metathesis of a fricative and plosive, for instance: [sp] → [ps]. Let us illustrate a rule of vowel nasalization, with loss of the following nasal consonant which occurred in our data thus:

$$\begin{array}{cccc} \left( \begin{array}{l} + \text{syllabic} \\ -\text{consonantal} \end{array} \right) & \left( \begin{array}{l} +\text{consonantal} \\ + \text{nasal} \end{array} \right) & [+ \text{nasal}] & \emptyset \\ \mathbf{1} & \mathbf{2} & \mathbf{1} & \mathbf{2} \end{array}$$

The metathesis of a fricative and plosive which we present above can now be formalized either as in (a) or as in (b):

$$\text{a. } \left( \begin{array}{l} -\text{sonorant} \\ +\text{cont} \end{array} \right) \left( \begin{array}{l} -\text{sonorant} \\ -\text{cont} \end{array} \right) \rightarrow \left( \begin{array}{l} -\text{sonorant} \\ -\text{cont} \end{array} \right) \left( \begin{array}{l} -\text{sonorant} \\ +\text{cont} \end{array} \right)$$

$$\mathbf{1} \quad \mathbf{2} \quad \mathbf{2} \quad \mathbf{1}$$

$$\text{b. } \left( \begin{array}{l} - \text{sonorant} \\ +\text{cont} \end{array} \right) \left( \begin{array}{l} -\text{sonorant} \\ -\text{cont} \end{array} \right) \rightarrow \mathbf{2} \quad \mathbf{1}$$

We present a single rule that can coalesce a vowel and nasal consonant into a nasalized vowel, as in:

$$V N \rightarrow \tilde{V} \quad \text{e.g. } [an] \rightarrow [\tilde{a}]$$

$$V \rightarrow \tilde{V} / \_ N \quad \text{e.g. } [an] \rightarrow [\tilde{a}n]$$

$$N \rightarrow \emptyset / \tilde{V} \_ \quad \text{e.g. } [\tilde{a}n] \rightarrow [\tilde{a}]$$

**Rule interaction and ordering**

A rule should be able to provide both descriptive adequacy, explanatory adequacy, and theoretical adequacy. For rules to do these they must interact and be ordered. At the beginning of generative phonology rules are said to apply in fixed order, one after the other. Furthermore, rules were ‘linear, transitive, and conjunctive’. What this means is that a rule appears once, and the output of one rule becomes the input of another. The implication is that rules are





extrinsic, imposed by the description and not derived from general principles or from the nature of the rules themselves. We put forward the following examples from Modern Greek. We report that some languages share rules, but the ordering of the rules differ. Some of the rules are:

Turn mid vowels into high when it occurs next to a low vowel.

$$V \quad \quad V \quad \quad V$$

$$[+ \text{Mid}] \rightarrow [+ \text{High}] / \text{ \_\_\_ } [+ \text{Low}]$$

Turn high vowels into semivowels if it occurs next to a vowel.

$$V \left( \begin{array}{c} + \text{High} \\ - \text{Cons.} \end{array} \right) \rightarrow - \text{Vowel} / \text{ \_\_\_ } [\text{Vowel}]$$

Turn semivowels into voice fricatives under certain conditions.

$$[w] \rightarrow [v]$$

Delete voiced fricatives intervocalically.

/aloyas/ ‘horse dealer’ → [aloas]

In (iv), the delete rule has been applied producing [aloas]. This means that in (i) the rewrite rule is already skipped therefore cannot apply to the mid vowel standing next to a low vowel. In Rodes dialect of Greek: /aloyas/ ‘horse dealer’ → [alvas]. In this data, the delete rule has been applied and the output has also undergone (i), (ii), and (iii) that is: [alos] → [alvas] → [alwas] → [alvas]. Here, order is vital.

The various limitations that the *linear transitive ordering* encountered led linguists to postulate the *cyclical rules*, which simply means that a rule can be repeated. But the constraints were imposed on the cyclical operation; the restraint is that rules that are deep (i.e., ‘early’ in the total set of ordered rules) and sensitive to syntactic information are allowed to repeat. Put differently, a set of cyclical rules will apply first within the morpheme, secondly, the same set of rules may apply within the word; thirdly, within phrases, etc. In other words, rules do not allow random repetition. This rule still enforces ‘*linear conjunctive order*’. In the *Sound Pattern of English*, it is only stress rules of English that are cyclical, other rules are post-cyclical (Chomsky and Halle 15-24).

Harm reports that in Russia’s Finno-Ugric language, the vowel [i] is inserted between consonants to avoid clusters of three consonants (99-100). In the word *pukšini* the vowel is inserted between ś and n while in *vundišni* the vowel is inserted between the d and ś. We are



now left to predict the correct form through applying the insertion rule cyclically. Consider the analysis below:

puk + *ś* + *ni*                    i.e. [[[puk][*ś*]] *ni*]  
 vund + *ś* + *ni*                    i.e. [[[vund][*ś*]] *ni*]

The insertion rule is represented thus:  $\emptyset \rightarrow i$  [XCC \_\_ CY].

The rule scans for a string that meets its structural description, working upwards from the smallest constituents. On the first cycle scanning the innermost brackets, the rule will not apply, on the next cycle, the innermost brackets will be ignored, and insertion applies to the three consonants within the string [vund*ś*] but will ignore [puk*ś*] since the CC\_\_C sequence is not found. On the next cycle [vund *i* *ś* *ni*], having undergone insertion rule, no longer has a CCC sequence; but [puk *ś* *ni*] does not trigger insertion. Cross linguistic data reveals that the principle of linear transitive order has faltered in the face of various examples of ordering paradoxes (Anderson 141; Sommerstein 174-6). In Icelandic these two rules exist as reported by Clark et al. (133):

An umlaut rule converting /a/ to a front rounded /ö/ before an /u/ in the following syllable: a → ö / \_\_ C<sub>o</sub>u

An elision rule deleting unstressed vowels in certain environments.

V

[-stress]                    →  $\emptyset$  / C \_\_ C #V

Noun	Dative	UR
jökul 'glacier'	jökli	/jakuli/
jötum 'giant'		

In this data the first vowel is underlying /a/ which has become /ö/ because of the /u/ in the following syllable. In (a) the /u/ triggers assimilation of the /a/ in the first syllable but is then deleted by the elision rule. Thus, the two rules apply in the order presented above (i) before (ii). Let us examine another data presented here:

Dative PL	UR
rögnum 'gods'	/raginum/
köttlum 'kettles'	/katilum/

In this data, the rules apply in reverse order. The unstressed /i/ is elided, which then allows the /u/ of the last syllable to trigger rounding of the preceding /a/. These inconsistencies gave rise to several suggestions about principles of rule ordering. The first suggestion is a postulation called *Partial Order*, a rule that states 'rules would be unordered and could apply whenever and wherever their conditions were met'. Of course, some of the rules could be specified as



preceding certain others, or as blocking the subsequent application of certain others. The second rule postulated is called *persistent rules* or *anywhere rules* (Chafe 168; Anderson 191). This rule is allowed to apply as often as it could, but the constraint is called *local order*, ‘the order of precedence might be specified only for pairs of rules at a time’ (Summerstein 176-88).

### **Functionality**

Here, discussion will center on feeding, bleeding, transparency, opaque, rule shift and conspiracies. The argument that led to these concepts is that linguists suspect that rule order might be determined by functionality in language or natural principle. In other words, rule order might be *intrinsic*, that is determined by the nature and function of the rules themselves. Kiparsky (1968) distinguishes between *feeding* and *bleeding*. He posits that where two rules exist, *X* and *Y*, and *X* produces outputs, which will become input to *Y*, then *X* feeds *Y*. If their order is reversed (non-feeding or counter feeding order results) there will be apparent exceptions to *Y*, since *X* produces outputs that escape the effect of *Y* by virtue of the ordering. Consider the next examples, where (i) feeds (ii):

1 → r /        ##

r → [-voiced] /        ##

The order of these two rules can be reversed. Counter-feeding means that occurrences of /r/ which resulted from (i) – and only those – would remain voiced in word-final position, violating the pattern implied in (ii).

When two rules *A* and *B* operate in such a way that *A* robs *B* of certain inputs, then *A* bleeds *B*. The reverse of these rules is non-bleeding or counterbleeding, then the operation of *B* is maximized not constrained. Here, counterbleeding seems the more natural order. By way of illustration, imagine that: Rule 1 below raises /a/ to /e/ before any palatal consonant, then Rule 2 bleeds Rule 1, which nasalizes the low vowel before any nasal:

R1: a → e /         $\left( \begin{array}{l} - \text{ Anterior} \\ + \text{ Coronal} \end{array} \right)$

R2: a → [+nasal] /        [+nasal]

Bleeding order means that an /a/ standing before a palatal nasal is raised to /e/ and then fails to undergo low vowel nasalization. This seems the most plausible situation given that R2 applies only to /a/ not /e/, whether generated by R1 or not. We posit that counterbleeding means that /a/ standing before a palatal nasal is nasalized and then raised to become /ẽ/ violating the general pattern that vowels other than /a/ are not nasalized before nasal consonants. We relate feeding and bleeding to the ideas of *transparency* and *opacity*. A rule is transparent if its effects are obvious from the phonetic forms of the language. If a rule realizes word-final [o] from [u], but there is no instance of word-final [o] or [u] in the language, then the rule is transparent. But, if the language has some instances of word-final [o] that dodge the effect of the rule, some instances of word-medial [u], and instances of final [u] which are not derived from [o], then



the rule is highly opaque. While in English, the reduction of unstressed vowels to schwa [ə] is transparent, the laxing of vowels is opaque.

Our data prove that a vowel will be lax before a consonant cluster in English as the following pairs of words: *mean/meant*; *sleep/slept* and *wide/width*. But a counter example also exists in English where vowels are tense before clusters: *fiend*, *heaped*, *pint*, and *height*. And some lax vowels before clusters are not derived from tense vowels: *dent*, *adept*, *crypt*, and *lint*.

Our data indicate that overtime rules tend to shift into the order which allows their fullest utilization in grammar. From the data below, we see that rules tend to shift into the order that favors paradigmatic uniformity, i.e., rules will occur in whatever order reduces irregularity in the morphology of the language. This Spanish data is illustrative.

hacer	[aθer]	‘to do’
hago	[aγo]	‘I do’
hacemos	[aθemos]	‘we do’

Note the alternation between c and g in this data. C occurs between a ~ e while g occurs between a ~ o. This is a non-uniform paradigm which is fast vanishing from the Spanish language in preference for a uniform paradigm. Another argument which states that rules are *self-preserving*; but concludes that though languages may tolerate a high degree of morphological irregularity, self-preserving rules do disappear from languages.

It is observed that sometimes rules which appear formerly unrelated may nevertheless serve a common functional target, such as elimination of consonant clusters, preservation of distinctiveness or maintenance of a generalized stress pattern. We, in this connection, argue that several phonological processes may conspire to trigger phonetic representation which contains no word-final clusters and no trilateral clusters – this is *conspiracy*. For instance, in Yidiny (an Australian language), stress and vowel length are subject to intriguing constraints: long vowels are forbidden in adjacent syllables, and in words with an odd number of syllables, at least one even-number syllable must contain a long vowel. Stress falls on the first syllable containing a long vowel (or on the first syllable if all the vowels in the word are short).

Data from Yidiny

yatjí: rringál  
wúngapa:tjinyúnta  
tjámpulángalnyúnta

In this data, several rules plus those determining the sequence as well as the form of affixes, conspire to maintain the phonotactic constraints. We argue that the details of affixation and vowel length must surely indicate that the development of Yidiny morphology has been in part oriented to the language’s overriding phonological targets – that every long vowel should occur in a stressed syllable, and that stressed and unstressed syllables should alternate in a phonological word. Regarding rule conspiracy, we claim that English tends to avoid the repetition of /l/ or /r/ within the same word, examine the following English words:



prattling	sprinkling	trampling
trickling	fluttering	glimmering
glittering	spluttering	

These words contain clusters of /l/ or /r/, but not two containing /l/ or two containing /r/ note no word like: \*flickling or \*sprittering. Secondly, observe that the adjectives that end in *-al* as in *educational, occasional, cultural, dental, and natural*; *-ar* appear where there is an /l/ in the stem: *cellular, circular, vulgar, lunar, and alveolar*. Of course, there are words like *laminal* and *laminar* which violate this conspiracy theory. Thirdly, *-al* marks nouns in English as in *betrayal, burial, dismissal, and denial*. Note there are no nouns with stems containing /l/ such as \**applial, \*dispellal, or \*recoilal*. We assert that conspiracies and functional targets are problems for any model of phonology that relies on formal devices such as bracketing to unite or relate rules.

### ***Devices in rule notation***

In English, [r] is deleted before a consonant as in *earlobe* or *earmuff* or at word-final when nothing follows as in *ear*. The deletion occurs in more than one environment; the implication is that we need more than one rule to capture it.

$$r \rightarrow \emptyset / \_ C$$

$$r \rightarrow \emptyset / \_ \# \#$$

These two rules can be merged into one super rule, as in:

$$r \rightarrow \emptyset / \_ \left[ \begin{array}{c} C \\ \# \# \end{array} \right]$$

Note that braces are only allowed when a rule is conjunctively ordered. We use the next rule to explain this phenomenon.

$$a \rightarrow [+ \text{round}] / \_ ([+ \text{nasal}]) C V$$

This type of rule is two or more rules collapsed into one. The convention is that parenthesis or brackets are used when the longer rule precedes the shorter rule. Besides, the component rules are ordered disjunctively, meaning that once one has applied, any subsequent rules are skipped.

We now turn to stress rules, monosyllables are stressed as 'CV; disyllabic words with stress on the first syllable will be represented as 'CVCV while trisyllabic words with stress on the third syllable from the end will be represented as 'CVCVCV or CV'CVCVCV. Here, we have assumed that every syllable is of the CV type. These can be changed into rules as follows:

$$V \rightarrow [+ \text{stress}] / \_ \# \# \text{ (monosyllables)}$$

$$V \rightarrow [+ \text{stress}] / \_ CV \# \# \text{ (disyllabic words)}$$

$$V \rightarrow [+ \text{stress}] / \_ CVC \# \# \text{ (polysyllabic words)}$$



These three rules can be combined into one rule thus:

$$V \rightarrow [+ \text{stress}] / \_ ((CV) CV) \# \#$$

The convention says that the expansions of the above rule apply in descending order of size, and once one applies, no other may apply.

The rule notation allows for the use of subscripts and superscripts as in  $C^3_1$  is shorthand for  $((C) C) C$ , which expands into CCC, CC and C applied disjunctively in that sequence. Other examples are:

$C^2_0$  two consonants, one consonant or none

$V^2_1$  two vowels or one

$C_1$  at least one consonant

The rule notation allows the use of angled brackets to enclose two optional elements that are either both present, or both absent. The environments  $C \_ C$  and  $VC \_ CV$  could be combined as  $\langle V \rangle C \_ C \langle V \rangle$ . In this convention the longer expansion applies first, and ordering is disjunctive, we present this with a rule below. The rule states that a high vowel receives stress before  $CV\# \#$  or if this condition is not met, any vowel is stressed before  $\# \#$ .

+ syllabic

$$\langle + \text{high} \rangle \rightarrow [+ \text{stress}] / \_ \langle CV \rangle \# \#$$

In a situation where a vowel is tense if it precedes a consonant plus a vowel, or if it precedes a nasal consonant plus vowel, or if it is word-final:

$$V \rightarrow [+ \text{tense}] / \_ \left( \begin{array}{l} ([+ \text{nasal}) CV \\ \# \# \end{array} \right)$$

A new notation is required if rules are complementary, for instance, an assimilation rule changes a feature to the value as that of the following segment. In Dutch, fricatives are as a rule voiceless before voiceless consonants and voiced before voiced consonants: in the plural noun *hoofden* 'heads', the fricative is voiced to [v] before voiced [d], but in the singular *hoofd* (where the word-final plosive is devoiced), the fricative is voiceless in agreement with the following voiceless plosive. Two rules are required to capture these.

$$\left( \begin{array}{l} -\text{sonorant} \\ +\text{continuant} \end{array} \right) \rightarrow [-\text{voiced}] / \_ [-\text{voiced}]$$

$$\left( \begin{array}{l} -\text{sonorant} \\ +\text{continuant} \end{array} \right) \rightarrow [+ \text{voiced}] / \_ [+ \text{voiced}]$$



These two rules are opposites and therefore can be combined into a single rule, as in:

$$\left( \begin{array}{l} \text{-sonorant} \\ \text{+continuant} \end{array} \right) \rightarrow [\alpha\text{voiced}] / \_ \_ [\alpha\text{voiced}]$$

The alpha symbol is also called feature coefficient, that is, a variable ranging over the values + and -. The variable must occur twice in a rule and any rule which contains alphas has only two expansions, one in which every occurrence of the alpha is plus, the other with alpha as minus throughout. A rule that says obstruents are voiced before sonorants but voiceless before obstruents can be represented as:

$$[-\text{sonorant}] \rightarrow [\alpha\text{voiced}] / \_ \_ [\alpha\text{sonorant}]$$

Another rule states that back vowels are rounded, and other vowels are unrounded when before a consonant:

$$\left( \begin{array}{l} \text{+syllabic} \\ \text{-continuant} \\ \alpha\text{back} \end{array} \right) \rightarrow [\alpha\text{round}] / \_ \_ [\text{+consonant}]$$

There are situations where the minus sign can occur before the alpha symbol, this allows reference to feature which are opposite in value. An example of dissimilatory process where [l] becomes [r] before [l] and [r] becomes [l] before [r] is illustrated here.

$$\left( \begin{array}{l} \text{+sonorant} \\ \text{-nasal} \end{array} \right) \rightarrow [-\text{lateral}] / \_ \_ [\text{+lateral}]$$

$$\left( \begin{array}{l} \text{+sonorant} \\ \text{-nasal} \end{array} \right) \rightarrow [\text{+lateral}] / \_ \_ [\text{+lateral}]$$

These two immediate rules can be combined into one alpha rule as expressed below.

$$\left( \begin{array}{l} \text{+sonorant} \\ \text{-nasal} \end{array} \right) \rightarrow [\alpha\text{lateral}] / \_ \_ [\alpha\text{lateral}]$$

A rule states that a word-final [n] is syllabic if it follows a monosyllabic segment, such as a plosive, but is otherwise non-syllabic:



$\left. \begin{array}{l} +\text{consonant} \\ +\text{nasal} \end{array} \right\} \rightarrow [\text{asyllabic}] / [\text{asyllabic}] \_ \# \#$

It is possible to use successive letters of the Greek alphabet as in the data below.

bilabials (m, b)	$\left. \begin{array}{l} +\text{anterior} \\ -\text{coronal} \\ -\text{high} \\ -\text{back} \end{array} \right\}$
alveolars (n, d)	$\left. \begin{array}{l} +\text{anterior} \\ +\text{coronal} \\ -\text{high} \\ -\text{back} \end{array} \right\}$
palatals (ɲ, j)	$\left. \begin{array}{l} -\text{anterior} \\ -\text{coronal} \\ +\text{high} \\ -\text{back} \end{array} \right\}$
velars (ŋ, g)	$\left. \begin{array}{l} -\text{anterior} \\ -\text{coronal} \\ +\text{high} \\ +\text{back} \end{array} \right\}$

## SUMMARY

This introduction states the background of the study. The ‘second coming’ has to do with concept review, theoretical framework, empirical review, and appraisal of literature. The ‘third outing’ focuses on the methodology adopted for this study, here the issue of population and sample are presented, method of data elicitation is discussed. The ‘fourth dimension’ deals with data presentation and analysis, this is followed by discussion of the various phonological processes and the rules arising from them, with the implications for English language learning.





Finally, the summary of the study, conclusions that we have arrived at and offer some recommendations.

## CONCLUSION

The title of this study is ‘feeding and bleeding in English phonological operations.’ The study seeks to understand the overall architecture of the operations of English phonological processes and the rules that are deducible from these operations, and how these rules interact, and are ordered. *Rule interaction* is at the core of this study; it is what we refer to as feeding and bleeding, although these words are strange to be found in phonological analysis of English they are accepted in the literature. The entire study is galvanized towards achieving the crucial understanding of what is rule writing, rule interaction, rule ordering, and rule direction, and their implications for English phonology especially for those of us learning English as a second language. All the sections are stretched using evidence from the English language and other languages to achieve this understanding.

It is Roman Jakobson (56) who rightly observed that “Effective communication processes must be achieved by maintaining the morphology, syntax, semantic and *phonological ideas of language*”. (Emphasis added). Without undermining the relevance of other aspects of the English language or other levels of language expression, our emphasis here is on the enhancement of good knowledge of phonological analysis, rule writing, rule ordering, rule interpretation, and rule interaction, among others, skills arising from the knowledge of phonological generalization will aid learners of the received pronunciation utilizes the full elements of the different levels of language development to achieve a good communication situation.

Abercrombie (6) sees pronunciation as an ‘audible gesture’, and as such both “... carry signs which reveal personal characteristics of the writer or speaker”. Pronunciation, in fact, can be regarded as a major intelligibility marker for any user of a language. In other words, a person is readily judged or assessed by the way he expresses himself. The essence of language is fully manifested through the verbal articulation of sounds. Proper pronunciation of words in any language is very critical in creating a good communication situation as well as in the preservation of that language.

Features are used in phonological rules in keeping with the tenets of generative phonology. Features can be acoustic, articulatory, perceptual, distinctive, cover or abstract. Features are the building block in rule writing and interpretation. Arguments of this kind led generative phonologists to abandon the concepts of phoneme and allophone, and to talk in terms of a relatively abstract or morphophonemic underlying, level of phonological representation from which the phonetic output could be derived by application of a set of phonological rules.

Against this background, generative phonologists dismiss much of modern phonology as ‘taxonomic phonemics’, having referred to ‘a curious and rather extreme contemporary view to the effect that true linguistic science must necessarily be a kind of pre-Darwinian taxonomy concerned solely with the collection and classification of countless specimens’ (25). They criticize in detail (75-95) the ‘taxonomic’ phonologists’ concern with segmentation, contrast, distribution, and biuniqueness and put forward the view that phonological description is not



based on 'analytic procedures of segmentation and classification' (95) but is rather a matter of constructing the set of rules that constitute the phonological component of a grammar.

Kiparsky's discussion of feeding and bleeding, in Russia, was in a historical context. He observes that over time 'rules tend to shift into the order which allows their fullest utilization in the grammar' (200), and he quotes instances and languages in which rules have evidently been reordered in line with this tendency. In other words, historical development of languages seemed to favor feeding and eliminating bleeding. Our data supports this argument, rules tend to shift into the order that favors paradigmatic uniformity, that is, rules will occur in whatever order reduces irregularity in the phonology and morphology of the language.

## RECOMMENDATIONS

We dare to recommend that those vested with the teaching of oral English in the secondary school system must brace up for the job. The act and art of teaching oral English, if we are to achieve international intelligibility, is much more than just proper articulation of the English lexical items in isolation but understanding the phonological operations with the overall architecture of English phonology.

Those who have given themselves the job of learning English, who speak it well, must also brace up to the challenges that come with being properly educated. Learning functional English that will open doors for them home and abroad. The government must put in place necessary machinery to produce quality teaching materials, personnel, supervision, infrastructure such as language laboratories, instructional materials, etc., that will aid the learning and teaching of English in schools in Rivers State.

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