How to Cite:
Shafeek, T., & Lalitharaja, L. (2022). Phoneme on/off mental image realisation. *International Journal of Health Sciences*, *6*(S3), 12473–12483. https://doi.org/10.53730/ijhs.v6nS3.9508

Phoneme on/off mental image realisatio

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***Abstract*---**Modern linguists' claim phonemes are distinctive sound units capable of distinguishing a word from other words. Empirical research on twenty-four elementary students aged between five and seven pointed out phoneme (the smallest unit in phonology) is realized as reflection of already constructed images in mind. Evidences from students who can identify alphabets of Malayalam (L1), Arabic, Hindi and English (L2) as well as numbers (1-10 only) in their L1 and L2s showed 'the differences' on language units. When presented four different cards bearing a 'phonetic element' representing distinct sound(s) or numbers of L1 or L2s, a disagreement did arise among the candidates on 'actuality'. Little realization of sameness/differences at the sight of 'phonetic element' did not support for 'distinctiveness of sounds'. It counter argued instead they (visualized phonetic element) are realized mental images

***Keywords*---**mind, phoneme, images, L1 and L2s.

Introduction

As it has generally been explicated and stated in Linguistics that phonemes are 'distinct units of sounds, little studies have been carried out for recognition of phoneme as mental image. Courtenay (1972) pointed out phonemes were 'mental images of sounds that speakers systematically deformed in the ongoing process of speech. This paper offers some evidence that phoneme is perceived to be a mental image. An empirical study on twenty-four elementary school going students aged between 5.4 and 6.7 (year and month) acknowledges the existence of phonemes as constructed images in their brain. Modern linguists have argued phonemes are 'distinctive sounds' to distinguish a word from the second one. If it is the case, why, in singly 'phoneme –display' contexts, have many of us failed to accurately

provide 'distinct sound unit for the particular phonetic element? It remains unclear why different sounds are possible for the same 'phoneme' symbol. The main purpose of this empirical work to see how a phoneme is treated: distinctive sound element or a reflection of mentally constructed image. One of significant roles of the human brain is to help identify more or less and differentiate specific phonemes from general phonemes. Specificity of phonemes is decided by the cognitive faculties of human brain. It is contradictory to say phoneme is distinct sound in a language whereas phonemes are in fact actually mentally perceived images. These images play a significant role in underpinning phoneme representation.

Phoneme - A traditional view

A phoneme is a sound of a given language that native speakers agree just ONE segment, and which enables them to recognize differences of meaning between words (Elgin, 1979). Phoneme is just 'same but different' sound segment of a particular language with which words are formed and distinguished from one another. In structural linguistics phoneme is explained as the 'psychological equivalent of physical sound'. We assume phoneme represents a 'phonetic segment' of linguistic expression or thought. What makes phoneme distinct is its feature of distinguishing words from other. As we are all aware phonemes vary by contexts and they are governed by certain rules. Little relevance is here to discuss on rule governance of phonemes or its contexts. My focus is to discuss phoneme in a cognitive approach.

Phoneme – Less identified as mental image

As I am aware phonology deals with selection and patterns of distribution sounds. Phoneme in phonology is instrumental and cognitively plays a crucial role for the rest of phonological process. Recent literatures have considerable views on 'phoneme' which is by-product of psychological drive based on experience and thought. Cognitive linguists like Courtenay, Nathan etc. have presented a different view; a reflection of by-product of an image- sensory- faculties in human brain in process- and lead to output. This can be illustrated as in Figure 1.

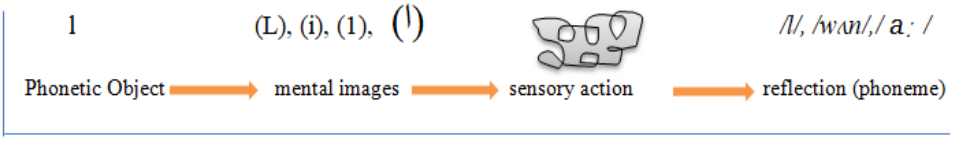

Figure 1. Mentally constructed images of 'l'

Possible perceived images of 'l' are shown in Figure 1 (see Table 3). Here the phonetic object (l) is speaker's visuals which are represented as mentally constructed ones not physically. Phonemes are thus mentally perceived images. We hear phonemes with our "ear of mind". Also non phonemes can be too mental images such as the sign of currency ($), icons, etc. At sight of this sort of sign(s), sensory action in no time sends signal either to retrieve already constructed specific image or to establish it so for the first time in the brain. In language there is one further step. We see different phonemes. Upon seeing phonemes, our

intellectual faculties start the same processes: 1) retrieve already mentally constructed image followed 2) reflection of the image 3) articulation 4) output. The insight we get from the 'phoneme' is its transmission as sound segment. Thus phonemes, which are perceived mental images, have their shapes as specific images in the brain which are processed in sound forms. Sounds are not images but a reflection of mental images. For process of reflections cognitive faculties of our brain function as active agents. They check the mental phonological system, retrieve, decide and approve the sound segment we utter. Instructions before the output are given by such faculties to feed phonemes as 'mental images' with the help of embodiments.

Embodiments and its role

In Cognitive Linguistics, one of fundamental principles is embodiment: inclusiveness of body and mind. In cognitive linguistics exists an argument; both psychological and philosophical aspect is embedded in human experience. These are termed as the embodied mind and the embodied experience. The embodied mind is vital to human specific conceptualization and schematization. We tend to see many objects as we advance in our life for the first time. How are all these novel entities conceptualized and organized? Say, for example, a pre- teen second language learner is capable, when closely observed, of sound pattern processing in unknown words. The process of the sound-patterned often appears natural and fluent. How is this possible? Independent and dependent functions of embodied mind and embodied experience are inherent in the phonological process of natural languages.

Embodied mind

Are the mind and body mutual entities? Are they distinct or discrete? Famous the seventeenth – century philosopher Rene Descartes formulated a view the body and the mind are distinct. Both the mind and the body are different entities. In principle it is a dualism. Here we must not forget Noam Chomsky's one of guided principle of Generative Grammar- innateness. Many proponents of this approach have argued possibility of understanding a language through the study on the mind.

Embodied experience

What makes someone call something 'experience'? What are roles of the mind and the body in 'human experience'? What is the significance of 'experience in Language'? In the literature of philosophy or psychology, these are already present and are shared by a number of psychologists Experience affects representation. The use of forms and certain pattern both in perception and production affects our representation in the brain (Bybee, 2001). The approach we take into our account is cognitive linguistic one. Experience is overall embodiment of certain human-specific cognitive structures. These structures influence or impact the nature of human experience. Gravity of experiences differ from human to human, or human to non- humans. This is due to 'timing of schematization' which play significant role in 'human perception- conception'. The decider of timing schematization in language processing is neural network. This is why we

see language-disorders. I would not like to discuss language disorder in this context as it deals particularly with psycho-linguistic discipline. I would rather discuss briefly role of schemas needed for sound pattern processing.

Schemas in cognitive phonology

What guides us in patterning sounds in unknown words? How do school children make an acceptable pattern in untaught words? How does sound processing of them look more natural? We know in the brain exists a schema or process of schematization. We seldom realize our mental grammar (innate knowledge) has certain conventional patterns for sound processing. These are pre-requisite to establish symbolic item in the brain. This is done with faculties of the brain/mind leading to schematization. Schematic features do not remain specific. They are more or less abstract and conventional too. These features help encode phonetic object(s) as phonemes with the help of embodied mind and experience. Figure 2 shows illustration of schematization.

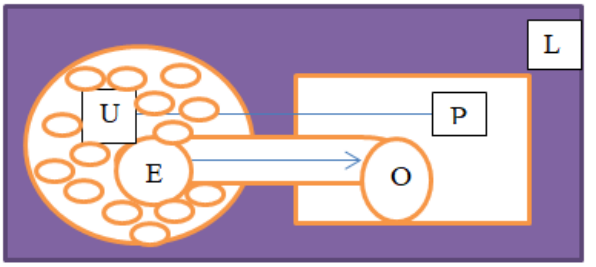

Figure 2. The schematization

L- Human language
U- U -Units (Symbolic)- abstract level
E- Experience (Conceptualization)
P- Phonetic unit (Symbolic) -concrete level
O- Output of schematization (Final Process)

Symbolic units in phonology; A cognitive approach

Evans and Green,(2006) in their *Cognitive Lingusitics:An Introduction*, have claimed symbolic units can be in different ways: In spoken language, the form is phonological: a string of speech sounds. However, language relies not only upon speech sounds but also upon written symbols, or manual gestures in the case of sign language. It follows that the idea of a symbolic unit. Here written symbols, be it printed or written, function as symbolic unit in the human brain.

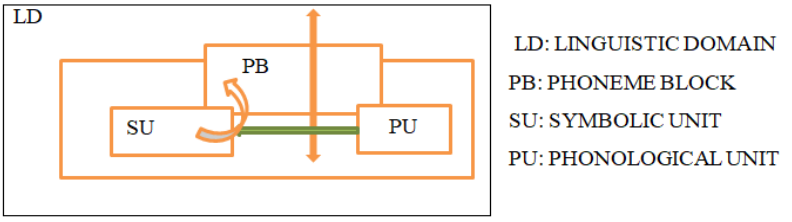

Figure 3. Phoneme construction

Phonological ambience

Elements conveying some relation whatsoever are termed as symbolic. That is to say any grapheme or alphabet is set to carry a symbolic relation with sound unit(s). These units must be first available for further processes. Every word of natural languages is made of these types of units. These units are further indivisible and analyzable. Symbolic units are instrumental acting as phonological pole in cognitive phonology. Our cognitive examination starts with such symbolic units. In fact, these symbolic units are the phonological to form morphemes. Like the phonological pole, semantic pole exists and its roles are not assessed. I will discuss only the phonological pole and its role as we deal with phonological processes

Phonological pole

Roles of phonological structure of elements, in many respects, are noticeable in system of phonology. Without which, phonology is meaningless. So what are phonological structures? Langacker (1987) defines phonological structures in *Foundation of Cognitive Grammar* as‘ phonological heirarchies have long bee recognised: segments are grouped into syllables, syllable into words, words into phonological phrases, and so on.’ (1987, pp328). Segments are treated as building phonological units inorder to form syllables which organises forms. A word is not possible without syllables. Similarly, syllables are not possible without segements. Segments are thus at leniear level. Though these elements are different strata, they require mutual relations

Cognitive phonology (CP) vs. Generative grammar (GG)

Have you ever wondered phonology is possible without intellectual faculties? Any component of phonology is deeply indebted to the cognition. Activities of intellectual faculties are implicit while the rest of phonological system is explicit. There we have a doubt to clarify. Cognitive phonology is part of generative grammar. We come to this point now. Cognitive phonologist Geoff Nathan has not adopted paradigm of generative grammar. Generative grammar is committed to innateness of mind. In Generative grammar language has independence structure. One of basic principles in cognitive phonology is functional motivation. Secondly, Generative Grammar is unconventional whereas Cognitive phonology is conventional. In other words, generative grammar continues to change in its principles since its inception in modern linguistics. Many tenets of GG were proved wrong and invalid. In the case phonology, there exists continuity than change. Tenants of phonology continue to be valid even today. Components of phonology such as phoneme, vowel, consonants, syllable, feature etc. have the same status in current phonology. These entities have been existing valid since the emergence of linguistics. This is too evident in cognitive phonology, major advanced branches of phonology. These phonological items are both generative and functional. As long as phonology exists, phonological forms continue to have status. In short, phonology has active tradition. Roles of intellectual faculties to pattern processing sounds are hardly recognizable, though they are vital in phonological system of a language.

Roles of cognitive phonology

- Connect the mental images of phoneme to the its phonetic sequences
- Connect phonetic sequences to corresponding mental images

Cognitive phonology is internal structure to observe phonetic object, select, decide and distribute the appropriate sound segments. Main function of cognitive phonology is to have these elements connected with cognitive faculties of human brain. Cognitive phonology thus relates mental images or symbolic units to phonetic sequences and vice versa. Our human mind is embedded with mental structures needed for processing and patterning sounds in language.

Setting and Methodology

During the research a study was conducted on twenty-four pupils of foundational stage of an X school. Their ages-range is between 05.04 and 06.07 (Year and Month). The ratio of boys and girls of the participants is 1:2. Ten participated pupils were enrolled as Lower Kindergarten (LKG) students and the remaining fourteen were Upper Kindergarten (UKG) level students of the school in 2021-22 academic year. The school offers students four languages; Malayalam, English, Arabic and Hindi. Orthography of all these language and language skills development commence at LKG level in the school. Malayalam is taught to the students as L1. Students learn English and Arabic as their Second Language (L2s) at elementary stage as part of the school curricula. Selection of students involved in this present study was a random process. Separate one-one informal meeting was held between the researcher and informants during lunch break time on school working days. Four different colored cards with inscription of 'a phonetic element' were used. The inscribed phonetic elements were 's', 'ി', 'o' and 'ന'. The main reason for selection of these symbols is that they symbolically represent different sounds of participants' L1 and L2s. In the first phase the researcher made rapport with both LKG and UKG classes. Second stage was a strategy: teachers were asked to send randomly selected students to school library to fetch any book. Colored cards were shown to them in between library and the student's walk back to the class. The researcher recorded each response. This continued for nine days to have responses recorded from at least 27 students of this sort.

Phoneme as a mentally constructed image: Evidences

It should not be confused with notion; a phoneme is a sound. Both are phonological elements. Main difference is phoneme has some linguistic features like capability of distinguishing meanings. Phoneme helps sort out word. Phoneme is made of sounds. On the contrary all sounds of a language are inestimable. However phonemes of the language can be estimated. Data in Table 1 points out responses from participants when a card with display of 's' was presented.

Table 1
Received responses at 's' display

Phonetic element	Responses in IPA	Language intended	No of participants	percentage
s	/s / (s)*	English (L2)	11	46
	/ʈ / (ട)*	Malayalam(L1)	8	33
	/ʔ/ (ء)*	Arabic(L2)	5	21
Total	3	3	24	

**language alphabetic symbol*

From Table 1, less than half of participants identified 's' as /s/, a voiceless alveolar fricative where 21% of informants considered 's' as glottal stop ʔ/ (ء) of Arabic Language. The remaining elementary students argued 's' as voiceless retroflex plosive /ʈ / (ട): Responses say that /s/, the phoneme, has 3 mentally constructed images Thus the phonetic object 's' is perceived as either /s/(L2) or /ʔ/ (L2) or /ʈ / (L1) by the informants. It is illustrated in Figure 4.1. It is thus claimed 's' is not a distinct sound but mentally constructed images of participants.

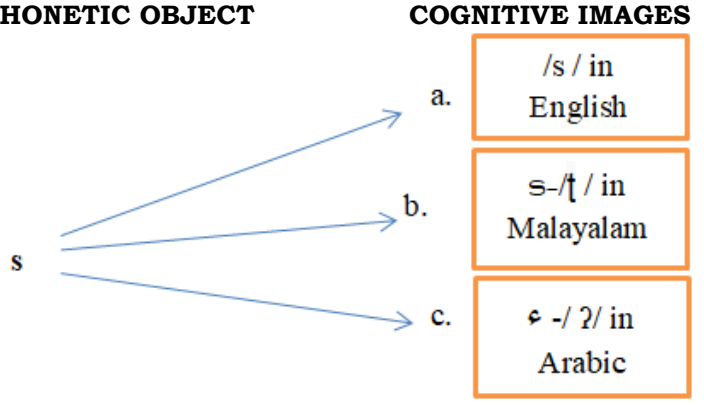

Figure 4.1

Similarly, Table.2 records 5 cognitive images were reflected in sounds against display card which has the phonetic object '٥'. Eight elementary students claimed '٥' , the numerical ' five' of Arabic language (L2). Five of the remaining students responded it as 'o' of English language. Three students have argued it is //ʈʰ/-(o), of their native language while 2 elementary have claimed it is 'a zero' of Arabic (L2). A quarter of participants did claim it was glottal sound /h/of Arabic language.

Table 2
Received responses on '٥'

Phonetic object	Responded sound	Linguistic area	No of participants	percentage
	/ɒ /	English (L2)	5	20.8

ം	/t̪ʰ/ (O)*	Malayalam(L1)	3	12.5
	/h / (ം)*	Arabic(L2)	6	25
	5(five)- (ം)*	Arabic (L2	8	33.3
	0- (zero)	Numerical	2	08.3
Total	5	5	24	

*language alphabetic symbol

Figure 4.2 shows proportionate of mentally constructed images of phonetic element 'ം'

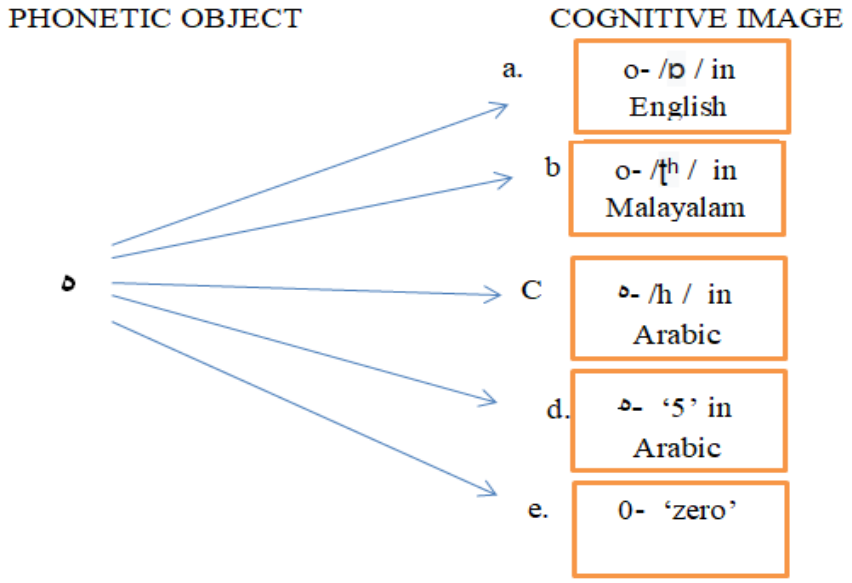

Figure 4.2

Figure .2 thus illustrates 'ം' is not a distinct sound but five sounds which are possible to retrieve only when mentally constructed images already exist in the human brain. Given this claim, it is argued 'ം', a phoneme in Arabic language, does not stand for a single sound. Table 3. shows us the phoneme symbol 'ا' has been identified as not a distinct sound but three: /a:/(long open front vowel) sound of Arabic, / I/ (voiced alveolar lateral) and first Cardinal (ا)

Table 3
Received sound responses of participants on 'ا'

Phonetic element	Responded sound	Language intended	No of participants	percentage
ا	/1 / (L)*	English (L2)	9	37.5
	/ a: / (ا)*	Arabic(L2)	5	20.8
	one (1)*	Numerical	10	41.7
Total	3	3	24	

It is evident that 41% of respondent have claimed 'ا' (one) is the first cardinal. They did not specify whether it is Arabic first cardinal (ا) or the number ONE. This

evidence is enough to refute that /l/ is not a distinct sound but a combinations of sounds(l:/wʌn/). Besides the phonetic element stands for two segments: /l/, a claim of 9 informants involved and /a:/ in Arabic, a claim of remaining participants. All such claims are based on participants' perceived image they have fed in their brain. Figure 3 shows us three perceived mental images on 'l'.

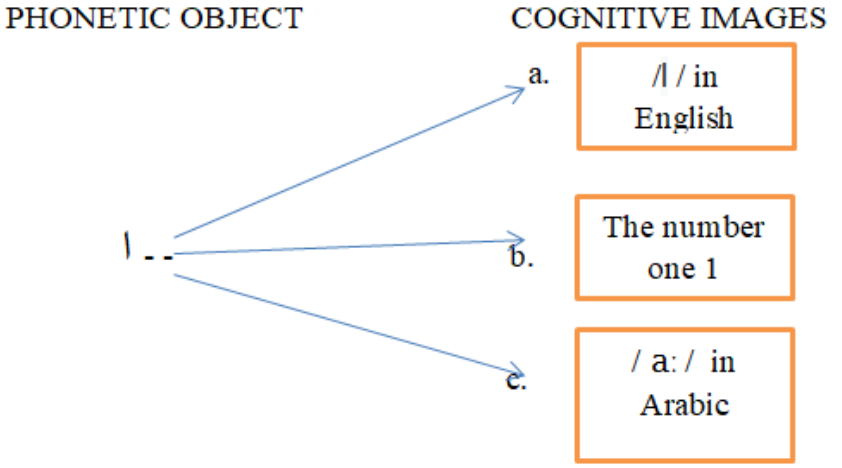

Figure 4.3

Table 4
Responses from elementary school students at the sight of 'ന'

Phonetic element	Responded sound	Language intended	No of participants	percentage
ന	/m / (m)*	English (L2)	9	37.5
	/ n̪/ / (ന)*	Malayalam(L1)	12	50
	/ t̪/ (ൻ)*	Malayalam(L1)	2	08.3
	/w/ (w)*	English (L2)	1	04.2
Total	3	3	24	

** Language specific symbol*

As it is evident from Table .4 half of the students argue the 'ന' is / n̪/ (ന), voiceless alveolar nasal sound of Malayalam, the native language of participants. However, 2 students have claimed it is not so but / t̪/ (ൻ), voiceless alveolar dental sound of Malayalam (L1). 37.5% of participants have pointed out 'ന' is the bilabial nasal sound /m / (IPA English). One response was /w/, the bilabial voiced approximant. It is assumed this respondent has shown dyslexic traits, a learning disorder. The upside down of 'm' is similar to 'ന', the phonetic element displayed on one of four cards of observation. Figure 4.4 shows 'ന' perceptions:

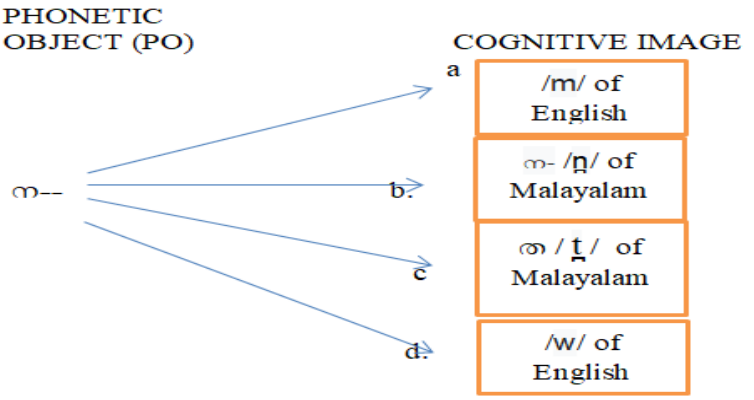

Figure 4.4

Concluding Remarks

Evidence for the claim; phoneme is a mentally constructed image reflection, has been reported in the present study. Many similar contexts, when conducted further study, can validate the claim. If linguists posit that phoneme is one sound segment to differentiate words or meanings of words between words, the reflected utterance on /ˈ / can be only one. Instead / ˈ / has actually been uttered as /1/ (English), /a :/ (Arabic) and number ONE (1).Sort of such images have been in the human brain prior to identify any phoneme of a given language. Given evidences reported in this paper, traditional and modern linguists claim, 'phoneme' is single distinctive sound unit, can be challenged hence.

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