DELETIONS IN HINDI-WORD UTTERANCES - A PROCESS OF COGNITIVE PHONOLOGY

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Abstract

Despite being taught or known, second language learners of Hindi have tendency to develop inaccurate or accurate sound –pattern processing (SPP) in 'taught or 'learnt' words. Hardly do they recognize deletions in their word- utterances are caused by Cognitive Phonology (CP). The present study is an attempt to highlight and discuss 'deletions', a phonological process, recorded in 2400 utterances of 240 students of two- group G1(age range is 10-11) and G2 (age range 11-12) in selected ten Hindi words classified as 'known'. Objectives of the undertaken study are 1) to examine 'deletions' in individually recorded utterances and discuss whether such 'deletions' in given words are unconsciously processed. 2) To throw some evidences based on data for the researcher's claim that a language learner/user, in particular, disregards 'explicit phonology' but is concerned with Cognitive Phonology which is 'independently' developed by the learners of Hindi. Despite various phonologically processed error-patterns were noticed in utterances of Hindi mono/di/try words/, this paper focuses on CP impacted segmental deletion, a significant phonological process.

Key words: deletion, process, sound pattern, Hindi

1. INTRODUCTION

1.1 Hindi Language – An advancing Language in the World

Hindi, the official language of India is widely used as communicative language in and out of India. There are significant number of Hindi speakers in South Africa, Mauritius, Fiji, Suriname, Guyana, Trinidad & Tobago and Nepal, Meena (2015). According to 2011 Indian census report, 528 million people of aforesaid Indian states (43.7% of the population of India) are regarded as native Hindi speakers. Hind language is taught at early stage of schools located in India and abroad. Teaching –learning process in Hindi begins at the primary lever in one of southern Indian states of India, Kerala where the present study was carried out. Many schools in Kerala have recently adopted a curriculum that prescribes teaching Hindi to kindergarten going students (LKG and UKG divisions) with an objective to develop multi-lingual proficiency in the walkway of students' life in years to come and achieve goals of Kendriya Hindi Samiti and the Hindi Salahkar Samiti

1.2 Orthography

Orthography of Hindi is mainly in the Devanagari script. It differs from the orthography of Arabic. Both phonetic and phonological awareness of the language is incorporated in orthography of Hindi whereas orthography of Arabic depends on both phonological and lexical awareness (Pandey, 2014). On 14 September 1949, the Constituent Assembly of India adopted Hindi written in Devnagri script as the official language of the Republic of India (Choudhry, Khosla, Mehta, 2016).It is worth understanding that writing system of Hindi

language is often termed as alpha-syllabic. Alpha-syllabic is a combination of alphabetic and syllabic systems. Units of writing system represent vowels and consonants in *alphabetic* system(e.g., English). Writing system is syllabic, if units of orthography stand for a syllable (e.g., Korean).

1.3. Standard Version of Hindi

Modern Standard Hindi (MSH) is referred to as a Standard form of Hindiustani (Paul, 2005). Modern Standard Hindi is based on the Khariboli dialect,mostly spoken in northern India, which came to replace earlier prestige dialects such as Awadhi, Maithili (sometimes regarded as separate from the Hindi dialect continuum) and Braj. Modern Hindi and its literary tradition evolved towards the end of the 18th century (Kumari, 2021)

1.3.1. Phonological Sketch of Hindi Language

Some of works done on the Hindi language between 1950s and 1980s are Schoolberg (1955), Vajpeyi (1957), Tiwari (1961), Dixit (1963), Bhatia (1964) , and Kellog, (1965). S Mehrotra (1980) has given a comprehensive discription on syllabification while the former prioritized generative phonology. Kelkar (1968) had well attempted to provide a detailed description of the word phonology of 'Hirdu' or Hindi-Urdu. Srivastava (1979) primarily worked on the Hindi language and contributed to the 'generative phonology

1.3.2. Ten Vowels

There are ten vowels in Modern Standard Hindi as shown in the vowel chart. The vowel /æ / occurs only in in English Loans (Ohala, 1983).

Table1. Tongue position of Hindi Vowels

Height	Front		Central		Back	
	Short	Long	Short	Long	Short	Long
High	i /ɪ इ	i: ई			ʊ/u उ	u: ऊ
High-Mid	e ए	ɛ: ऐ	ə		o: ओ	ɔ: औ
Low			ɑ अ	ɑ: आ		
Diphthongs	ɑɪ		oʊ			

Vowel like /e:/, /ɛ:/, / o: / and /ɔ:/ are not usually articulated as shorter but longer one in MSH as they stand for 'a little length of sound' /i/ which can be described as short half close (high) front unrounded vowel while its long correspondent /i:/ as a long close front unrounded vowel. On the other hand, vowel phonemes such as /i/, /a/, and / ʊ/ have their longer counter parts; /i :/, /a:/, and / u:/ in as shown in Table 1

1.3.3. Consonants of Hindi Language

Table.2 Modified Chart of Consonant Phonemes of Standard Hindi

Table 2

Manner of Articulation		Place of Articulation								
		Bi -labaial	Labio-dental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Glottal
Stop	voiced	b bʰ ब भ		d dʰ द ध			ɖ ɖʰ ड ढ		g gʰ ग घ	
	voiceless	p pʰ प फ		t̪ t̪ʰ त थ			t tʰ ट ठ		k kʰ क ख	
Fricative	voiced				z ज़					
	voiceless		f फ़		s स	ʃ श	ʂ ष			ɦ ह
Nasal	voiced	m म			n ध		ɳ ण	ɲ ञ	ŋ ङ	
Affricate	voiced					dʒ dʒʰ ज झ				
	voiceless					tʃ tʃʰ च छ				
Lateral	voiced				l ल					
Tap	voiced				r र					
Glide	voiced		ʋ व						j य	

indicates Modern Standard Hindi (MSH)has five nasal sounds All stops of MSH have their aspirated counterparts like /p/- /pʰ/, /b/-/ bʰ/, /t̪/-/ t̪ʰ/,/d/-/ d̪ʰ,/ and / g/- gʰ/ .
Similarly affricates have aspirated versions like /dʒ/-/ dʒʰ/ and / tʃ/-/ tʃʰ/ . MSH is characterized by retroflex sounds which are articulated with 'curled tip of the tongue'.

1.3.2 Consonant Vowel (CV) Patterns

Hindi words can have any of the following type syllabic CV structures;

a)   CV   e.g.,   /ab /   'now'
b)   VC   e.g.,   /ʊ ʈʰ/ 'rise'
c)   VCV   e.g.,   / ʊ ʈʰo:/ 'get up' (order
d)   CVC   e.g.,   /bʰi:ɖ/ 'crowd'
e)   CCVC e.g.,   /pra:ɳ/   'life'
f)   CCVCC e.g., /pra:n ʈ/ 'province'

1.4. Phonology vs Cognitive Phonology (CP)

The Greek word φωνή ([fone], *sound*, or *voice*), pertains to the sounds of language. Phonology, unlike other components of linguistics, is not obvious. Every language has a system of featured phonology which is distinct and complex to define. The phonological knowledge and awareness underlies speech processing in a language. The term 'process' distinguishes the cognitive phonology from the structural phonologyBates, Bretherton, & Snyde (1990) , Moore (1973), MacNamara,(1972) and Piaget (1954) argue that a language is a subordinate part of cognitive development, dependent on the attainment of various concepts. These various concepts are explored by cognitive linguists providing increased research interests in cognitive phonology. These interests range from sub-disciplines of phonology like cognitive phonology, developmental phonology e.t.c

1.4.1. Phoneme

Phoneme is usually defined as a distinct unit to differentiate words. However it is argued phoneme is a 'mentally construct' image. See figure 1. As we are aware that phonology deals with selection and patterns of distribution sounds. Speech-phoneme in phonology is instrumental and cognitively plays a crucial role for the rest of phonological process. Phonemes are perceived mental images, have their shapes as specific images in the brain which are processed in sound forms (Shafeek, 2022). Courtenay (1972) pointed out phonemes were 'mental images of sounds that speakers systematically deformed in the ongoing process of speech. 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; reflection of by-product of an image- sensory- faculties in human brain in process- and lead to output. This can be illustrate as in Figure 1.

l   (L), (i), (1), (ⁱ)   /l/, /wʌn/,/ a: /

Phonetic Object ⟶ mental images ⟶ sensory action ⟶ reflections(phonemes)
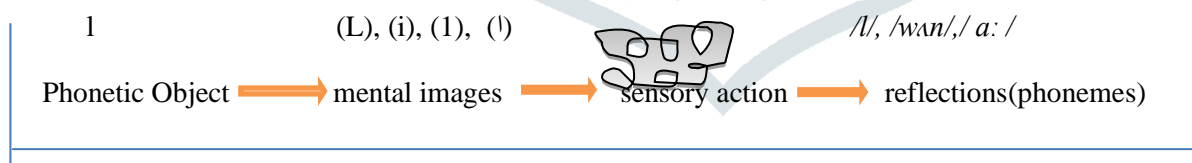
Figure 1. Mentally constructed images of 'l'

1.4.2. Deletion of a Segment- Cognitively Processed

  Deletion, a significant cognitive process, is of three types;

Type 1: Apheresis- A process of un-pronouncing an initial segment of a word i.e., the first segment of a word goes deleted in sound pattern processing .
   e.g. 'psyche' > /saiki / = /p/ is unpronounced.

  Type 2: Syncope – A process of un-pronouncing a medial segment in a word- utterance
    i.e, non-initial and non-final segment goes unpronounced.
   e.g. 'subtle' > /sʌt.l / = /b/ is unpronounced

Type 3: Apocope- A process of un-pronouncing the final segment in the stream of a word- utterance.

    e.g., 'tomb' > tu:m = /b/ is elided

2.   METHODOLOGY

The data basis for the undertaken study is 2400 word- utterances of 240 students of two aged groups classified as Group1/G1 in learnt Hindi. The age range of G1(hereafter G1) is between 10 and 11year-old and of group2(G2) is between 11 and 12.The term 'known words' is considered in the sense the speakers have been taught about them or they have 'seen' or heard their teacher say in their Hindi language teaching - learning process. Students involved in the study were chosen randomly from 6 CBSE syllabus run schools located in Malappuram district of Kerala state. Participants began learning Hindi as L2 from primary stage. The ratio of boys and girls in both G1 and G2 is 1:1. Each of the participant was personally interviewed either in physical or virtual mode or virtually and presented a sheet which consisted 'printed 10 Hindi known words. He/she was required to pattern sounds only once in the given words. Word-utterances were recorded using 'researcher's smartphone. Recordings were systematically examined and interpreted phonetically to generate 'qualitative data'. Formula in MS excel is used to generate percentage distribution of three types of deletion: deletion of initial segment, of final and of non- initial and non- final segment. A discussion is being made on SPP-resulted in changes.

3. Hindi Word Utterances of G1 and G2

.The following type words,classified as known Hindi words, were presented to G1 and G2.

Table 3. List of Articulated Hindi Words

Sl	Words	CV Pattern	Gloss
1	मटका [maʈʰ.ka]	CVC-CV	*'pitcher'*
2	नुकसान [nʊk.sa:n]	CVC-CVC	*'loss'*
3	साहस [sa:. ɦas]	CV-CVC	*'courage'*
4	मेंढक [mɛ:ñ.dʱak]	CVC-CVC	*'frog'*
5	गाना [ga:na]	CV-CV	*'song'*
6	आज़ादी [a:za: ɖi]	VCV-CV	*'freedom'*
7	झोपड़ी [dʒʱ o:paɖi]	CV-CCV	*'hut'*
8	अचरज [a tʃ.radʒ]	VC-VCC	*'surprise'*
9	भीड़ [bʱi:ɖ]	CVC	*'crowd'*
10	गुजरना [gu.dʒar.na:]	CV.CVC.CV	*'to pass on'*

Participants involved are required to utter words shown in Table 3 separately and individually It was observed participants have exhibited deviated/segment deleted as well as appropriate sounds distributions.

3.1. RESULT

G1 and G2 have caused various changes to segments during utterances of Hindi words. These primarily include deletions (apheresis, syncope, and apocope), insertions of a segment, transposition of a segment, substitution of a segment and alternation of a segment We shall not discuss all types of process resulted –in due to SPP in given known Hindi words (listed above).

All deletions were presented under 'derived processes'. A ' **.**' is used to indicate syllable boundary in the phonetically transcribed texts. A '**-**' 'under segmental change' stands for a segment of the word that remains unchanged. Notice that '-' is used to show segmental sequence of a derived process. For instance the first word [mat^h.ka:] is a di syllabic (syllable boundary is marked with a '.'), and consists of five segments. Thus we five unchanged '-' under 'segmental change'. A 'Ø' stands for a deleted segment of the derived processes.

3.1.1. Syncope in मटका [mat^h.ka:]

	Derived processes	Syllable structure	Segmental change
(a)	[mat^h.ka:]	CVC.VC	- - - . - - - . .
(b)	[ma.t^ha:]	CV.CV.	- - . – Ø- .

Two processes were derived due to SPP in the Hindi word 'मटका' [mat^h..ka:]. Voiceless velar plosive sound /k/ is elided in the stream of the represented word utterance shown as 1 (b). It is thus syncope. 1(a) is an appropriate SPP made in the word' मटका' of certain speakers in the given word.

3.1.2. Deletion and Vowel Alteration in 'साहस' [sa:. ɦas]

Participants have made following alternation and deletion as SPP output

	Derived processes	Syllable structure	Segmental change
a.	[sa:. ɦas]	CV.CVC	- - . - - - .
b.	[sa:. ɦʊs]	CV.CVC	- - . - ʊ - .
c.	[sa:. ɦis]	CV.CVC	- - . - i - .
d.	[sa:. ɦs]	CV.CVC	- - . - Ø - .

 Vowel alternations in 3 (b) and (c) and deletion of vowel segment in 3(d) were resulted –in changes due to SPP in the word notified in 3. A number of G1 and G2 speakers have altered the vowel /a/ to the back-rounded vowel /ʊ/ or front high unrounded vowel /i/. Appropriate sound patterning   of numerous speakers was too evident in the given word.

3.1.3. Synocpe in 'मेंढक' [mɛːñ.ɖ^{ɦ}ak]

	Derived processes	Syllable structure	Segmental change
a.	[mɛːñ.ɖ^{ɦ}ak]	CVC.CVC	- - - . - - - - . .
b.	[miː.ɖ^{ɦ}ak]	CVV.CVC	- i Ø. - - -.
c.	[mɛː.ɖ^{ɦ}ak]	CV.CVC	- - Ø. - - - .

Notice the second vowel /ɛː/ is altered to /iː/, the high- front- long vowel, before deleting the medial segment [ñ] in the stream of sounds distributions. However, in 4(c), process of deletion of the same segment was resulted without any change on its preceding ore following vowel. 4(c) is purely syncope while 4(b) syncope incorporated as it has vowel alternation. 3 (a) is an accurate SPP in the word given in 3.

3.1.4. Initial and internal Deletion in झोपड़ी [dʒʱ oːpaɖi]

	Derived processes	Syllable structure	Segmental change
(a)	[dʒʱoː.pa.ɖi]	CV. CV.CV	- -. - -. - -.
(b)	[dʒʱoː.pɖi]	CV. CCV	- -. - - Ø -.
(c)	[dʒʱoː.mɖi]	CV. CCV	- - . m Ø - - .
(d)	[dʒʱe.pɖi]	CV. CCV	- eː. - Ø. - -. .
(e)	[eːpaɖi]	CV. CCV	Ø eː: - -. - -.
(f)	[iːpaɖi]	CV. CCV	Ø iː: - -. - -.

Changes to segments except [ɖ], the penultimate segment, of the word due to SPP of G1 and G2 include; apheresis plus vowel alternation 4(d), (e) and (f), substitution plus syncope as indicated in 4 (c), and deletion of internal vowel phoneme as shown in 4 (b) .Both apheresis (deletion of an initial sound of a word) and alternation of vowel [oː] to [eː] or [iː] as shown in 6(f) were SPP resulted-in changes. Accurate phonological pattern like 4(a) in the given word was too resulted among speakers.

3.1 5. Apheresis and Apocope in tri-syllabic गुजरना [gu.dʒar.naː]

This is the only tri syllabic- known Hindi word which was presented for SPP. Two type of deletion processes were evident among G1 and G2 speakers' in the word -utterances.. 1)apheresis, a deletion of initial segment of the word and 2) apocope, a deletion of final segment i.e.,[a]. Following are deletion type of phonological processes.

	Derived processes	Syllable structure	Segmental change
(a)	[gu.dʒar.naː].	CV.CVC.CV	- -. - - - -. - -.
(b)	[gudʒ.raːn].	CVC.CVC	- - dʒ. r aː - Ø.
(c)	[u.dʒar.naː].	CV.CVC.CV	Ø.-. - - - -. - -.

Notice apocope in the word utterances as shown in 5 (b) was resulted due to SPP. However, partial metathesis, transposition of segments (e.g., /..ar../> /...ar…/ was processed first before deleting [a], the final segment of the word. 5 (c) is apocope where some speakers did not articulate [g], voiced-velar-stop

3.2. Impacts of Cognitive Phonology
The following diagram shows a number of CP affected-deletions that were exhibited in utterances of G1 girls and boys

Deletions in G1

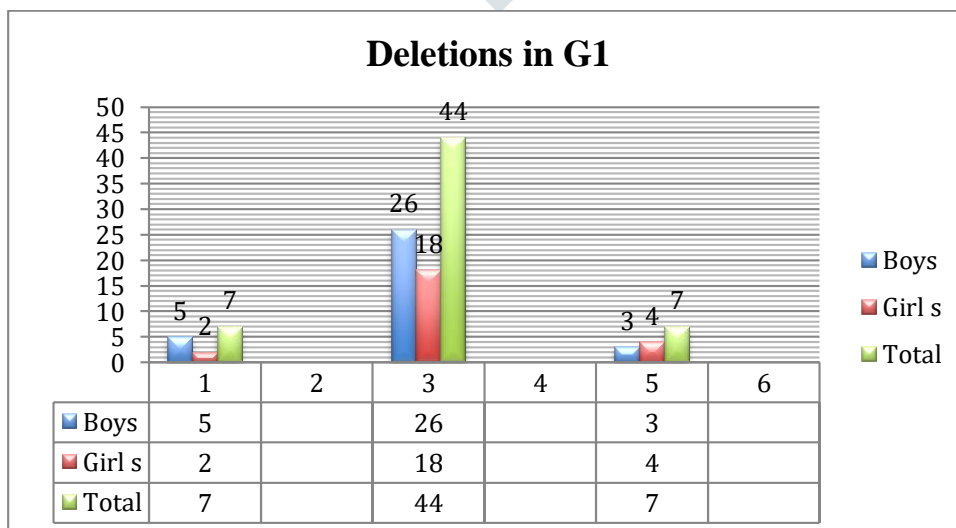|	1	2	3	4	5	6
Boys	5		26		3	
Girl s	2		18		4	
Total	7		44		7	

Figure 2. SPP resulted-in deletion of G1 in known Hindi words

Figures 2 shows CP- affected deletions that were noticed in word utterances of group 1. The highest number of deletions in G1 was the second type, i.e., syncope (44). Of 44 syncope processes, twenty-six boys of G1 had not articulated a medial segment in their SPP whereas eighteen girls of the same group had deleted a medial segment of either of presented 10 word. Apheresis, the first type of deletion and apocope, the third type deletions were minimal and equal in both G1 and G2 (7 each).

3.3. CP Prompted Deletions of G2

The following diagram shows a number of CP affected-deletions of G2 girls and boys in 1200 utterances after SPP.

Deletions in G2

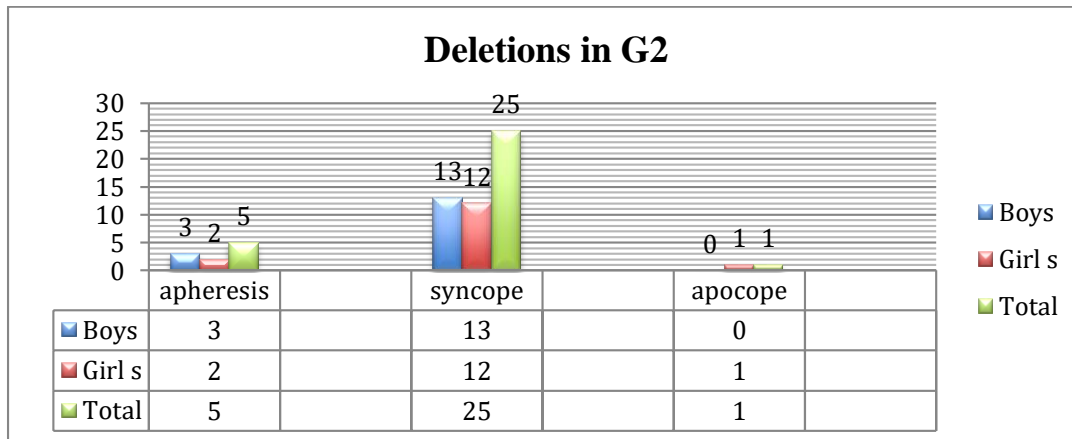|	apheresis	syncope	apocope
Boys	3	13	0
Girl s	2	12	1
Total	5	25	1

Figure 3 SPP resulted-in deletion of G2 in known Hindi words

The above illustration is CP - affected deletions that are evident in group2 (G2). Like G1, the highest number of deletions in G2 were too the second type, i.e., syncope (44). Apocope was the lowest type of deletions that were evident in G2 (only 1). Of 25 syncope-processed utterances, boys and girls were proportional (B:G-13:12) in un-pronouncing a medial segment in their SPP. No apocope was evident in utterances of G2 boys.

3.3 Three Type Segmental Deletions in G1 and G2

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Deletion in unknown Hindi word: G1 vs.G2

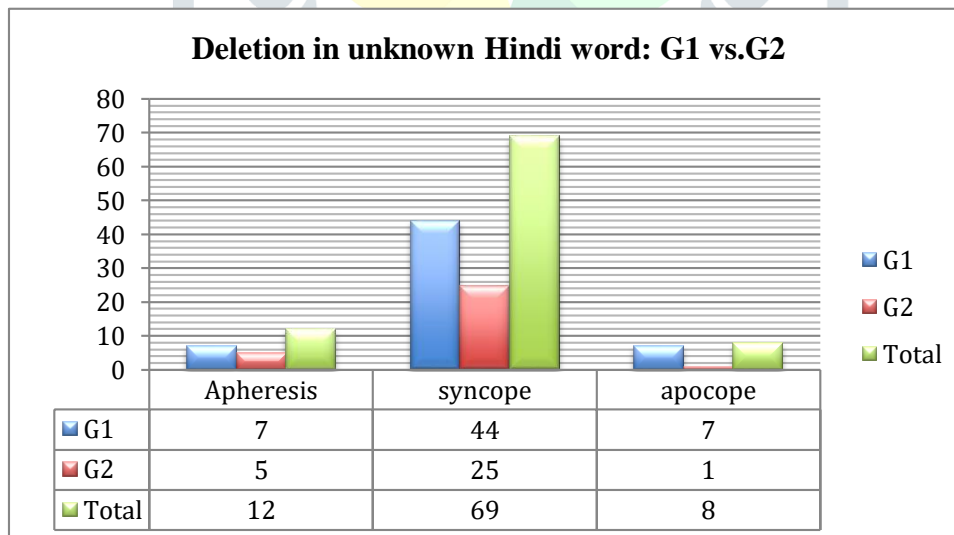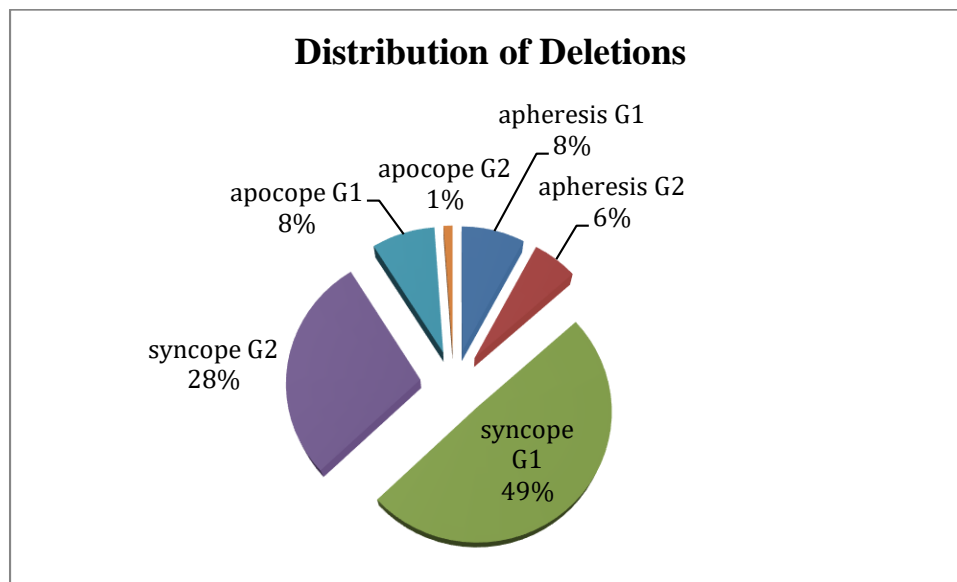|	Apheresis	syncope	apocope
G1	7	44	7
G2	5	25	1
Total	12	69	8

Figure 4. Counts of 3 type deletions noticed in G1 and G2 utterances

3.4 Utterances of G1 and G2- A Comparison

An illustration of percentage CP impacted deletion that were found in 2400 speech utterances is shown in Figure 5.

Distribution of Deletions

Figure 5 illustration of percentage distribution SPP impacted deletions G1 vs. G2 (Total 89 Deletion)

The above is an illustration of cross sectional comparison of three type deletions that were resulted significant phonological processes caused by G1and G2 is presented in table 4.4. Girls have shown of 'higher CP driven outputs. Type 2 deletions – syncope is the highest (49%) in group 1. In G2 SPP resulted-in is 28%. Both, apheresis-deletion of initial segment, and apocope- deletion of final segment of word were 8% in 120 of students (age range 10-11) whereas apocope and apheresis in G2 is 1% and 6% respectively in G2 (120 students of aged between 11-12).

4. CONCLUSION

Cognitive Phonology (CP)-driven deletions ;apheresis, syncope and apocope, of G1 and G2 in ten Hindi classified words known' have been found. Knowledge of phonetic and phonemic awareness of known words did not generate error free or appropriate phonological patterns A number of processes deleting of initial segment (apheresis) and final segment (apocope) were always processed in known Hindi word utterances. Given such evidence of CP affected deletions, it is claimed that inappropriate and inaccurate sound pattern in learnt Hindi words is due to cognitive phonology, a phonology the learner has independently developed with. The relationship between perception-productions of segment is characterized by human awareness of cognitive phonolgy. The participated L2 learner/users of Hindi, being in possession of independent phonology in particular, disregards 'explicit phonology' and resort to the workings of phonology of his/her second language (implicit phonology) resulting deletions

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