Syllable Onset Clusters and Phonotactics in Pahari

Abdul Qadir Khan, Ph.D. Student, Naveed Sarwar, M.Phil. Student and Nadeem Haider Bukhari, Ph.D.

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Abstract

Pahari is one of the ancient most languages of South Asia. It belongs to Indo-Aryan family of languages. Pahari is spoken over a vast region stretching from Nepal and running through lower Himalayas, in the Himachal Pradesh, and also in the Pakistan and India administered parts of Kashmir. It is a neglected language that has neither a written grammar nor a compiled dictionary. This paper is an effort to look into the possible consonant clusters in onset position of syllable and also to identify syllable onset phonotactics in Pahari.

The study shows that two consonants (C1, C2) occupy onset position.C1 is always

[- sonorant] while C2 can be / l, r, ɽ, j /.The study also explains that C1 and C2 satisfy Sonority Sequencing Principle (SSP) and exhibit a trend of increase from C1 to C2 by at least two degrees. The study further illustrates some onset phonotactics in Pahari.

Introduction

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One of the major goals of generative phonologists is to find out the universal principles and a structure to all languages.It is generally accepted that all languages have at least some kind of syllable structure. Different languages have different constraints on the way segments are combined to form syllables. The initial consonants of the syllables are known as Onset. The vowel is the Peak and the closing consonants form the Coda. Coda and peak form one unit called the Rhyme

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 The following diagram shows these constituents:

```
                        Syllable
                      /          \
              Onset              Rhyme
                               /        \
                           Peak          Coda
```
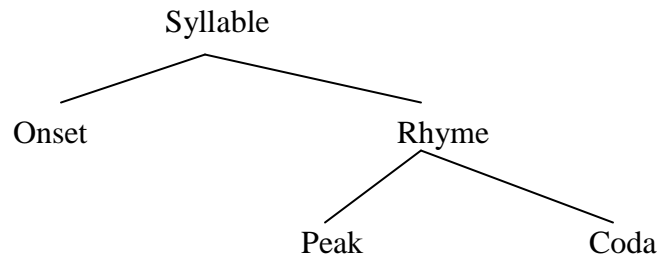
Figure 1

According to Blovin (1995), the lowest degree of complexity in syllable structure is represented by language that has a single (short) vowel in the peak and optionally allows maximally one consonant in the onset. The syllable structure of such a language is (C) V. In some languages, like Maba and Arabela ,onset may be obligatory CV and Onset may be complex. Some languages allow only one consonant in the onset, like Finnish and Havaiian while others allow two or more , such as English and Spanish .

Maddison (2005) has divided languages according to their syllable structure into three categories: simple, moderate complex and complex.

Simple

    (C) V   Fijian , Yareba
     CV   Maba

Moderate Complex

     CVC

     (C) (C2) V   C2 = liquids/glides

     (C) (C2) V (C)   C2= w Darai (Indo-Aryan)

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Complex

   (C) (C) (C) V (C) (C) (C)   English

It is generally accepted that SOV languages have simple syllable structure.

Section two of the paper discusses the relevant aspects of two approaches to consonant clusters namely, Sonority Sequencing Principle (SSP) and CVX theory. In section three, the background of Pahari language and its possible onset clusters have been analyzed. Section four explains the syllable onset phonotactics in Pahari. Section five   concludes the whole discussion.

Approaches to Onset Clusters

Sonority Sequencing Principle (SSP)

Classical approaches to possible and impossible consonant clusters have made reference to sonority hierarchy and the degree to which the consonants in the clusters must differ in sonority (Kenstowhich,1994,Rocca Johnson ,1999).Gold Smith (1994) reports that in the analysis of English cluster ,there are four degrees of sonority and onset clusters must rise in sonority from the first to the second consonant by at least two degrees in the hierarchy. This restriction in English is called " Minimal Sonority Distance" (MSD …..)

Sonority Scale in English

Sounds	Sonority Scale
Glides	4
Liquids	3
Nasals	2
Obstruents	1

Duanmu (2002) criticizes the sonority based analysis of possible and impossible consonant sequences. In English some clusters such as /tl/ /fw/ satisfy MSD (of two degrees) but they are not found in the inventory of language. Other clusters such as / st/ and /sn/ violate MSD but are found in the inventory .These inconsistencies lead linguists to add two more assumptions to sonority based analysis), that is , i) two sounds in a cluster must not have the same place of articulation, and ii) initial /s/ must be added to English as an Appendix.

CVX Theory

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Daunmu (2002) presented CVX theory and made an interesting claim that onsets in English and Chinese are limited to a single slot rather than a sequence of sounds governed by sonority. The primary criterion that determines what a single segment can be is the No Contour Principle given in Figure 2

No Contour Principle

N

[a F]   [-a F]   N = any node

a = any value (i.e. + or -)

F= any feature
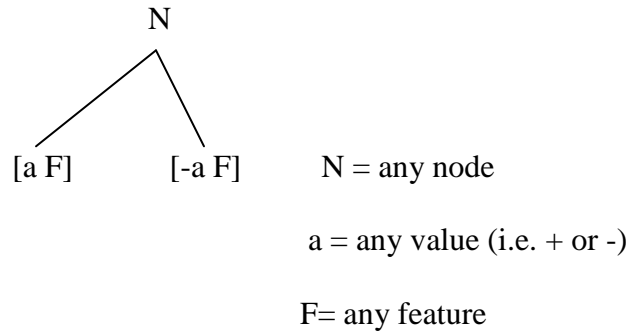
Figure 2

The feature geometry assumed by Daunmu (2002) is given in   Figure 3 (ref. Clements 1985, Sagey 1986, Kenstowich 1994).This feature geometry is based on articulation based feature theory.

Articulation based feature geometry

Root

Stricture   Vocal Cords   Velum   Place

[±Son]   [±Cont] [±Asp] [±Voiced]   [±Nasal]   labial Coronol   Dorsol

[±round] [±lateral] ±high ±low ±back

Figure 3

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Marto (2005) applied CVX theory on three languages , namely; Spokane Salish, Bella Coola ,and Sipakapense, but there were complications for the CVX theory with respect to the Sipakanese data, which seem to allow up to two segments in onset position .The Bella Coola data also did not support this theory and it supports two slot onsets analysis with constraints on sonority. Marto (2005) states that it is unclear if there is a universal syllable structure as proposed by Daunmu (2002).

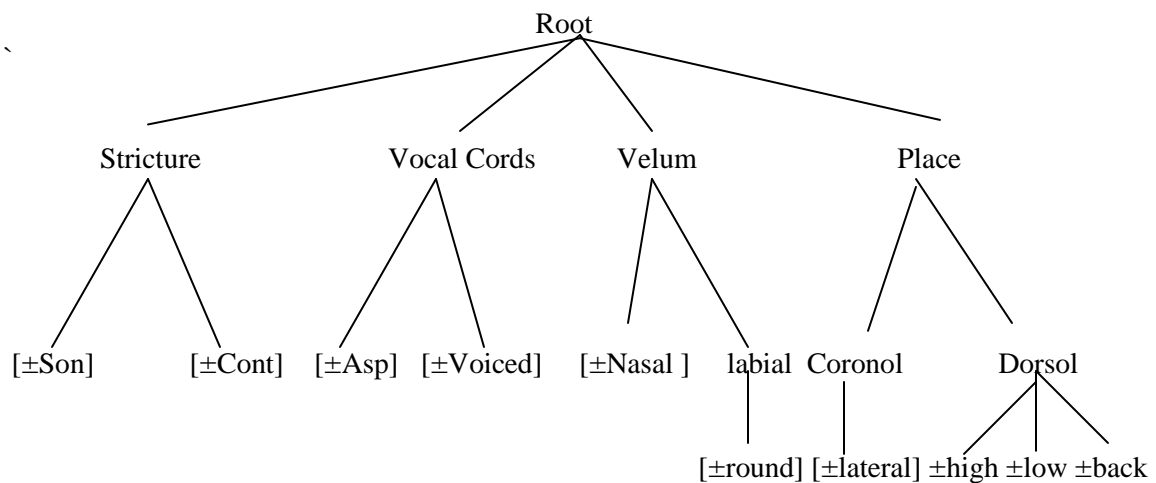This paper analyses onset clusters in Pahari in the SSP frame work.

Sonority Scale (Old Version)

Oral Stops		Fricatives		Nasals	Liquids	Glides		Vowels	
Voiceless	voiced	voiceless	voiced					high	low
P	b	f	v	m				i	a
t	d			n					
k	g	s	z	ŋ	l	r	j w	u	ae

Sonority

Table 1

± Sonority Scale (feature based version)

`

    [- sonorant]   [+ sonorant]

        [- continuant]   [+continuant]

          [+lateral]   [-lateral]

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```
                                    /\
                                   /  \
                                  /    \
                                 /      \
                   [+consonantal]        [-consonantal]

                                              [+high][-high]


/p,b,f,v,…../          /m , n , ŋ /    /l/            /r/              j w i u   a

                Sonority
```

Figure 4

Pahari Language

Pahari belongs to the Indo-Aryan branch of Indo-European languages. It is further divided into three main groups known as Eastern Pahari being spoken in Nepal, Cenral Pahari being spoken in Gharhwal and Dardoon area and western Pahari being spoken in Himachal Pradesh, and in the Pakistan and India administered Kashmir regions and Murree Hills.

Western Pahari consists of a great number of dialects varying from hill to hill (Grierson 1917).The focus of this study is the dialect of Pahari spoken in Poonch belt of the Kashmir region in Pakistan.

Little work has been done so far to explore this dialect of Pahari language. Therefore, many of its phonological ,morphological and syntactic structures are yet to be studied.

Syllable structure of Pahari

The basic syllable structure in Pahari language is (C1) (C2) V (V) (C3)(C4).The onset is optional in Pahari and can have two consonants, The rhyme minimally contains a monophthongal vowel or a diphthong. At coda position C3 and C4 are always optional.

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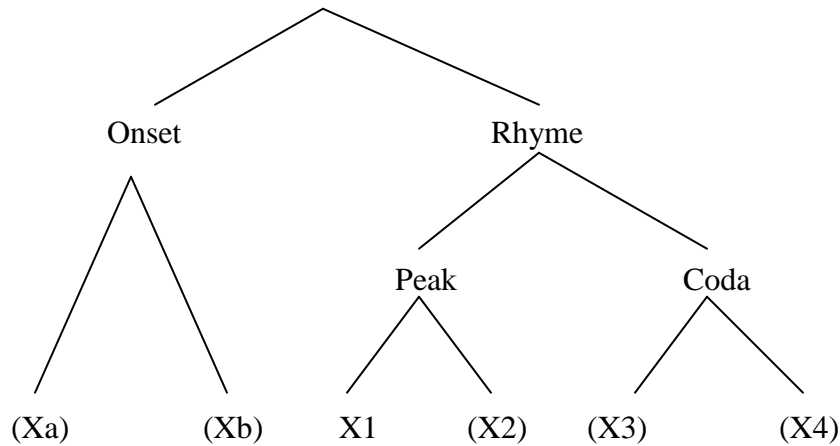Syllable Onset Clusters and Phonotactics in Pahari

Syllable

Figure 5

This study is restricted to onset cluster and addresses the following research questions.

Research Questions

- What are the possible onset clusters in Pahari language?
- What are the syllables onset phonotactics in Pahari?

Results and Discussion

The following table shows all possible two consonant clusters C1C2, with C1 shown along the vertical axis and C2 along horizontal axis. Examples of C1C2 consonant clusters are given in front of them. -

	m	n	ŋ	l	r	ɽ	w	j	Examples
p				+	+	+		+	ploknã, prun, pɽosi,pjar
b				+		+		+	blornã , bɽẽ,bja
Pʰ				+				+	Pʰlornã , Pʰju
f									
v									
ʈ					+			+	ʈraɽ , ʈjar
ɖ					+			+	ɖrati , ɖjar
ʈʰ									

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s		+	+	slata, sropʊɽ,
z				
t				
ɖ				
tʰ				
ʃ				
tʃ	+			tʃlungnã
dʒ	+			dʒ lav
tʃʰ				
K		+	+	+	kloi, kropnã ,kɽƏm,
g			+	+	grã, gɽang,
kʰ		+	+	+	kʰlær, kʰrosnã,kʰɽƏk k
x				
ɣ				
h				

Table 2

The data in the above table shows that at the most there can be two consonants (C1C2) in onset position in Pahari. Let us first address the role of SSP (Sonority Sequencing Principle) in the construction of Pahari Onset clusters. The phonotactics will be discussed subsequently in the second half of this section.

SSP and Onset Clusters

It is clear from the above table that onsets conform to SSP as the [- sonorant] sounds are listed along vertical axis and take C1 position while on horizontal axis [+sonorant] sounds are listed and they can take C2 position. The plus signs (+) appear under columns headed by the more sonorous sounds while in rows headed by less sonorous obstruents.The data shows that the C1C2 consonant cluster occupying the onset tend to be chosen from opposite axis of the sonority scale .Like English,MSD in Pahari also rises from first(C1) to second consonant (C2) by at least two degrees in hierarchy.
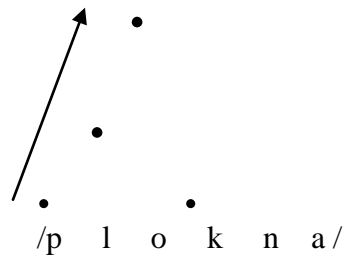
 e.g   Plokna

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/p l o k n a /

Figure 6a
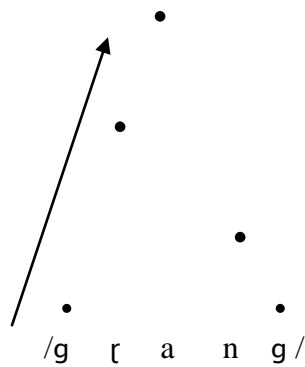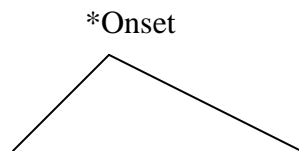
b).   gɽang

/g ɽ a n g /

Figure 6b

As adjacent consonants in onset differ by two degrees of sonority, it shows that onset can have maximum two X-position and even consonants that satisfy SSP rising sonority condition in onset like /tl/,/tr/ are systematically not the part of its syllable inventory.. This leads us to address the second research question.

Phonotactics in Onset clusters

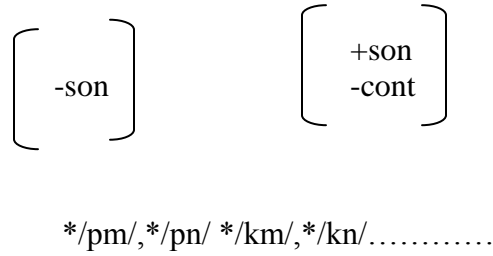In Pahari / m.n. ŋ / are not permitted after [-sonorants].

*Onset

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$$\begin{bmatrix} \text{-son} \end{bmatrix} \qquad \begin{bmatrix} \text{+son} \\ \text{-cont} \end{bmatrix}$$

/pm/,/pn/ */km/,*/kn/…………

Figure 7

/ ɽ /, a retroflex flap is frequently used after stops but is not permitted after fricatives.

*Onset

$$\begin{bmatrix} \text{-son} \\ \text{+cont} \end{bmatrix} \qquad \begin{bmatrix} \text{+ son} \\ \text{+cont} \\ \text{+corn} \\ \text{-ant} \\ \text{-lateral} \end{bmatrix}$$

/fɽ/,/sɽ/, */xɽ/……………….
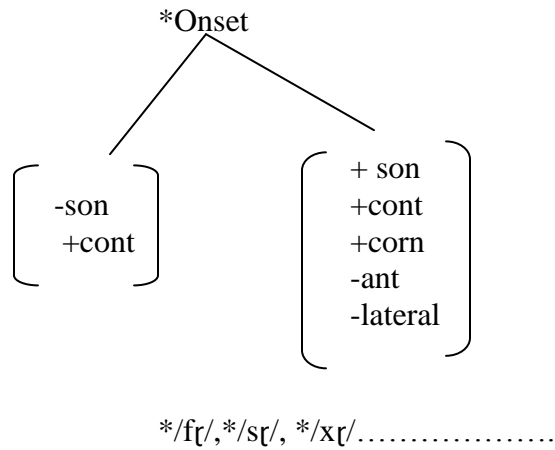
 Figure 8

Lateral /l/ is not permitted after dental stops / t̪, d̪, t̪ʰ /

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*Onset

.

```
┌          ┐        ┌          ┐
│ -son     │        │          │
│ +coronal │        │ +lateral │
│ +anterior│        │          │
│ +cont    │        │          │
└          ┘        └          ┘
```

*/ʈl/,   */ɖl/, */ ʈʰl/
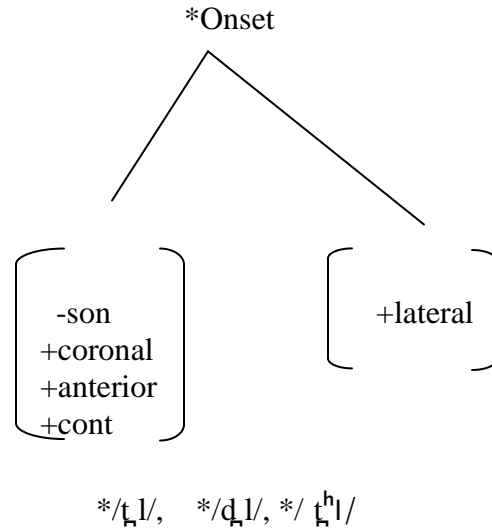
Figure 9

Lateral /l/ is not allowed after retroflex stops / ʈ, ɖ, ʈʰ/

*Onset

.

```
┌          ┐        ┌          ┐
│ -son     │        │          │
│ +cont    │        │ +lateral │
│ +coronal │        │          │
│ -anterior│        │          │
└          ┘        └          ┘
```

*/ ʈl/, */ɖl/,*/ ʈʰl/
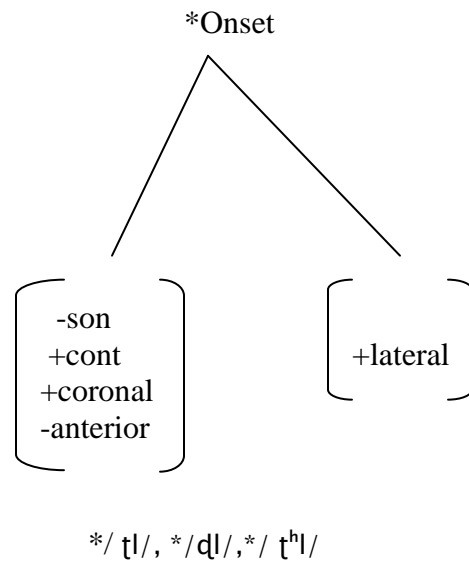
Figure 10

[+sonorant].sounds are not allowed after voiced alveolar fricative

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*Onset

```
        -son
        +cont
        +coronal
        +anterior
        +voiced          +son
```
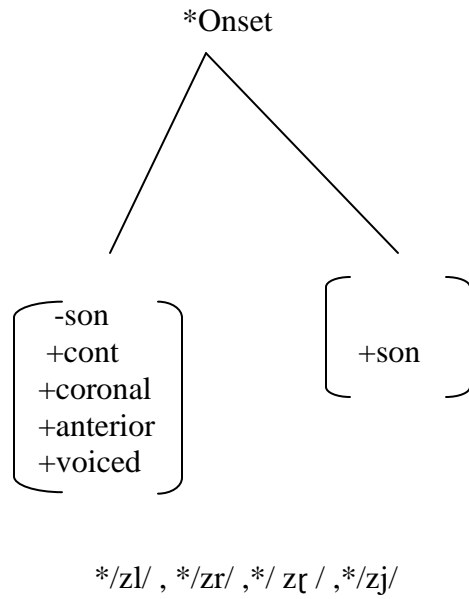
*/zl/ , */zr/ ,*/ zɽ / ,*/zj/

Figure 11

[+sonorant].sounds are not permitted after labiodental fricatives

*Onset

```
        -son
        +cont
        +coronal
        +anterior
        -strident        +son
```

*/fl/, */fr/ , */fɽ/ ,*/ʋl/ , */ʋr/ , */ʋɽ/

Figure 12

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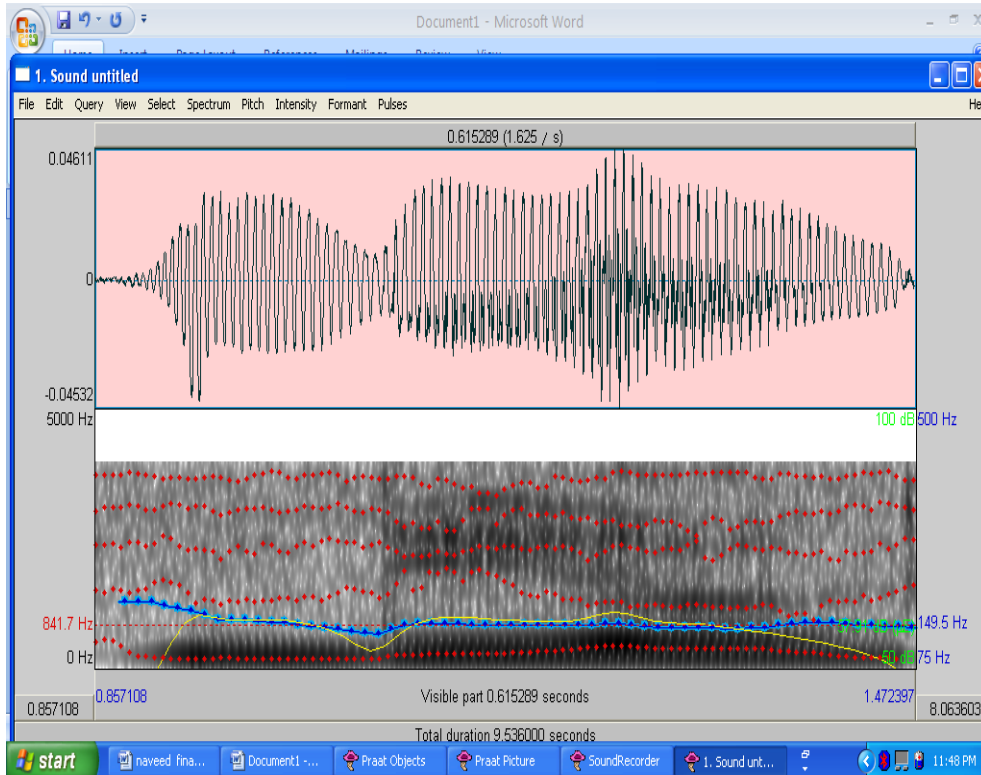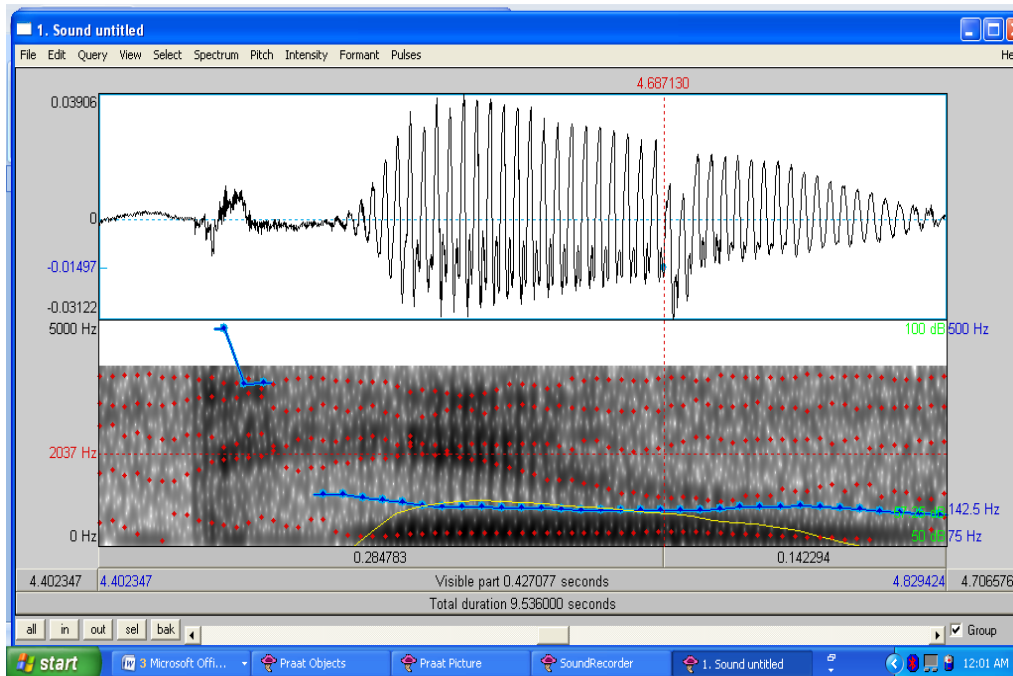Syllable Onset Clusters and Phonotactics in Pahari

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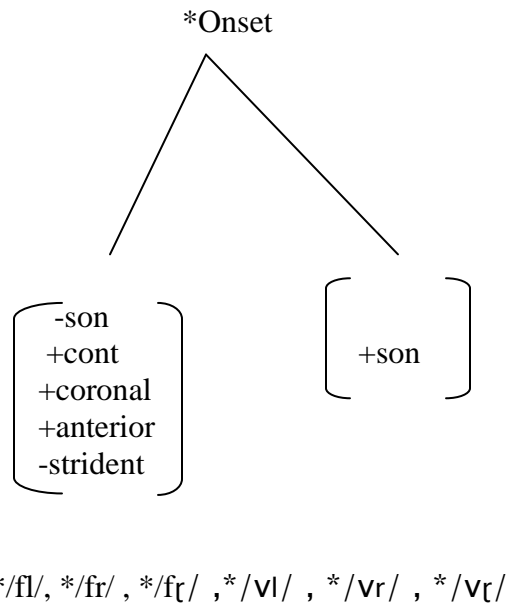
Palatal glide /j/ allows onset clusters with only bilabial and dental stops. Five speakers were given words where C2 was /j/ and they were recorded by using microphone with the help of PRAAT software. Spectrograms clearly show that /j/ allows onset clusters only with bilabial and dental stops.

Spectogram of / ɖjar /

The above spectrogram shows that after the burst of dental voiced stop / ɖ/,there is clearly seen a big gap between FI and F2 of and a small gap between F2 and F3.These are the cues of palatal glide /j/.C2 is /j/.

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Spectogram of / Pʰju/

The above spectrogram also shows the acoustic cues of /j/.

Conclusion

It is generally claimed that Indo-Aryan languages do not allow consonant clusters in the onset position of a syllable. However, this study proves that Pahari, an Indo-Aryan language, allows two consonants (C1 ,C2) at the onset and there can be maximum two x-positions in the onset .C1 at onset is always a [-sonorant] while C2 can be / l,r,ɽ ,j/. In addition to this there are some constraints on the combinations of C1 and C2 in onset .This study also shows that C1C2 consonant cluster satisfies SSP and sonority increases from the first (C1) to the second consonant (C2) by at least two degrees of sonority. A detailed study needs to be undertaken in order to further explore different constituents of a syllable in Pahari language.

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References

Akram, B. (2002). Analysis of Urdu Syllabification Using Maximal Onset Principle and

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Sonority Sequence Principle. In Center for Research in Urdu Language Processing.Vol:160-66.

Baart, Joan L.G. (1997). The Sounds and Tones of Kalam Kohistani.National Institute of Pakistan Studies, and Summer Institute of Linguistics, Islamabad.

Bokhari, S. (1985). *Phonology of Urdu Language*. Karachi: Royal Book Company.

Clark &Yallop, C. (1992). *An Introduction to Phonetics and Phonolog*y. Blackwell Publishers, Oxford, UK.

Comric, B. 1990. *The major languages of South Asia, The Middle Eash and Africa*; London: Routledge. (26)

Davenport,M.& Hannahs,S.J.(2005).*Introducing Phonetics and Phonology*. London:Hodder Arnold.

Grierson,George A. (1917). *The Indo-Aryan Languages*. BSOS: 247-81.

Gussenhoven, C. & Jacobs. (1998). *Understanding Phonology*. London

Hussain, Sarmad, 1997. "Phonetic correlates of lexical stress in Urdu". Northwestern University, Illinois.

Kenstowicz, M. 1994. *Phonology in Generative Grammar*; Cambridge: Backwell Publishers.

Masica, C.P. (1991). *The Indo-Aryan Languages*.Cambridge: CUP

McMahon, A. (2002). *An Introduction to English Phonology*. Edinburgh: Edinburgh University Press Limited.

Nazar, M.N. (2002). Syllable Templates in Urdu Language. *In Center for Research in Urdu Language Processing*.Vol.1.PP 189-194

Rehman, A.Khawaja & Baart L.G. (2002). The Language of the Qurashis of Kundal Shahi in Azad Kashmir. In Joan L.G.Baart (ed.): Pakistani Languages and Society. Islamabad: National Institute of Pakistan Studies and Summer Institute of Linguistics.Pp 1-20.

Roach, P. (1991). *English Phonetics and Phonology*. Cambridge: University Press Cambridge.

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