Chapter – 3

3. The Consonant Clusters

A consonant cluster is defined as a group or sequence of consonants that appear together in a syllable without a vowel between them (instrasyllabic). (cf. eg, Jones 1976). For example, /sp/ and /ts/ in the word ‘spots’ or /spr/ in the word ‘spring’.

3.1 The Consonant Clusters in English

So as to give a complete picture of initial (onset) and final (coda) clusters in English, the following sources have been compared: Heinz J. Giegerich (1992) who analyses consonant clusters in terms of generative phonology, Peter Roach (2002) whose analysis of possible phoneme combinations is based on more traditional structural approach, San Duanmu (2009) who supplements Giegerich’s and Roach’s descriptions of the phonotactic possibilities of English with the aspects of Optimality Theory and gives the reliable statistical data, and one internet source (http://www.btml) which offers the practical list of some consonant clusters in English.

The word, i.e. the syllable in English can begin with a vowel, with one, two or three consonants. No word in English begins with
more than three consonants (roach 2002 : 71), thus the maximum number of segments in the word-initial consonant cluster is three.

At the beginning of English words (syllables), in many cases, the first element is /s/ and the second consonant is approximant /l, r, w, j/ (cf. Roach 2002 : 73 ; Duanmu 2009 : 160).

3.1.1 Initial CC Clusters in English:

**Starting with oral plosive** /p/ as first member followed by /r, l, j, w, f, s/ as second members.

<table>
<thead>
<tr>
<th>Initial</th>
<th>Second</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>pr</td>
<td>prei</td>
<td>pray, prey</td>
</tr>
<tr>
<td>pl</td>
<td>plei</td>
<td>play</td>
</tr>
<tr>
<td>pj</td>
<td>pjʊər</td>
<td>pure</td>
</tr>
<tr>
<td>pw</td>
<td>pweblə</td>
<td></td>
</tr>
<tr>
<td>pf</td>
<td>pfennig</td>
<td>pfnig</td>
</tr>
<tr>
<td>ps</td>
<td>psi</td>
<td>psai</td>
</tr>
</tbody>
</table>
Starting with oral plosive /b/ as first member followed by /r, l, j/ as second members.

- br - bræ:s, bred = brass, bread
- bl - blʌd, blok = blood, block
- bj - bju:ti = beauty

Starting with oral plosive /t/ as first member followed by / r, w, j / as second members.

- tr - trail, treid = trail, trade
- tw - twin, twais = twin, twice
- tj - tju:n, tju:te = tune, tutor

Starting with oral plosive /d/ as first member followed by / r, j, w/ as second members.

- dr - draːft, drill = draft, dril
- dj - djuː, djuːti = due/dew, duty
- dw - dwel, dwindle = dwell, dwindle

Starting with oral plosive /k/ as first member followed by / r, l, w, j, n, v/ as second members.

- kr - kros, krai = cross, cry
- kl - kleim, klaːs = claim, class
- kw - kwæk = quack
kj - kjuːpid, kjʊər = cupid, cure
kn - kneset = Knesset
kv - kvaːs (kvæs), kvɛtʃ = kvas, kvetch

Starting with oral plosive /ɡ/ as first member followed by /r, l, w/ as second members.

gr - graːs, grænt = grass grant
gl - glæd, glɑːs = glade, glass
gw - gwen, gwenda = Gwen, Gwenda

Starting with nasal plosive /n/ as first member followed by /j, j/ as second members.

nj - njuː, njuːz = new, news
mj - mjuː, mjuːt = mew, mute

Starting with fricative /f/ as first member followed by /l, r, j/ as second members.

fl - flæt, fləː = flat, flaw
fr - freʃ, friːz = fresh, freez
fj - fjuː, fjʊərɪ = few, fury
Starting with fricative /v/ as first member followed by / j / as second member.

\[
\begin{align*}
\text{vj} & - & \text{vju:, vjetnæm} & = & \text{view, vietnam} \\
\end{align*}
\]

Starting with fricative /θ/ as first member followed by / r, w, j / as second members.

\[
\begin{align*}
\text{θr} & - & \text{θri:, θril} & = & \text{three, thrill} \\
\text{θw} & - & \text{θwə:t} & = & \text{thwart} \\
\text{θj} & - & \text{θju:li:, θju:sididiːz} & \\
\end{align*}
\]

Starting with fricative /s/ as first member followed by / t, p, k, l, w, n, m, t, j, r / as second members.

\[
\begin{align*}
\text{st} & - & \text{step, stif} & = & \text{step, stiff} \\
\text{sp} & - & \text{spot, spin} & = & \text{spot, spin} \\
\text{sk} & - & \text{skоф, sku:l} & = & \text{scoff, school} \\
\text{sl} & - & \text{sli:t, sli:p} & = & \text{sleet, sleep} \\
\text{sw} & - & \text{swet, swi:p} & = & \text{sweat, sweep} \\
\text{sn} & - & \text{sneil, snə} & = & \text{snail, snow} \\
\text{sm} & - & \text{smɑːt, smiθ} & = & \text{smart, smith} \\
\text{st} & - & \text{stəʊv, sti:l} & = & \text{stove, steel} \\
\text{sj} & - & \text{sjuːt} & = & \text{suit} \\
\text{sr} & - & \text{srinəgə} & = & \text{srinagar} \\
\end{align*}
\]
Starting with fricative /z/ as first member followed by /l/ as second member.

zl - zloti = zloty

Starting with fricative /h/ as first member followed by /j/ as second member.

hj = hjuːmid, hjuːmən = humid, human

Starting with affricate:

The number of the initial three consonant clusters in English is quite limited, there are nine of them, all starting with /s/ as first member followed by /pl, pr, pj, tr, tj, kl, kr, kw, kj/ as second members.

spl - splæʃ = splash
spliːn = spleen
spr - sprɪŋ = spring
sprain = sprain
spj - spjʊərɪəs = spurious
str - strein = strein
straɪk = strike
stj - stjuːpid = stupid
stjuːdrəʊ = studio
skl - sklərəsɪs = sclerosis
In Duanmu's view, the initial /s/ can be excluded and onset clusters either form a complex sound (they are produced with different articulator, cf. Duanmu 2009; 43 - 44) or they are predictable by morphology as real or potential affixes.

The word (syllable) in English can end with a vowel, with one, two, three or four consonants (Roach 2002; 73). The maximum number of consonants in the final consonant cluster is four.

There are 55 final two-consonant clusters in English. They usually end with /s, z, t, d, o/ which represent separate morphs (Roach 2002 : 73); / s, z / are the sound forms of ending -(e)s, and /t, d/ stand for the ending -(e)d.

### 3.1.2 Final CC Clusters in English

Starting with oral plosive / p / as first member followed by / θ, t, s / as second members.

- **pθ** - **depθ** = depth
- **pt** - **stopt** = stopped
- wept = wept
Starting with oral plosive /b/ as first member followed by /d, z/ as second members.

bd - robd = robbed
    rbd = rubbed

bz - kbdz = cubs

Starting with oral plosive /t/ as first member followed by /s,/ as second member.

ts - kts = cuts
    mæts = mates

Starting with oral plosive /d/ as first member followed by /z/ as second members.

dz - wodz = woods

Starting with oral plosive /k/ as first member followed by /θ, t, s/ as second members.

kθ - keoniən = chthonian

kt - w3:kt = worked
    tə:kt = talked

ks - tə:ks = talks
    w3:ks = works
Starting with oral plosive /g/ as first member followed by /d, z/ as second members.

- gd - begd = begged
- gz - bægz = bags

Starting with nasal plosive /m/ as first member followed by /p, f, d, z/ as second members.

- mp - kæmp = camp
- mf - nimf = nymph
- md - dæmd = damned
- mz - bɒmz = bombs

Starting with nasal plosive /n/ as first member followed by /ə, t, d, s, z/ as second members

- nə - tenə = tenor
- nt - wənt = want
- nd - wənd = wand
- ns - tens = tense
- nz - henz = hens
Starting with nasal plosive / ŋ / as first member followed by /d, z, k/ as second members

\[
\begin{align*}
\eta d & - \quad r\eta d & = & \text{wronged} \\
\eta z & - \quad s\eta z & = & \text{sings} \\
\eta k & - \quad b\eta k & = & \text{bank}
\end{align*}
\]

Starting with fricative / f / as first member followed by /θ, t, s/ as second members

\[
\begin{align*}
f\theta & - \quad f\theta & = & \text{fifth} \\
ft & - \quad \text{left} & = & \text{left} \\
fs & - \quad snifs & = & \text{snifs}
\end{align*}
\]

Starting with fricative / v / as first member followed by /d, z / as second members

\[
\begin{align*}
v d & - \quad seivd & = & \text{saved} \\
v z & - \quad \text{knives} & = & \text{naivz}
\end{align*}
\]

Starting with fricative / θ / as first member followed by /s/ as second member.

\[
\begin{align*}
\theta s & - \quad m\theta s & = & \text{myths}
\end{align*}
\]

Starting with fricative / ð / as first member followed by /d, z/ as second members.

\[
\begin{align*}
\delta d & - \quad ri:\delta d & = & \text{wreathed} \\
\delta z & - \quad bri:\delta z & = & \text{breathes}
\end{align*}
\]
Starting with fricative /s/ as first member followed by /p, t, k/ as second members.

\[
\begin{align*}
\text{sp} & \rightarrow \text{wasp} = \text{wɔsp} \\
\text{st} & \rightarrow \text{last} = \text{lɑːst} \\
\text{sk} & \rightarrow \text{ask} = \text{ɑːsk}
\end{align*}
\]

Starting with fricative /z/ as first member followed by /d/ as second member.

\[
\begin{align*}
\text{zd} & \rightarrow \text{surprised} = \text{səpraizd}
\end{align*}
\]

Starting with approximant /l/ as first member followed by /p, f, ð, t, d, s, z, k/ as second members.

\[
\begin{align*}
\text{lp} & \rightarrow \text{plup} = \text{pɅlp} \\
\text{lf} & \rightarrow \text{pelf} = \text{pelf} \\
\text{lθ} & \rightarrow \text{health} = \text{helθ} \\
\text{lt} & \rightarrow \text{knelt} = \text{nelt} \\
\text{ld} & \rightarrow \text{wʒ:lд} = \text{wild} \\
\text{ls} & = \text{fə:ls} = \text{falls} \\
\text{lz} & = \text{hilz} = \text{hills} \\
\text{lk} & = \text{bɅlk} = \text{bulk}
\end{align*}
\]


The final three consonant clusters are quite numerous too, there are 40 of them. They usually end with /s,z,t,d/ (which, as
already mentioned, can easily be accounted for by morphology since they represent separate morphones).

3.1.3 Final CCC Clusters in English

Starting with oral plosive / p / as first member followed by /əs, ts, st/ as second members.

\[
\begin{align*}
\text{pes} & - \quad \text{depəs} = \quad \text{depths} \\
\text{pts} & - \quad \text{ədəopts} = \quad \text{adopts} \\
\text{pst} & - \quad \text{læepst} = \quad \text{lapsed}
\end{align*}
\]

Starting with oral plosive / t / as first member followed by /əs/ as second member.

\[
\begin{align*}
\text{tes} & - \quad \text{eitəs} = \quad \text{eighths}
\end{align*}
\]

Starting with oral plosive / k / as first member followed by /ts, st/ as second members.

\[
\begin{align*}
\text{kts} & - \quad \text{ækts} = \quad \text{acts} \\
\text{kst} & - \quad \text{nekst} = \quad \text{next}
\end{align*}
\]

Starting with nasal plosive / m / as first member followed by /ps, fs/ as second members.

\[
\begin{align*}
\text{mps} & - \quad \text{læmps} = \quad \text{lamps} \\
\text{mfs} & - \quad \text{nimfs} = \quad \text{nymphs}
\end{align*}
\]
Starting with nasal plosive /n/ as first member followed by /ts, dz/ as second members.

\[
\begin{align*}
\text{nts} & \quad - \quad \text{tents} \quad = \quad \text{tents} \\
\text{ndz} & \quad - \quad \text{sændz} \quad = \quad \text{sands}
\end{align*}
\]

Starting with nasal plosive /ŋ/ as first member followed by /st/ as second member.

\[
\begin{align*}
\text{ŋst} & \quad - \quad \text{əmŋst} \quad = \quad \text{amongst}
\end{align*}
\]

Starting with fricative /f/ as first member followed by /θs, ts/ as second members.

\[
\begin{align*}
\text{fəs} & \quad - \quad \text{fifəs} \quad = \quad \text{fifths} \\
\text{fts} & \quad - \quad \text{lifts} \quad = \quad \text{lifts}
\end{align*}
\]

Starting with fricative /s/ as first member followed by /ts/ as second member.

\[
\begin{align*}
\text{sts} & \quad - \quad \text{təsts} \quad = \quad \text{toasts}
\end{align*}
\]

Starting with approximant /l/ as first member followed by /md, m, pt, ps, bz, vd, əs, nz, dz, ks, kl/ as second members.

\[
\begin{align*}
\text{lmd} & \quad - \quad \text{əʊvəhwelmd} \quad = \quad \text{overwhelmed} \\
\text{lm} & \quad - \quad \text{elmz} \quad = \quad \text{elms} \\
\text{lpt} & \quad - \quad \text{helpt} \quad = \quad \text{helped} \\
\text{lps} & \quad - \quad \text{helps} \quad = \quad \text{helps}
\end{align*}
\]
The final four consonants clusters in English (7) are usually formed by three consonant clusters not containing final /s,z,t,d/ for the suffixes - (e)s and - (e)d.

### 3.1.4 Final CCCC Clusters in English:

Starting with oral plosive /k/ as first member followed by /sts, sès/ as second members.

\[
\begin{align*}
\text{lbdz} & \quad - \quad \text{b\&ldz} & = & \quad \text{bulbs} \\
\text{lvd} & \quad - \quad \text{f\&ldvd} & = & \quad \text{shelved} \\
\text{les} & \quad - \quad \text{he\&les} & = & \quad \text{heat} \\
\text{lnz} & \quad - \quad \text{kilnz} & = & \quad \text{kilns} \\
\text{ldz} & \quad - \quad \text{holdz} & = & \quad \text{holds} \\
\text{lks} & \quad - \quad \text{h\&lks} & = & \quad \text{hulks} \\
\text{lkt} & \quad - \quad \text{milkt} & = & \quad \text{milked}
\end{align*}
\]


Starting with nasal plosive /m/ as first member followed by /pts/ as second member.

\[
\begin{align*}
\text{lks} & \quad - \quad \text{prompts} & = & \quad \text{pompts}
\end{align*}
\]
Starting with approximant /l/ as first member followed by /fθs, kts/ as second members.

\[
\begin{align*}
\text{l}f\theta s & \quad - \quad \text{twelf} \theta s & \quad = \quad \text{twelths} \\
\text{l}k\text{t}s & \quad - \quad \text{m} \Lambda \text{l}k\text{t}s & \quad = \quad \text{mulcts}
\end{align*}
\]

English shows that in the case of three-consonant clusters the phonotactic possibilities of the English phonemes are higher at the end of the syllable (word). Although the number of two-consonant clusters is identical in the word-initial (syllable onset) and word-final (syllable coda) position, three-consonant clusters are rare in onsets and frequent in codas, and four-consonant clusters occur only in codas.

However, on the basis of the CVX theory all coda clusters can be explained by morphology as real or potential affixes or they form a complex sound (Duanmu 2009: 171-181).

### 3.2 The Manipuri Consonant Clusters

The consonant cluster in Manipuri are the occurrences of two consonants within a syllable. The clusters found mostly at the initial position of a syllable or a word. No final clusters are found.

**Initial cluster**: The initial clusters are found in the word initial or syllable initial positions. The first members of such clusters with /w/ are the phonemes /k, kʰ, g and s/ and the phonemes /r/ occurs as the second member of the phonemes /p, k, kʰ, pʰ, b, s, ɳ/ in case of reduplication.
Occurring with /w/ as the second member:

\[
K + w \quad - \quad kwa \quad = \quad \text{betel nut} \\
Kwak \quad = \quad \text{crow} \\
k^h + w\quad - \quad k^hwaŋ \quad = \quad \text{waist} \\
s + w \quad - \quad swaydə \quad = \quad \text{here} \\
g + w \quad - \quad gway \quad = \quad \text{name of river}
\]

Occurring with /r/ as the second member:

\[
P + r \quad - \quad \text{prok} – \text{prok} \ (cakpə) \quad = \quad \text{intorably hot} \\
K + r \quad - \quad \text{krık} – \text{krık} \ (təkpə) \quad = \quad \text{scraching} \\
k^h + r \quad - \quad k^hʁɛk \ - \ k^hʁɛk \ (kəŋbə) \quad = \quad \text{extremely dry} \\
p^h + r-p^hʁəŋ \ - \ p^hʁəŋ \ (coŋbə) \quad = \quad \text{skipping'} \\
b + r \quad - \quad brɛŋ \ - \ brɛŋ \ (həwbə) \quad = \quad \text{flammable'} \\
ŋ + r \quad - \quad ŋʁəŋ \ - \ ŋʁəŋ \ (ŋəŋbə) \quad = \quad \text{grumbling'} \\
s + r \quad - \quad sru \ - \ sru \ (təkpə) \quad = \quad \text{scrubbing’}
\]

3.2.1 Syllable initial clusters in Manipuri

In the syllable initial clusters, the phonemes /p, b, c, k, b, d, j, g, pʰ, th, kʰ, s, m, ŋ/ are followed by the flap sound /r/. These clusters with /r/ as the second member are the result of loss of the vowel /ə/. As in the example /ŋakcrəw/ ‘a kind of fish’. 

\[
c + r \quad - \quad ŋakcrəw \quad = \quad \text{a kind of fish} \\
t + r \quad - \quad kəptreŋ \quad = \quad \text{spinning machine} \\
k + r \quad - \quad ŋəkra \quad = \quad \text{a kind of fish} \\
b + r \quad - \quad cumbrəy \quad = \quad \text{peach}
\]
d + r - kanḍrum = ball

g + r - məŋgra = sweet potato

j + r - məyjraw = name of place

pʰ + r - pompʰri = mended cloth

th + r - lanṯʰray = a kind of plan

kʰ + r - canḵʰrəŋ = a kind of weeds

m + r - leymram = name of place

s + r - laysrəm = a surname

ŋ + r - ŋəŋrannəbə = a colour

In the syllable initials, the phoneme /p/ and /d/ also found as the first member while /w/ as the second member:

p + w - məwpwa = brother

d + w - ōdwaydə = around there

Sometimes /y/ is found as the second member of the phoneme. occurs with /y/ as the second member of syllable:

kʰ + y - sənəkʰya = word used as an honour

kyamgey = place mane

3.3 Contrastive study

Clusters found in both English and Manipuri:

All the following Manipuri initial clusters – /kw, kl, tr, dw, pr, sw, sr, pw, kr, br, dr/ are also found in English.
**Initial cc clusters**

kw = This consonant initial cluster is found in both the languages.

eg. English - kw - quack = kwæk
    Manipuri - kw - kwa = betel nut

kl = This consonant initial cluster is found in English only because it is found only in loan words in case of Manipuri.

eg. English - kl - claim, class = kleim, kloːs
    Manipuri - kl - klas = class

tr = This consonant initial cluster is found in both the languages.

eg. English - tr - trail, trade = trail, treid
    Manipuri - tr - kəptreŋ = spinning machine

dw = This consonant initial cluster is found in both the languages.

eg. English - dw - dwell, dwindle = dwel,
    dwindle
    Manipuri - dw - ñedwaid a = out there

pr = This consonant initial cluster is found in both the languages.

eg. English - pr - pray prey = prei
    Manipuri - pr - cəmpra = lemon
sw = This consonant initial cluster is found in both the languages.
   eg. English – sw - sweat, sweep = swet, swiːp
       Manipuri – sw - sway = nervousness
sr = This consonant initial cluster is found in both the languages
   eg. English – sr - srinagar = srɪnəɡə
       Manipuri – sr - laysrəm = a surname
pw = This consonant initial cluster is found in both the languages
   eg. English – pw - pwebləʊ = pueblo
       Manipuri – pw - məwpwa = younger brother
kr = This consonant initial cluster is found in both the languages.
   eg. English – kr - cross, cry = kros, krai
       Manipuri – kr - leykrək = crack
br = This consonant initial cluster is found in both the languages
   eg. English – br - brass, bread = brɑːs, bred
       Manipuri – br - sømbru = mole
dr = This consonant initial cluster is found in both the languages
   eg. English – dr - draft, dril = draːft, drill
       Manipuri – dr - kanḍrum = hockey ball
gr = This consonant initial cluster is found in both the languages.

eg. English – gr - grass = grɑːs
    Manipuri – gr - məŋgra = sweet potato

Clusters found in English only:

Initial CCC clusters are found in English only.

eg. spl - splash, spleen = splæʃ, spliːn
    spr - spring, sprain = sprɪŋ, sprain

Final CC clusters (syllable coda) are found in English only.

eg. pθ - “depth” = depθ
    ts - “cuts, mates” = kɅts, mæts

Final CCC clusters (syllable coda) are found in English only.

eg. pst - lapsed = læpst
    tθs - eights = eitθs

Final CCCC clusters (syllable coda) are found in English only.

eg. ksθs - sixths = siksθs
    ksts - texts = tekst
Clusters found in Manipuri only:

These initial clusters are found in Manipuri only: /ky, kʰw, kʰr, tʰr, gr, cr, mr, jr/.

e.g. Manipuri - kʰw - kʰwaŋ = waist
     kʰr - pəkʰra = widower
     cr - cocrobi = a type of sand
     mr - ləymram = a clan
     jr - həyjraŋ = knife
     tʰr - kunθra = thirty

Manipuri has only 2 word initial clusters (onset) while English has 2, 3, 4 word initial clusters, such as CC, CCC and CCCC clusters.

Manipuri does not have initial CCC clusters (syllables onset). Besides Manipuri does not have final clusters such as CC, CCC, CCCC (syllable coda) which are found in English. Because of these reason that the Manipuri speaker find it very difficult to pronounce words of these categories.