**Class 2: Case study of Dutch**

Data come mainly from Booij 1977[1], Booij 1995[2], Booij 2002[3]; analysis is based on Booij 1999.[4]

I'll start by asserting that p-words are formed a certain way in Dutch, then go through the phenomena that support the description.

## I.   P-wd formation
### (1) Left edge of stem (N,V,A) projects left edge of p-wd
*Compounds*

|  | /N+N/ | ALIGN(Stem,L,PWd,L) | NORECURSION |
|---|---|---|---|
| ☞ *a.* | (N)-(N) | | |
| *b.* | (N-N) | *! | |
| *c.* | (N-(N)) | | *! |
| *d.* | ((N)-N) | *! | * |

### (2) Suffixes
*form their own p-word if they can*

|  | /draag_V + baar/ 'bearable' | ALIGN (Stem,L,PWd,L) | NORECURSION | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|
| ☞ *a.* | (draag)-(baar) | | | |
| *b.* | (draag-baar) | | | *! |
| *c.* | (draag-(baar)) | | *! | * |
| *d.* | ((draag)-baar) | | *! | |

*but not if the suffix lacks a full vowel* (lijk = /lək/)

|  | /draag_V + lijk/ 'bearable' | ALIGN (Stem,L,PWd,L) | MINIMALITY | NORECURSION | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|---|
| *a.* | (draag)-(lijk) | | *! | | |
| ☞ *b.* | (draag-lijk) | | | | * |
| *c.* | (draag-(lijk)) | | *! | * | * |
| *d.* | ((draag)-lijk) | | | *! | |

MINIMALITY = shorthand for requirements that p-wd contain a foot, foot contain at least two moras, and schwa be nonmoraic.

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[1] Geert Booij (1977). *Dutch Morphology*. Lisse: Peter de Ridder.
[2] Geert Booij (1995). *The Phonology of Dutch*. Oxford: Clarendon.
[3] Geert Booij (2002). *The Morphology of Dutch.* Oxford: Oxford University Press.
[4] Geert Booij (1999). The role of the prosodic word in phonotactic generalizations. In T. Alan Hall & Ursula Kleinhez (eds.) *Studies on the Phonological Word*. Amsterdam/Philadelphia: John Benjamins.

*and not if the suffix is vowel-initial*

| /wandel$_V$ + aar/ 'walker' | ALIGN (Stem,L,PWd,L) | MINI- MALITY | GOOD TREE | ALIGN (PWd,L/R,Stem,L/R) | ONSET |
|---|---|---|---|---|---|
| a.　(wan.del).-(aar) | | | | | *! |
| b.　(wan.de).(l-aar) | | | | *! | |
| c.　(wan.de.l)-(aar) | | | *! | | |
| ☞d.　(wan.de.l-aar) | | | | | |

GOODTREE: something like "a segment can't belong simultaneously to $D_1$ and to $d_1$ if $d_1$ is dominated by $D_2$ (distinct from $D_1$)" (where $D_1$ and $D_2$ are instances of the same-level domain)

*except for one exception: -achtig always forms its own p-wd—insert theory of exceptions.*

## (3) Prefixes
*form their own p-word if they can, even if hiatus results (though see below)*

| /on+aard$_A$+ig/ 'unkind' | ALIGN (Stem,L,PWd,L) | MINI- MALITY | NO RECURSION | ONSET | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|---|
| ☞ a.　(on).-(aar.d-ig) | | | | * | |
| b.　(o.n-aar.d-ig) | *! | | | | |
| c.　(on.-(aar.d-ig)) | | | *! | * | |

*but not if the prefix lacks a full vowel* (be = /bə/)

| /be+adem$_V$/ 'breathe air into' | ALIGN (Stem,L,PWd,L) | MINI- MALITY | NO RECURSION | ONSET | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|---|
| a.　(be).-(a.dem) | | *! | | * | |
| b.　(be.-a.dem) | *! | | | * | |
| ☞ c.　(be.-(a.dem)) | | | * | * | |

## (4) Clitics
*generally join the preceding word* ('t = /ət/)

| /kochten$_V$ 't boek$_N$/ 'bought the book' | ALIGN (Stem,L,PWd,L) | MINIMALITY | NORECURSION | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|
| a.　(kochten)('t)(boek) | | *! | | |
| ☞ b.　(kochten 't)(boek) | | | | * |
| c.　(kochten)('t boek) | *! | | | |
| d.　((kochten)'t)(boek) | | | *! | |
| e.　(kochten)('t(boek)) | | | *! | |

*but if there is no preceding word, adjoin to following word* (je = /jə/)

| /je eet$_V$/ 'you eat' | ALIGN (Stem,L,PWd,L) | MINIMALITY | NORECURSION | ALIGN (Stem,R,PWd,R) |
|---|---|---|---|---|
| a.　(je) (eet) | | *! | | |
| b.　((je) eet) | *! | | * | |
| ☞ c.　(je (eet)) | | | * | |

(A few clitics are directional, specifying that they must encliticize; a few function words are optionally freestanding p-words.)

**II.  Evidence for p-wd** (by the way, stress is too much of a mess, so I haven't attempted it)
**(5) Domain of syllabification (B2002 p. 168,  N&V)**
...with syllable, in turn, being the domain of final (i.e., coda) devoicing.

syllabification

|  |  |  |  |
|---|---|---|---|
|  | (lood).-(spet) | 'drop of lead' |  |
| (stem)+(stem) | (loods).-(pet) | 'sea captain's cap' |  |
|  | (lan[t]).-(a.del) | 'landed gentry' | < land-adel |
| (stem)+(suffix) | (roo[t]).-(ach.tig) | 'reddish' | < rood-achtig |
| (stem+suffix) | (ro.[d]-ig) | 'reddish' |  |
| (prefix)+(stem+suffix) | (ont).-(er.v-en) | 'to disinherit' |  |

**(6) Domain of obligatory schwa deletion (B1995 pp. 49-50, 68)**

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| (stem+suffix) | (kade+en) | > | [kad_ən] | 'quays' |  |
|  | (zÿde+ig) | > | [zɛid_əx] | 'silky' |  |
|  | (Roma+ein) | > | [rom_ɛin] | 'Roman' |  |
| (stem)+(stem) | (zijde)+(achtig) | > | [zɛidəɑxtəx] | 'silky' | schwa-deletion can happen here but is optional |
|  | (zijde)+(inkomsten) | > | [zɛidəɪŋkɔmstən] | 'silk revenues' |  |
|  | (mode)+(opleiding) | > | mod[ə]-opleiding | 'fashion academy' |  |
| (prefix+(stem)) | (be+(antwoorden)) | > | [bəɑntʋordən] | 'to reply' |  |

**(7) Domain of r-coloring (N&V, Gussenhoven & Jacobs 1998 p. 252[5])**
Long vowels have their quality modified before *r*—indicated by underlining (schwa off-glide?)

|  |  |  |
|---|---|---|
| (stem) | (sm_e_ris) | 'copper' |
|  | (d_o_ráde) | 'dorado' (shows V and *r* don't have to be in same foot, assuming trochaic feet in Dutch) |
| (stem+suffix) | (k_eu_r-ing) | 'test' |
| (stem)+(stem) | (k_eu_)-(ring) | 'cue ring' |
| (prefix)+(stem+suffix) | (m_ee_)-(reis-en) | 'accompany' |

Notice that r-coloring doesn't drive prosodification:

| /dorade/ 'you eat' | $*(...V_{uncolored}r...)_{PWd}$ | ALIGN (PWd,L/R,Stem,L/R) | IDENT(Vcolor) |
|---|---|---|---|
| ☞ *a.*   (d_o_rade) |  |  | * |
| *b.*   (dorade) | *! |  |  |
| *c.*   (do)(rade) |  | *! |  |

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[5] Carlos Gussenhoven & Haike Jacobs (1998). *Understanding Phonology*. London: Arnold.

**(8) Domain of s-voicing (Gussenhoven & Jacobs 1998 p. 252)**

      s → z / [+voice] __ V (optional?)

| | | |
|---|---|---|
| (stem) | (ma[s]a) | 'mass' |
| (stem+suffix) | (hij[s]-en) | 'to hoist' |
| (stem)+(suffix) | (ij[z])-(achtig) | 'ice-like' |
| (stem)+(stem) | (men[z])-(aap) | 'orangutan' |
| (prefix)+(stem) | (mi[z])-(oogst) | 'mis-harvest' |

    o   What Selkirkian category does this rule fall into?

**(9) Domain of obligatory degemination (B1995, pp. 68-69)**

| | | | | |
|---|---|---|---|---|
| (stem+suffix) | (*groot-te*) | > | [ɣrotə] | 'size' |
| (pref+(stem+suffix)) | (on-(midde**l-l**ijk)) | > | [ɔmɪdələk] | (don't know what happened to the /n/) |
| (pref)+(stem) | (ver)-(assen) | > | [vɛrɑsən] | 'to cremate' |
| | (ver)-(rassen) | > | [vɛrːɑsən] | 'to surprise' (degemination is actually optional here, and in larger domains in general: B1995 p. 151) |

**(10) Domain of obligatory /t/-deletion (B1995, pp. 152-153)**

| | | | |
|---|---|---|---|
| (stem+suffix) | (klach**t**-je) | 'complaint' | |
| | (kas**t**-je) | 'cupboard' | |
| | (ech**t**-st) | 'most real' | obligatory |
| | (ech**t**-s) | '(something) real' | |
| (stem)+(stem) | (vrach**t**)-(wagen) | 'truck' | |
| | (herfs**t**)-(kleuren) | 'autumn colours' | Optional, "although for many speakers it will be obligatory in frequent words such as *postkantoor*" |
| (stem)+(suffix) | (zich**t**)-(baar) | 'visible' | |
| (pref)+(stem+suffix) | (on**t**)-(ploff-en) | 'to explode' | |

Many factors, apparently, probabilistically affect optional *t*-deletion: sonority of surrounding segments, word frequency, whether CtC string is spread over one p-phrase or two

**(11) Domain of phonotactics (i.e., static prohibitions)**
*Long vowels, diphthongs, and schwa can't be followed by a complex coda,* except *that word-final (clusters of) coronal obstruents don't count* (B1995 p. 28)*:*

| | | |
|---|---|---|
| (stem)+(suffix) | (koo**rts**)-(achtig) | 'feverish' |
| (stem)+(stem) | (he**ftst**)-(kleuren) | 'autumn colours' |
| (prefix)+(stem) | (aa**rts**)-(bisschop) | 'archbishop' |

*Superheavy syllables are allowed only word-finally*

Here is a case where, for some words, faithfulness can drive prosodification. These are supposed to be monomorphemic words that (as diagnosed by stress) act like compounds (B2002 p. 173— see Riggle & Munro 2004,[6] Martin 2005[7]):

      (áal)(mòes)   'alms'
      (máar)(schàlk) 'marshall'
      (óor)(dèel)    'verdict'       (B2002 p. 173)

(There are exceptions, though, and suffixed words somehow escape the restriction [e.g., béem.d-en 'meadows']—see B1995 p. 34)

*No non-prevocalic obstruent-liquid sequences*
The domain of this restriction can't be the (root) morpheme (B1999 p. 50):

      (cele**br**-eer)   'to celebrate'
      (emi**gr**-eer)    'to emigrate'

*No $C_i \partial C_i$* (B1999 pp. 56-57):

| (stem+suffix) | (sted-[ə]ling)$_\omega$ | 'city dweller' | *(ka**l**-[ə]**l**ing)$_\omega$ | 'bald person' |
|---|---|---|---|---|
| | (sted-[ə]lijk)$_\omega$ | 'city-' | *(taa**l**-[ə]**l**ijk)$_\omega$ | 'linguistic' |
| (stem)$_+$(stem) | | | (formu**l**[ə])-(**l**ijst) | 'formula list' |
| | | | (fina**l**[ə])-(**l**ied) | 'final song' |

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## (12) Constituent in "prosodic gapping" (B2002 pp. 171-172, B1995 p. 51)
*(stem)+(stem)*
(land)-__ en (tuin)-(bouw)         'agri-(culture) and horticulture'
(wespe)-__ en (bijes)-(teken)     'wasp-(stings) and bee-stings'
(hoofd)-__ of (neven)-(accent)    'main (stress) or secondary stress'
(regel)-(ordening) en __-(toepassing) 'rule ordering and (rule) application'
(heren)-(schoenen) en __-(jassen)   'men's shoes and (men's) coats'
(wis)-__ en (natuur)-(kunde)      'mathematics and physics'

*(stem)+(suffix)*
(rood)-__ of (groen)-(achtig)  'redd(ish) or greenish'
(storm)-__ en (regen)-(achtig)     'storm(y) and rainy'
(zicht)-__ en (taast)-(bar)         'visi(ble) and tangible'
(christen)-__ en (heiden)-(dom)     'Christen(dom) and heathendom'
(een-zij-dig)-__ of (part-ij-dig)-(heid) 'onesided(ness) or partiality'
(twee)-__ en (drie)-(ling-en)      'twins and triplets'
(oever)-__ en (zoute)-(loos)       'bank(less) and saltless' i.e., endless and insipid
(zwangr)-__ en (moeder)-(schap)   'pregnanc(y) and motherhood'
(eer)-__ en (deugd)-(zaam)        'respectable and virtuous'
(ijs)-__ en (bruine) (beren)        'polar (bears) and brown bears'—note first item is
                              compound, second phrase

*(stem+suffix)*

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[6] Jason Riggle & Pamela Munro (2004). One morpheme, two reduplicants; pseudo-compounds in Pima. Presented at LSA, Boston.
[7] Andy Martin (2005). Loanwords as pseudo-compounds in Malagasy. Presented at AFLA XII, UCLA.

*absurd- en (banal-iteit)                   'absurd(ity) and banality'
*rod-__ of      (groen-ig)                   'redd(ish) or greenish'

*(prefix+(stem))*
*(be-(fiets-en)) of __-lop-en              'to cycle on or to walk on'

*(prefix)+(stem)* (G&J p. 248)
(in)-__ en (uit)-(voer)                      'im(port) and export'

More on *wis- en natuurkunde*—arguments against internal compounding
- *wis* 'certain' is an adjective, and *natuur* is a noun
- Wis- en natuurkunde zijn moelijke vakken
   'Math and physics are (plural) difficult subjects (plural)'
...and against morphological gapping
- (wis)-__ en (natuur)-(kund-ig-e) overwegingen
   'mathematical and physical considerations'
   *kundige* is only a phonological constituent, not a morphological constituent
           $[[[wis]_A [kunde]_N ]_N ig]_A ]_A$
- similarly,      (land)-__ en (tuin)-(bouw-er-s)         'agri(culturers) and horticulturers'
           $[[[[land]_N[bouw]_N]_N er]_N s]_N$

*Further evidence for left-edge orientation*
"linking phonemes" /s/ and /ə/ often occur between two elements of a compound

(hon.[d]-e)-(brod)                     'dog's food'
(hond-e)-__ en (katt-e)-(brood)        'dog-(food) and cat-food'

## III. Issues and puzzles
### (13) Hiatus resolution
Within a p-word, hiatus is resolved by...
- glottal stop between [a] and main-stressed V
       pa[ʔ]élla       'paella'
       a[ʔ]órta        'aorta'
- nothing between [a] and other Vs
       cháos  'chaos'
       fárao  'Pharaoh'
- schwa-deletion if first V is schwa (as seen above)
- glide insertion otherwise:
       Édu[ɥ]ard       'Eduard'
       Ge[j]a           'Gea'
       *zee+en* [zejən] 'seas'
       Ru[ʋ]anda        'Rwanda'
       *hou+en* [hɔuʋən]        'to hold'
But at a p-word boundary you can have either [ʔ]-insertion (the usual option) or glide insertion:

(koe)-(achtig)  [kuʔɑxtəx] or [kuʋɑxtəx] 'cow-like'
(zee)-(arend)  [zeʔarənt] or [zejarənt] 'sea eagle'   (B1995 pp. 65-68)

Glide insertion can also apply across the IP:

(Henk)ɸ (haalde)ɸ (de vlo)ɸ [ʋ](uit het eten)ɸ )IP      'Henk removed the flea from the food'

*Hiatus resolution with clitics* (B1995 ch. 8):

(Zij) (koch.t-e.n 't  ) (buk)   If /n/ were p-word final, it would be able to delete.
 they bought     the  book

(Ik) (zie.[j] 't  ) (boek)      glide insertion
 I    see    the  book

(Ik) (merkte 't) (direkt)     > [mɛrktət] or [mɛrktənət]  schwa deletion or n-insertion
 I    noticed it  immediately

Enclitics vs. proclitics:

(wilde-[n]-ik) 'wanted I'     vs.     (je [ʔ](eet)) (lekker)  'you eat nicely'

**(14) Lexicalization of historically complex words (B2002 p. 173, B1995 p. 50)**

| *aard* | 'earth' | + | *appel* | 'apple' | > | (aar.[d]a.ppel) | 'potato' |
|---|---|---|---|---|---|---|---|

(han[t]).-(a.ppel)      'eating apple' < *hand*

| *tand* | 'tooth' | + | *arts* | 'doctor' | > | (tan.[d]arts) | 'dentist' |
|---|---|---|---|---|---|---|---|
| *reuz* | 'giant' | + | *achtig* | '-like' | > | (reu.[z]ach.tig) | 'fantastic' |

cf. reu[s].ach.tig      'giant-like'

| *her* | 're-' | + | *inneren* | 'internalize' | > | (he.ri.nne.ren) | 'to remember' |
|---|---|---|---|---|---|---|---|
| *re* | 're-' | + | *ageran* | 'act' | > | (re.[j]a.ge.ran) | 'to react' |

It would be nice to have independent criteria for calling these examples lexicalized rather than exceptions.

**(15) Status of clitics**
een hon.[t] aan de lijn 'a dog on the leash' < *hond*

B1995's solution (p. 56):

|  | *hɔnd* |
|---|---|
| syllabification | *.hɔnd.* |
| coda devoicing | *.hɔnt.* |
| SYNTAX | *.hɔnt. an* |
| resyllabification | *.hɔn.t an* |

But, there is variation: for frequent verbs, devoicing sometimes doesn't apply before a V-initial clitic, suggesting "that certain verb+clitic combinations are lexically stored" (B1995, p. 175)

|  | *hɛb ik* 'have I' |
|---|---|
| syllabification | *.hɛ.bik.* |
| coda devoicing | -- |
| SYNTAX | -- |
| resyllabification | -- |

If we need cyclicity/lexical phonology, can we do away with the p-word entirely? (counteranalysis next time if time)