A Strictly Phonological Account of Dutch Short Diminutives. *Can Orthographies Cause Blind Spots?*

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1. Introduction:

Dutch diminutives can be split into two major categories, ones taking –ətyə and others taking –tyə or one of its allomorphs. Given an underlying –tyə, it appears to be generally accepted that no purely phonological account is available for the –ətyə suffix.

More significantly, rules determining the – tyə alternants have also been generally thought of as morphophonemic, that is rule governed but not fully and strictly phonologically determined.

Trommelen (1983:56) states:
(These rules) must mention the category DIMINUTIVE explicitly, and to the best of my knowledge there is no other phenomenon in Dutch that can lead to a generalisation is this respect.

In this article I would like to present just such a phenomenon and the generalisation it leads to, that is, I would like to propose a strictly phonological account of these forms. I will also briefly discuss a strictly phonological alternative, tentatively offered from an Optimality Theoretical perspective (van de Weijer 2002 / Kooij and van Oostendorp 2003).

2. The Data

Alternations in Dutch diminutives have received ample attention. Generally a major distinction is made between words that take -ətyə and the ones that lack the –ə-, e.g. :

/mɑn/ - /mɑnətyə/ '(small) man'
/man/ – /mantyə/ '(small) moon'

In more neutral environments, like following vowels, only –tyə is observed. This has led to a fairly general consensus that -tyə is the underlying diminutive suffix. As to the longer form, there seems to be no compelling phonotactic reason for a form like /kɑn-tyə/ 'small can' to become [kɑnətyə] as [kɑntyə] 'small edge/border' also occurs. (Cf. Booij 1981:157). Furthermore, a number of forms with the long diminutive have a short alternative, e.g. /wɛx/ 'path' has either /wɛxyə/ or /wɛxətyə/.

I will, therefore, conclude that the long diminutive can not be derived from underlying –tyə by phonological rule only. For the purpose of this article, it will be assumed that items are marked for the type of diminutive (long or short) they take and the focus here will be on the second type, the short diminutive. *
These forms and their short diminutives show extensive phonologically determined "allomorphy"

Maud Fontein's research amongst adults and children confirms the existence of two word classes. The ones taking "-etje" have to be specially stored, the other diminutives are rule governed. Fontein (2004) en Fontein (2005).

The following table is fairly representative of what can be found:

Word/Diminutive Orthographical	Word/Diminutive Underlying	Word/Diminutive Surface	Gloss (Diminutive of):
ei / eitje	ɛy / ɛytyə	ɛy / ɛytyə	Egg
koe / koetje	ku / kutyə	ku / kutyə	Cow
koop / kopje	kop / koptyə	kop / kopyə	Cup
staaf / staafje	staf / staftyə	staf / stafyə	Bar
raam / raampje	ram / ramtyə	ram / rampyə	Window
straat / straatje	strat / strattyə	strat / stratyə	Street
stad / stadje	stɑd / stɑdtyə	stɑt / stɑtyə	Town
jas / jasje	yɑs / yɑstyə	yɑs / yɑsyə	Coat
haan / haantje	han / hantyə	han / hantyə	Rooster/cock
kool / kooltje	kol / koltyə	kol / koltyə	Coal
paar / paartje	par / partyə	par / partyə	Pair
zaak / zaakje	zak / zaktyə	zak / zakyə	Pocket
lach / lachje	lɑx / lɑxtyə	lɑx / lɑxyə	Laugh
haag / haagje	haɣ / haɣtyə	hax / haxyə	Hedge
koning / koninkje	konɪŋ / konɪŋtyə	konɪŋ / konɪŋkyə	King
mops / mopsje	mɔps / mɔpstyə	mɔps / mɔpsyə	Pug
kaft / kaftje	kɑft / kɑfttyə	kɑft / kɑfyə	Cover
hemd / hemdje	hɛmd / hɛmdtyə	hɛmpt / hɛmpyə	Vest
pats / patsje	pɑts / pɑtstyə	pɑts / pɑtsyə	Slap
kast / kastje	kɑst / kɑsttyə	kɑst / kɑsyə	Cupboard
hond / hondje	hɔnd / hɔndtyə	hɔnt / hɔntyə	Dog
dans / dansje	dɑns / dɑnstyə	dɑns / dɑnsyə	Dance
schors / schorsje	sxɔrs / sxɔrstyə	sxɔrs / sxɔrsyə	Bark
schort / schortje	sxɔrt / sxɔrttyə	sxɔrt / sxɔrtyə	Apron
werf / werfje	wɛrf / wɛrftyə	wɛrf / wɛrfyə	Shipyard
wals / walsje	wɑls / wɑlstyə	wɑls / wɑlsyə	Waltz
kalf / kalfje	kɑlf / kɑlftyə	kɑlf / kɑlfyə	Calf
vilt / viltje	vɪlt / vɪlttyə	vɪlt / vɪltyə	Felt
heks / heksje	hɛks / hɛkstyə	hɛks / hɛksyə	Witch
contact / contactje	kɔntakt / kɔntakttyə	kɔntakt / kɔntakyə	Contact
bocht / bochtje	bɔxt / bɔxttyə	bɔxt / bɔxyə	Corner
korps / korpsje	kɔrps / kɔrpstyə	kɔrps / kɔrpsyə	Corps
korst / korstje	kɔrst / kɔrsttyə	kɔrst / kɔrsyə	Crust
burcht / burchtje	bʊrxt / bʊrxttyə	bʊrxt / bʊrxyə	Fortress
kunst / kunstje	kʊnst / kʊnsttyə	kʊnst / kʊnsyə	Art
vangst / vangstje	vɑŋst / vɑŋsttyə	vɑŋst / vɑŋsyə	Catch
oogst / oogstje	oxst / oxsttyə	oxst / oxsyə	Harvest
prompt / promptje	prɔmt / prɔmttyə	prɔmpt / prɔmpyə	Prompt (computer)
inkt / inktje	ɪŋt / ɪŋt	ɪŋkt / ɪŋkyə	Ink (type of)

As can be gleaned from the orthographic renderings, Dutch spelling follows the changes only to the extent that the suffix is perceived to be altered. Dutch phonologists have followed suit in considering precisely those alterations to be in need of marking i.e. not the pure result of phonological processes operative throughout the language.

3. Approaches

The phonological environments which determine the "allomorphs" are clear.
(Cohen 1958, Ewen 1978, Gussenhoven 1978, Booij 1981a, Trommelen 1983 ,
Booij 1995, van de Weijer 2002, Kooij en Oostendorp 2003, Huber 2005)

-yə after stem final non sonorant consonants
-pyə following /m/
-kyə following /ŋ/
-tyə elsewhere (following n, r, l, vowels and semivowels)

Virtually all approaches call upon an "assimilation" rule to account for the data.
Gussenhoven and Jacobs (1998:108), e.g. provide the following version:

t → [α place] /   ⌈ +nasal ⌉ + __ yə]ₐᵢₘ
                   ⌊ α place ⌋

$$t \rightarrow [\alpha \text{ place}] \; / \; \begin{bmatrix} +\text{nasal} \\ \alpha \text{ place} \end{bmatrix} + \underline{\quad} \text{yə}]_{dim}$$

Notice the significant *dim*-specification. It marks the rule as one that is not
purely phonological. I will call such rules *Morphophonemic rules* (MP-rules for
short). Rules requiring only phonological information will be called *Phonological
Rules* (P-rules for short). Traditional accounts of these diminutives have – to my
knowledge- all been morphophonemic in nature apart from a recent attempt
based on Optimality Theory. It should also be noticed that the usage of 'dim' is
somewhat unsatisfactory in that the very same alternants turn up for the manner
adverb suffix -tyəs, and thus a generalisation appears to get lost. e.g.:

Adj./Adv.		Adverb		
/say/	+ /tyəs/	[saytyəs]	*saaitjes*	'in a dull/boring way'
/zɑxt/	+ /tyəs/	[zɑxyəs]	*zachtjes*	'softly'
/fɛyn/	+ /tyəs/	[fɛyntyəs]	*fijntjes*	'in a refined manner'
/ɑmpər/	+ /tyəs/	[ɑmpərtyəs]	*ampertjes*	'just about'
/kɑlm/	+ /tyəs/	[kɑlmpyəs]	*kalmpjes*	'calmly'
/vremd/	+ /tyəs/	[vrempyəs]	*vreemdjes*	'in a somewhat strange manner'
/vrom/	+ /tyəs/	[vrompyəs]	*vroompjes*	'piously'

3.1.   The Morphophonemic Account.

The spanner in the wheel of a pure P-rule solution is the celebrated rule of
regressive (nasal) assimilation. Trommelen (1983:55):*

Finally, - tyə *and –* kyə *cannot be produced by progressive assimilation. Dutch
does have a rule producing homorganic clusters of nasals and consonants, but
the direction is regressive …*

** Also compare Marc van Oostendorp's remark in his review of Helga Humberts ('05) on whether
Humberts' analysis can explain the assimilation process in Dutch diminutives. "As far as I can see,
that is not the case: The direction of the assimilation appears to be wrong (from coda to onset)."
(Nederlandse Taalkunde 2005)*

Also Booij (1995:70)

Note, however, that it is normally the nasal consonant that assimilates to a following obstruent, whereas here it is the obstruent that assimilates to a preceding nasal.

Examples of Dutch nasal assimilation tend to be:

ɔn + *adjective*   /ɔn + orbar/   →   [ɔnorbar]   'improper'
                     /ɔn + kis/   →   [ɔŋkis]'   'indelicate'
                     /ɔn + bɛwʊst/   →   [ɔmbəwʊst] 'unaware'

an+ *verb*   /an + stɛlə/   →   [anstɛlə]   'put on airs'
                     /an + bidə/   →   [ambidə]   'offer'
                     /an + kɔndəɣə/   →   [aŋkɔndəɣə] 'announce'

It should, however, be noted that it is only the coronal nasal which assimilates, /m/ and /ŋ/ stay put:

e.g. :   [imkər] 'bee-keeper' [mɛŋbɑk] 'mixing-trough' [vɑŋplats] 'catching grounds'

It seems therefore somewhat premature to conclude that /t/ can not assimilate to a preceding /m/ or /ŋ/ only because /n/ is seen to assimilate to a following stop.

Even so, progressive assimilation of stops following non coronal nasals is categorically considered to be not (fully) phonological.

Schultink (1974:28)
"Assimilation rules that turn –mtyə into –mpyə, and –ŋtyə into ŋkyə, however, have a purely ad hoc character in Dutch, and should therefore be excluded from the phonological component."

Trommelen (1983:55-56) echoes this:
"(These rules) must mention the category DIMINUTIVE explicitly, and to the best of my knowledge there is no other phenomenon in Dutch that can lead to a generalisation is this respect."

In this article I would like to present the very phenomenon Trommelen had wondered about and state the consequent generalisation. The solution will, significantly, **not** imply the notion of progressive assimilation.

3.2.   *Optimality Theoretical Attempt*

Van de Weijer (2002) and following him, Kooij and Oostendorp (2003) attempt an account of these diminutives from the point of view of Optimality Theory. To explain progressive assimilation of -tyə they call upon the principle of root preservation.:

                    Preserve root characteristics.

The constraint implies that affixes are more likely to change than roots. This way you can predict that /n/ assimilates to a following /k/ in e.g. /ankɔmst/ [aŋkɔmst] 'arrival' but that /t/ assimilates to a preceding m or ŋ in e.g. /ramtyə/ [rampyə] 'small window'.

I will discuss their suggestions later on in this paper, but first focus on a more rule oriented approach. The account I will put forward should have been amongst the proposals available for the diminutives within this type of theoretical setting. That it never was, I am inclined to attribute to "orthographic blind spots".

4. Relevant Phonological Rules.

In this section the rules will be discussed needed to account for the diminutives. I hope to show that they are all P-rules and therefore, when applied together, make for a phonological solution.

4.1.   T-deletion

T-deletion has been amply demonstrated in Dutch phonological literature. Although there may be marginal differences in its exact formulation, there is a strong consensus as to its applicability. Here are some data:

Complex adjectives

/hor + bar/	[horbar]	'audible'
/zɪxt + bar/	[zɪxbar]	'visible'
/tɑst + bar/	[tɑsbar]	'tangible'

Compounds

/pɔst + bodə/	[pɔsbodə]	'postman'
/vrɑxt + waɣə/	[vrɑxwaɣə]	'lorry/truck'

Booij (1995:152) has the rule apply to the following type of diminutives (following morphophonemic deletion of /t/ in /tyə/.)

/kɑft + tyə/	→	kɑft+yə	→	[kɑfyə]	'small cover'
/vrɑxt + tyə/	→	vrɑxt+yə	→	[vrɑxyə]	'small load'
/kɑst + tyə/	→	kɑst+yə	→	[kɑsyə]	'small cupboard'

He discusses this rule in the context of connected speech or "Phonology above Word Level", and states that the rule of /t/-deletion is "typically one of the processes that occur in fast speech, but to a lesser extent also in careful speech." This suggestion (apart from being too vague) makes little sense. Deliberate disconnected speech potentially cancels all kinds of natural phonological rules. This would also disable stop-voicing in e.g. /zɑkbʉk/ [zɑgbʉk] 'notebook' or /ɔpnemə/ [ɔbnemə] 'include', which Booij considers to be a case of word-level phonology.
Here, it concerns cases where the stem final /t/ deletes, but there doesn't seem to be any compelling evidence to suggest that it doesn't also apply to the

following diminutives (given underlying –tyə). Booij would employ a different deletion rule to account for these forms:

/kɑs + tyə/	→	[kɑsyə]	'Small greenhouse'
/lɑx + tyə/	→	[lɑxyə]	'Little smile'
/staf + tyə/	→	[stafyə]	'Small bar'

Booij's derivations would imply the following:

Underlying:	/kɑs + tyə/	/kɑst + tyə/
T-deletion (MP)	kɑsyə	kɑstyə
T-deletion (P)	---	kɑsyə
Surface	[kɑsyə]	[kɑsyə]
Gloss (dim)	*greenhouse*	*cupboard*

To account for the loss of -t in diminutive suffixes, Booij applies a second rule of t-deletion. This time the rule is morphophonemic (Booij 1995:70). In the absence of evidence to the contrary I will suggest that it is the same P-rule which (together with a degemination process) deletes the /t/ in the diminutive suffixes as well as the stem final ones.

I'll formalise the rule as follows:

T-deletion (TD)   t → Ø / [-son] + ___ [-voc]

> *–t is deleted following a non sonorant and before a non vowel.*

t/d also deletes under other circumstances, one of them preceding /st/ (see also Booij 1995:152):

Adjective	*superlative*		
/moy/	/moy + st/	[moyst]	'most beautiful'
/ɛxt/	/ɛxt + st/	[ɛxst]	'most real'
/bɔnt/	/bɔnt + st/	[bɔnst]	'motliest'

I believe this to be a different process than the t-deletion rule in focus and simply due to the presence of another –t- in the cluster.

4.2.   Degemination

Dutch does not have double or long consonants, so, whenever they are presented morphologically, a process of degemination takes place. Degeminaton, therefore, concerns a P-rule that reduces identical consonants to a single one. There is no disagreement, as far as I know, about its phonological character. I'll state it as follows:

Degemination (DG): $C_i + C_i → C_i$

Identical consonants turn into a single consonant

The rule accounts for diminutives like the following:

/vrɑcht + tyə/	→	vrɑxtyə	→	[vrɑxyə]	'small load'
/kɑft + tyə/	→	kɑftyə	→	[kɑfyə]	'small cover'
/kɑst + tyə/	→	kɑstyə	→	[kɑsyə]	'small cupboard'

But also explains forms like:

/lad + də/	→	[ladə]	'load (past tense)'
/ɔp + pɑkə/	→	[ɔpɑkə]	'pick up (infinitive)'

4.3.   *Voice Assimilation:*

Another rule relevant in diminutive derivations, will be called Voice Assimilation.

Voice Assimilation (VA)   -son → α voiced / ___ $\begin{bmatrix} - \text{cont} \\ \alpha \text{ voice} \end{bmatrix}$

A non sonorant consonant takes on the voice of a following non continuant consonant.

Examples:

/vɑt + bar/	→	[vɑdbar]	'susceptible'
/bɑd + plats/	→	[bɑtplats]	'seaside resort'
/zɑk + buk/	→	[zɑgbuk]	'notebook'

It effects diminutives like the following:

/hɔnd + tyə/	→	hɔnttyə	→	[hɔntyə]	'little dog'
/baz + tyə/	→	bastyə	→	[basyə]	'little master'
/ʋɛb + tyə/	→	ʋɛptyə	→	[ʋɛpyə]	'smal web'

Notice that it is not considered to apply to fricative-initial stems (cf. Trommelen & Zonneveld 1982:43, Booij 1995:58.)

E.g.	/ɑsvɑt/	→	[ɑsfɑt]	'ash container'
	/plɑtzɑk/	→	[plɑtsɑk]	'broke'
cf.	/ɑsbɑk/	→	[ɑzbɑk]	'ash-tray'

The assimilation with stem-initial fricatives is of a progressive nature!

4.4.   *Phonetic Rules.*

In discussions of Dutch diminutives, palatalisation is also frequently mentioned. It accounts for the refinement of forms like the following:

/kɑsttyə/ → kɑstyə → kɑsyə → [kɑʃə]

As /ʃ/ may not be part of the Dutch phoneme inventory, it will be taken for granted as a phonetic realisation and not be included in the derivational forms.

4.5.   Homorganic Stop Insertion

We now get to a rule which is pivotal to our account of Dutch diminutives. It will be called Homorganic Stop Insertion. Here are some examples:
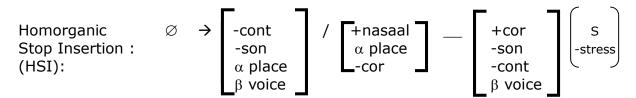
/kɑm+t/   → [kɑmpt]   *hij kamt z'n haar*   'he <u>combs</u> his hair'
/kɑmp+t/ → [kɑmpt]   *hij kampt met problemen* 'he <u>struggles</u> with problems'

/zɪŋ+t/   → [zɪŋkt]   *hij zingt een lied*   'he <u>sings</u> a song'
/zɪŋk+t/   → [zɪŋkt]   *hij zinkt naar beneden*   'he <u>sinks</u> to the bottom'

Booij (1995:137), briefly discusses forms like these in a section on "connected speech", suggesting that there would be a slow variant where the stop is not inserted. Other phenomena in his section on "connected speech" are shwa-deletion, vowel reduction and shortening.
Personal single phoneme suffixes are strongly tied to their stems. A slow form [kɑm…t] is inconceivable in normal natural speech, unless a deliberate attempt is made to follow the spelling. Elsewhere Booij (1995:41) had already attested that (in the same syllable) "the nasal is always (!) homorganic with the following plosive".
Crucial in this respect is the incorporation by Cohen *et al.* (1959:96) of /mt/ and /ŋt/ in the set of word final consonant groups allowed in Dutch. /mpt/ and /ŋkt/ are neither mentioned nor excluded from their triple consonant clusters. Cohen *et al.* do not refer to notions like underlying and surface forms. Dutch has no simplex forms in which –mt   and –mpt or -ŋt and -ŋkt contrast. The orthography echoes this ambivalence. Followed by -*d* we get *hemd* [hɛmpt] 'vest' en *vreemd* [vrempt] 'strange'. But a following -*t* appears to be preceded by a *p*, e.g. *prompt* [prɔmpt] 'punctual' or even *b* as in *ambt* [ɑmpt] 'function'. There is no doubt that *prompt* rhymes with *komt* /kɔm+t/ '(he) comes' and *ambt* with *kamt* /kɑm + t/ and *kampt* /kɑmp + t/
I conclude therefore that underlying /mt/ and /ŋt/ are subject to the P-rule of Homorganic Stop Insertion, producing [mpt] and [ŋkt] respectively.

Homorganic   ∅ → ⎡ -cont ⎤ / ⎡ +nasaal ⎤ ___ ⎡ +cor ⎤ ⎛ s   ⎞
Stop Insertion : | -son | | α place | | -son | | -stress |
(HSI): | α place | | -cor | | -cont | ⎝   ⎠
                                      ⎣ β voice ⎦   ⎣ β voice ⎦

Insert a homorganic stop between a bilabial or velar nasal and a following t or d.
If not word-final, the following syllable will have to be unstressed.

Notice how the rule takes care of a wide range of forms:

/kɔm+t/	[kɔmpt]	*hij komt*	'he comes'
/kɑm+t/	[kɑmpt]	*kamt z'n haar*	'he combs'
/kɑmp+t/	[kɑmpt]	*hij kampt met ..*	'he struggles
/sxam+tə/	[sxamptə]	*schaamte*	'shame'
/ʋarm+tə/	[ʋarmptə]	*warmte*	'warmth'
/inxədam+d/	[inxədampt]	*ingedamd*	'reclaimed'
/drom+də/	[drombdə]	*hij droomde*	'he dreamt'
/sɪŋ+t/	[sɪŋkt]	*hij zingt*	'he sings'
/sɪŋk+t/	[sɪŋkt]	*hij zinkt*	'he sinks'
/ɔmrɪŋ+d/	[ɔmrɪŋkt]	*omringd*	'surrounded'
/lɛŋ+tə/	[lɛŋktə]	*lengte*	'length'
/ɛŋ+tə/	[ɛŋktə]	*engte*	'strait(s)'
/kɑlm+tə/	[kɑlmptə]	*kalmte*	'calm'

The condition that a following syllable will have to be unstressed, is in keeping with the notion that stressed syllables "attract" consonants. The initial consonants of unstressed syllables consequently also become part of the coda of the preceding stressed syllables.

5. A Phonological Account of the Short Diminutives.

We are now ready to show how these independently established P-rules interact to account for the diminutive forms:

Underlying:	kɑs+tyə	kɑst+tyə	ram+tyə	konɪŋ+tyə	kɔp+tyə	hɔnd+tyə
VA	---	---	---	---	---	hɔnttyə
DG	---	kɑstyə	---	---	---	hɔntyə
HSI	---	---	ramptyə	konɪŋktyə	---	---
TD	kɑsyə	kɑsyə	rampyə	konɪŋkyə	kɔpyə	---
Surface	kɑsyə	kɑsyə	rampyə	konɪŋkyə	kɔpyə	hɔntyə
Gloss(dim)	'greenhouse'	'cupboard'	'window'	'king'	'cup'	'dog'

Underlying:	la+tyə	pal+tyə	hɛmd+tyə	ɪŋt+tyə
VA	---	---	hɛmttyə	----
DG	---	---	hɛmtyə	ɪŋtyə
HSI	---	---	hɛmptyə	ɪŋktyə
TD	---	---	hɛmpyə	ɪŋkyə
Surface	latyə	paltyə	hɛmpyə	ɪŋkyə
Gloss(dim)	'drawer'	'pole'	'vest'	'ink'

Notice how these rules also correctly derive the surface forms for the manner adverb - tyəs

Underlying	xəwontyəs	zɑxt + tyəs	stikəm + tyəs	vremd+tyəs
VA	--	--	--	vremttyəs
DG	--	zɑxtyəs	--	vremtyəs
HSI	--	--	stikəmptyəs	vremptyəs
TD	--	zɑxyəs	stikəmpyəs	vrempyəs
Surface	xəwontyəs	zɑxyəs	stikəmpyəs	vrempyəs
Gloss:	'simply'	'softly'	'stealthily'	'strangely'

True P-rules also tend to manifest themselves in connected speech across word boundaries. Witness the given rules in action:

Underlying	/kɔm+t/ /yə/ /zʊs/?	/zɪŋ+t/ /yə/ /zʊs/?
VA	--	--
DG	--	--
HSI	kɔmptyəzʊs	zɪŋktyəzʊs
TD	kɔmpyəzʊs	zɪŋkyəzʊs
Surface	kɔmpyəzʊs	zɪŋkyəzʊs
Gloss	'lit.: comes your sister?'	'lit.: sings your sister?'

Notice that in the correct derivation of the short diminutives, we have made use of generally applicable P-rules only and therewith established a strictly phonological account of these forms.

6. Homorganic Stop Insertion

What makes the wheel of this account spin, is the rule of homorganic stop insertion. As I will argue later on, Dutch orthography may well have been the reason why HSI was never called upon in this context. The facts are clear enough. In simplex words there never is a distinction between /mt/ and /mpt/ or /ŋt/ and /ŋkt/. Forms with these syllable final clusters are spelled as follows:

prompt   'punctual'
ambt   '(formal)'function'
vreemd   'strange'

And the only /ŋkt/ I am aware of:

inkt   'ink'

If anything, this spelling signals ambivalence. An ambivalence which is to be expected as (in Dutch) /md/, /mt/ and /mpt/ are all pronounced exactly the same, as would be /ŋd/, /ŋt/ and /ŋkt/.
Stop epenthesis has drawn the attention of phoneticians. Warmer and Weber (2001) report on an experiment they carried out on the Perception of Epenthetic Stops. Amongst the structures they investigated were our /mt/ and /ŋt/ clusters. They had drawn up lists of non existing words with final nasal + obstruent clusters. Amongst these were:

flemt, flimt, flomt, framt etc. and
fleŋt, fliŋt, floŋt, fraŋt etc.

The lists were recorded by two Dutch natives (with a background in linguistics). The words were interspersed with "fillers" so the target ones would not stand out. To measure the perceptual presence of the epenthetic stops, 72 Dutch students were involved. They were divided into three groups each focussing on another stop (p, t or k). In one task they were asked to respond when hearing the target sound (monitoring task), in another they were are asked to transcribe the words using standard Dutch orthography (dictation task).

From the results we can conclude that the /mt/ stimuli were perceived of as /mt/ or /mpt/ in almost identical proportions. In other words, roughly half of the clusters were transcribed as 'mt' and another half as 'mpt'
As Dutch spelling uses both "mt" and "mpt" to render the same sound cluster, it comes as no surprise to find that the transcripts follow suit. It also confirms the point that "mt" and "mpt" neutralise at some surface level.

It is of interest to notice that the /ŋt/ sequence was largely transcribed as "nkt". This, too, provides strong evidence dat /ŋt/ and /ŋkt/ are (at some level) phonemically the same in Dutch. At the same time it begs the question why the alternative "ngt" was never used. The researchers attribute this to the consistent and stronger presence of the epenthetic burst in these clusters. In Dutch "ng" is used to represent the velar nasal, which itself only occurs stem final or as an allophone of /n/ preceding /k/. Dutch natives, in general, do not have a clear awareness of /ŋ/ as one of their basic sounds, as they would of /m/ and /n/. This may well be the reason why /ŋ/, represented by 'ng' was hardly ever heard and not used in the transcripts.

The results appear to lend credence to the hypothesis that /mt/ and /mpt/ as well as /ŋt/ and /ŋkt/ do not constitute contrasting pairs. My believe is that HSI neutralizes their underlying distinction whenever it occurs. HSI, therefore, appears to be a natural strictly phonological phenomenon in Dutch, the very phenomenon that makes for a strictly phonological description of its short diminutives.

7. Optimality Theoretical Proposal

As pointed out earlier on, Optimality Theory, looking at the data in terms of universal constraints, could allow for (traditionally rejected) progressive assimilation of the /t/ in underlying /tyə/ by evoking its principle of root-faithfulness , e.g. McCarthy & Prince (1995), recalled in van de Weijer (2002:202) as

Faith(Root) >> Faith(Affix)
Faithfulness requirements are enforced more strictly within the root than in non-root morphemes, such as affixes.

The principle is clearly interesting as a statement of tendency, it may be harder to incorporate into a formal account of Dutch diminutives. As it is, the coda position of Dutch roots is very susceptible to change, witness word final devoicing also of roots in this position ([lat] / [ladə] 'load sg. / load pl.', t-deletion (/zɑxt+st/ → [zɑxst] 'softest'), r-deletion in Northern variants (/bar+t/ → [bat] 'gives birth'), etc..
Furthermore root-initial fricatives are considered to be assimilated to the previous obstruent, as pointed out earlier on:

E.g.   /ɑf-vɑlə/   →   [ɑffɑlə]   'to lose weight'
Cf.   /ɑf-dun/   →   [ɑv-dun]   'to take off'

Voiced fricatives are, admittedly, weak in Dutch initial position with many speakers not using them at all here (replacing /z/ by /s/, /v/ by /f/ and /ɣ/ by

/x/). It would, nevertheless, require another overriding constraint or an adjustment of the existing root-faithfulness constraint.

In favour of the proposal would be that it also accounts for the /-də/ - /-tə/ alternation in Dutch past tense suffixes. :

Stem	Infinitive	Past Tense	Gloss
rui	ruiə	ruidə	'row'
pɑs	pɑsə	pɑstə	'fit
bɔf	bɔfə	bɔftə	'be lucky'
ban	banə	bandə	'make way'
bar	barə	bardə	'give birth'
lev [lef]	levə	levdə	'live'
vrez [vres]	vrezə	vrezdə	'fear'

The basic suffix would then have to be /-də/ and you would need a progressive voice assimilation rule to change it to /-tə/ following a voiceless consonant.

Dutch phonologists have struggled with these forms as assuming a progressive assimilation rule appears to conflict with the apparent regressive nature of voice assimilation elsewhere. Unless, of course, the following consonant is a fricative, which prompted Trommelen en Zonneveld (1979:119) to postulate an underlying voiced fricative (/đ/) in this position. Booij (1995:62, footnote) rejects this solution as too abstract and then offers a solution, which relies on the postulation of an underspecified stop, say /D/. This begs the question whether underspecification is not used here as a distinguishing feature, not at all dissimilar to the rejected use of [+cont].
Van de Weijer (2002:203) ends up also resorting to the use of underspecification in the diminutive suffix as well as the past tense suffix.
The need for this adaptation badly mars the neat constraint based solution, but appears called for as other suffixes do not seem to tow the line.

Consider the following forms and what the principle would predict

    /stɛrv + tə/ → [stɛrftə]   *stɛrvdə   'the dying'
    /bred + tə/ → [bretə]   *bredə   'the width'

also:
    /sɛs + də/   → [sɛzdə]   *sɛstə   'sixth'
cf.:   /sɛsə/   → [sɛsə]   'sixes'
    /vɛyv + də/ → [vɛyvdə]   'fifth'
    /tin + də/   → [tində]   'tenth'

Neither would the superlative suffix /-stə/ support root faithfulness as the following example indicates:

    /sxev/   →   [sxef]   'slanting'
    /sxevə/   →   [sxevə]   'slanting'
    /sxev+stə/   →   [sxefstə]   * sxevzdə ?? 'most slanting'

Furthermore:

/sxam+tə/	[sxamptə]	* sxambdə	'shame'
/ʋɑrm+tə/	[ʋɑrmptə]	* ʋɑrmbdə	'warmth'

The Past Tense solution has another problem, related to the absence of a voiced/voiceless distinction for fricatives with many Dutch speakers. Cohen *et al.* (1959:34) report on the absence of a voiced counterpart for /x/, that is /ɣ/, in the large cities in the West. Here /lɑxə/ 'to laugh' and /vlɑɣə/ 'to put out the flag' would be /lɑxə/ and /vlɑxə/. In this variant there is no justification for postulating /vlɑɣ/ as the underlying stem, yet the past tense is [vlɑɣde], [ɣ] now an allophone of /x/. We now have a situation in which there is no clue left in the underlying root to determine the kind of past tense that can be expected:

/lɑx + də/	→	[lɑxtə]	
/vlɑx + də/	→	[vlɑɣdə]	*vlɑxtə

My conclusion is that the d/t alternation in past tense suffixes is of a morphophonemic nature and lexicalised for –x final verbs in certain language variants.

On the other hand, an account crucially incorporating Homorganic Stop Insertion and following a more traditional generative model, neatly accounts for the diminutives and a host of other data.

8. Orthographic Blind Spots?

The given solution depends crucially on the rule of Homorganic Stop Insertion. That it was never proposed before in the context of the diminutives, is somewhat baffling. My suspicion is that the orthography can be blamed, supported by reputed analyses like Cohen *et al.* (1959) in which the lack of contrast between e.g. /mt/ and /mpt/ was not noticed.

A word like *hemdje* is a case in point. The natural pronunciation is [hɛmpyə].

A common but colloquial pronunciation [hɛmpi] even crept into a Dutch soccer anthem: *Laat de leeuw niet in z'n hempie staan* ('Don't leave the lion standing in his vest = don't let him be put to shame'). It is interesting to see that the intrusive –p- openly emerges as soon as orthographic constraints fall away. Interestingly enough Cohen *et al.* (1959:45) already called attention to this "substandard" use of *hempie*. Generally the intrusive /p/ has gone unnoticed. Booy (1995:152) also renders [hɛmtyə].

The occurrence of orthographic *prompt* and the existence of the superlative suffix –*st*, (therefore *promptst*) led Kooij and Oostendorp (2003:50) to the claim that Dutch can have up to 5 consonants in its coda: [prɔmptst]

The form rhymes with /kɔmst/ [kɔmst] 'arrival' and contains no more than 3 consonants.

Calling on the rule of t-deletion before /st/ and underlying /prɔmt/, its surface form is simply and naturally derived:

UF	/prɔmt/	/prɔmt + st/
T-st deletion	---	prɔmst
HSI	prɔmpt	---
Surface	[prɔmpt]	[prɔmst]
Gloss	'punctual'	'most punctual'

9. Conclusion

I hope to have shown that a strictly phonological account of the short Dutch diminutives is possible and that such an account should, to say the least, be part of the inventory of available rule based solutions.
The article may hopefully also serve as a wake-up call to a fresh and orthography-free look at Dutch phonological structures.(*)

* In a momentous work, tracing the development of phonological and orthographic systems throughout the world, R. A Kraak (2006) squarely blames Western alphabetic traditions for the lack of progress made in our understanding of language. According to him, we never ceased to look at language through what he calls "Alphabet Glasses" ("een alfabetische bril"). I do not agree with his final analysis, but there definitely is common observational ground and a clear call to think again.

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