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SYMPATHY THEORY AND GERMAN TRUNCATIONS

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1. Sympathy defined

McCarthy 1997 makes the important proposal that phonological opacity arises through constraints on a new type of correspondence relation holding within the candidate set that Gen(erator) produces for a given input, i.e., a relation between co-candidates. The main idea is that a candidate may win because it is in *sympathy* with a particular failed co-candidate—a candidate that is optimal with respect to a specific lower-ranking constraint. McCarthy 1997 illustrates his proposal with an example from Biblical Hebrew: the opaque interaction of epenthesis and *ʔ*-deletion in forms like /dešʔ/ → *deše* 'grass'. The epenthetic final *e* is obligatory (*deše, *deš*) and explicable as resolving a final *šʔ*-cluster—the trouble being, however, that the *ʔ* triggering epenthesis is absent from the output form (*deše, *dešeʔ*) for independent reasons (it is not a possible coda). In serialist terms, the virtual form *dešeʔ*, which is neither an input nor an output but instrumental in the explication of epenthesis, is conceptualized as an intermediate stage of the derivation:

(1)	UR	/dešʔ/
	Epenthesis	dešeʔ
	Deletion	deše

In terms of the OT-analysis in (2), the challenge is to explain why the transparent candidate (2b) *deš* is not the winner:

(2) (from McCarthy 1997, 5)

/dešʔ/	CodaCnd	Max-IO	Dep-IO	Align-R (Root, σ)
☞ a. deše opaque winner		*	*	*
☜ b. deš transparent rival		*		*
❀ c. dešeʔ sympathy candidate	*!		*	✓

The candidate (2b) fulfills not only the Coda Condition against syllable-final ʔ, but also Dep-IO. Its violation marks are in fact a proper subset of those of the intended winner (2a), so no mere reranking of constraints can solve the problem. The basic idea behind Sympathy Theory is that such opacity effects in the selection of the overall winner are not caused by some residual serialism in the overall design of the grammar (e.g., in the form of derivational levels, as suggested by Kiparsky 1997), but are in fact fully parallel in nature. In McCarthy's 1997 conception, Opacity is caused by a new type of faithfulness—"Sympathy"—to a specific failed candidate (here, the sympathy candidate (2c) marked with '❀': the candidate that best-satisfies Align-R and the rest of the constraint system, in that order).

This paper presents independent evidence for Sympathy by arguing that, enriched with the new notion, OT can explain a certain type of prosodic-morphological formation requiring access to virtual forms accessible neither at input nor at output. In a broader vein, it is suggested that with the inclusion of Sympathy, the power of Output-Output constraints can be drastically reduced, leading to a simpler overall theory.[1]

2. Truncation in German: templatic requirements through Sympathy

A productive pattern of truncation deriving hypocoristics and other kinds of shortenings (*"Kurzwörter"*) in contemporary German[2] is illustrated in (3).[3]

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[1] We are indebted to John McCarthy for sharing his ideas about Sympathy with us, and for detailed discussion. Thanks also to the audiences at H-OT and SWOT, and to the participants in the spring 1997 phonology proseminar at UCSC and at the Scandinavian Summer School in Generative Phonology (Hvalfjörður, Iceland, June 1997), in particular, Paul Kiparsky, for challenging questions and discussion. For detailed comments on an earlier version of this paper, we are grateful to Dan Karvonen and Adam Sherman. This work was partially supported by faculty senate grants from the University of California at Santa Cruz and by the National Science Foundation under grant SBR-9510868. The names of the authors appear in alphabetical order.

[2] The initial impetus for this work stems from discussions with Caroline Féry at the University of Tübingen (Dec. 1996), and we have benefited from her careful OT analysis (Féry 1997) of the German truncations.

[3] See Bellmann 1980, Latzel 1992/94, and Greule 1983/4 for many other examples. Previous phonological analyses include Féry (1997), Neef (1996), and Wiese (1996).

(3) a. *Personal names:*

Gàbriéle	Gábi	
Éva	Évi	
Wáldemàr	Wáldi	
Stéfanìe	Stéffi[4]	
Ótto	Ótti	
Úlrich	Úlli	
Hóward	Háui	(pop singer Howard Carpendale)

b. *Surnames:*

Górbatschòw	Górbi	
Hónecker	Hónni	(as in Udo Lindenberg's song 'Wann geht der Sonderzug nach Potsdam?')
Schimánsky	Schímmi	(the actor Götz George, who played Detective Schimansky)
Klínsmànn	Klínsi	(soccer player)
Tö́pperwìen	Tö́ppi	(sports reporter)
Schláppner	Schláppi	(soccer coach)
Wásmèier	Wási	(ski champion)

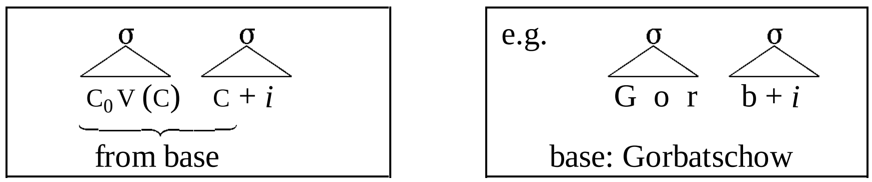
c. *Common nouns, mostly denoting persons:*

Àlkohóliker	Álki	'alcoholic'
Àmerikáner	Ámi	'American'
Àssistént	Ássi	'assistant (professor)'
Chíp	Chíppi	'computer fan'
Schátz	Schátzi	'darling'
Mútter	Mútti	'mother'
Óma	Ómi	'grandmother'
Pròletárier	Próli	'proletarian'
Pròminénter	Prómi	'VIP'
Sànitä́ter	Sáni	'paramedic'
Érdkùnde	Érdi	'geography' (as a school subject)
Rèligión	Réli	'religion' (as a school subject)
Trabánt	Trábi	(car produced in former East Germany)
Trä́nengàs	Trä́ni	'tear gas'

[4] Orthographic doubling of consonant letters indicates the shortness of the preceding vowel (and often ambisyllabicity of the consonant), not consonant gemination.

The general form of these truncations is as in (4): one syllable corresponding to the beginning of the base word,[5] followed by an additional base consonant and the suffix -*i*, which is the characteristic mark of these truncations.[6]

(4)



Itô & Mester (1992, 16) introduce the idea of a non-templatic approach to so-called templatic effects. On the basis of an extensive analysis of Japanese truncations (building on Itô's 1990 templatic analysis), it is shown that the considerable prosodic variety of truncated forms can be reduced to a very simple core: they are all instances of the unmarked prosodic word of the language. It is demonstrated that the notion 'unmarked prosodic word' cannot adequately be captured by some kind of template pool—rather, it must be formally expressed by a set of constraints leaving a certain amount of variation space: hence the observed variety of prosodic shapes.

Further developed within OT under the slogan "Emergence of the Unmarked" (McCarthy & Prince 1994, 1995) for reduplication, this approach has given rise, among other things, to a nontemplatic analysis of truncation (Benua 1995) schematically summarized in (5), with structural markedness constraints sandwiched between dominant IO-Faithfulness and dominated truncation-specific Faithfulness.

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[5] Generally speaking, left-anchoring is fulfilled even in cases where the first syllable of the base is unstressed: *Schimánski*→*Schímmi*, etc.—but examples like *Augúste*→*Gústi*, with head-to-head correspondence preferred to proper left-anchoring, do exist. The variability is mainly associated with nicknames, and should not be taken to weaken the basic left-anchoring pattern, which reveals itself productively with the truncation of common nouns (*Alki, Proli,* etc.). It is well-known that nicknames (associated with individuals), while usually observing templatic requirements, come with idiosyncrasies and irregularities that are arguably a result of child language patterns, sound-symbolism, and even sociological trends. Such extraneous factors are interesting in their own right (and may eventually impact the grammatical system), but are clearly not central to the basic phonological analysis.

[6] Other suffixes, such as -*o* in *Heinrich* → *Heino*, etc., do exist, but -*i* is the only truly productive suffix.

(5)	*general-purpose maximizer*		*size restrictors*		*truncation-specific maximizer*
	Max-IO	»	All-Ft-L, Parse-σ, etc.	»	Max-BT[7]

The analysis in (6) builds on the idea that, just as reduplication, truncation is governed by OO-Identity constraints—here, Max-B(ase)-T(runcatum)—on the correspondence between the truncatum and its base, not by IO-Faith constraints (e.g., Max-IO; for reduplication, this conforms to McCarthy & Prince's 1995 "basic model").

(6) Input: /gorbačof/ /TRUNC + i/

IO-Faith

Output: [gorbačof] [gorb i]

BT-Ident

As shown in (7), a direct application of these ideas achieves the right result for examples such as *Gorbatschow* → *Gorbi*.

(7)

Base: [(.gór.ba).(čòf.)] Input: /TRUNC + i/	Max-IO	All-Ft-Left	Parse-σ	Max-BT
a. (.gór.ba).(čòf-i.)		*!		
b. (.gór.ba).č-i.			*!	of
☞ c. (.gór.b-i.)				ačof
d. (.gó.r-i.)				bačof!
e. (.gór.ba.)	i!			čof
f. (.górb.)	i!			ačof
g. (.gór.)	i!			bačof

[7] Max-BT is parallel to Max-BR for reduplication systems: T(runc) = truncatum, cf. R(ed) = reduplicant.

Here, the suffix -*i* is the only I(nput)-element to reckon with (TRUNC being an empty morpheme whose output exponence is governed by OO-Identity, not by IO-Faithfulness). Max-IO is therefore violated only in (7e-g), where the suffixal -*i* is missing in the output. The preservation of base segments in the truncatum is regulated by low-ranking Max-BT, which is crucially dominated by All-Ft-Left: this is why the two-foot candidate (7a) loses against the one-foot candidate (7c).[8]

Even though successful in (7), the analysis cannot cope with a second class of bases such as *Gabriele* → *Gabi*. Here the incorrect form **Gabri* is the predicted truncatum (8c).

(8)

Base: (.gà.bri).(é.le.) Input: /TRUNC + i/	Max-IO	All-Ft-Left	Parse-σ	Max-BT
a. (.gà.bri).(é.le).-i.		*!	*	
b. (.gà.bri).(é.l-i.)		*!		e
wrong winner: ☞ c. (.gá.br-i.)				iele
desired winner: d. (.gá.b-i.)				riele!
e. (.gáb.)	i!			riele

The source for the problem is not hard to find: Max-BT has the effect of always maximally preserving the cluster in the truncatum, whether this is the correct output (*Gorbi*) or not (**Gabri*). Examples of maximized clusters appear in (9), followed by non-maximized clusters in (10).

(9) *Maximized clusters:*

Hans	Hansi	*Hanni	(personal name)
Gorbatschow	Gorbi	*Gorri	(name of politician)
Stoltenberg	Stolti	*Stolli	"
Alkoholiker	Alki	*Alli	‘alcoholic’
Computer	Compi	*Commi	‘computer’
Fundamentalist	Fundi	*Funni	‘fundamentalist Green Party member’
Gruft	Grufti	*Gruffi	‘older person’ (*Gruft* ‘grave’)

[8] Here we abstract away from coda devoicing that would affect the final segment in candidate (7f); see section 3 below.

Handarbeit	Handi	*Hanni	‘handicraft’ (as a school subject)
Hirn	Hirni	*Hirri	‘brain’ (slang for ‘stupid person’)
Hunderter	Hundi	*Hunni	‘100DM bill’
Imperialist	Impi	*Immi	‘imperialist’ (as in: *Anti-Impi*)
Knast-insasse	Knasti	*Knassi	‘prisoner’ (*Knast* ‘prison’)
Radenković	Radi	*Rai	(well-known former goalkeeper)
Spontaner	Sponti	*Sponni	‘member of spontaneous leftist group’
Sympathisant	Sympi	*Symmi	‘sympathizer’
Torpedo-maat	Torpi	*Torri	‘petty officer on a torpedo boat’
Tourist	Touri	*Toui	‘tourist’
Transvestit	Transi	*Tranni	‘transvestite’

(10) *Examples of non-maximized clusters:*

Andreas	Andi	*Andri	(personal name)
Benjamin	Benni	*Benji	"
Dagmar	Daggi	*Dagmi	"
Edmund	Edi	*Edmi	"
Gabriele	Gabi	*Gabri	"
Heinrich	Heini	*Heinri	"
Siegfried	Siggi	*Sigf(r)i	"
Tusnelda	Tussi	*Tusni	"
Ulrich	Ulli	*Ulri	"
Wilhelm	Willi	*Wilhi	"
Klinsmann	Klinsi	*Klinsmi	(name of soccer player)
Littbarski	Litti	*Littbi	"
Schlappner	Schlappi	*Schlappni	(name of soccer coach)
Wasmeier	Wasi	*Wasmi	(name of ski champion)
Bhagwan-jünger	Bhaggi	*Bhagwi	‘follower of Bhagwan’
Plastik	Plasti	*Plassi	‘McDonald’s type’
Imker	Immi	*Imki	‘beekeeper’
Knoblauch	Knobi	*Knobli	‘garlic’
Transvestit	Transi	*Transvi	‘transvestite’

A first attempt to isolate the difference between (9) and (10) might focus on the observation that complex onsets are avoided in truncata (see Neef 1996 and Féry 1997 for discussion), a familiar (un)markedness effect (Steriade 1988)—hence *.An.di.* instead of **.An.dri,* etc. This line of attack, however, has nothing to say about cases like *Ulrich* → *Ulli*, **.Ul.ri.* or *Imker* → *Immi*, **Imki*, where onset complexity is not involved (and neither is, incidentally, syllable contact).

There is a different generalization, more abstract than the direct markedness-based approach, which covers all truncations: the bare truncatum (i.e., the shortened form without the suffix *-i*) must be a *possible* syllable of German (11) (abstracting away from coda devoicing, see below).[9]

(11)

	Gorb-i	*Gab-i*	*And-i*
	✓ σ .gorb. <ačof>	* σ .gabr. <iele>	* σ .andr. <eas>
		✓ σ .gab. <riele>	✓ σ .and. <reas>

Maximization still plays a role here: Besides being a possible syllable, the truncatum must be the *maximal* syllable extractable from the base (12).

(12)

	σ	σ	σ
	*.gor.<bačof>	*ga.<briele>	*.an. <dreas>
	**Gor-i*	**Ga-i*	**An-i*

What, then, is the status of the syllables [.gorb.], [.gab.], [.and.], etc. that play such a pivotal role in the formation of the truncated forms *Gorbi*, *Gabi*, and *Andi*? They are not constituents of some input; they are not output forms themselves; they are not constituents of the base form (cf. *gor.ba.čof.*, *.ga.bri.e.le.*, *.an.dre.as.*, etc.); and they are not constituents of the truncated output forms (cf. *.gor.bi.*, *.ga.bi.*, *.an.di.*, etc).

We are left with the conclusion that $[gorb]_\sigma$ etc. are not to be found anywhere in the input or in the output; still, they influence the selection of the winning candidate

9 The understanding of the parallel case in English (*rugby* → *rugger*, **rugber* vs. *Bolshevik* →*Bolshy*, **Bolly*) by means of mapping to a $\sigma = W_{min}$ template is due to McCarthy & Prince (1986, 60); see also Kenstowicz (1994, 9). Neef (1996, 282-283) notes that the German truncations follow the same pattern, albeit far more productively than in English.

in a decisive way. In other words, this is an instance of phonological *opacity*. An important lesson of such cases is that, in order to achieve full generality, the concept of opacity must be detached from the rule-interactionist thinking of traditional rule-based phonology ("feeding, bleeding, counterfeeding, counterbleeding"; "opaque vs. transparent rule interaction"; see Kiparsky 1968, 1973; see also Iverson 1995 for a recent overview, from a contemporary perspective). The case at hand arises in the midst of prosodic morphology, where phenomena of this kind were treated procedurally by means of Prosodic Circumscription (see McCarthy & Prince 1990 for the general theory and analyses involving circumscription of the minimal word; see Mester 1990 for the case that is relevant here, namely, syllable circumscription).

Using the German truncation case as an example, we will now show that Sympathy Theory, properly extended, accounts for opacity effects in prosodic morphology.[10] The crucial step in the analysis is to find a way of singling out one of the (infinitely many) co-candidates of the output [.gor.bi.], namely, the monosyllabic [.gorb.]. Even though not the overall winner, [.gorb.] plays a special role by influencing the selection of the optimal candidate through *Sympathy* (in the sense of McCarthy 1997).[11]

For notational clarity, we denote the constraint responsible for the selection of the sympathy candidate as $\mathbb{C}^{❀}$. Like all constraints, $\mathbb{C}^{❀}$ partitions the candidate set into two subsets: (i) those that do not violate it, and (ii) those that violate it (to whatever degree—gradiency of violation is irrelevant as long as there is at least one candidate that does not violate $\mathbb{C}^{❀}$ at all). The designated sympathy candidate is that element of subset (i) that best-satisfies the rest of the constraint system, in the standard optimality-theoretic sense (Prince & Smolensky 1993). Slightly more formally, we offer the definition in (13).

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[10] For the analysis of sporadic further simplifications (such as *Ostdeutscher* → *Ossi*, *Westdeutscher* → *Wessi*), see Féry 1997.

[11] Compare the procedural statement (as in classical prosodic morphology, see McCarthy & Prince 1986, 1990): (i) Maximally map the base segments onto a monosyllable (no skipping, left-to-right, (ii) suffix /i/, /-o/, etc., (iii) resyllabify.

(13) Def.: *sympathy candidate selected under* $C^{\text{❀}}$

> Given a constraint hierarchy [$\mathbb{C}_1$ » ... » $\mathbb{C}_i$ » $\mathbb{C}^{\text{❀}}$ » $\mathbb{C}_j$ » ... » $\mathbb{C}_n$], the *sympathy candidate selected under* $C^{\text{❀}}$ is the candidate that, among the candidates best-satisfying $\mathbb{C}^{\text{❀}}$, best-satisfies [$\mathbb{C}_1$ » ... » $\mathbb{C}_i$ » $\mathbb{C}_j$ ... $\mathbb{C}_n$] (i.e., the remainder of the constraint hierarchy). (The sympathy candidate is marked by '❀'.)

In other words, the sympathy candidate is the candidate that best-satisfies the constraint hierarchy [$\mathbb{C}^{\text{❀}}$ » $\mathbb{C}_1$ » ... » $\mathbb{C}_i$ » $\mathbb{C}_j$ » ... » $\mathbb{C}_n$] (with top-ranking $\mathbb{C}^{\text{❀}}$), in a separate optimization in the sense of Wilson 1997.

The basic idea is illustrated in (14): cand_3 and cand_4 violate $\mathbb{C}^{\text{❀}}$ and are hence crossed out. The remaining candidates are evaluated in the usual optimality-theoretic way, and cand_1 is handed the ❀-mark.

(14)

	$\mathbb{C}_1$ »	...	$\mathbb{C}_i$	$\mathbb{C}^{\text{❀}}$	$\mathbb{C}_j$ »	...	$\mathbb{C}_n$
❀ cand_1			*				
cand_2	*!						
cand_3			*	*!		*	
cand_4				*!			
cand_5			*		*!		
cand_6			*				*!

The necessary extension of Sympathy Theory beyond the proposal of McCarthy 1997 concerns the class of constraints that can play the role of $\mathbb{C}^{\text{❀}}$. In the original version of the theory, it was stipulated that $\mathbb{C}^{\text{❀}}$ must be a faithfulness constraint. The suggestion here is simply to remove this stipulation, as in (15).[12]

[12] Are there *any* limits on what can be a $C^{\text{❀}}$-constraint? Most likely there are—but rather than imposing some a priori limit at the outset, in the name of restrictiveness, we will leave this issue to be settled in future work, after further empirical exploration of the issues. As Colin Wilson (personal communication) reminds us, the extension in (15) flows from the very essence of OT, namely, ranking variation among constraints. Whereas $\mathbb{C}_i$ might dominate $\mathbb{C}_j$ in some systems, the opposite might hold in others. For the case at hand, whereas Faithfulness might be dominant in sympathy candidate selection in many systems, the logic of OT itself compels us

(15) **Extended Sympathy:**
Other types of constraints, besides Faithfulness, can serve as ℂ❀ (the constraint determining the sympathy candidate, as defined in (13)).

For the analysis of German truncations, ℂ❀, the constraint determining the designated candidate, is a structural (prosody-to-prosody) alignment constraint. After all, the sympathy candidate—for example, *Gorb* for the truncation *Gorbi*, associated with the base word *Gorbatschow*—is noteworthy not for its faithfulness to the base word, but rather for its shortness, and for the fact that it consists of only a single syllable. The central step in the analysis is (16).

(16) Analysis: German Truncation
ℂ❀ = All-σ-Left: Align (σ, Left, PrWd, Left)[13]

We illustrate this analysis by deriving the truncation *Andreas*→ *Andi*. First, the selection of the sympathy candidate is shown in a separate tableau in (17) (perhaps to be thought of as a separate optimization, see the remark after (13)).

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to expect other constraints in this role as well. And whereas there are good reasons to assume that for many pairs of constraints there are limits on free ranking, imposed on the grammatical system from the outside (under the influence of articulatory, acoustic, and other grammar-external factors), the reranking of Faithfulness constraints is undoubtedly the most frequently invoked, and best-motivated, analytical tool in optimality-theoretic work. Regarding the special role of Faithfulness constraints, Itô & Mester 1995 propose that grammar-internal reranking in stratally organized lexica is in fact limited to faithfulness constraints (a variant of this idea works with separate stratally-indexed faithfulness constraints, following the version of Correspondence Theory in McCarthy & Prince 1995 in a more literal way; for derivational levels, the restriction on reranking has recently been taken up in Kiparsky 1997). One of the most important questions here is whether the pivotal role of faithfulness in this context is a fact of ranking markedness or a grammatical absolute (and as such hard-wired into UG). Since the latter strikes us as an unlikely possibility (and one contributing little, if anything, to the illumination of the underlying factors in the first place), we assume the former as a working hypothesis.

[13] See McCarthy & Prince 1993 for the general theory of prosody-to-prosody alignment; Syllable-to-PrWd Alignment was introduced in Mester & Padgett 1994 in order to account for 'directional' biases in the selection of epenthesis sites. Templatic effects of All-σ-L/R in reduplication (i.e., minimization to a single syllable) are extensively studied in Spaelti 1997.

(17)

B: .an.dre.as. I: /T + i/	Max-IO	All-σ-Left❀	Max-BT
sympathy candidate ❀ a. .and.	i		reas
b. .an.	i		dreas!
c. .a.	i		ndrea!s
~~d. .a.n-i.~~		~~σ~~	~~dreas~~
~~e. .an.d-i.~~		~~σ~~	~~reas~~
~~f. .an.dr-i.~~		~~σ~~	~~eas~~
~~g. .an.dre.a.s-i.~~		~~σ σ σ~~	

The first three candidates (17a-c) do not violate All-σ-L: the others (17d-f) violate All-σ-L and leave the competition after the first round (they are hence crossed out). Among (17a-c), (17a) [.and.] best-satisfies the remainder of the constraints, and is hence marked as the (sympathy) ❀-candidate.[14]

The ❀-candidate exerts its influence through the *sympathy* constraints, which check the faithfulness of each output candidate to the designated ❀-candidate. Just as IO-faithfulness monitors input-output relations, the sympathy constraint, i.e., ❀O-faithfulness, monitors the relation between two output candidates, one of which is the designated ❀-candidate. For the case at hand, the operative sympathy constraint is Dep-❀O (18), which militates against output elements not present in the ❀-candidate (here, $[\text{and}]_\sigma$), as seen in (19).

(18) Dep-❀O: "Every segment in the output has a correspondent in the ❀-candidate."

Max-IO eliminates the monosyllabic candidates (19a-c) (including the ❀-candidate itself).[15] Candidate (19f) [andri], which would have been the (wrong)

[14] Note that All-σ-Left cannot be replaced by the all-purpose minimizer *Struc (here, *Struc-σ)—the latter would select the Ø-candidate as the designated ❀-candidate (regardless of where MParse is ranked).

[15] Other possible candidates are ruled out by other high-ranking constraints. For example, [.ai.] is ruled out by *RT-SFX-SEGREGATION: "A root and a suffix cannot be wholly contained in a single syllable" (McCarthy & Prince 1993, 169); and [.i.] violates *REALIZE-MORPHEME (Gnanadesikan 1997, after Samek-Lodovici 1993; cf. also MORPHDIS (Morphemic disjointness), as defined in McCarthy & Prince 1995, 310)).

winner in the standard BT analysis (see (8)), now loses to candidate (19e) [andi] because of the additional Dep-❀O violation: [andi] is more faithful to [and] than [andri] since it avoids the ❀-extraneous /r/. Low-ranking Max-BT still plays a role in rejecting (19d) [ani] in favor of (19e) [andi].

(19)

B: .an.dre.as. I: /T + i/	Max-IO	Dep-❀O	All-σ-Left❀	Max-BT
❀ a. .and.	i!			reas
b. .an.	i!			dreas
c. .a.	i!			ndreas
d. .a.n-i.		i	σ	dreas!
☞ e. .an.d-i.		i	σ	reas
f. .an.dr-i.		ri !	σ	eas
g. .an.dre.a.s-i.		re!asi	σ σ σ	dreas

Tableau (20) shows that normal IO-relations (i.e., in cases not involving truncation) are not disturbed by the designated sympathy candidate and the sympathy constraint Dep-❀O since Max-IO reigns supreme.

(20)

I: /andreas/	Max-IO	Dep-❀O	All-σ-Left❀	Max-BT
❀ a. .and.	r!eas			
b. .an.	d!reas			
c. .a.	a!ndreas			
d. .an.dre.	a!s	re	σ	
e. .an.dre.a.	s!	rea	σ σσ	
☞ f. .an.dre.as.		reas	σ σσ	

This analysis then employs all three types of correspondence: IO-correspondence (Max-IO), OO-correspondence (Max-BT), and sympathy correspondence (Dep-❀O). It is interesting to note that distinguishing Max-BT from Max-IO does not do all the work; sympathetic faithfulness is independently necessary, which raises the question whether OO-correspondence is still needed (at least for cases such as these), given the presence of sympathetic faithfulness (McCarthy 1997). We will return to this point below in section 4.

3. Coda Condition and Constraint Conjunction

So far the analysis has not taken into account the well-known Coda devoicing facts in German (and other languages), which have been given a positional faithfulness account in Lombardi 1995 and Beckman 1997 (distinguishing, for example, between Ident(F) and Ident-*Position*(F), where *Position* is a variable over prominent positions).

Two observations are pertinent at this point. (i) Given that the overall theory contains some version of local constraint conjunction in the sense of Smolensky 1995, there is an imperative to reduce complex constraints to simpler, more elementary ones. As an immediate consequence, positional faithfulness effects are unlikely to be directly reflected in positional faithfulness constraints, since they are prime candidates for reduction to a constellation of more elementary factors. Many, and perhaps all, of them can be understood as conjunctions of a general faithfulness constraint with a position-specific constraint (e.g., Alignment-, Anchoring-, Coincide-, etc.). Similar considerations hold for licensing-oriented approaches with specific constraints governing complex elements (Zoll 1996). As pointed out by Prince 1997, constraint-internal reference to complexity violates an endogenous constraint on Optimality Theory, indicating that proper reduction has not been achieved.

(ii) For the case in question, namely, coda devoicing, a constraint-conjunctive analysis is possible (as proposed in Itô & Mester 1996) that obtains the facts in an arguably simpler way, namely, out of pure markedness considerations: ruled out is the *marked* in a *marked* position, here, a voiced obstruent in a syllable coda. In this constraint-conjunctive proposal, the two basic constraints—the syllable structure constraint NOCODA and the markedness constraint against voiced obstruents—are locally conjoined (domain: C) to derive the new constraint which militates against codas with voiced obstruents (21).

(21) Derived constraint — NoCoda &$_\ell$ *[+voi, -son]
"*no voiced obstruents in codas*"

⇑ (c)

(a) (b)

Basic constraints: *[+voi, -son] NoCoda
"*no voiced obstruents*"

The crucial intervention of the Ident[+voi] constraint between the conjoined constraint and the feature markedness constraint correctly results in coda devoicing (22a) but not onset devoicing (22b).

(22)a.

/li:b/ lieb ‘dear, pred.’	NoCoda &$_\ell$ *[+voi,-son]	Ident[+voi]	*[+voi, -son]	NoCoda
.li:b.	*!		*	*
☞ .li:p.		*		*

b.

/li:bə/ liebe ‘dear, attr.’	NoCoda &$_\ell$ *[+voi,-son]	Ident[+voi]	*[+voi, -son]	NoCoda
☞ .li:.bə..			*	*
.li:.pə.		*!		*

This conjoined constraint, henceforth CODACOND, disallows voiced obstruents in coda position: *[+voi,-son] $]_\sigma$, and appears to be undominated in German. When included in the truncation tableau for *Andreas* (23), the candidate [.ant.] (23a) (and not [.and.] (23b)) will be chosen as the ❀-candidate (CodaCond » Ident-BT(voi)), but [.an.di.] (23c) will be the ☞ winner because of the ranking Ident-BT(voi) » Ident-❀O(voi).

(23)

B: .an.dre.as. I: /T + i/	Max-IO	Dep-❀O	All-σ-Left❀	Max-BT	Coda-Cond	Ident-BT (voi)	Ident-❀O (voi)
❀ a. .ant.	i!			reas		*	
b. .and.	i!			reas	*!		*
☞ c. .an.d-i.		i	σ	eas			*
d. .an.t-i.		i	σ	eas		*!	

Tableau (23) illustrates an important point about the workings of Sympathy Theory and the similarity between the ❀-candidate and the overall ☞ winner: Although Dep-❀O has an effect on the size of the winning candidate, low-ranking Ident-❀O does not force the winner to be faithful to the ❀-candidate in terms of voicing.

4. Truncation without OO-Correspondence

Given the inclusiveness of the candidate set in OT, the Sympathy-based analysis of truncation presented above raises the serious possibility that OO-correspondence between separate output forms might be (totally, or partially) reducible to Sympathy to a special co-candidate. Sympathetic faithfulness to this co-candidate is arguably the more general solution, along the lines of McCarthy's 1997 opacity proposal.[16]

More specifically, the overall templatic effect, achieved through (i) a prosodic delimiter constraint and (ii) specific BT-Maximization, could plausibly be taken over by (i) sympathetic Faithfulness to the ❀-candidate (here: monosyllabic) and (ii) general-purpose IO-Maximization, respectively.

That is, no BT-relation is posited, instead the input contains the underlying form of the base. IO-Faithfulness applies, but is dominated by sympathetic Faithfulness.[17]

[16] For relevant arguments, see Karvonen & Sherman 1997, who show that a Sympathy account is superior to an appeal to OO-correspondence in dealing with opacity effects in Icelandic.

[17] In essential points, this is similar to the revised model of reduplication proposed in Spaelti 1997 (see pp.32–35, 70-73). For reduplication, the theory continues to contain a family of Base-Reduplicant Identity constraints. These are constraints on OO-correspondence, but of a very special kind, namely, holding between elements contained within a single linguistic form, not between independent forms.

For *Andreas* → *Andi*, **And*, the input for [andi] is not /TRUNC + i/, but /andreas+i/ with the base segments.

Two further ingredients are needed to get the analysis off the ground. First, the information leading to truncation must be encoded somewhere in the input. Instead of postulating an abstract morpheme TRUNC for just this purpose, we can simply assume that the overt truncation affix /-i/ is specified with the lexical requirement $\mathbb{C}^{❀}$=ALL-σ-L, (i.e., ALL-σ-L is the constraint determining the designated candidate for forms headed by /-i/). This is not a further complication, since the BT analysis needs a similar lexical requirement on its abstract morpheme TRUNC.

Second, NONFINALITY (24) ranks above Max-IO, blocking monosyllabic *[and] as an output—together with All-σ-Left, it results in the disyllabicity requirement holding for this and other truncations.[18]

(24) NONFINALITY: No head-σ of PrWd is final in PrWd.

Tableau (25) selects the ❀-candidate in the familiar way, and tableau (26) shows the overall ranking, with the selection of the winning candidate.

(25)

/andreas+i/	NonFinality	Max-IO	All-σ-Left❀
☞ a. .an.dre.a.si.			σ σ σ
b. .an.dri.		eas	σ
c. .an.di.		reas	σ
d. .a.ni.		dreas	σ
❀ e. .and.	*	reasi	
f. .an.	*	dreas!i	
g. .a.	*	ndrea!si	
h. .ai.	*	ndrea!s	
i. .i.	*	andre!as	

18 See Kubozono, Itô & Mester 1997 for this use of NONFINALITY, in the context of an analysis of Japanese truncations.

(26)

I: /andreas+i/	NonFinality	Dep-❀O	Max-IO	All-σ-Left❀
❀ a. .and.	*!		reasi	
b. .an.	*!		dreasi	
c. .a.	*!		ndreasi	
d. .i.	*!	i	andreas	
e. .ai.	*!	i	ndreas	
f. .a.ni.		i	dreas!	σ
☞ g. .an.di.		i	reas	σ
h. .an.dri.		ri!	eas	σ
i. .an.dre.a.si.		re!asi		σ σ σ

Here, Max-IO alone does the job that used to be done jointly with Max-BT.[19]

Just as in the analysis above (in (17)-(23)), which simply adds Sympathy-correspondence to BT- and IO-correspondence, IO-relations are here unperturbed in normal (non-truncatory) cases like *Andreas* (27), but for a different (and more straightforward) reason: Without a truncating suffix triggering the designation of a ❀-candidate, there is no sympathetic correspondence between co-candidates, and hence the sympathy constraint Dep-❀O is vacuously satisfied by all candidates.

(27)

I: /andreas/	NonFinality	Dep-❀O	Max-IO	All-σ-Left
a. .and.	*!		reasi	
b. .an.	*!		dreasi	
c. .a.	*!		ndreasi	
d. .an.dre.			a!s	σ
☞ e. .an.dre.as.				σ σ σ

We conclude by raising a number of related questions worthy of further exploration. First, is BT-correspondence still necessary to account for the fact that,

[19] We assume high-ranking REALIZE-MORPHEME (or Align-R), to ensure the parsing of the *i*-suffix.

besides Anchor-Left, head-to-head correspondence (preservation of the stressed syllable, see Alderete 1995 and Crosswhite 1995 for related cases) is crucial in truncation like *Augúste* → *Gústi*? Perhaps, but *Augúste* is also a co-candidate of *Gústi*: Given Sympathy, no additional transderivational power is needed in order to access crucial properties of the first form. Is BT-correspondence still independently necessary to account for the *L*[æ]*rry* ~ *L*[æ]*r* overapplication effects discussed in Benua 1995? Possibly—but again, *L*[æ]*rry* is among the co-candidates of the truncation *L*[æ]*r*, and might be responsible for the front vowel through Sympathy.

From the perspective of the overall theory, Sympathy Theory, as developed by McCarthy 1997, recaptures within parallelism some core insights of serialist phonology in the treatment of opacity. We have tried to show that the parallelist OT-conception of opacity is in fact essential in helping us understand the phenomenon in its full generality, including prosodic-morphological instances of opacity. Finally, the new approach opens up the prospect of a simpler overall theory in which a whole class of OO-constraints has been eliminated, with their former work now subsumed under Sympathy Theory.

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