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Opacity in Icelandic: A Sympathy Account

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1. Introduction

Phonological opacity is an area that has proven problematic for Optimality Theory (henceforth OT; Prince and Smolensky 1993). In a derivational framework, opacity is handled via rule ordering. Intermediate representations are therefore crucial, since every phonological rule after the first applies to an intermediate representation which is created as the result of the application of a previous rule. Such opaque interactions pose a challenge to parallelist versions of OT since they pair only an input with an output, and therefore lack intermediate representations. To overcome this challenge, McCarthy (1997) proposes that opacity results from a correspondence relation (dubbed *Sympathy*) that holds between a designated failed candidate (the *sympathy* candidate) and the members of the output candidate set.

In this paper, we provide a sympathy account of the well-known counterbleeding interaction between Glide Deletion and [ʏ]-Epenthesis[1] in Icelandic. We first present the data and discuss the alternations that occur. We then go on to demonstrate how a standard OT analysis cannot account for cases where both of the rules apply. Next, we show how Sympathy provides a straightforward account of the data. Finally, we demonstrate that Output-Output (OO) Correspondence (Benua 1995, 1997, Burzio 1996, *inter alia*) fails to provide a unified account of the phenomena, since such an approach would involve questionable correspondence relations, and more importantly, cannot correctly distinguish between underlying and epenthetic [ʏ].

2. Glide Deletion

In Icelandic, underlying glides /j/ and /v/ surface in certain inflected forms of nouns, adjectives, and verbs and delete in others (Orešnik 1972), as informally described in (1) and illustrated by the data in (2) (Einarsson, 1945):

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[1] We use a fairly broad IPA transcription throughout this paper for Icelandic, contrary to the practice found in much of the literature of using the orthography only. [ʏ] represents a high, front, rounded, lax (-ATR) vowel.

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(1) /j, v/ → Ø / C __ {#, C}

(2) a.	/bɪlj/	byl	[bɪl]	'(snow)storm, acc.sg.'	cf. bylj-i (acc.pl.)
	/bɪlj-s/	byls	[bɪls]	'(snow)storm, gen.sg.'	cf. bylj-um (dat.pl.)
	/bɪrj/	byr	[bɪr]	'wind for sailing, acc.sg.'	cf. byrj-ar (gen.sg.)
	/söŋgv-s/	söngs	[söjŋks]	'song, gen.sg.'	cf. söngv-a (gen.pl.)
	/mörv/	mör	[mör]	'suet, acc.sg.'	cf. mörv-a (gen.pl.)
b.	/krefj/	kref	[kref]	'demand, 1.sg.pres.'	cf. krefj-a (3.pl.pres.)
	/sekkv/	sekk	[sekk]	'sink, 1.sg.pres.'	cf. sökkv-a (3.pl.pres.)
c.	/mɪðj/	mið	[mɪð]	'middle, nom.sg.fem.'	cf. miðj-an (acc.sg.masc.)

Underlying glides thus delete when they are unsyllabifiable (Kiparsky 1984, Itô 1986); i.e., when they cannot be incorporated into a coda cluster because this would violate the Sonority Sequencing Principle (SSP) (Jespersen 1904). The SSP requires sonority to rise in complex onsets and to fall in complex codas. Glides surface only when they can be syllabified into the onset, as illustrated by the forms in the rightmost column in (2).

We propose an OT analysis of Glide Deletion that crucially makes use of the constraint SONCON (Benua 1995), which is the OT correlate of the SSP. SONCON interacts with the standard correspondence-theoretic faithfulness constraints MAX-IO and DEP-IO (McCarthy and Prince 1995), which militate against segmental deletion and insertion, respectively.

(3) SONCON (Benua 1995:90)
Complex onsets rise in sonority, and complex codas fall in sonority.

(4) MAX-IO (McCarthy and Prince 1995)
Every segment of the input has a correspondent in the output.

(5) DEP-IO (McCarthy and Prince 1995)
Every segment of the output has a correspondent in the input.

SONCON is crucially ranked above MAX-IO in Icelandic, since unsyllabifiable glides delete in order to respect SONCON, as shown in the following tableau:

(6) [bɪl] '(snow)storm, acc.sg.'

/bɪlj/	SONCON	MAX-IO
☞ a. bɪl		*
b. bɪlj	*!	

To prohibit epenthesis in such cases, DEP-IO must be crucially ranked above MAX-IO. This is shown in the tableau in (7):

(7) [bɪl] '(snow)storm, acc.sg.'

/bɪlj/	SONCON	DEP-IO	MAX-IO
☞ a. bɪl			*
b. bɪlj	*!		
c. bɪljʏ		*!	
d. bɪlʏj		*!	

If MAX-IO outranked DEP-IO, we would expect candidate (c) or (d) to emerge the winner. However, this is not the case; we must compel deletion of the input-final /j/ in the output. Thus, MAX-IO must be ranked below DEP-IO. The ranking so far is given in (8) (the ranking between SONCON and DEP-IO will be justified in the next section).

(8)

SONCON
|
DEP-IO
|
MAX-IO

3. [ʏ]-Epenthesis

In Icelandic, the vowel [ʏ] (orthographic *u*) is inserted between a consonant and the liquid [-r] at the end of a word (Anderson 1974). The [-r] ending is the masculine singular nominative ending for nouns and adjectives, as well as the third person singular ending for verbs. An informal description of the rule is given in (9), followed by data illustrating the alternations in (10):

(9) Ø → [ʏ] / C __ [r] #

[ʏ]-Epenthesis occurs before the nominative masculine singular ending [-r] in nouns and adjectives (10ab) and before the second and third person singular ending [-r] in the present tense of certain verbs (10c):

(10) a.	/daɣ-r/	dagur	[daɣʏr]	'day, nom.sg.'	cf. snjó-r 'snow, nom.sg.'
	/stað-r/	staður	[staðʏr]	'place, nom.sg.'	
b.	/snarp-r/	snarpur	[snarpʏr]	'rough, nom.sg.masc.'	cf. ný-r 'new, nom.sg.masc.'
	/harð-r/	harður	[harðʏr]	'hard, nom.sg.masc.'	
c.	/tek-r/	tekur	[tekʏr]	'take, 3.sg.pres.'	cf. elska-r 'love, 3.sg.pres.'
	/skɪl-r/	skilur	[skɪlʏr]	'understand, 2.sg.pres.'	

As illustrated by the forms in the rightmost column in (10), [ʏ] is not epenthesized if the stem ends in a vowel (e.g., *snjó-r* [snjour] 'snow, nom.sg.').

We introduce two new constraints to handle cases of [ʏ]-Epenthesis: REALIZE-M(ORPHEME) (Rose 1997, Gnanadesikan 1997, after Samek-Lodovici 1993) and ANCHOR-R(IGHT). REALIZE-M requires each morpheme in the input to have an expression in the output. Crucially, we require at least one segment of a morpheme to be present in the output.

(11) REALIZE-M(ORPHEME)
For every morpheme in the input, the output must contain at least one segment of that morpheme.

REALIZE-M ensures that a single-segment morpheme like the nominative singular masculine suffix /-r/ will always be contained in the output. Under this definition, an output candidate like [daɣ] would be ruled out for underlying /daɣ + r/, but a multi-segment morpheme may delete segments without violating REALIZE-M, as long as at least one segment of that morpheme is present in the output. Of course, such multi-segment morphemes that delete segments from input to output will violate MAX-IO.

ANCHOR-R(IGHT-IO) (McCarthy and Prince 1995) requires that the segment at the right edge of the input have a correspondent at the right edge of the output:

(12) ANCHOR-R(IGHT-IO)
Any element at the right edge of the input has a correspondent at the right edge of the output.

The interaction of the five constraints posited thus far is illustrated in the tableau in (13) for the word *dagur* [daɣʏr] 'day, nom.sg.':

(13)

[daɣʏr] 'day, nom.sg.'

/daɣ + r/	SONCON	REALIZE-M	DEP-IO	ANCHOR-R	MAX-IO
a. daɣ		*!		*	*
b. daɣr	*!				
c. daɣrʏ			*	*!	
☞ d. daɣʏr			*		

This tableau provides a definitive ranking argument between the constraints SONCON and DEP-IO; SONCON must outrank DEP-IO, as shown by the competition between (b) and (d). If DEP-IO were ranked above SONCON, (b) would incorrectly emerge the winner. Epenthesis is thus tolerated, but only to satisfy the higher-ranked SONCON constraint. REALIZE-M prevents the suffix /-r/ from deleting, ruling out candidate (a). In addition, ANCHOR-R prevents the epenthetic vowel from appearing at the end of the word, ruling out (c). Adding REALIZE-M and ANCHOR-R to the tableau in (7) (i.e., cases involving Glide Deletion only) does not change the result.

A candidate not shown in the tableau in (13), [dar], deserves discussion.[2] Given the five constraints posited thus far, [dar] would be the winning candidate, since it fulfills SONCON, REALIZE-M, DEP-IO, and ANCHOR-R, violating only the relatively low-ranked MAX-IO constraint. What constraint is responsible for [dar] not surfacing as optimal? The important difference between [dar] and the candidates considered in (13) is that [dar] lacks the underlying /ɣ/ of the root morpheme. In order to rule out such a candidate we might assume a high-ranking CONTIG(UITY) constraint, which requires segments contiguous in the input to be contiguous in the output. The segments /ɣ/ and /r/ are contiguous in the input, but are not in the output in [dar]. However, the winning candidate [daɣʏr] would also seem to violate CONTIG, since /ɣ/ and /r/ are not

[2] Thanks to Rachel Walker for pointing out the existence of this candidate to us.

contiguous, in this case because of epenthesis of [ɣ] between them. To resolve this issue, we crucially assume that there are two CONTIG constraints, analogous to the I-CONTIG and O-CONTIG constraints proposed by McCarthy and Prince (1995:371):

(14) I-CONTIG
The portion of S_1 [the input] standing in correspondence forms a contiguous string.

O-CONTIG
The portion of S_2 [the output] standing in correspondence forms a contiguous string.

I-CONTIG prohibits string-internal deletion from input to output, while O-CONTIG prohibits string-internal insertion from input to output. This is schematized in the following diagrams:

(15) a. I-CONTIG violated b. O-CONTIG violated

```
a b c          a b   c
|   |          | |   |
a   c          a b d c
```

In (15a), I-CONTIG is violated because *b* has no correspondent in the output string and *ac* is not a contiguous string in the input. However, the output string *ab* would not violate I-CONTIG, since *ab* is a contiguous string in the input. By contrast, O-CONTIG is violated in (15b) because the string *bc* is not contiguous in the output, since *d* is epenthesized between *b* and *c*. Seen in this way, these two CONTIG constraints can be thought of as MAX and DEP instantiations of the same constraint, which seems natural since CONTIG is a constraint that refers to both the input and the output. We therefore propose to rename the I-CONTIG and O-CONTIG constraints CONTIG$_{MAX}$ and CONTIG$_{DEP}$, respectively.[3] Note that these constraints permit deletion and insertion at the edges of strings; it is only *string-internal* deletion and insertion that are punished. As we will show, the Icelandic data provide evidence for CONTIG to be separated into two distinct constraints. This raises the broader question of whether *all* constraints on input-output mapping[4] (such as ANCHOR, see Sherman 1998) have MAX and DEP instantiations. This seems a natural extension of correspondence theory, which we leave to future research.

Why do we need both CONTIG$_{MAX}$ and CONTIG$_{DEP}$ in Icelandic? Consider the candidate [dar] again. It violates CONTIG$_{MAX}$, since the string [ar] is not contiguous in the input. The winning candidate, on the other hand, violates CONTIG$_{DEP}$, since the string [ɣr], which is contiguous in the input, is not contiguous in the output. Recall that this notion of CONTIG(UITY) allows deletion and epenthesis at the edges of input strings; it only prohibits them string-internally.

How must CONTIG$_{MAX}$ and CONTIG$_{DEP}$ be ranked in Icelandic? Returning to the tableau in (13), CONTIG$_{MAX}$ must be ranked at least above DEP-IO, since [daɣʏr], and not [dar], emerges the winner. This is shown in (16).

[3] Thanks to Bill Idsardi, Junko Itô, Armin Mester, and Bernard Tranel for much useful discussion on this point.

[4] See Itô and Mester (1997), who argue for a division of constraints into two types: two-argument constraints (those that refer to both an input and an output) and one-argument constraints (those that evaluate output well-formedness only) in their work on core-periphery phenomena in Japanese loanword phonology.

(16)

[daɣʏr] 'day, nom.sg.'

/daɣ + r/	SONCON	REALIZE-M	CONTIG_{MAX}	DEP-IO	ANCHOR-R	MAX-IO
a. daɣ		*!			*	*
b. daɣr	*!					
c. daɣrʏ				*	*!	
☞ d. daɣʏr				*		
e. dar			*!			*

Note that (16e) is the only candidate that violates CONTIG_{MAX}. (16a) does not violate it, since deletion of the underlying /-r/ occurs at the edge of the string and only string-internal contiguity is at stake. How is CONTIG_{DEP} ranked? It must be relatively low-ranked, since the winning candidate (16d) violates it, but no other candidate does. CONTIG_{DEP} must thus be crucially ranked at least below ANCHOR-R, since ANCHOR-R is the deciding constraint in (16). To simplify matters we will leave CONTIG_{DEP} out of all subsequent tableaux, since it does little work here, given its low-ranking status.

Adding CONTIG_{MAX} does not affect the outcome in cases involving Glide Deletion, as illustrated in (17):

(17)

[bɪl] '(snow)storm, acc.sg.'

/bɪlj/	SONCON	REALIZE-M	CONTIG_{MAX}	DEP-IO	ANCHOR-R	MAX-IO
☞ a. bɪl					*	*
b. bɪlj	*!					
c. bɪljʏ				*!	*	
d. bɪlʏj				*!		
e. bɪj			*!			*

In (17), REALIZE-M is satisfied by every candidate, since /bɪlj/ is a monomorphemic input. DEP-IO is thus the deciding constraint in this case, ruling in favor of (17a). CONTIG_{MAX} again rules out the candidate that deletes a segment string-internally (17e). The tableaux in (16) and (17) illustrate an additional point. The inputs in (16) and (17) are similar in that they both contain final clusters that rise in sonority, thus violating SONCON. The crucial difference is that /daɣ + r/ contains two morphemes while /bɪlj/ contains only one. This underscores the necessity of the constraint REALIZE-M in choosing the correct candidate. Without REALIZE-M, the winning candidate in (16) would be [daɣ]. REALIZE-M thus ensures that the nominative masculine singular ending /-r/ is not deleted.

To sum up the analysis so far, the constraint ranking we have posited is the following:

(18)

SonCon
|
Realize-M(orpheme)
|
$\text{Contig}_{\text{Max}}$
|
Dep-IO
/ \
Anchor-R(ight)   Max-IO

4. Opacity

So far we have seen cases where either Glide Deletion or [ʏ]-Epenthesis occurs, but not both. The more interesting cases involve forms which have undergone both Glide Deletion and [ʏ]-Epenthesis. In a serial, rule-based account the rules apply in a counterbleeding order, since [ʏ]-Epenthesis potentially bleeds Glide Deletion, but Glide Deletion actually applies:

(19)

UR:	/krefj + r/	/mɪðj + r/	/bɪlj + r/
Glide Deletion	krefr	mɪðr	bɪlr
[ʏ]-Epenthesis	krefʏr	mɪðʏr	bɪlʏr
PR:	[krefʏr]	[mɪðʏr]	[bɪlʏr]
	'demand, 2,3.sg. pres.'	'middle, nom.sg.masc'	'(snow)storm, nom.sg.'

The result is phonological opacity, since the environment for the rule of Glide Deletion is not present on the surface in the forms in (19), yet the rule has applied. A derivational approach accounts for this opacity through the availability of the intermediate stage, but how can a parallelist theory like OT explain such forms, given that no intermediate forms are available? The tableau in (20) illustrates how an opaque candidate like [bɪlʏr] '(snow)storm, nom.sg.'can never emerge as optimal:

(20)

[bɪlʏr] '(snow)storm, nom.sg.'

/bɪlj + r/	SonCon	Realize-M	$\text{Contig}_{\text{Max}}$	Dep-IO	Anchor-R	Max-IO
a. bɪl		*!			*	**
b. bɪlj	*!	*			*	*
c. bɪlr	*!		*			*
d. bɪljr	*!					
intended winner: ☞ e. bɪlʏr			*!	*		*
wrong winner: ☜ f. bɪljʏr				*		
g. bɪljʏ		*!		*	*	*

The portion of the tableau in (20) outlined with a heavy black line highlights the area illustrating why the opaque candidate (e) [bɪlʏr] can never emerge as optimal. Candidate (f) is wrongly predicted to be the optimal candidate, and is hence marked with the backward-pointing hand. There is no way that (e) can emerge the winner with these constraints: (f) has a proper subset of the violations incurred by (e) and will thus emerge the winner under any reranking. In the following section, we show how Sympathy (McCarthy 1997) provides a solution to this dilemma.

5. Sympathy

McCarthy (1997) invokes Sympathy to explain the phonological opacity evident in the following derivation for the Tiberian Hebrew word [deše] 'tender grass'.

(21)

UR	/dešʔ/
Epenthesis	/dešeʔ/
Pharyngeal Deletion	/deše/
PR	[deše]

This is an example of phonological opacity. The conditioning environment (a final cluster) for the epenthetic vowel [e] is no longer present on the surface, since the glottal stop has been deleted by the rule of Pharyngeal Deletion. Pharyngeal Deletion potentially bleeds Epenthesis, but since Epenthesis actually applies, the rules occur in a counterbleeding order. Rule ordering explains how the output is derived, but an OT account is at first unsuccessful. The following tableau illustrates the problem faced by an OT account.

(22) (from McCarthy 1997)

/dešʔ/	CODACOND	MAX-IO	ALIGN-R❀	DEP-IO
☞ a. deše		*	*	*
☜ b. deš		*	*	
❀ c. dešeʔ	*!			*

Given the constraint ranking in (22), candidate (b) is predicted to be the winner, but (a) is the actual output. Note that the predicted winner (22b) incurs a proper subset of the violations incurred by the actual output (22a). No reranking of these constraints will be able to produce (a) as the winner. McCarthy proposes that in this case, (a) is the winner because it resembles a particular failed candidate in a way that (b) does not. This failed candidate is called the *sympathy* candidate, and relations between the sympathy candidate and all members of the candidate set are regulated through correspondence. In (22), the sympathy candidate is (c). How is the sympathy candidate chosen? The sympathy candidate is the most harmonic of all the candidates that satisfy the constraint ALIGN-R. This constraint is therefore marked with a superscript ❀ (ALIGN-R❀). In (22), (c) is the only candidate that satisfies ALIGN-R❀. It is thus marked with a ❀ to indicate its status as the sympathy candidate.

We must then evaluate faithfulness to this ❀-candidate. This is accomplished via a new constraint that regulates correspondence between the ❀-candidate and all members of the candidate set. In Hebrew, this constraint is MAX-❀O, defined in (23):

(23) MAX-❀O
Each segment in the ❀-candidate has a correspondent in the output.

Crucially ranking MAX-❀O below CODACOND and above DEP-IO results in the correct output emerging the winner, as illustrated in (24).

(24)

/deš?/	CODACOND	MAX-IO	ALIGN-R*	MAX-❀O	DEP-IO
☞ a. deše		*	*	*	*
☜ b. deš		*	*	**!	
❀ c. deše?	*!				*

As seen in (24), (b) is ruled out and (a) is chosen as the winner because of the violations of the new constraint, MAX-❀O. (a) has one violation of this constraint, while (b) has two; this is how (a) is more faithful to the ❀-candidate (c) than (b) is. Recall that (c) cannot be the output here because it violates high-ranked CODACOND. This case thus exemplifies how Sympathy provides a mechanism for analyzing opacity in a parallelist framework.

6. Sympathy and Opacity in Icelandic

Returning now to the opaque rule interaction between Glide Deletion and [ʏ]-Epenthesis in Icelandic, we can now show how a sympathy account solves the problem illustrated above in (20), repeated here as (25):

(25)

[bɪlʏr] '(snow)storm, nom.sg.'

/bɪlj + r/	SONCON	REALIZE-M	$\text{CONTIG}_{\text{MAX}}$	DEP-IO	ANCHOR-R	MAX-IO
a. bɪl		*!			*	**
b. bɪlj	*!	*			*	*
c. bɪlr	*!		*			*
d. bɪljr	*!					
intended winner: ☞ e. bɪlʏr			*!	*		*
wrong winner: ☜ f. bɪljʏr				*		
g. bɪljʏ		*!		*	*	*

We propose that the constraint responsible for choosing the sympathy candidate in Icelandic is DEP-IO*.[5] Of the candidates that satisfy DEP-IO*, i.e. candidates (a)-(d), (a) is the most harmonic, since candidates (b)-(d) all violate SONCON, which is crucially

[5] As pointed out to us by Bill Idsardi (personal communication), the selection of the sympathy candidate in (25) is actually somewhat more complex than described here. If a candidate like [bɪr] is considered, the constraint responsible for selecting the sympathy candidate cannot be DEP-IO; otherwise [bɪr] would both be the sympathy candidate and win the overall computation. However, if the conjoined constraint [$\text{CONTIG}_{\text{MAX}}$ &ₗ DEP-IO]* (see Smolensky 1993, 1995 on local conjunction of constraints) is responsible for selecting the ❀-candidate, [bɪl] will be the ❀-candidate and [bɪlʏr] will correctly emerge the winner. Such an analysis assumes a conception of constraint conjunction whereby a candidate satisfies a conjoined constraint only if it satisfies both of the lower-ranked individual constraints (Hewitt and Crowhurst 1995). [bɪl] would thus satisfy the conjoined constraint [$\text{CONTIG}_{\text{MAX}}$ &ₗ DEP-IO]* since it violates neither $\text{CONTIG}_{\text{MAX}}$ nor DEP-IO, whereas [bɪr] would violate the conjoined constraint since it violates $\text{CONTIG}_{\text{MAX}}$. The analysis presented in this paper, while somewhat different in detail from that outlined here, yields the same results.

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ranked above REALIZE-M. (a) is thus selected as the ❀-candidate. Since the ❀-candidate [bɪl] contains less segmental material than all of the other candidates, the constraint that evaluates correspondence between the sympathy candidate and the members of the candidate set will crucially be a DEP constraint, here DEP-❀O, punishing "epenthesis."

(26) DEP-❀O

Each segment in the output has a correspondent in the ❀-candidate.

For (e) to emerge the winner, DEP-❀O must crucially be ranked above $\text{CONTIG}_{\text{MAX}}$, as shown below:

(27)

[bɪlʏr] '(snow)storm, nom.sg.'

/bɪlj + r/	SONCON	REALIZE-M	DEP-❀O	CONT_{MAX}	DEP-IO*	ANCHOR-R	MAX-IO
❀ a. bɪl		*!				*	**
b. bɪlj	*!	*	*			*	*
c. bɪlr	*!		*	*		*	*
d. bɪljr	*!		**				
☞ e. bɪlʏr			**	*	*		*
f. bɪljʏr			***!		*		
g. bɪljʏ		*!	**		*	*	*

With DEP-❀O ranked above $\text{CONTIG}_{\text{MAX}}$, (e) is the winner, since it only incurs two violations of DEP-❀O, while (f) incurs three.

The DEP-❀O constraint, once posited, is part of the constraint ranking for the entire language and cannot be invoked solely for cases which exhibit opaque interactions. We must therefore not only consider cases where both Glide Deletion and [ʏ]-Epenthesis have occurred, but also cases where only one or neither has occurred. Consider the tableau in (28) for ***byljum*** [bɪljʏm] '(snow)storm, dat.pl.' where neither Glide Deletion nor [ʏ]-Epenthesis occur.

(28) Vacuous sympathy

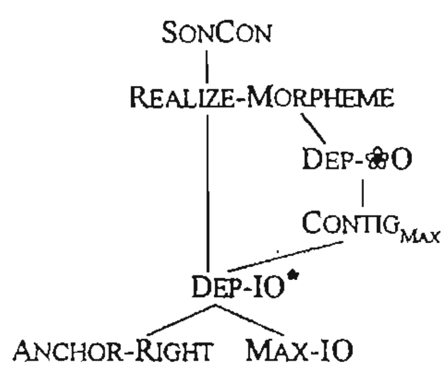
[bɪljʏm] '(snow)storm, dat.pl.'

/bɪlj + ʏm/	SONCON	REALIZE-M	DEP-❀O	CONT$_{MAX}$	DEP-IO*	ANCHOR-R	MAX-IO
a. bɪl		*!				*	***
b. bɪlj	*!	*				*	**
c. bɪlm	*!			*			**
d. bɪljm	*!			*			*
e. bɪlʏm				*!			*!
☞ ❀ f. bɪljʏm							
g. bɪljʏ						*!	*

Since the [ʏ] in [bɪljʏm] is underlying and not epenthetic, none of the candidates violate DEP-IO*, the constraint responsible for choosing the ❀-candidate. Therefore, of the candidates that satisfy DEP-IO* in (28) (i.e., every candidate), the most harmonic is (f), since it violates no constraint. (f) is thus the ❀-candidate. In assessing faithfulness to the ❀-candidate via the constraint DEP-❀O, it is clear that all of the candidates satisfy it, since all of them contain fewer segments than (f). DEP-❀O does no real work here and so the result is the same with or without sympathy, as witnessed by the lack of violations of DEP-❀O incurred by any candidate. (f) is thus the sympathy candidate as well as the actual output: it is sympathetic to itself.

We propose the final ranking schema for Icelandic:

(29)



Sympathy thus provides a mechanism for handling opacity in OT through a correspondence relation between a designated failed candidate and members of the candidate set. Recall that on a rule-based approach, opacity is captured by reference to intermediate representations and by rule ordering. With Sympathy, the ❀-candidate may or may not be identical to the intermediate representation on a rule-based approach. It is noteworthy that in the case of *bylur* [bɪlʏr] '(snow)storm, nom.sg.', the ❀-candidate [bɪl] is *not* an intermediate representation, which would be [bɪlr] on a rule-based approach (after Glide Deletion has applied). Sympathy is thus not merely a device for referring to an intermediate representation in a parallelist, constraint-based framework; its more abstract properties enable it to pick out any potential candidate provided by GEN. However, this power is limited in the sense that the constraint responsible for selecting the sympathy candidate is intrinsically linked to active processes in the language. In Icelandic, DEP-IO* is the constraint responsible for selecting the sympathy candidate, since it is sensitive to underlying versus epenthetic segments.

7. An Output-Output Correspondence Approach

An alternative approach to the problem of opaque rule interaction in Icelandic within strictly parallel OT might be Output-Output (OO) Correspondence (e.g., Benua 1995, 1997, Burzio 1996). OO-Correspondence allows correspondence relations between related output forms of words. Instead of the sympathy constraint, one might imagine an OO constraint ranked where the sympathy constraint is ranked in our analysis.

This approach is problematic on several grounds. First, an OO analysis would require different types of correspondence relations for nouns, adjectives, and verbs. For example, with nouns, the nominative singular masculine *bylur* [bɪlʏr] '(snow)storm' would have to correspond to the accusative singular masculine *byl* [bɪl], since [bɪlʏr] surfaces without the underlying glide /j/. In the case of adjectives, the nominative singular masculine *miður* [mɪðʏr] 'middle' would have to correspond to the nominative singular feminine *mið* [mɪð]. Finally, for verbs, the second and third person singular form *krefur* [krefʏr] 'demand' would have to correspond to the first person singular *kref* [kref]. The natural question to ask is why the *nominative* singular masculine should correspond to the *accusative* singular masculine in nouns, but the nominative singular *masculine* to the nominative singular *feminine* in adjectives? And why should the second and third person singular correspond to the *first* person singular in verbs?

A plausible hypothesis is that we are dealing with correspondence to suffixless forms in all three cases (since *byl* [bɪl], *mið* [mɪð], *kref* [kref] are all suffixless). However, the dative plural *byljum* [bɪljʏm] '(snow)storm' could not correspond with the suffixless accusative singular *byl* [bɪl], since as we saw it must correspond with itself (what we termed 'vacuous sympathy') in order to prevent deletion of the glide /j/. By contrast, on a Sympathy approach, vacuous sympathy (or 'self-sympathy') only arises in cases where the vowel /ʏ/ is underlying (as in the dative plural suffix /-ʏm/), while in cases involving opacity, [ʏ] is always epenthetic and therefore sympathy is not vacuous. On an OO-Correspondence approach, there is no principled way to enforce self-correspondence in some forms, while disallowing it in others. Thus, it seems that OO-Correspondence needs to be invoked when [ʏ] is epenthetic, but somehow prevented from applying when the /ʏ/ is underlying. Such a stipulation illustrates the nature of the problem with the OO-Correspondence approach: it attempts to provide a morphological explanation for what is a strictly phonological phenomenon. Sympathy provides a unified, phonological account of underlying vs. epenthetic [ʏ] in Icelandic, since it is crucially the DEP-IO* constraint (which punishes epenthesis) that chooses the sympathy candidate.

8. Conclusion

In this paper we considered opacity effects that result from the interaction between Glide Deletion and [ʏ]-Epenthesis in Icelandic. We showed that these effects can be captured in strictly parallel OT by appealing to McCarthy's (1997) Sympathy theory, which allows correspondence between a designated failed candidate and members of the candidate set. We also demonstrated that an alternative proposal, that of OO Correspondence, cannot capture opaque interactions in Icelandic since in addition to requiring unprincipled correspondence relations, it fails to distinguish between underlying and epenthetic segments.

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