Long-Distance Licensing in Harmonic Grammar

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1 Introduction

This paper probes the behavior of Positional Licensing constraints under Harmonic Grammar (HG; e.g. Legendre et al. 1990). These constraints are used to account for patterns in which some element must have membership in a prominent position, and my focus here is on systems in which an element subject to such a restriction spreads to that prominent position (as opposed to moving there or disappearing altogether, e.g.). We will see that when applied to these kinds of processes Positional Licensing constraints are pathological in HG in ways that they are not in Optimality Theory (OT; Prince & Smolensky 1993/2004). In particular, they interact with faithfulness constraints to predict unattested patterns in long-distance assimilation. I will argue that the proper repair for this defect involves recasting Positional Licensing as a gradient constraint, and this in turn requires further refinements to avoid issues presented by gradience: Positional Licensing must be a positive constraint that rewards licensing instead of a negative one the penalizes its absence, and it must be implemented in Serial HG.

The paper is structured as follows: in section 2 I provide background on Positional Licensing and introduce the pathology it triggers under HG. Sections 3 and 4 present the modifications to Positional Licensing that are necessary to avoid the pathology, and section 5 argues that alternative remedies are unsatisfactory. Section 6 summarizes the results and discusses questions needing further attention.

2 Positional Licensing and a Pathology

Languages often restrict certain phonological elements to one prominent position or another. In well-known patterns, the full range of vowel contrasts is found only in stressed syllables (as in English), or voiced obstruents appear only in onsets (as in German). Such patterns are the subject of a large body of research (Barnes 2006; Beckman 1999; Crosswhite 2001; de Lacy 1999, 2002; Kaplan 2008, 2015; Walker 2011, among many others), and one constraint type that is often called upon to account for them is Positional Licensing (Beckman 1999; Goldsmith 1989; Ito 1988; Lombardi 1994; Steriade 1995; Walker 2011; Zoll 1997, 1998a,b, etc.). Focusing on vocalic patterns, Walker (2011) develops a theory of Positional Licensing (building on much of the work just cited) in which constraints of the form LICENSE(λ, π) require elements of the type λ to coincide with a position of the type π. I take as a starting point the constraint definition in (1), which is simplified from the formalism developed by Walker.

(1) LICENSE(λ,π): assign a violation for each λ that does not coincide with a π.

For example, LICENSE([+high], $\acute{\sigma}$) penalizes [+high] features that do not have membership in a stressed syllable. This constraint is satisfied by the following three configurations.

(2) a. *Indirect Licensing*
$\acute{\sigma}$ σ σ
[+hi]

b. *Identity Licensing*
$\acute{\sigma}$ σ σ
$[+\text{hi}]_i$ $[+\text{hi}]_i$

c. *Direct Licensing*
$\acute{\sigma}$ σ σ
[+hi]

Under indirect licensing (2a), [+high] may appear outside the stressed syllable because it also has membership in the stressed syllable. This pattern is exemplified by metaphony in the Romance variety spoken

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in Central Veneto, where post-tonic high vowels trigger raising of the stressed vowel (Walker, 2005, 2008, 2010, 2011):

(3)	kals-ét-o	'sock (m sg)'	kals-ít-i	'sock (m pl)'
	kant-é-se	'sing (1pl)'	kant-í-si-mo	'sing (1pl impf subj)'
	órdeno	'order (1sg)'	úrdini	'order (2sg)'

As the final example in (3) shows, vowels between the triggering high vowel and the stressed vowel also raise. The result is a configuration like that in (2a).

Identity licensing (2b) satisfies LICENSE([+high], $\acute{\sigma}$) because the [+high] feature that is outside the licensing position stands in correspondence with a feature that is in the licensing position. Such a pattern is found in the metaphony found in Lena, a Romance variety spoken in Spain (Hualde 1989, 1998; also Neira Martínez 1955, 1983 cited in Walker 2011). As (4) shows, post-tonic high vowels trigger raising of the stressed vowel, just like in Central Veneto, but this time intervening vowels do not raise. This is evidence that the unlicensed [+high] does not spread to the stressed syllable, but is instead copied in that position, resulting in a configuration comparable to (2b).

(4)	trwébanos	'beehive (m pl)'	trwíbanu	'beehive (m sg)'
	burwébanos	'wild strawberry (m pl)'	burwíbanu	'wild strawberry (m sg)'

Finally, direct licensing characterizes systems in which the restricted feature is found exclusively in the licensing position. Familiar patterns of this sort include vowel reduction in English and many other languages.

In Walker's (2011) theory, all three patterns in (2) satisfy LICENSE([+high], $\acute{\sigma}$), and the ranking of other constraints determines which of those three configurations actually surfaces. In this paper I focus primarily on indirect and identity licensing; the tableaux below show how they emerge in Walker's framework. In both cases, LICENSE([+high], $\acute{\sigma}$) $\gg$ IDENT(high) ensures that Positional Licensing is obeyed. The third constraint, *DUPLICATE, penalizes the coindexed-feature configuration that characterizes identity licensing. When it outranks IDENT, as in (5a), indirect licensing results. Under the opposite ranking (5b), identity licensing emerges.[1]

(5) a. *Central Veneto*

/órdeni/	LICENSE([+high], $\acute{\sigma}$)	*DUPLICATE	IDENT(high)
a. órdeni	*!		
☞ b. úrdini			**
c. úrdeni		*!	*

b. *Lena*

/trwébanu/	LICENSE([+high], $\acute{\sigma}$)	IDENT(high)	*DUPLICATE
a. trwébanu	*!		
b. trwíbinu		**!	
☞ c. trwíbanu		*	*

As an inspection of (5a) reveals, the ranking in that tableau produces indirect licensing no matter how many intervening vowels appear: any number of IDENT violations is better than violating either LICENSE or *DUPLICATE. But in HG, where every constraint contributes to a candidate's harmony score, as the distance between trigger and target increases, IDENT violations accumulate, and eventually they overwhelm the other constraints. (6) illustrates this with schematic examples. In both tableaux, the faithful form's violation of LICENSE results in a score of -5. Identity licensing—candidate (b) in each tableau—always has a score of -6: it violates *DUPLICATE and IDENT once each. But as more intervening vowels appear between the

[1] These tableaux abstract away from various details; see Walker (2011) for the full analyses. For example, I have omitted constraints that require the final vowel in each form to be faithful: **órdene*, e.g., would satisfy LICENSE by eliminating the unlicensed feature altogether. For direct licensing, Walker (2011) uses CRISPEDGE constraints (e.g. Ito & Mester 1999) to prevent the relevant feature from appearing in multiple syllables.

trigger and target, the penalty that IDENT assigns for indirect licensing escalates: with one intervening vowel (6a), there are two IDENT violations for a score of -4, and that candidate wins. But a second intervening vowel in (9) adds another IDENT violation, and the resulting -6 harmony score means that the faithful candidate is superior.

(6) a.

/ée-i/	LICENSE([+high], $\acute{\sigma}$) 5	*DUPLICATE 4	IDENT(high) 2	H
a. ée-i	-1			-5
b. íe-i		-1	-1	-6
☞ c. íi-i			-2	-4

b.

/éee-i/	LICENSE([+high], $\acute{\sigma}$) 5	*DUPLICATE 4	IDENT(high) 2	H
☞ a. éee-i	-1			-5
b. íee-i		-1	-1	-6
c. íii-i			-3	-6

The fact that indirect licensing occurs across one intervening vowel but not two is a consequence of the particular constraint weights in this example. The distance that spreading may cover can be set arbitrarily: for n positions that must assimilate in indirect licensing, that assimilation will occur as long as $n \cdot w(\text{IDENT}) < w(\text{LICENSE})$. Once $n \cdot w(\text{IDENT})$ exceeds the weight of LICENSE, indirect licensing will lose to either the fully faithful form or the identity-licensing candidate, depending on the relative weights of LICENSE and *DUPLICATE.

Systems like this are unattested: there are no known licensing-based processes that are sensitive to arbitrary distances between trigger and target. Some phenomena may distinguish adjacency from non-adjacency (e.g. Chamorro umlaut (Chung, 1983) occurs only if the trigger and target are adjacent), but that is a far cry from a process that occurs only if no more than, say, five positions intervene between the trigger and the target. But the constraints used in (6) predict that *every* licensing-based phenomenon has an upper bound: no matter the weights of LICENSE and IDENT, at some point the number of IDENT violations incurred by indirect licensing will be enough to overcome the lone violation of LICENSE assigned to the faithful candidate.

That asymmetry between LICENSE and IDENT is at the heart of this pathology: failure to satisfy LICENSE always results in a single violation, but spreading through the intervening positions to the licensor incurs potentially many violations. In the next section I argue that this problem is remedied by revising positional licensing so that it assigns violations in proportion to the distance between the trigger and the target.

3 Distance-Sensitive Positional Licensing

The problem illustrated by (6) can be remedied if LICENSE's penalty for failure to spread increases with distance to keep up with IDENT's penalty for spreading. An easy way to do this is by revising Positional Licensing so that it assigns not just -1 to each unlicensed feature, but another -1 for each position between an unlicensed feature and its nearest target, as in (7), which is further amended below. The crucial new addition to the formalism is underlined.

(7) Revised LICENSE(λ,π) (version 1): assign -1 for each λ that does not coincide with a π <u>and -1 for each syllable that intervenes between λ and the nearest π</u>.

With this change, it is no longer sufficient for λ to coincide with π (or to correspond with something that coincides with π); nothing may intervene between λ and π—the constraint favors indirect licensing over identity licensing. Now, as (8) shows, for any number of intervening positions, the penalty for not spreading (from LICENSE) is identical to the penalty for spreading (from IDENT). Consequently, as long as $w(\text{IDENT}) < w(\text{LICENSE})$, spreading will occur.

(8)

	LICENSE	IDENT
a. é-i vs. í-i	-1	-1
b. ée-i vs. íi-i	-2	-2
c. éee-i vs. íii-i	-3	-3

This solution avoids the immediate problem at hand, but it introduces a new one: identity licensing is now impossible, as (9) shows. With one intervening position and weights of n and m for LICENSE and IDENT, respectively, failure to spread has a harmony score of $-2n$ while indirect licensing has a harmony score of $-2m$. Together, they collectively harmonically bound (Samek-Lodovici & Prince, 1999) identity licensing, which has a score of $-n-m$: if $n > m$, then $-2m > -n-m$, and candidate (c) wins; if $n < m$, then $-2n > -n-m$, and candidate (a) wins. Adding *DUPLICATE only makes matters worse: it penalizes only the identity-licensing candidate. (If $n = m$, all three candidates tie as far as LICENSE and IDENT are concerned. I set this possibility aside for reasons of space.)

(9)

/ée-i/	LICENSE n	IDENT m	H
(☞) a. ée-i	-2		$-2n$
b. íe-i	-1	-1	$-n-m$
(☞) c. íi-i		-2	$-2m$

The remedy for this problem is fairly straightforward. To produce both indirect and identity licensing, we need the penalty for not spreading to the licensor to always overcome the lone IDENT violation for that particular operation. This is accomplished in the current arrangement under $w(\text{IDENT}) < w(\text{LICENSE})$. But the penalty for not targeting the intervening positions should only sometimes overcome the penalty from IDENT for spreading to them. We can achieve this state of affairs by reducing the penalty from LICENSE for not targeting those positions. (10) shows one way of doing this, with the changes again underlined.

(10) Revised LICENSE(λ,π), version 2: assign -1 for each λ that does not coincide with a π and $\underline{-.5}$ for each syllable that intervenes between λ and the nearest π.

The weighting conditions for indirect and identity licensing are given in (11). An intervening position that does not assimilate is assigned $-.5$ by LICENSE; if it assimilates, it incurs -1 from IDENT. Therefore, if the motivation to assimilate from LICENSE is to overcome IDENT's discouragement, LICENSE must have more than twice the weight of IDENT. In that case, indirect licensing occurs. But if the weight of LICENSE is less than twice (but still greater than) the weight of IDENT, identity licensing results. As before, I set aside the ties, which, with respect to the intervening positions, occur when LICENSE has exactly twice the weight of IDENT.

(11) a. Indirect licensing: $\frac{w(\text{LICENSE})}{w(\text{IDENT})} > 2$

b. Identity licensing: $1 < \frac{w(\text{LICENSE})}{w(\text{IDENT})} < 2$

The system is illustrated in (12) and (13). In (12), the harmony score for the indirect-licensing candidate gets worse as the distance between the trigger and target increases, but so do the harmony scores for the other candidates. IDENT can no longer overwhelm LICENSE, and the pathology presented in section 2 cannot arise. And in (13), the increased weight of IDENT (compared to (12)) means that only spreading to the licensor is possible. Significantly, we can now produce both indirect and identity licensing without calling on *DUPLICATE: now Positional Licensing itself discourages the gapped configuration that *DUPLICATE penalizes. In this sense, then, the theory has been simplified.

(12) a.

/é-i/	Lic 3	Ident 1	*H*
a. é-i	-1		-3
☞ b. íi-i		-1	-1

b.

/ée-i/	Lic 3	Ident 1	*H*
a. ée-i	−1.5		−4.5
b. íe-i	−.5	−1	−2.5
☞ c. íi-i		−2	−2

c.

/ée-i/	Lic 3	Ident 1	*H*
a. éee-i	−2		−6
b. íee-i	−1	−1	−4
☞ c. íii-i		−3	−3

d.

/éeee-i/	Lic 3	Ident 1	*H*
a. éeee-i	-2.5		-7.5
b. íeee-i	-1.5	-1	-5.5
☞ c. íiii-i		-4	-4

(13) a.

/é-i/	Lic 3	Ident 2	*H*
a. é-i	-1		-3
☞ b. í-i		-1	-2

b.

/ée-i/	Lic 3	Ident 2	*H*
a. ée-i	−1.5		−4.5
☞ b. íe-i	−.5	−1	−3.5
c. íi-i		−2	−4

c.

/ée-i/	Lic 3	Ident 2	*H*
a. éee-i	−2		−6
☞ b. íee-i	−1	−1	−5
c. íii-i		−3	−6

d.

/éeee-i/	Lic 3	Ident 2	*H*
a. éeee-i	-2.5		-7.5
☞ b. íeee-i	-1.5	-1	-6.5
c. íiii-i		-4	-8

The Positional Licensing formalism has now been adapted for Harmonic Grammar in that it is no longer susceptible to distance-based pathologies like the one introduced at the beginning of this paper. As a consequence, this constraint type has become gradient so that it can keep up with the escalating faithfulness penalties incurred by indirect licensing. In fact, it quite closely resembles standard Alignment constraints (McCarthy & Prince, 1993) in that it penalizes particular elements in proportion to how far they are from a designated landmark.

However, there are at least three salient differences between gradient Positional Licensing and Alignment. First, Alignment does not assign reduced penalties for the intervening positions; this is presumably because the phenomena that Alignment is typically used to produce (non-licensing-based harmony, stress placement, reduplicant placement, etc.) do not exhibit identity licensing-like gapped configurations. Second, Alignment constraints motivate edge matching: the left edge of a harmony domain aligns with the left edge of a morpheme, or the right edge of a foot appears at the right edge of a word, etc. But Positional Licensing is not concerned with edges: *iíi-i*, where a single [+high] is shared by all the vowels, satisfies LICENSE([+high], $\acute{\sigma}$) but not ALIGN([+high], L, $\acute{\sigma}$, L), a constraint that could otherwise achieve the same spreading of [+high] to the stressed syllable that occurs in (12). Finally, and perhaps most fundamentally, the licensor designated by a Positional Licensing constraint must be a prominent position of some sort (Walker, 2011) because licensing-based phenomena like the metaphony patterns of Central Veneto and Lena (but also including many other quite different patterns that Walker (2011) examines) always show interactions with prominence. In fact, Kaplan (2015) argues that there are exactly three positions that Positional Licensing may designate as a licensor: primary stress, roots/stems, and initial syllables. Alignment is subject to no such restriction. McCarthy & Prince (1993), for example, posit constraints in which elements must align with one or the edge of a host of units including the following: a prosodic word, a foot, a syllable, a consonant, a vowel, a stem, and the main-stress foot. Some of these units are prominent (main-stress feet and stems), but the rest may be prominent only by coincidence (e.g. if the vowel happens to be in a stressed syllable).

Gradient constraints are often argued to be problematic (e.g. McCarthy 2003) for a variety of reasons. But the behavior of Positional Licensing in HG suggests that, at least in HG if not in OT, gradience can have advantages over categorical violation assessment. This does not mean that gradient Positional Licensing is unencumbered by the defects of gradient constraints. Kimper (2011) argues that recasting gradient harmony constraints as positive constraints avoids the problems of gradience, and in the next section I show that this solution is also applicable to Positional Licensing.

4 Positive Positional Licensing

Harmony-driving constraints that penalize each disharmonic element predict certain unattested patterns (Kimper, 2011). For example, in the Johore dialect of Malay, progressive nasal harmony is blocked by liquids and obstruents (Walker, 2000):

(14)

mĩ̃nõm	‘to drink’
baŋõn	‘to rise’
mãʔ̃ãp	‘pardon’
pənə̃ŋãh̃ãn	‘central focus’
mãj̃ãŋ	‘stalk (palm)’
mə̃nãw̃ãn	‘to capture’ (active)
mə̃ratappi	‘to cause to cry’
pəŋãw̃ãsan	‘supervision’
mãkan	‘to eat’

We can produce harmony with ALIGN([nasal],R,PWd,R), and the blocking effects are achieved by ranking *NASOBSTRUENT and *NASLIQUID over the Alignment constraint. (This analysis is modified slightly from Walker (2000).) The tableau in (15) illustrates the analysis.

(15)

/pəŋawasan/	*NASOBSTRUENT	*NASLIQUID	ALIGN([nasal],R,PWd,R)
a. pəŋawasan			******!
☞ b. pəŋãw̃ãsan			***
c. pəŋãw̃ãs̃ãn	*!		

Now consider the hypothetical Malay′, which in addition to nasal harmony has vowel epenthesis to break up word-final clusters, driven by *CC#. (This example is taken from Kimper (2011).) If ALIGN outranks *CC#, epenthesis blocked just in case it is preceded by a harmony domain in the word:

(16)

/nawakast/	ALIGN	*CC#	DEP
☞ a. nãw̃ãkast	****	*	
b. nãw̃ãkasət	*****!		*

The same interaction occurs in HG: epenthesis separates the [nasal] domain even farther from the word's right edge, so it is blocked by Alignment. Such systems are unattested. Kimper's solution is to recast the harmony-driving constraint as a positive constraint that rewards harmonic segments instead of penalizing disharmonic ones. His SPREAD(nas) constraint essentially assigns $+1$ to each segment to which [nas] spreads; see Kimper (2011) for the details. Thus adding a new disharmonic segment does not affect SPREAD(nas)'s evaluation of the candidates, and *CC# can compel epenthesis:

(17)

/nawakast/	ALIGN 3	*CC# 2	DEP 1	*H*
a. nãw̃ãkast	$+3$	-1		7
☞ b. nãw̃ãkasət	$+3$		-1	8

Gradient Positional Licensing produces the same pathology. Consider Lena′, which has the identity-licensing pattern of Lena and an additional epenthesis pattern to break up clusters. Just as with Malay′, epenthesis is blocked if it adds another disharmonic segment to a (potential) harmony domain:

(18)

/trwébtanu/	LICENSE([+high],$\acute{\sigma}$) 4	IDENT 3	NOCODA 2	DEP 1	*H*
a. trwébtanu	-1.5		-1		-8
💣 b. trwíbtanu	$-.5$	-1	-1		-7
c. trwébatanu	-2			-1	-9
(☞) d. trwíbatanu	-1	-1		-1	-8

Recasting Positional Licensing as a positive constraint solves the problem. As formalized in (19), Positional Licensing now rewards elements that are licensed, and what was formerly a $-.5$ penalty for disharmonic intervening positions is now a $+.5$ reward for each non-licensing position that the restricted feature is associated with. (That $+.5$ reward only applies to elements that receive the $+1$ reward for appearing in the licensing position. Space does not permit a full defense of this arrangement, but the basic idea is that it prevents the constraint from motivating harmony that does not place the restricted element in the licensor.)

(19) Revised LICENSE(λ,π), final version: assign $\underline{+1}$ for each λ that coincides with a π. For each λ that coincides with π, assign $\underline{+.5}$ for each additional position that λ coincides with.

As (20) shows, epenthesis is no longer blocked. Candidates (b) and (d), each with identity licensing but only the latter with epenthesis, are rewarded identically by LICENSE. Consequently, NOCODA is free to trigger epenthesis.

(20)

/trwébtanu/	LICENSE([+high],$\acute{\sigma}$) 4	IDENT 3	NOCODA 2	DEP 1	*H*
a. trwébtanu			-1		-2
b. trwíbtanu	$+1.5$	-1	-1		1
c. trwébatanu				-1	-1
☞ d. trwíbatanu	$+1.5$	-1		-1	2

One final step remains. Kimper points out that positive constraints invite an "infinite goodness" problem: to maximize the reward from Positional Licensing, the best strategy is to epenthesize more vowels that can harmonize, as shown schematically in (21). As long as the weight of LICENSE is more than twice that of DEP, each new epenthetic vowel improves the form's harmony score.

(21)

/é-i/	LICENSE([+high],$\acute{\sigma}$)	DEP
a. í-i	$+1.5$	0
b. íi-i	$+2$	-1
c. íii-i	$+2.5$	-2
d. íiii-i	$+3$	-3

Kimper's solution is to couch positive constraints in a gradual theory—Serial HG. In such a framework, epenthesis and harmony must occur on different steps, but since epenthesis is not motivated in the absence of harmony, the first step on the path toward infinite epenthesis is not advantageous. The derivation in (22) demonstrates this. In Step 1, the stressed vowel harmonizes. In Step 2, candidate (b) epenthesizes a vowel and therefore violates DEP. Were this vowel able to harmonize on this step, the new reward from LICENSE would more than offset the penalty from DEP, but as things stand, DEP renders that candidate less harmonic than the candidate without epenthesis. Infinite goodness is avoided.

(22) *Step 1*

/é-i/	LICENSE([+high],$\acute{\sigma}$) 3	IDENT(high) 1	DEP 1	*H*
a. é-i				0
☞ b. í-i	$+1.5$	-1		3.5

Step 2 (Convergence)

/í-i/	LICENSE([+high],$\acute{\sigma}$) 3	IDENT(high) 1	DEP 1	*H*
☞ a. í-i	$+1.5$			4.5
b. íV-i	$+1.5$		-1	3.5

To summarize, in this section we have seen that the gradient version of Positional Licensing introduced in the previous section requires further refinements if it is to function soundly. Turning Positional Licensing into a positive constraint prevents it from interacting with other constraints in pathological ways, but this move in turn requires shifting to a gradual theory like Serial HG to prevent runaway derivations brought on by escalating rewards from Positional Licensing. We have therefore arrived at a theory of Positional Licensing that (i) avoids the distance-based pathology identified in section 2, (ii) produces both indirect and identity licensing, and (iii) avoids other pathologies like the infinite-goodness and blocked-epenthesis problems. In the next section I argue briefly that modifying Positional Licensing in this way is the only viable solution.

5 Alternatives

5.1 *Modified Faithfulness* Recall that the distance-based pathology emerges because IDENT assigns penalties to indirect-licensing candidates in proportion to how many positions harmonize, while (the original formulation of) Positional Licensing assigns the same penalty no matter how many positions fail to harmonize. So instead of changing Positional Licensing to match IDENT, we could instead change IDENT so that it assigns the same penalty no matter how many unfaithful segments appear.

This alternative is problematic for a variety of reasons. To give just one example, it invites counting effects: under the weights in (23), the grammar allows one voiced obstruent but not two. If IDENT(voice) assigns just one violation no matter now many unfaithful segments a candidate has, violations of *VOICEDOBSTRUENT can accumulate and eventually overwhelm IDENT(voice). As with the distance-based pathology in section 2, the cut-off point is arbitrary: with different weights, we could produce a language with no more than n voiced obstruents in a word for any n. This kind of categorical faithfulness, then, introduces problems that are at least as bad as the ones it is intended to solve.

(23) a.

/gap/	IDENT(voice) 3	*VOICEDOBSTRUENT 2	*H*
☞ a. gap		-1	-2
b. kap	-1		-3

b.

/gab/	IDENT(voice) 3	*VOICEDOBSTRUENT 2	*H*
a. gab		-2	-4
b. kab	-1	-1	-5
☞ c. kap	-1		-3

5.2 **Skip and Related Constraints* Eliminating the distance-based pathology requires providing a counterweight to IDENT's escalating penalties. Instead of counting on Positional Licensing itself to provide that counterweight, we might instead modify *DUPLICATE. Whereas in (6), e.g., it assigns -1 to identity-licensing candidates regardless of the distance between the coindexed elements, it might assign violations proportionally: -1 for each position that intervenes between the coindexed items. This is essentially the *SKIP constraint proposed by Kimper (2012), and it does not solve the problem, as (24) shows. *SKIP does indeed penalize disharmonic intervening positions more when there are more of them, but this misses the point: we do not need to penalize identity licensing more, we need a greater penalty for the faithful form.

(24) a.

/ée-i/	LICENSE([+high], $\acute{\sigma}$) 5	*SKIP 3	IDENT(high) 2	*H*
a. ée-i	-1			-5
b. íe-i		-1	-1	-5
☞ c. íi-i			-2	-4

b.

/éee-i/	LICENSE([+high], $\acute{\sigma}$) 5	*SKIP 3	IDENT(high) 2	*H*
☞ a. éee-i	-1			-5
b. íee-i		-2	-1	-8
c. íii-i			-3	-6

The failure of *SKIP to solve the problem highlights the fact that the distance-based pathology emerges from the interaction of Positional Licensing and IDENT—the solution must be housed in one or the other of these two constraints. We can avoid this conclusion by splitting gradient Positional Licensing in two: one constraint to replicate traditional Positional Licensing, and the other to deal with the intervening positions by assigning violations for each position that falls between an element and position that Positional Licensing wants it to appear in. In other words, it would penalize both *éee-i* and *íee-i* twice because there are two positions between the [+high] and its intended licensor. (This is different from *SKIP and *DUPLICATE, which penalize only the second of these forms and hence do not make the necessary distinctions in (24).) Such a constraint is exceedingly odd, though: it must consult the Positional Licensing constraint to determine which element and which position must coincide, and it must penalize *éee-i* not according to the properties of the form itself, but according to the properties of a hypothetical alternative with a raised stressed vowel.

6 Conclusion

In HG, every constraint has a say in a candidate's well-formedness. Consequently, even when Positional Licensing outweighs faithfulness, the latter can prevent satisfaction of the former when the cost in faithfulness—too many positions must assimilate—exceeds the benefit of placing the feature restricted by Positional Licensing in the licensor. I argued above that the only sound way to counter this interaction is by amending Positional Licensing so that its assessment of candidates is sensitive to the distance between trigger and target, just as faithfulness is sensitive to the number of positions that must change for a feature to reach its licensor.

The fact that Positional Licensing must take different forms in OT and HG underscores the observation that the two frameworks, despite their similarities, often necessitate different constraint inventories, and the constraints they have in common may may not produce identical results (Jesney, 2011). Furthermore, gradient Positional Licensing has its own problems; these are addressed by formalizing Positional Licensing as a positive constraint couched in Serial HG. Licensing-based phenomena, then, provide new support for these particular theoretical constructs.

Finally, the theory of Positional Licensing developed here is designed to avoid distance-based pathologies that result from its interaction with faithfulness. But it remains to be seen whether it can be extended to produce direct licensing as well as non-metaphony-like patterns, such as spreading from the licensor to non-licensing positions. Additionally, the metaphony patterns of Lena and Central Veneto present complications that could not be addressed here. For example, low vowels do not raise in Central Veneto (*gá̲t-i* 'cat (masc pl)'), and they raise only to *e* in Lena (*ʃé̲nu* 'diligent worker (masc sg)'; cf. *ʃá̲na* 'diligent worker (fem sg)'). Walker (2011) integrates these facts into her OT-based account of these metaphony systems, but it would not be surprising to discover that HG and gradient Positional Licensing require quite different approaches. I have also examined here only what we might consider the simplest or canonical input configuration: a single non-licensor hosts a feature subject to Positional Licensing and triggers non-vacuous assimilation in the licensor. But if this feature appears in multiple non-licensors underlyingly, the balance between Positional Licensing and faithfulness may be upset: the mappings /éei-i/ → *íii-i* and /éee-i/ → *íii-i* receive the same reward from Positional Licensing, but the former incurs one fewer faithfulness violation than the latter. The theory of Positional Licensing developed here is only a first stab at reconciling this constraint type with HG, and it should be tested against a wider variety of configurations to assess its viability.

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