DEEP INTO THE SURFACE

We defend a purely monostratal view of phonology, one in which there is only one relevant phonological representation. Different from the Correspondence model (McCarthy & Prince, 1995), all constraints are defined on this representation, including faithfulness constraints. We argue that the 'too many solutions problem' put forward by Steriade (2001), should not be solved by making the surface representations more phonetic, but by making them more abstract.

Background. Classical OT (Prince & Smolensky, 1993) was truly monostratal: all constraints referred to properties of the surface. Faithfulness constraints were of two types. PARSE constraints prohibited material which was not incorporated into the prosodic structure and therefore not pronounced — hence effectively banning deletion. FILL constraints, on the other hand, militated against the empty material that would arise from epenthesis.

McCarthy & Prince (1995) washed away work on this model of OT, which we will henceforth call 'Containment', and replaced it with Correspondence Theory, stating that input and output are separate representations, and faithfulness constraints are constraints on the 'correspondence' between elements in those two representations.

Recent times have seen a revived interest in monostratalism, however (Eychenne, 2006; Goldrick, 2000; van Oostendorp, 2005, to appear; Revithiadou, to appear; Uffmann, 2007). Following these authors, we argue that Correspondence Theory is computationally too strong and makes the wrong predictions. Furthermore, we briefly discuss the evidence of the authors mentioned to show that the objections against Containment can be answered.

Too Many Solutions? One important class of puzzles for OT is the so-called 'Too Many Solutions Problem': in order to satisfy a constraint, we could apply many different repairs, but languages of the world seem to uniquely prefer only a small subset of those. Given that constraints are freely rankable, this is unexpected

The label 'Too Many Solutions Problem' originates with Steriade (2001). She observes that many analysts posit a markedness constraint that we will call FD in the universal set of constraints:

(1) FD: Obstruents in coda must be voiceless.

According to Steriade (2001), FD could be satisfied in many different ways in principle:

(2)

	Change to satisfy FD	Corresponding constraint ranking
a.	Devoicing: /tab/→[tap]	FD≫IDENT-[±voice]
b.	Nasalisation: /tab/→[tam]	FD≫IDENT-[±nasal]
c.	Lenition: /tab/→[taw]	FD≫IDENT-[±cons]
d.	C Deletion: /tab/→[ta]	FD≫MAX-C
e.	V Insertion: /tab/→[tabə]	FD≫DEP-V
f.	Segment reversal: /tab/→[bat]	FD≫LINEARITY (for segments)
g.	Feature reversal: /tab/→[dap]	FD≫LINEARITY (for features)

Steriade (2001) claims that only option (2a) is actually attested in natural languages. Her solution is to propose a specific model of Correspondence, one which is based on 'perceived similarity': segment α is more likely to replace segment β if they 'sound more similar'. It is unclear, however, how perceived similarity can be formalised precisely, as Steriade (2001) recognizes.

On closer inspection, however, such a radical move into unknown territory does not seem necessary. Given reasonable assumptions about constraints within Containment,

most of the 'solutions' mentioned by Steriade, actually are not solutions at all, since they are harmonically bound by the devoiced candidate [tap].

First, under a reasonable, phonological, view of final devoicing, the constraint FD should refer to features, and be as general as possible:

(3) FD: The feature [voice] should not be parsed in the coda.

Given (3), a change from /tab/→[tam] in order to satisfy FD, would involve at least *two* changes: one would be to add [+nasal], and one would be to delete [+voice]. It would be presumed that the voicing on sonorants is phonetic and automatic, hence not (necessarily) present in the phonology. But given this, [tap] harmonically binds [tam]:

(4)

/tab/	FD	PARSE-[voice]	PARSE-[nasal]
[tap]		*	
[tam]		*	* W

The phonological specification of the glide in lenition would also need to lose [+voice] in order to satisfy FD, and hence [taw] would also be bound by [tap].

A similar story holds for consonant deletion. Under Containment, all constraints against deletion are PARSE constraints.

(5) a. PARSE-[voice]: The feature [voice] should be parsed into prosodic structure.
b. PARSE-segment: Segments should be parsed into prosodic structure.

Not parsing a segment involves not parsing features linked to that segment, so that again harmonic bounding results:

(6)

/tab/	FD	PARSE-[voice]	PARSE-segment
[tap]		*	
[ta]		*	* W

As to the LINEARITY violations needed to account for (2f) and (2g), the option of metathesis is not available under Containment (since the input has to be literally contained in the output), and changes from /tab/ to [dap] or [bat] can only be made by massively changing features. Hence harmonic bounding is responsible for a lack of these alternative solutions as well.

This leaves us with only three plausible candidate outcomes: fully faithful [tab], found in languages without FD, such as English; devoiced [tap]; and a form with vowel epenthesis [tabə]. Since the latter involves a FILL violation and no PARSE violation, it should be available in our inventory of solutions. Based on data from West-Germanic (Dutch and German) we argue that this is a desirable result, and Steriade (2001)'s typology is too restrictive on this point.

To conclude, we briefly discuss the implications of our findings for the more general issue of the Too Many Solutions Problem. We argue that a restrictive view on representations and constraints will ban many of the solutions also in other cases. Apparent problems with surface-based generalizations should be solved by looking deeper into the surface.