A Note on Parallel and Serial Derivations in OT

1. The HS analysis of MCS depends on serial phonological derivation.
   - There are analyses that depend on the parallelism of standard OT – these cannot be translated directly into HS.

2. Lithuanian syncope in serial OT: Bakovic's analysis cannot be translated in serial OT because it depends on evaluating complete output candidates.
   - Cs of verbal prefixes /ap-/ and /at-/ assimilate in voicing and palatalization to a following obstruent.

at-ko:pʲtʲi	'to climb up'	ap-kalʲbʲetʲi	'to slander'
ad-gautʲi	'to get back'	ab-gautʲi	'to deceive'
atʲ-pjʲautʲi	'to cut off'	apʲ-tʲemʲdʲi:tʲi	'to obscure'
adʲ-bʲekʲtʲi	'to run up'	abʲ-gʲi:dʲi:tʲi	'to cure (to some extent)'

     - There is also palatalization of Cs before [i].
   - 'If the initial consonant of a stem is identical to the prefix-final consonant, or differs from it only in terms of voicing or palatalisation (or both)' /i/ is epenthesized between the consonants (with concomitant palatalization)

atʲi-taikʲi:tʲi	'to make fit well'	apʲi-putʲi	'to grow rotten'
atʲi-tʲeisʲtʲi	'to adjudicate'	apʲi-pʲi:lʲtʲi	'to spill something on'
atʲi-duotʲi	'to give back'	apʲi-barʲtʲi	'to scold a little bit'
atʲi-dʲetʲi	'to delay'	apʲi-bʲerʲtʲi	'to strew all over'

   a. AGREE[voi], violated by adjacent obstruents that differ in voicing.
      AGREE[pal], violated by adjacent consonants that differ in palatalisation.
   b. IDENT[voi], violated by changes in voicing from input to output.
      IDENT[pal], violated by changes in palatalisation from input to output.
   c. NOGEM, violated by adjacent identical consonants (geminates).
   d. DEP(V), violated by vowel epenthesis.

3. Ranking required to derive voicing/palatalization assimilation in heterorganic clusters differs from parallel OT
   - NOGEM, AGREE(pal) >> DEPV >> AGREE(voice)
     - DEPV must outrank at least one AGREE constraint otherwise epenthesis would win where the UR violates both AGREE constraints (candidate d), because epenthesis eliminates both violations, whereas changing [voice] or [pal] only eliminates one.
     - The AGREE constraints must be ranked with respect to each other to decide which disagreement to eliminate first – I've ranked AGREE(pal) higher.

   - This ranking correctly derives assimilation in voicing and palatalization (and no epenthesis) with heterorganic clusters:

i.

/at-bʲekʲtʲi/	NoGem	Agree (pal)	DepV	Agree (voice)	Ident [voice]	Ident [pal]
a. atbʲekʲtʲi		*!		*		
b. adbʲekʲtʲi		*!			*	
c. ☞ atʲbʲekʲtʲi				*		*
d. atibʲekʲtʲi			*!			

ii.

/ atʲbʲekʲtʲi /	NoGem	Agree (pal)	DepV	Agree (voice)	Ident [voice]	Ident [pal]
b. atʲbʲekʲtʲi		*!				
c. ☞ adʲbʲekʲtʲi						*
d. atʲibʲekʲtʲi			*!			

(No further improvement – all markedness violations eliminated)

4. The problem arises in deriving epenthesis in homorganic clusters that differ in both palatalization and assimilation.
   - Where the consonants differ in two features, gemination involves a two feature change, so it is not a licit candidate at the first derivational step.
   - So where the homorganic cluster in the UR differs in both voicing and palatalization, as in /at-dʲetʲi/, it must undergo assimilation in one feature before epenthesis applies.
     - Here it undergoes palatalization assimilation since Agree(pal) is ranked higher than Agree (voice).

i.

/at-dʲetʲi/	NoGem	Agree (pal)	DepV	Agree (voice)	Ident [voice]	Ident [pal]
a. atdʲetʲi		*!		*		
b. addʲetʲi		*!			*	
c. ☞ atʲdʲetʲi				*		*
d. atidʲetʲi			*!			

   - No further improvement is possible, so the ranking fails to derive epenthesis.

ii.

/ atʲdʲetʲi /	NoGem	Agree (pal)	DepV	Agree (voice)	Ident [voice]	Ident [pal]
b. !☞ atʲdʲetʲi				*		
c. adʲdʲetʲi	*!					*
d. atʲidʲetʲi			*!			

   - For epenthesis to win here, Agree(voice) would have to outrank Dep(V), but, as we saw above, the reverse ranking is required to block epenthesis in heterorganic clusters that differ in voicing and palatalization.
   - So we have a ranking paradox: no ranking of these constraints will derive all the desired winners.
   - The problem arises because voicing and palatalization have to be derived in separate steps.

- At the intermediate stage, an unassimilated cluster must be preferable to epenthesis, so an AGREE constraint must be ranked below DEPV.
- But then that AGREE constraint is ranked too low to ever force vowel epenthesis.

5. In parallel OT, voicing and palatalization assimilation can apply simultaneously, so both AGREE constraints can rank above DEPV, so, together with NOGEM they can force epenthesis. Assimilation is preferred to epenthesis, if it would not yield a geminate, because DEPV in turn ranks above faithfulness to [voice] and [pal].

Assimilation between adjacent disagreeing consonants

/at-bʲektʲi/	AGREE[voi] AGREE[pal]	DEP(V)	IDENT[voi] IDENT[pal]
a. at-bʲekʲtʲi	*!		
☞ b. adʲ-bʲekʲtʲi			*
c. atʲi-bʲekʲtʲi		*!	

Epenthesis between adjacent identical consonants

/ap-putʲi/	AGREE[voi] AGREE[pal]	NOGEM	DEP(V)	IDENT[voi] IDENT[pal]
a. ap-putʲi		*!		
☞ b. apʲi-putʲi			*	
c. ab-putʲi	*!			*

Epenthesis, not assimilation

/ap-bʲertʲi/	AGREE[voi] AGREE[pal]	NOGEM	DEP(V)	IDENT[voi] IDENT[pal]
a. ap-bʲerʲtʲi	*!			
b. abʲ-bʲerʲtʲi		*!		*
☞ c. apʲi-bʲerʲtʲi			*	

6. I think there are other phenomena with a similar structure that are also problematic for serial OT.