## A Formal Definition of LOCALITY Adam Baker University of Arizona

The following is a possible formalization of Locality-IO, which is referred to in Yip (2002). Tone studies in OT have been hindered by the fact that tone languages often spread a tone to a single TBU, and no further, which effect is not easily derivable through constraint interaction. Locality prevents tones from spreading by more than one TBU, but how such a constraint might be formalized is not a straightforward matter. The following correspondence-theoretic (McCarthy & Prince 1995) definition provides a formalization of the faithfulness constraint necessary OT analysis of tonal phenomena.

### LOCALITY-IO

Let  $T_I \in S_1$ ,  $T_O \in S_2$ ,  $T_I \Re T_O$ Let  $E_I$  be the exponents of  $T_I$ . Let  $E_O$  be the exponents of  $T_O$ . Let  $D = E_I \cap E_O$ . Then  $x \in D \to \exists y : Adj(x, y), y \Re z, z \in E_I$ 

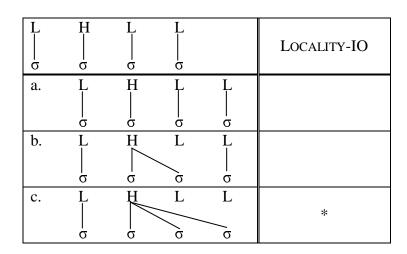
#### Less Formal:

Given that  $T_I$  is in the input and  $T_O$  is in the output, and that the tones correspond. Define  $E_I$  as the set of all of the TBUs associated with  $T_I$ , and  $E_O$  as the set of all TBUs associated with  $T_O$ . D is the intersection of these two sets, which identifies the new association lines in the output. Then, for every member x of D, there must be some y which is adjacent to x, and y must be a correspondent of some z which is in  $E_I$ .

#### Informal:

All TBUs which are newly associated to a tone must be adjacent to a correspondent of a TBU which was associated to the tone in the input.

### Illustration:



# References

McCarthy, John and Alan Prince. 1995. "Faithfulness and Reduplicative Identity." University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory. Ed. by Jill Beckman, Suzanne Urbanczyk and Laura Walsh Dickey. pp 249-384. Yip, Moira. 2002. Tone. Cambridge University Press.