The expressivity of liquid dissimilation in Yidiny

Tatevik Yolyan & Adam McCollum, Rutgers University
{tatevik.yolyan, adam.mccollum@rutgers.edu

Recent work has proposed that phonological patterns can be meaningfully understood in terms of their computational complexity. This body of work has also argued that phonological patterns are subregular within the Chomsky hierarchy (e.g. Heinz 2011a,b, 2018). Jardine (2016) and McCollum et al. (2020) have challenged this claim, offering evidence that some tonal as well as vowel harmony patterns are not subregular, but instead require the full expressivity of non-deterministic regular functions. In this paper we argue, contra Payne (2017) that liquid dissimilation in Yidiny is also non-deterministic, and as such, provides evidence that some consonantal patterns also require the full expressivity of the regular languages.

In Yidiny, a suffixal lateral dissimilates to [r] when followed by another lateral (1b). However, when the alternating lateral is preceded by a rhotic, dissimilation is blocked (1c). Dixon (1977; see also Walsh-Dickey 1997; Suzuki 1998; Bennett 2013) suggests that blocking in (1c) can be analyzed as the composition of two rules – one that maps /l/ to |r| before another /l/, and a second that maps |r| to [l] after a rhotic. Based on Dixon's analysis, Payne (2017) conjectures that the pattern is weakly deterministic, the most expressive class of subregular functions. Payne's analysis crucially depends on Heinz & Lai's (2013) proposal that weakly deterministic functions can be decomposed into two contradirectional subsequential functions that do not introduce abstract segments or increase the length of the intermediate string. This composition is exemplified in (2); triggers and targets are marked with boldface type.

(1)	a.	/dʸuŋga-ŋa**l**i-n/	[dʸuŋga:-ŋa**l**i:-ɲ]	'run-going-past'
	b.	/dʸuŋga-ŋa**l**i-ŋa-**l**/	[dʸuŋga:-**r**i-ŋa:-**l**]	'run-going-com-past'
	c.	/bu**r**wa-ŋa**l**i-ŋa-**l**/	[bu**r**wa:-**l**i-ŋa:-**l**]	'jump-going-com-past'

(2)	Input	/bu**r**waŋa**l**iŋa**l**/
	Leftward lateral dissimilation	|bu**r**wa**r**iŋa**l**|
	Rightward rhotic dissimilation	[bu**r**wa**l**iŋa**l**]

The proposed weak determinism of this mapping is inconsistent with work like Jardine (2016), which notes that a pattern is non-deterministic (Jarinde's *unbounded circumambient*) if the output quality of some symbol depends on long-distance information in both directions. This is precisely the nature of the dependency in Yidiny; the output of /l/ in the comitative suffix depends on information a potentially unbounded distance in both directions – a following /l/ as well as a preceding /r/.

This dissonance suggests that Heinz & Lai's (2013) definitions does not distinguish weakly deterministic from non-deterministic functions because non-deterministic input-output mappings can be generated without introducing abstract segments or augmenting the length of the string, as in the Duke of York derivation in (2). In contrast, Meinhardt et al's (2020) definition of weakly deterministic functions properly characterizes the expressivity of the Yidiny pattern. Meinhardt et al. argue that function interaction is key – weakly deterministic mappings can be decomposed into two contradirectional functions that can be simultaneously applied; non-deterministic mappings cannot. Liquid dissimilation in Yidiny is non-deterministic because the two functions in (2) are crucially ordered; lateral dissimilation feeds rhotic dissimilation. In turn, our findings also support Jardine (2016) and McCollum et al's (2020) case that phonology is not categorically subregular.