Learning morpho-phonology with Gradient Symbolic Representations: Stages and errors in the acquisition of French *liaison*

Anne-Michelle Tessier, University of British Columbia(joint work with Karen Jesney, Carleton University)

Smolensky and Goldrick (2016) make the case for their Gradient Symbolic Representations (GSRs) as the inputs to phonological grammar using the phenomena of French *liaison*: morpho-phonological alternations in which a limited set of consonants come and go at word boundaries. In the examples below, liaison consonants (given in bold) do not appear when they would be codas, but surface when they can be onsets that resolve vowel hiatus. As the rest of the examples demonstrate, however, French does not otherwise regularly enforced these phonotactics. Liaison has been particularly controversial with respect to its underlying forms (for a recent overview see Smith 2015) — and Smolensky & Goldrick argue that positing inputs with gradient and blended segments can resolve much of this controversy.

les nuages	[le.ny.ˈaʒ]	'the clouds'		*petit nuage*	[pœ.ti.ny.ˈaʒ]	'little cloud'
les profs	[le.pʁɔf	'the profs'		*petite navette*	[pœ.tit.na.ˈvɛt	'little shuttle'
les héros	[le.e.ˈʁo]	'the heros'		*petit héro*	[pœ.ti.e.ˈʁo]	'little hero'
les amis	[le.**z**a.ˈmi]	'the friends'		*petite héroïne*	[pœ.tit.e.ʁo.ˈin]	'little heroine'
les ours	[le.ˈ**z**uʁs]	'the bears'		*petit ami*	[pœ.ti.**t**a.ˈmi]	'little friend (ms)'
joli ami	[ʒɔ.li.a.ˈmi]	'pretty friend'		*petite ami*	[pœ.ti.ta.ˈmi]	'little friend (fem)'
joli ours	[ʒɔ.li.ˈuʁs]	'pretty bear'		*petit ours*	[pœ.ti.ˈ**t**uʁs]	'little bear'

This talk is an initial study of how a learner might use GSRs to acquire the breadth and depth of liaison (see also Hsu, 2018; Rosen, 2016, 2019). We will first lay out the nature and trajectories of errors that French-learning children make with liaison forms, relying primarily on data from Chevrot and colleagues. Then, building on Smolensky and Goldrick's learning sketch, we will present a set of assumptions for how learning begins and proceeds using GSRs and a Harmonic Grammar, and discuss a simple computational simulation of liaison learning. We will show how some child-like stages and errors are easy to derive; while others are fundamentally much harder; we will also illustrate how asymmetries in lexical frequency can crucially influence the simulated learner's development and ultimate success. We will conclude with some discussion of how a GSR learner can differ in its predictions from existing related accounts (namely Smith, 2015's PCA approach and the schema-based accounts as in Chevrot, Chabanal and Dugua, 2007) and the kinds of novel learning data that could further tease them apart.