The Trouble with Learning Nothing: Problems for deriving lexical avoidance with MParse

Several analyses of absolute ineffability in adult phonologies use the constraint MPARSE (Prince and Smolensky, 1993/2004), which is violated only by the 'null parse' candidate [⊙] (McCarthy and Wolf, 2008; Raffelstein, 2004). This approach has also been extended to capture *lexical avoidance* in phonological acquisition: a phenomenon whereby children categorically avoid or statistically under-represent words with marked phonological structure in their own productions (e.g. Schwartz and Leonard, 1982; Kiparsky and Menn, 1983; Adam and Bat El, 2009). While good arguments have recently been made for deriving children's lexical avoidance in their grammars, as with MPARSE (Tessier and Day, 2015; Becker, 2012; also van Oostendorp, 2009), this paper examines three different error-driven learning approaches using MPARSE and presents evidence that each one fails to capture the attested developmental stages.

The three learning stages to be captured are as follows: first, the learner may avoid a marked configuration M among their target words; later, words with M will be attempted but produced unfaithfully; finally, the target grammar is achieved and M is tolerated. This trajectory – which as we will see proceeds at different speeds for different marked structures – suggests an initial state ranking (1), which creates errors as in (2). But how to learn from there?

(1) *Initial state*: **M**ARKEDNESS ≫ **F**AITHFULNESS ≫ **MPARSE**

(2) *An initial state error*	ONSET	***CC-ONSET**	IDENT	MAX	**MPARSE**
CCV ~ ⊙	e	L	e	e	W

1. Learning ordinal rankings As shown by Prince and Tesar (2004) and Hayes (2004), one major difficulty in restrictive error-driven learning is the tension between resolving errors as in (2) while still maximally obeying biases as in (1). Once all markedness constraints "which prefer no losers" (see above refs) have been installed, the biases in (1) provide <u>two</u> constraint strata (F and MPARSE) to keep low-ranked. How should they be weighed against the learning data?

Option 1 is to resolve the error but otherwise prioritize the M >> F bias. As illustrated in (3), this approach installs MPARSE in the second stratum (because it prefers a winner, resolving an error); the next strata will include all remaining M and F respectively. This new grammar has learned <u>too much</u>: not only are complex onsets now attempted rather than avoided (3a), but since all faithfulness is below MPARSE, *no* marked structure is ever again avoided (see 3b)

(3a) /CCV/	ONSET	MPARSE	*CC-ONSET	MAX		(3b) /V/	ONSET	MPARSE	*CC-ONSET	DEP
CCV			*!			V	*!			
☞CV				*		☞ CV				*
⊙		*!				⊙		*!		

Option 2 is to prioritize the F > MPARSE bias, while still resolving the error. This is shown in (4): here the second stratum will include all F constraints (even though they prefer no winners); below that MPARSE will be installed (resolving the error), and finally the remaining M. Sadly this grammar has also learned too much: between (2) to (4a) the learner has moved from avoiding complex onsets to preserving them faithfully, skipping the repair stage entirely:

(4a) /CCV/	ONSET	MAX	MPARSE	*CC-ONSET		(4b) /V/	ONSET	DEP	MPARSE	*CC-ONSET
☞ CCV				*		V	*!			
CV		*!				CV		*!		
⊙			*!			☞ ⊙			*	

2. Learning numerical rankings Adopting a gradual error-driven learner – whether via an OT-GLA learner (e.g. Boersma and Hayes, 2001) or within Harmonic Grammar (e.g. Jesney and Tessier, 2011) – is also not a general solution to the MPARSE learning problem. A biased GLA-OT learner with the same initial state from (1) has two potential next stages; the choice depends on the relative speed with which M and MPARSE's values are adjusted when learning from errors like (2). One promising second stage emerges if markedness constraints remain high-ranked and MPARSE is promoted just above some faith constraint (e.g. MAX). As shown using simulated values (5), the resulting grammar replaces avoidance with repairs somewhat selectively – *only* if repairing the marked structure can be achieved by violating MAX (5a), but not e.g. DEP (5b):

(5a) /CVC/	ONSET, *CODA 100	*CC-ONSET 80	MPARSE 30	MAX 29	(5b) /V/	ONSET, *CODA 100	*CC-ONSET 80	DEP 31	MPARSE 30
CVC	*!				V	*!			
☞CV				*	CV			*!	
⊙			*!		☞ ⊙				*

While this may seem an improvement, Becker (2012) stresses that avoidance is observed relative to markedness, *not* faithfulness. In his case study, a child stops avoiding sonorant codas and starts repairing them with deletion *before* they stop avoiding complex onsets, but eventually their avoidance is also replaced by deletion (on this data point, see also esp. Kiparsky & Menn, 1983).

3. Learning with a revised MParse A potential diagnosis of the problems presented thus far is that they come from the definition of MPARSE as a unitary constraint. Can MPARSE be somehow relativized to reduce its effect on the learner's entire system? Becker (2012) re-interprets MPARSE as a family of constraints each tagged to a markedness constraint – but this requires a rather novel constraint definition, relating its violation profile to the 'fully faithful candidate' (McCarthy, 2003). Another possibility might be to initially clone a copy of MPARSE for each individual word – however, several examples demonstrate that both children and adults can attempt or avoid marked structures as a result of phonological context *within a phrase*, not just at the word level. A striking example comes from the child studied in Donahue (1986), who resolved his avoidance of two-word utterances but only chose combinations of targets that did not compel consonant harmony across a word boundary.

Conclusions The formal problem of establishing MPARSE'S correct domain has already been raised in the literature (see McCarthy and Wolf, 2008 and references therein); in the context of learning, this problem seems especially acute. On the one hand, if existing learning algorithms cannot capture stages of avoidance, repair and faithfulness using MPARSE, then absolute ineffability in adult grammars may not be the right analog for childhood lexical avoidance (cf. van Oostendorp, 2009). On the other hand, to the extent that avoidance appears to be grammatically conditioned (rather than a generalized aversion to output complexity), we must ultimately find a way to connect it to the learner's developing phonology.

Selected References Becker, M. (2012). Target Selection in Error Selective Learning. Brill's Annual of Afroasiatic Languages and Linguistics 4: 120–139. * Donahue, M. (1986). Phonological constraints on the emergence of two word utterances. *JCL* 13(2): 209-218. * McCarthy, M. and M. Wolf (2008). Less than zero: Correspondence and the null output'. In Rice and Blaho (eds.), *Ineffability in Optimality Theory*. London: Equinox. * Prince. A. & B. Tesar (2004). Learning phonotactic distributions. In Kager, Zonneveld & Pater (eds.) *Fixing Priorities: Constraints in Phonological Acquisition*, CUP; 245–291. * Tessier, A.M. and K. Day (2015). Grammatical restrictions on lexical avoidance. Poster, OCP, Barcelona.