

Phonological templates in early words

The field of language acquisition must ultimately find a way to account for the developmental source of linguistic system. Dynamic systems theory (Thelen & Smith, 1994), with its emphasis on the deep interconnectedness of learning in action and perception, on the independent emergence of related skills as a self-organizing catalyst for behavioral change, and on the role of variability in developmental advance, with a consequent emphasis on the intensive study of individuals, offers a highly promising perspective on early speech development, despite the fact that these ideas have not as yet been tested in any detail in the area of language. This talk will draw on dynamic systems theory in proposing an emergentist account of phonological development.

One long-standing approach to phonological development – ‘whole word phonology’ – takes the position that the first words are represented holistically (Waterson, 1971; Menn, 1971, 1983; Ferguson & Farwell, 1975; Beckman & Edwards, 2000). Arguably, the very first words, typically produced in contexts that provide strong situational priming, are based on an implicit match between the child’s well-practiced vocal patterns or ‘Vocal Motor Schemes’ (VMS: the result of production practice) and frequent input forms (i.e., on distributional analysis based on repeated hearing of closely similar speech sequences). Once a small production lexicon has begun to be established in this way, children can be seen to develop one or more systematic word production routines or ‘templates’, based on the experience of saying many words in a particular way and hearing both self and others produce those same words, which have become salient also by repetition.

The projection of the template onto less similar adult word targets leads to an increase in the numbers of words attempted while at the same time limiting the range of phonological patterns produced (and thus permitting the child to expand his or her phonetic repertoire only very gradually). However, that process also leads to regression with respect to accuracy in relation to the adult target form: The template typically reflects the child’s restricted phonetic resources, both as regards prosodic structure (e.g., one or two syllables in length, maintenance of a single consonant type across syllable positions, onset and coda, or across onsets in disyllables) and segments (stops, nasals and glides are the most common early consonant types, cross-linguistically). Such templates, or early word patterns, are used both to produce target words similar to the template, suggesting lexical ‘selection’ for the phonetic match to the child’s pattern, and ‘adapted’ words, which reflect more radical changes as the child fits a somewhat less similar target form into the pattern (see Table 1). Although use of a template does not lead directly to more accurate production, it does speed word learning and it can be thought to represent a first step in phonological organization or systematicity.

Among the empirical questions that may be asked regarding the word templates we will focus here on the most basic: To what extent can the notion be considered to apply to all children? Analysis of the word forms produced late in the single word period by each of 34 children acquiring one of five different languages has revealed a degree of patterning in all cases, but with a relationship between (a) extent of reliance on templates and (b) extent of phonetic diversity, indexed by scoring consonant use,

which has been established as the best predictor of phonological advance (Stoel-Gammon, 1992).

From a dynamic systems perspective we see phonetic diversity and emergent systematicity as independent variables whose interaction differs by individual child and determines rate and type of phonological development. (1) A child with no consistent production patterns – no VMS – is not ready to enter into word production. In contrast, (2) a child with a small range of often used segments or longer patterns may induce from those well-practiced units a template which facilitates the representation of novel word forms; the wider range of targets should, in turn, lead to later phonetic diversity. On the other hand, (3) a child with sufficient phonetic resources to begin word production but who fails to be sensitive to the latent patterning of her early words may slowly continue to learn unrelated adult words, increasing phonetic diversity without yet developing a phonological system.

Table 1. Noël (French child), aged 17 months; N word shapes in session = 31.

Left-most columns show three relatively accurate ‘selected’ word forms, each exhibiting the same simple CVN structure, a template for this child.

Right-most columns show three words onto which the template has been ‘projected’, despite the distance between adult form and child pattern. The first two, *ballon* and *peinture*, require ‘adaptation’ by the specific phonological processes listed on the far right. Alternatively, the <CVN> template can be seen to be applied as a whole to these words, two of which invite such application by having a nasal vowel while the third, *poire*, is swept into the pattern under the pressure exerted by the several other [pVn] monosyllables produced.

<i>selected</i>			<i>adapted</i>			<i>adaptation</i>
target word	target form	child form	target word	target form	child form	
<CVN>						
<i>donne</i>	[dɔ̃n]	[dʌn]	<i>ballon</i> ‘ball’	[balɔ̃]	[βan]	Change nasal V into V+ n; merge syllables
<i>pomme</i> ‘apple’	[pɔ̃m]	[pam]	<i>peinture</i> ‘painting’	[pɛ̃tyʁ]	[pan]	Change nasal V into V+ n; omit 2d syllable
<i>poum</i> ‘boom’	[pum]	[pʌm]	<i>poire</i>	[pwaʁ]	[pœn]	Create V+n syllable