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Segmentally untethered tonal contour production in a pre-multilingual toddler

(a just-for-fun micro-pseudo-squib)

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At a family dinner in early February 2025, the author had the opportunity to observe a number of utterances made, in a naturalistic setting, by a pre-trilingual toddler 1 year 5 months of age. The child has been raised in an environment involving frequent exposure to Cantonese (spoken primarily by his mother and maternal family), Vietnamese (spoken primarily by his father and paternal family), and American English (spoken by most others including, usually, the author). The child's utterances rarely matched actual lexical items in any of these languages, but he exhibited a striking linguistic pattern not attested in any fully acquired languages known to the author.

First, some background just in case: Cantonese words generally belong to one of 6 (or arguably 9) tonal classes which are traditionally referred to with numbers 1 through 6 (or 9). In Cantonese "Motherese" or baby-talk speech directed toward infants, various words take on special tonal patterns that differ from the normal tonal patterns of those lexical items. One such pattern is associated with reduplication, in which a morpheme is repeated with a modified tone (usually either 1, a high tone, or 2, a high-rising tone), such as [syu4syu2] "(go) pee-pee (baby talk)" in which one morpheme (<syu4> with the low-falling tone 4, meaning "urine") is repeated with a modified tone. This resulting 4-2 tonal pattern is also observed on some common kinship terms, even in normal speech registers, such as [po4po2] "maternal grandmother".

While I was observing the toddler mentioned earlier, I found that he wasn't recognizably producing any specific lexical items, but was consistently -- constantly -- producing this [(C)V4(C)V2] tonal contour in a very focused and controlled way. Often he would do so with a nasal articulation [m4m2] which, despite the existence of syllabic <m> in Cantonese, is not an actual lexical item even in baby-talk. Other times he would produce utterances like [ba4ba2], [ta4ta2], and [a4a2] (also not lexical items).

How can we understand these utterances from a theoretical perspective? If we assume that the child is attempting to produce actual utterances (rather than just playing around), then I see several analysis options, of which I will sketch three here.

First, in an Optimality Theoretical framework, we could posit that this wide variation in outputs reflects Richness of the Base in a grammar whose constraint weights are not yet fully determined and therefore subject to per-utterance variability. This would require a probabilistic

interpretation of Optimality Theory, unless one supposes that the grammar is deterministic yet changes after every single utterance. If it's the latter case, then it's notable that no external input is required to prompt the grammar update; instead the child's utterances themselves, or perhaps a continuous internal process, are triggering constraint weight updates over time.

A second option here, viable under any theory that assumes separate tonal and segmental tiers, is that I managed to observe the tonal tier itself "leaking" out into utterances. Suppose that the child has identified this tonal pattern as a lexical entry, perhaps with a label such as "kinship term" or "baby-talk", but his lexicon doesn't yet contain the actual lexical items associated with this tonal contour. The child attempts to produce this utterance, which with either of the meanings suggested above would in fact be a very frequently encountered one indeed, but because he is attempting to produce the pure tonal contour, and because a tonal contour cannot exist without some segmental substrate, the grammar chaotically associates arbitrary segments with the contour each time an utterance is attempted. This could be viewed as analogous to the natural variation in phonetic properties (such as level of aspiration or vowel duration) observed in adult speakers, where segmental and sometimes tonal context is fixed in the lexicon but phonetic detail is underspecified.

The third option, which leads down a very different conceptual direction, is to consider these utterances through the lens of Emergent Phonology or Grounded Phonology. In this case, lexical representations match the phonetic realities that the child has experienced so far, and so there is not necessarily any abstracted tonal contour for the child to be producing as a standalone lexical item. This leads us to the question that I've managed to dodge so far: what is the child actually attempting to produce anyway? If he is trying to replicate words he has heard before with this tonal pattern such as [syu4syu2] and [po4po2], then there's no obvious theoretical explanation (at least to the author). But this seems unlikely in the first place, since at the time of the observations, the child did not need to urinate, nor was his maternal grandmother nearby. Yet if the child were simply practicing production of entirely arbitrary lexical items, then why would they all share a single tonal contour? Emergent Phonology could give an alternative explanation: in this framework, the phonetic realities are stored in the lexicon first, and then from those a speaker deduces grammatical patterns and potential new lexical items. So I suspect that what the author observed was in fact this very process in action, that is, the child had recently noticed this [(C)V4(C)V2] pattern as a pattern, and was attempting to determine what other lexical items might fit it. Notably, at the same event the child had received substantial positive feedback (verbal repetitions and visible excitement from onlookers) when he produced actual lexical items. The production of non-lexical [(C)V4(C)V2] "word attempts" could simply represent the child's attempt to most easily learn of the existence (if not the meaning) of new lexical items, by producing them according to a known pattern and gauging onlookers' reactions.

Ultimately, it's difficult for the author to say which of these theoretical approaches best explains the child's unusual series of utterances. But one way or another, it sure was cute!