

Meaning, Consciousness, and the Onset of Language

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Semiotic Resources in the Child

Manual action as exploration

Full body action as representational play -- 5 Levels to be described

Vocalization -- babbling with the rhythm of speech -- establishing
consonantal control

Laryngeal action under conditions of effort, attention, communication

Manual action as gesture

Language -- context-limited words, referential words, combinations,
sentences

Initial Hypothesis: Mental representation provides a foundation for
language

Theoretical & Empirical Resources

Werner & Kaplan (1963) - Symbol formation :

How children develop symbolic capacity in the vocal domain.

Physiognomic Resonance with the natural world in the context of parental presentation of the ambient language.

Piaget (1962) - Play, dreams, and imitation in childhood:

How children build the capacity for mental representation (symbolic capacity) through imitative action and **representational play**

McCune & Vihman (1987) **Vocal motor schemes**.

McCune et al. (1996) **Grunt communication** in human infants.

Thelen (1989) Self organization -- **dynamic systems** in development

Daddesio (1995) **Semiosis in relation to development**

The child's knowledge at 9 to 12 months is **sensorimotor** not **conceptual**.

Sensorimotor knowledge and perceptual experience form the basis for moving toward **meanings that are representational and are lexicalized in a given language**.

Sensorimotor knowledge includes:

- structuring and use of near space
- recognition of simple gravitational effects

Representational capacity allows:

- prediction and recall of elements in potentially reversible sequences
- figure/ground relations including occluded objects.

Mental Representation and Language

Why do children begin talking when they do?

I began with the notion that language is a representational system. Hence, it might develop in synchrony with nonlinguistic representational ability, if a nonlinguistic measure could be found.

Piaget describes the development of mental representation using play as an example, but also proposes representational play as a mechanism for the transition from sensorimotor development to conceptual ability.

Mental representation is only part of the story...A dynamic system of variables can predict the transition to referential words in an individual child.

From Piaget: Early Pretend Play is Analogy

Between ages one and two years children develop the ability to recreate aspects of their everyday experience in play, inviting others to participate.

At first, they need stimulation by an object to remind them of an activity.

Encountering an empty cup, the child will put it to her lips, recognizing its use, or recreate drinking with sound effects and gestures.

A few weeks or months later, she will stir with a spoon in a cup, and offer the empty spoon to mother or doll, so they can partake of the “food”. This “analogical” ability should be available for language learning.

By the time they are frequently combining words, children create sequences that are “planned” or guided by internal transformations. The child may search out pot and spoon, stir, and offer it to mother, saying *soup..... hot?*, then feed a doll and try some herself.

These more advanced activities seem “hierarchical” guided by internal designations.

Why Play:

1. Piaget identified the development of representational play as the next series of steps in children's development following the sensorimotor period.
2. Play levels can be discriminated for comparison with language level.

Does this mean that I was hypothesizing that learning to pretend **causes** changes in language?

Definitely not!

Rather, theory suggests that both rely on underlying representational ability: **That is -common structure**

Method

Children were video-recorded in their homes at play with their mothers with a standard set of toys. 10 children were observed monthly from 8 to 24 months. An additional sample of 104, 6 at each month of age were also observed. The sample was 50% girls in each group.

Language and action were transcribed and transcripts and videos are available on CHILDES.

Transition to Reference: My initial project was aimed at understanding contributing factors to children's ability to refer to objects and events in their world with referential language.

Result:

McCune (2008) How children learn to learn language. NY: Oxford.

Transition to Sentences: **The current project aims at understanding developments that contribute to children's ability to communicate with sentences.**

Five levels of Representational Play

1. Presymbolic Scheme
2. Self-Pretend
3. Other Pretend
4. Combinatorial Pretend
5. Hierarchical Pretend

Some important definitions of words:

Context-limited words:

These words occur only in limited situations where they have been learned or are extended idiosyncratically.

Referential Words:

These words are used conventionally across objects, activities and events.

Naming words for entities: e.g., doggie, dollie, baby, bottle, cup.

Dynamic Event Words for changes over time and space: e.g., up, allgone, out, more.

Hypothetical relationships:

1. Context-limited words should occur at the same time as or after **Level 2 Self Pretend**.
2. Referential words should occur at the same time as or after **Level 4 Combinatorial Pretend**.
3. Word combinations should dominate the repertoire only at the same time as or after **Level 5 Pretend**.

Evaluate:

Does the timing of developmental change in the non-language cognitive area match up with developmental changes in language?

Findings:

1. Children did not tend to exhibit the hypothesized **language level** unless they already showed the **play level**. In fact, referential words began with play combinations.
2. In the cross-sectional sample (102 children) some children showed the **play level** **without** the expected **language**. But not the reverse!
3. In the longitudinal sample (10 children followed from 8-24 months) some children showed **delays** between attaining a **play level** and the **expected language level**.

Where to go from here?

1. The play levels did develop in order, so that means they can be used as a measure of the development of mental representation.

2. In each case the language behavior developed at the same time as or after the the level of play behavior hypothesized.

3. **But** there were delays in timing between the play levels and the language skills for some children.

Additional semiotic resources are influential!

For the longitudinal sample, timing of phonetic skill and grunt communication allow accurate prediction of language transitions.

Phonetic development should contribute: previous studies showed the importance of consonant production, but consonants babbled were not necessarily those in the early words.

McCune & Vihman Approach :

1. Description of the relevant phenomena as they naturally occur, and analysis of their developmental sequence and interaction.

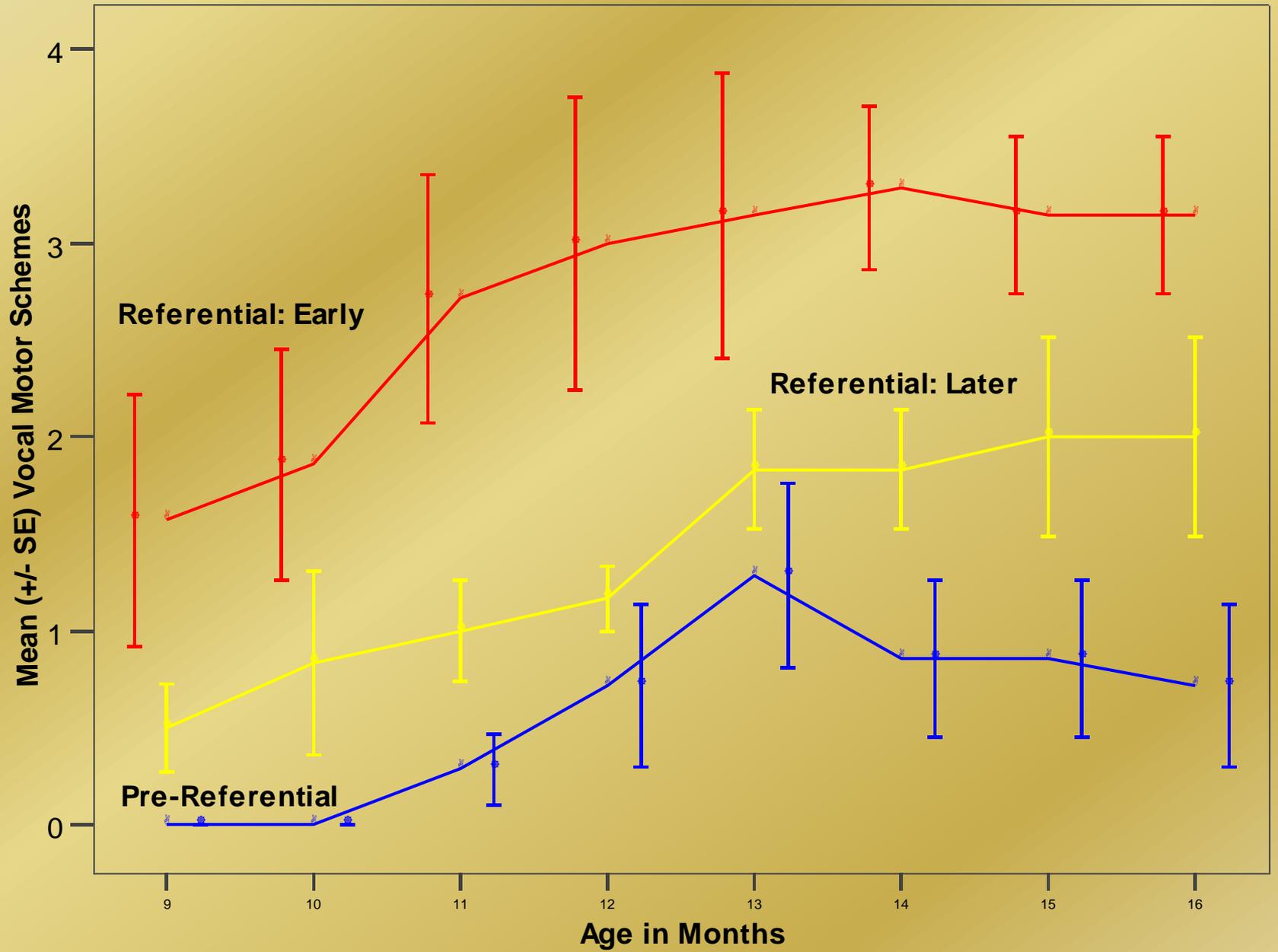
2. Productivity analysis:

Referential words are those that occur twice in a session in varied but related situations.

Vocal Motor Schemes (VMS) are vocal productions that occur repeatedly in a session (10 X) and over time (3 months).

Findings: Phonetic Skill and Referential Production

1. Of 20 children, 7 made the transition to referential language at 14 months (**Early**), 6 at 15 to 16 months (**Later**), 7 later than 16 months (**Pre-Referential**).
2. Only those children exhibiting 2 or more VMS consonants made the referential transition in production.
3. Only referential children included labial p/b in their VMS repertoire.
4. The most productive early talkers relied on word templates for the majority of their word productions. (**Beyond today's talk!**)



Consonants occurring as VMS:

Number of Children

[t/d] 17

[p/b] 10

[k/g] 7

[m] 5

[n] 3

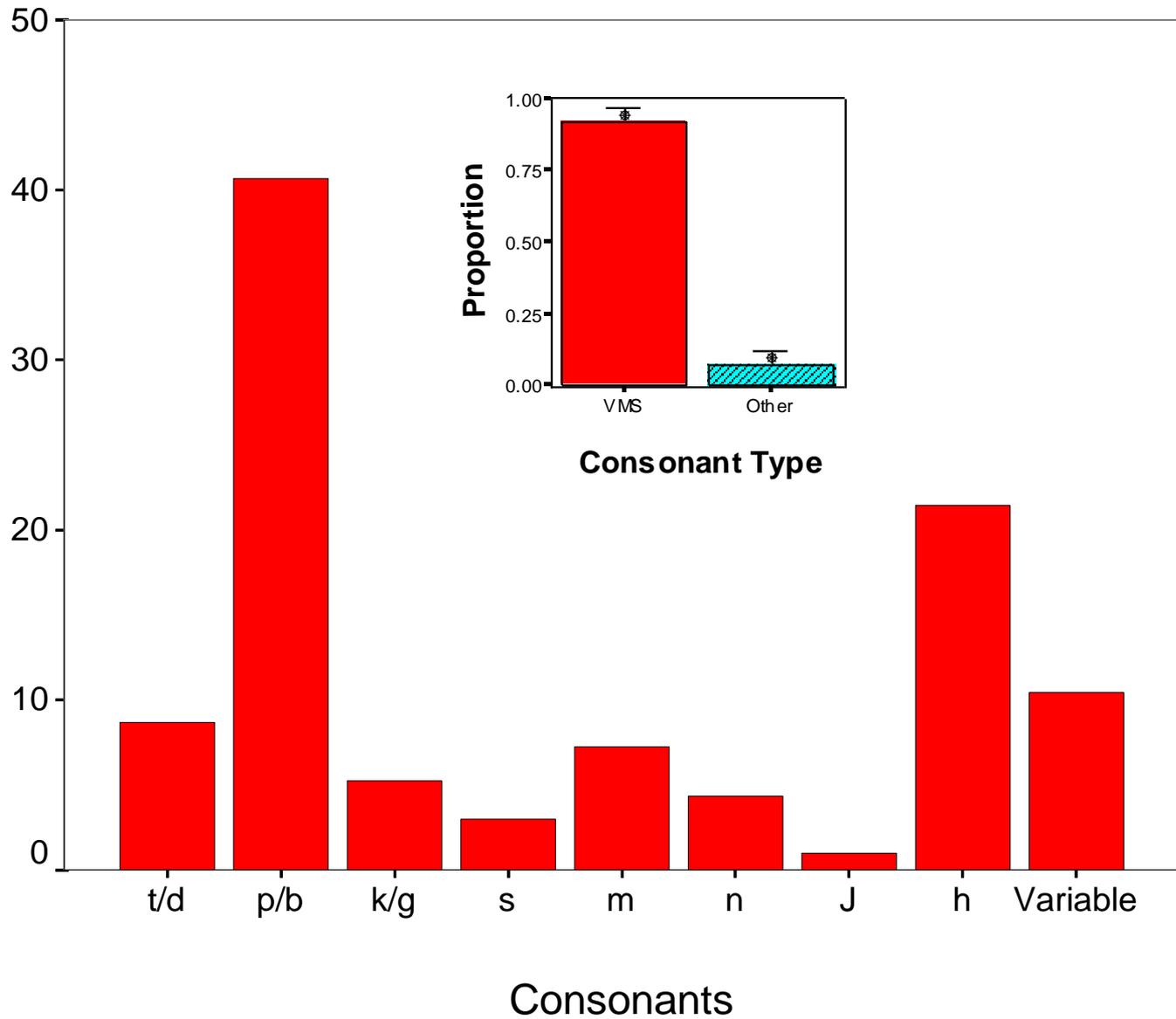
[l] 1

Glottals and glides meeting VMS frequency criteria:

[h] 18

[j] 9

[w] 1



Discovering Communicative Grunts

The child who did not talk, but only grunted and squealed and pointed a little!

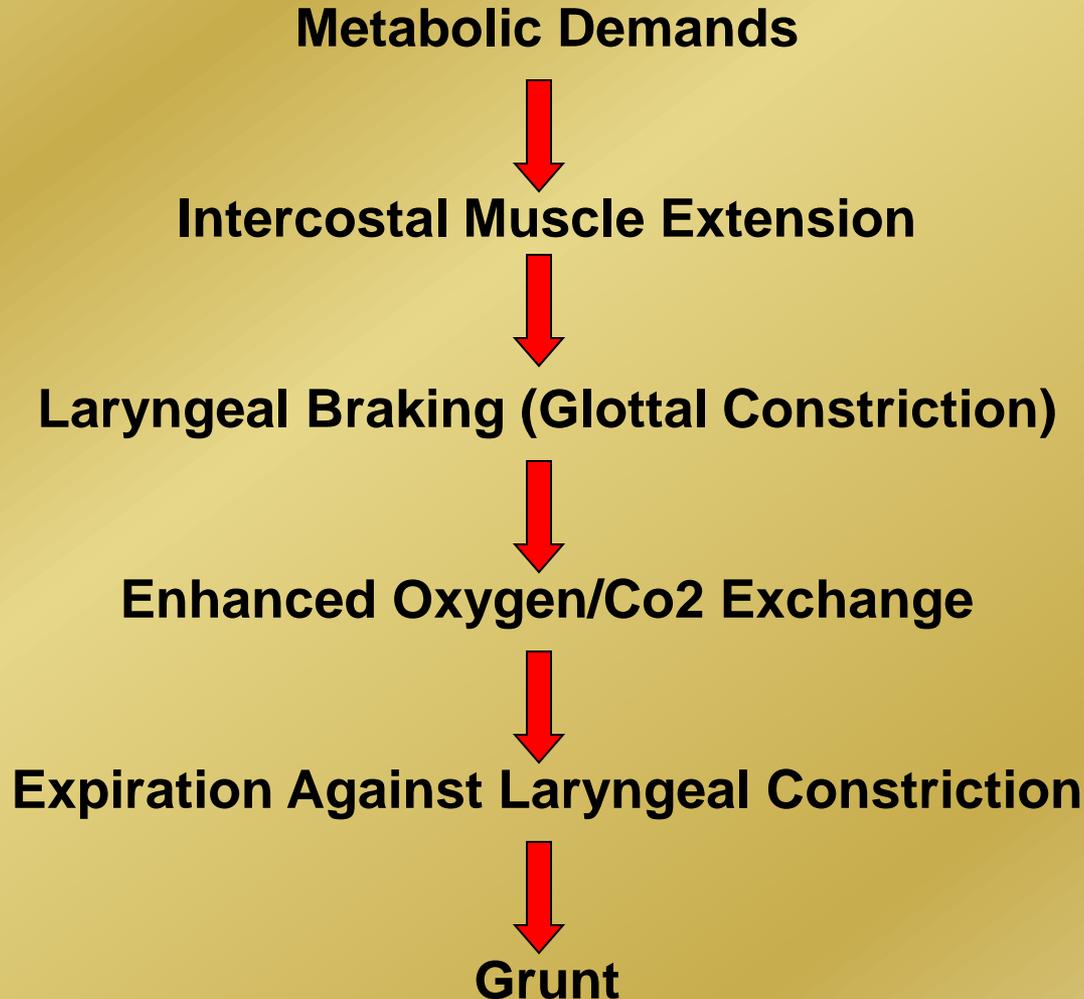
But they were all grunting! Where does it come from?

Careful study of 5 children from an exploratory perspective:

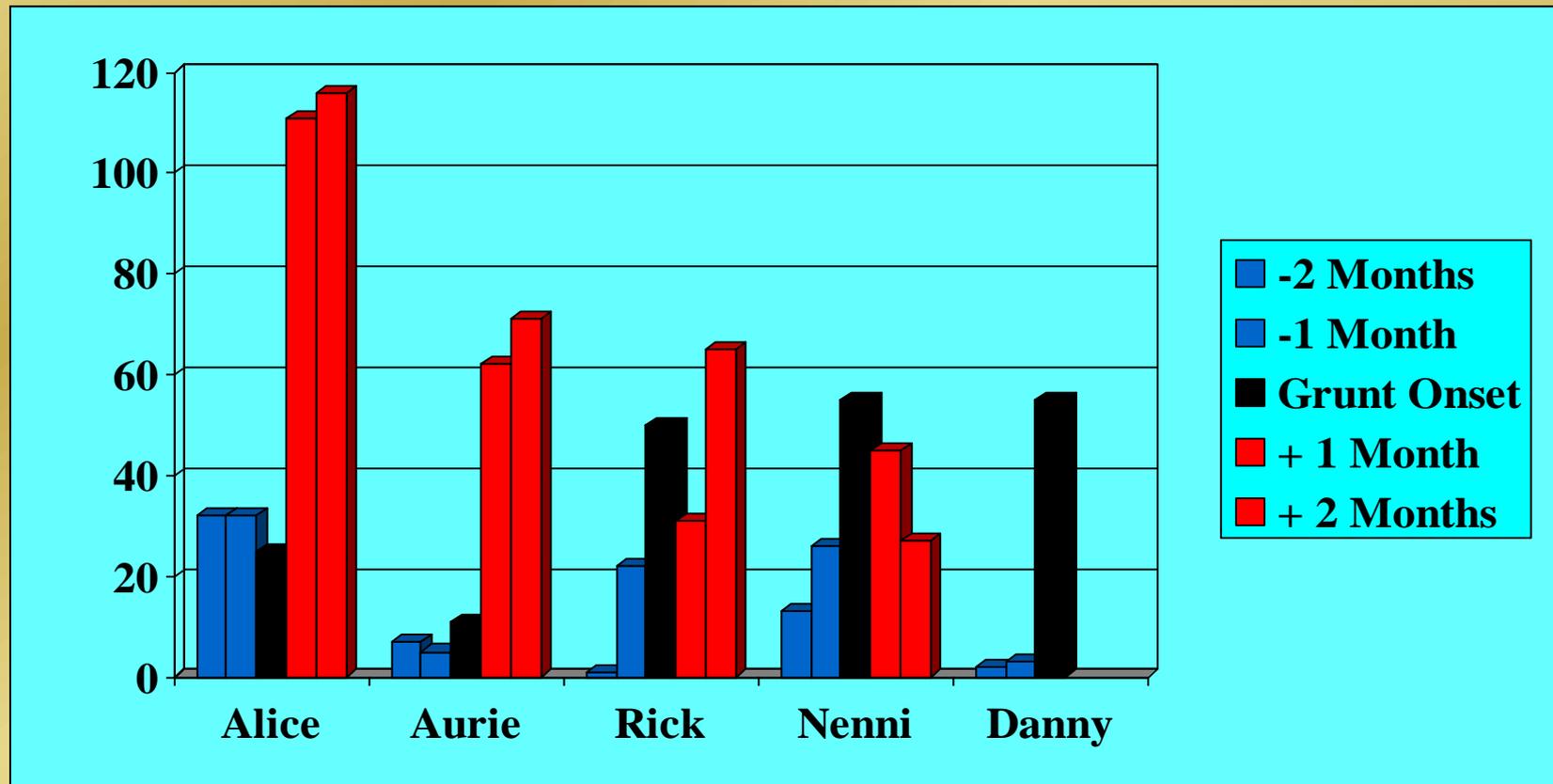
Effort, attention, communication

McCune (1999) reports that vervet monkeys (Cheyney & Seyfarth) and chimpanzees (Plooij) seem to exhibit the same sequence!

Physiological Processes Underlying Autonomic Grunt Production



Total of Communicative Events (including vocal alone + gestural alone + events including both) Shows Sharp Increases either at or Following Communicative Grunt Onset. See Totals below. For Danny grunt onset occurred at his final session.



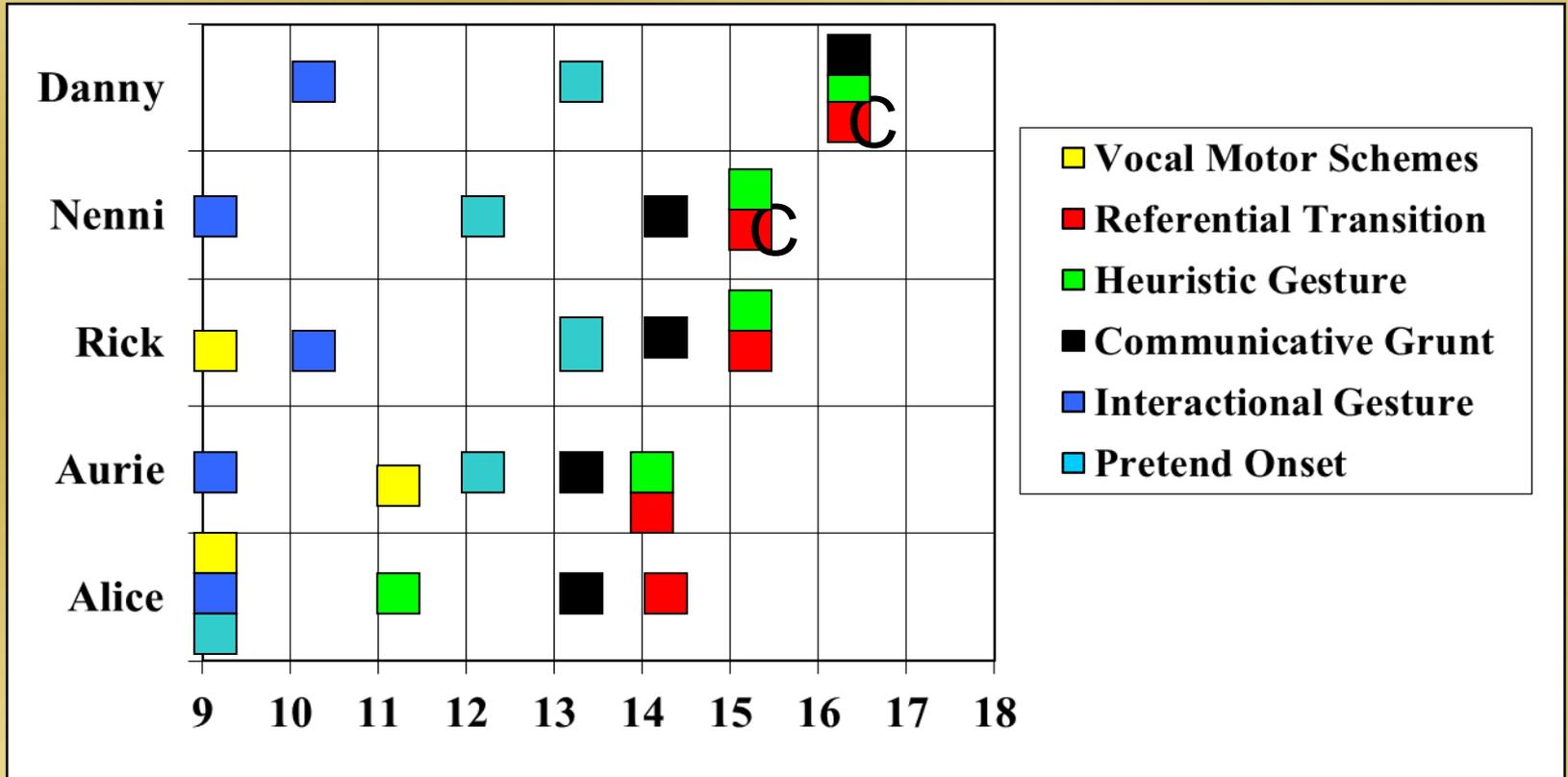
The Dynamic System of Variables

On the next slide you see the timing of development of the variables described thus far for 5 children followed longitudinally. The period of the figure is from 9 to 16 months, although the children were followed for a longer period.

Control parameters are the last variables to develop, leading immediately to the shift in question.

You will see that referential words begin only when all other variables are in place. There is not a necessary order of development of these variables. Danny and Nenni show the transition in comprehension, but not production because they lack phonetic skill. By age 3 they caught up.

Timing of onset of pretend combinations, gesture and grunt variables suggest these all contribute to the referential transition (in red). Danny and Nenni, lacking VMS show the transition in comprehension only. Heuristic gestures depend upon language comprehension.



Age in Months

Summary: Component skills for language

- 1. Relatedness with others**
- 2. Experiencing and expressing meaning without language (grunts and gestures)**
- 3. Phonetic ability: control of vocalization (VMS)**
- 4. Experiencing word meaning: names for things, and people, and for reversible actions: (dynamic event words)**
- 5. Representing meaning: (levels of pretend play)**

Special properties of labials: They are overdetermined for production ease.

Historic/evolutionary: the primate lipsmack

Visual: accessible to visuo-motor processing

Motoric simplicity: pure frame production

Neurological:

All actions produced are subject to efference/afference monitoring from peripheral organs (Evarts, 1982). This is normally accomplished by golgi tendon organs and muscle spindles, absent in the lips. Hence bilabial production offers broad and continuous direct feedback through cutaneous contact between the lips (Barlowe & Farley, 1989).

Production ease facilitates communication and “dynamic schematizing” in the development of sound/meaning correspondence.

Primate Repertoire:

Grunts: Vocalization using the larynx

Labials: Vocalization with air stop at the lips

Additional Human Repertoire:

Vocal Motor Schemes: Learned production patterns for vocalization units

Templates: Production patterns with wide application