
**THE ACQUISITION OF ENGLISH PARTICLE PLACEMENT:
A CASE STUDY IN DEVELOPING PRODUCTIVITY**

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INTRODUCTORY REMARKS

- Focus on **early syntactic productivity**.
- Enquiry into the **level of abstraction within syntactic structures** in child language.
 - **Principles and Parameters** (Chomsky & Lasnik 1983, Hyams 1986).
 - **Item-based / emergentist** (Tomasello 2003, Behrens 2009).
- Internal development of structure and acquisition of adult distributions.
- A corpus-based approach:
 - **Case study of the development of verb-particle constructions** across the data for Adam, from the Brown corpus (1973).
 - **Statistical methods** allow us to look at child data in its development, rather than focusing on simple 'first attestations' .

THE VERB-PARTICLE CONSTRUCTION (VPC)

- English has a category of particles forming 'more or less cohesive units with the verb' (Brinton 1985: 157)
- Particles are **homomorphous with prepositions**, but are distinguished by their syntax, semantics and phonology.

1. **Pablo took his tray up the ladder.** (prepositional *up*)
2. **Pablo took cricket up this summer.** (particle *up* – idiomatic VPC)
3. **Pablo took all his money out from the bank.** (particle *out* – spatial VPC)

- Prepositions head a PP, while **particles belong to the VP**, regardless of their semantic opacity/transparency.
- Phonologically, **a particle bears stress**, while a preposition rarely does (Dehé 2002).

PARTICLE POSITION ALTERNATION (PPA)

- VPCs display position alternation of particle and direct object.

4. a) They **followed** dinner **up** with lively conversation. (**discontinuous**)
 b) They **followed up** dinner with lively conversation. (**continuous**)

- Prepositional constructions, and pronominal-object VPCs don't display PPA.

5. a) They **followed** the chief **up** the embankment. (**prepositional**)
 b) *They **followed up** the chief the embankment.
6. a) They **followed it up**. (**pronominal object**)
 b) ?They **followed up** it.

- **PPA describes a stable syntactic category** and constitutes the most important test for VPC membership (Jackendoff 2002).
- **But, is the alternation predictable?**

FACTORS CONSTRAINING ADULT PRODUCTIVE PARTICLE PLACEMENT

- Gries (2001, 2003) uses statistical analyses to argue for factors constraining particle placement.

Length and complexity of the object NP

Kim woke up the neighbour's three-month-old baby.

Semantic transparency of VPC

The firemen figure out the problem.

Type of object NP (pronominal/nominal; definite/indefinite)

Emilia picked this dress out.

Semantic entrenchment of the VPC (frequency of use).

Our team eked out a plan.

- How do children acquire the principles upon which the alternation occurs?

PREVIOUS STUDIES:

DIESEL & TOMASELLO 2005 (D&T)

- In the parametric approach (cf. Bennis et al. 1995, Snyder 2007): **discontinuous forms are attested first, so they must be the default.**
- Diessel and Tomasello (D&T) study of two children (1;6 – 2;3):
 - Eve (Brown 1973)
 - Peter (Bloom et al. 1974-5).
- They find that the **first attestations of continuous VPCs (1:10) are not significantly later than that of the discontinuous order (1:9).**
 - **Argues against the setting of a binary parameter.**
- Furthermore, across the entirety of the child data two factors play a significant role in PPA:

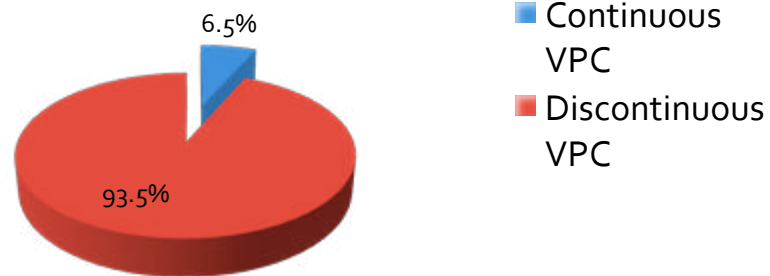
Significant Variables (Multifactorial Analysis):

- Object type (pronominal/nominal): **pick it up vs. pick up the chair**
- VPC Meaning (non-spatial/spatial): **figure out something, eat up the apple vs. take the toy out.**

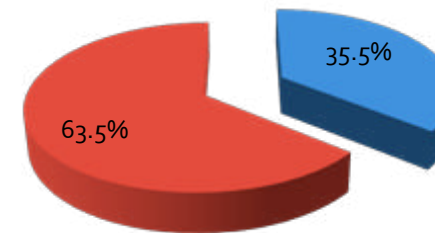
PREVIOUS STUDIES: DIESSEL & TOMASELLO 2005 (CTD.)

- **Frequencies for VPC ordering across the corpus** were established:

Early Child VPCs by Order (D&T)



Adult VPCs by Order (Gries, 2003)



- If the discontinuous VPC is not the default, and the productive system is not yet fully developed:
Why the asymmetry between continuous and discontinuous forms?

Ambiance Language

Mothers' PPA similar to children:

Continuous (7.3%); Discontinuous (92.7%)

Same factors are significant in mother.

Early Development of Productivity

Most VPCs restricted to one order.

'Productive patterns and fixed formulas coexist in the child's mental grammar' (108).

MOTIVATION FOR THIS STUDY

- Previous studies analyse developmental data in the same way as adult data. There is **no view to corpus-internal development**.
- There has **only been a focus on the earliest stage** of VPCs, without explaining the transition to adult distributions.
- The **development of specific VPCs** has not been examined with regard to the overall distribution of particles.

THE PRESENT STUDY

- Expanding on D&T work, this case study asks:

1. Is there growth in the proportion of continuous VPCs during the period of language development of our corpus (2;3 – 4;10)?

2. Do the variables identified by D&T (**object type** and **VPC semantics**) condition the growth of the continuous VPC?

3. Is the distribution of particle position random or item-dependent across VPC types?

THE CORPUS: DATA GATHERING

- All **55 transcripts for Adam** (Brown 1973)
 - naturalistic speech
 - collected every fortnight
 - ages 2;3 – 4;10.
- The **ten most commonly occurring particles** were compiled.
up, out, on, off, down, in, back, over, away & around
- The corpus contains **1,301 VPC tokens across 213 types**.
- As in D&T's data, we find early attestations of **both orders**:

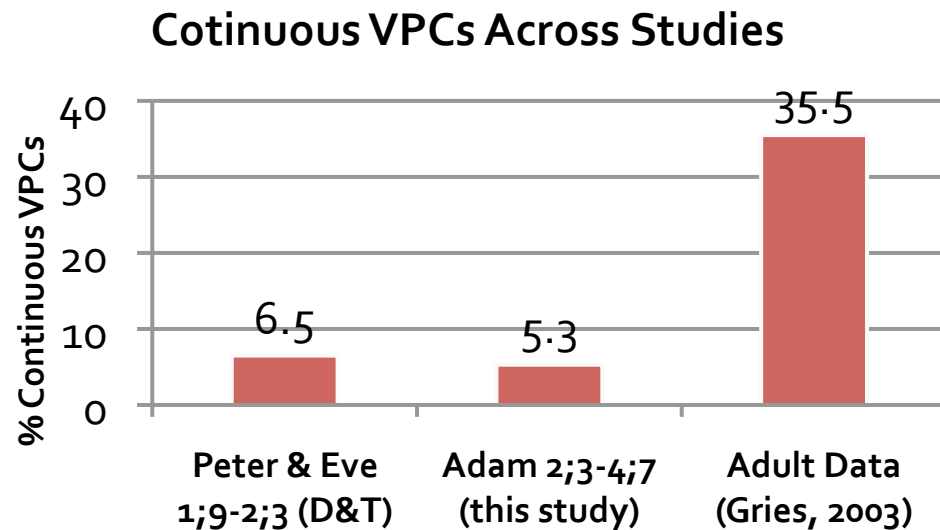
First Discontinuous VPCs:

pull panda up; pick Adam up; pick dirt up;
put shoe on; (file 1, age: 2;3.4)

First Continuous VPC:

move over tape recorder (file 2, age: 2;3.18)

THE CORPUS IN CONTEXT



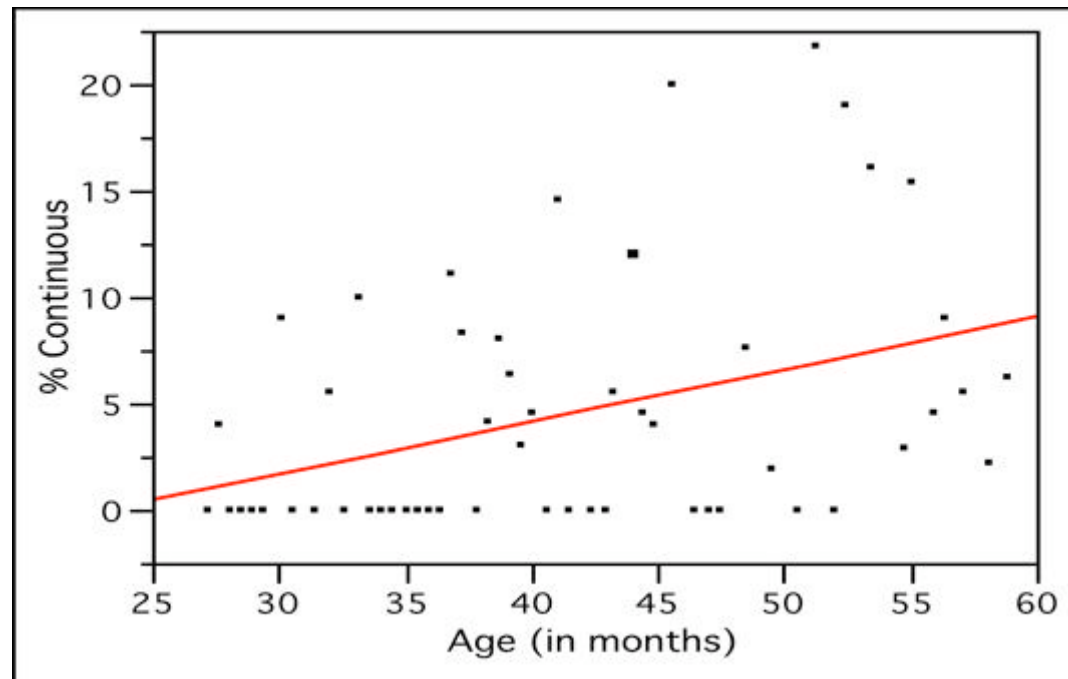
- Compared to the ages studied by D&T (1;9-2;3), Adam's data (2;3-4;7) there is a drop, not growth in the percentage of continuous VPCs.

- How is the adult target reached then?
 - Individual, developmental child data cannot be treated in the same manner as adult multi-subject corpus data.
 - **Raw numbers**, treating the entire corpus as a single, monolithic whole, **may not tell the full story**.
 - **Corpus-internal development** must be examined more closely.

RESULTS OF ANALYSIS: RQ 1

IS THERE GROWTH IN THE PROPORTION OF CONTINUOUS VPCs DURING THE PERIOD OF LANGUAGE DEVELOPMENT OF OUR CORPUS?

Bivariate Analysis for % Continuous VPCs by Adam's Age



- The relation is highly **significant** ($p = .004$)
- **Prediction:** adult VPC order (35% cont.) will not be reached until after age 12.

INTERPRETATION OF RESULTS: RQ 1

CONSEQUENCES OF THE GRADUAL CORPUS-INTERNAL PARTICLE POSITION SHIFT

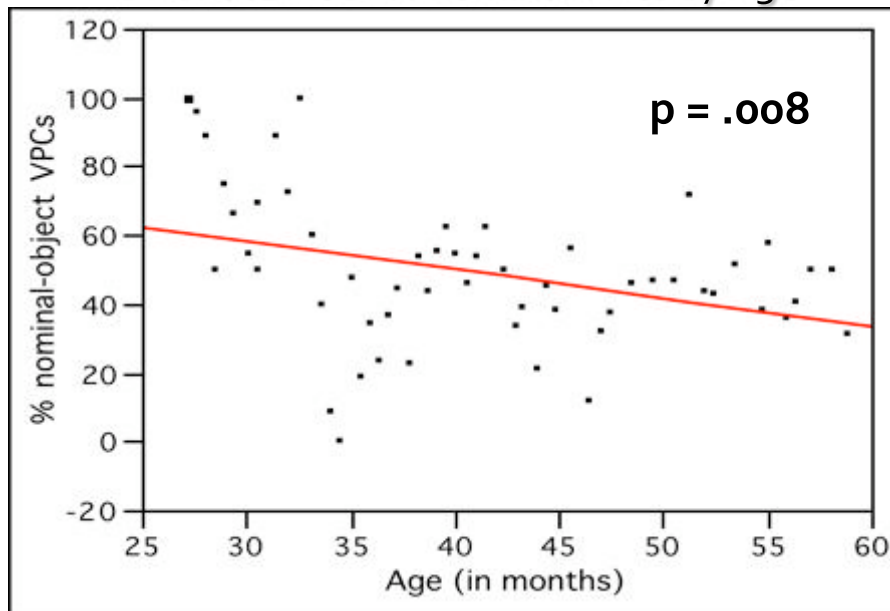
- **Baseline fact:** throughout our corpus there is **growth of the percentage of continuous VPCs** towards the adult target.
- The acquisition of adult-like particle order is a **gradual process**.
- **Not compatible with a binary parameter setting.**
- The slow learning curve of the alternation may be better described on the basis of **processes within the VPC**.

RESULTS OF ANALYSIS: RQ 2

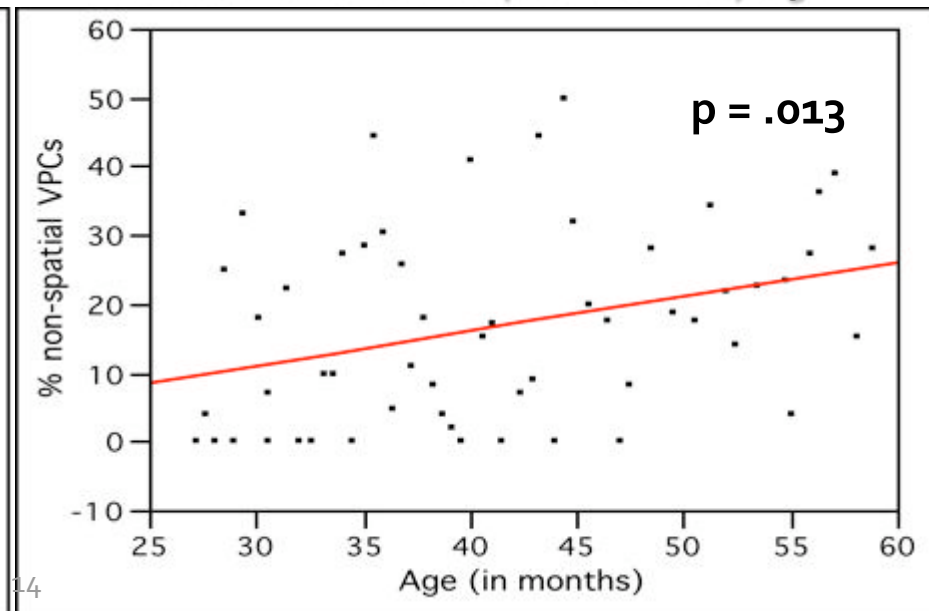
DO THE VARIABLES IDENTIFIED BY D&T (OBJECT TYPE AND VPC SEMANTICS) CONDITION THE GROWTH OF THE CONTINUOUS VPC?

- Across the entire corpus, we find the same clear tendency as D&T:
 - **NP Type** : pronominal object NPs take the discontinuous order
I pick it up ($\chi^2 = 14.829$; $p = .0001$)
 - **Semantics**: non-spatial VPCs surface in the continuous order
I figure out something ($\chi^2 = 52.224$; $p = .0001$)
 - Corpus internally:

Bivariate Fit of % nominal VPCs by Age



Bivariate Fit of % non-spatial VPCs by Age



INTERPRETATION OF RESULTS: RQ 2

CORRELATION BETWEEN VPC ORDER AND MORPHOSYNTACTIC/SEMANTIC VARIABLES

- Gives evidence for **incipient productivity of child VPCs**.
- The drop in percentage of nominal VPCs in line with general **growth of pronouns during this period** (Hendriks and Spender 2006).
- The increased use of pronominal forms correlates to **greater abstraction** through the **understanding of person, case, gender, etc.**

Pull panda up Mommy (2;3) Chained him up; Stand it up here (4; 10)

- Use **non-spatial VPCs** on the other hand, implies **cognitively more abstract reference** than in the case of concrete, spatial meanings.

Pick Adam up (2;3) I'm the one that's making up a story (4; 9)

INTERPRETATION OF RESULTS: RQ 2 (CONT.)

CORRELATION BETWEEN VPC ORDER AND MORPHOSYNTACTIC/SEMANTIC VARIABLES

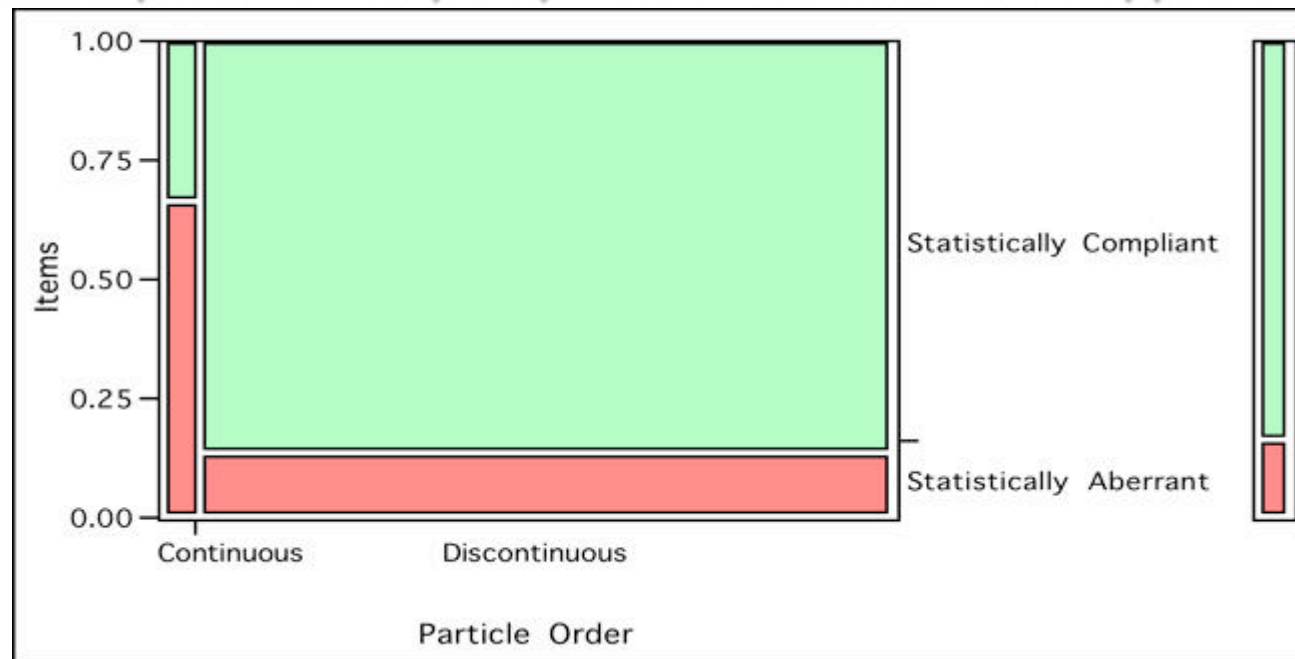
- Productive PPA comes as the result of at least **two variables correlated to greater cognitive abstraction**.
- A case of **grammatical developments mirroring the growth of cognitive structure** (as in Bowerman, 2007 and Behrens, 2001).
- In line with a “**Cognitive Commitment**” (Lackoff 1991, 54-55).
- **One factor which conditions the growth of the continuous VPC has been identified.**

RESULTS OF ANALYSIS: RQ 3

IS THE DISTRIBUTION OF PARTICLE POSITION RANDOM OR ITEM-DEPENDENT ACROSS VPC TYPES?

- 19 types (out of the total 213) were found to be statistically aberrant ($p < .05$) in terms of frequency of particle placement.

Mosaic Graph of statistically compliant and aberrant VPC Items by particle order



- 16% of tokens are statistically aberrant.
- Statistically aberrant forms make up 66% of the total continuous VPCs.

INTERPRETATION OF RESULTS RQ 3

CONSEQUENCES OF VPC TYPE'S ROLE IN PARTICLE PLACEMENT

- VPC order is not distributed randomly across the entire corpus:
 - **19 (9%) of the VPC types have a statistically unexpected distribution.**
- Does this imply that VPC ordering is item-based?
- Not necessarily:
 - VPC order, we've seen, **acts in a principled manner (RQ 1 & 2).**
 - Our data shows that **the productive VPC system is in development throughout the period.**
 - **91% of the corpus does behave as would be statistically predictable.**
- So, how can we account for the aberrant items' distribution?
 - Ambience language?
 - A brief **comparison of Adam and his mother** was conducted.

INTERPRETATION OF RESULTS RQ 3 (CONT.)

CONSEQUENCES OF VPC TYPE'S ROLE IN PARTICLE PLACEMENT

Sample Irregularly Distributed Items				
VPC item	Adam		Mother	
	Cont	Disc	Cont	Disc
Run over	11 (0.58)	0 (10.48)	4	1
Find out	3 (0.16)	0 (2.84)	2	0
Chop down	3 (0.16)	0 (2.84)	0	0
Cut out	7 (0.94)	11 (17.05)	1	0
Put in	0 (5.02)	96 (90.97)	2	102

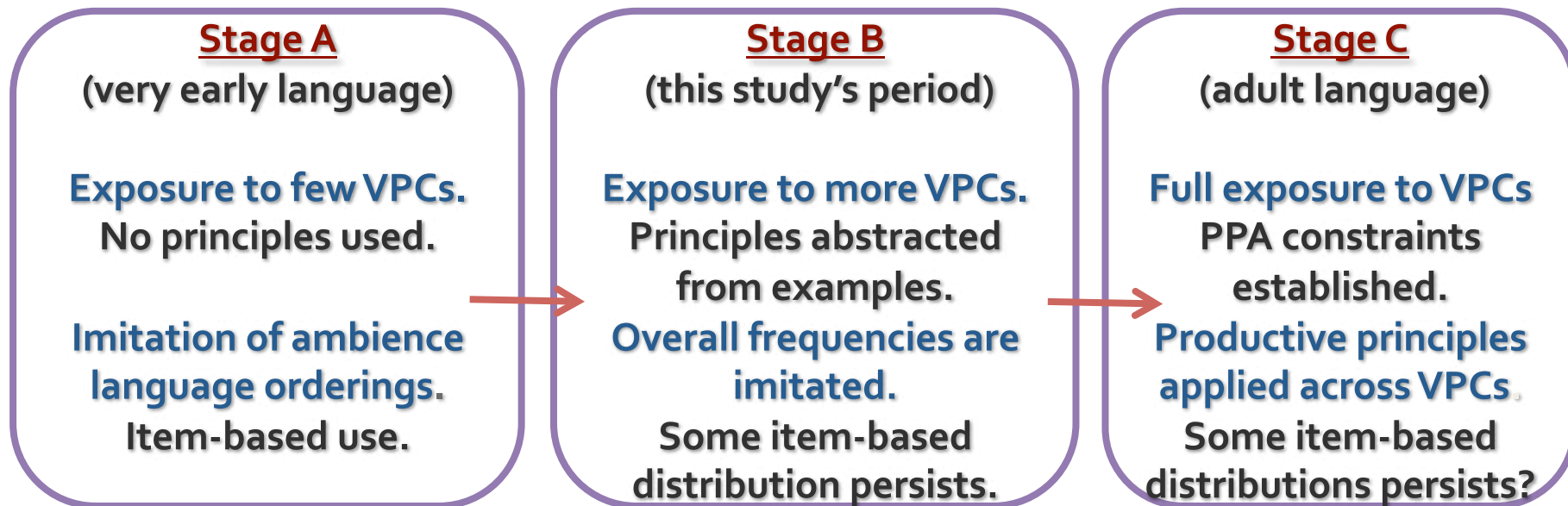
Sample Regularly Distributed Items				
VPC item	Adam		Mother	
	Cont	Disc	Cont	Disc
Turn on	1 (0.99)	18 (18.01)	0	8
Take off	3 (5.65)	105 (102.3)	0	47
Take out	2 (3.77)	70 (68.23)	0	49
Turn off	1 (0.63)	11 (11.37)	0	4
Bring down	0 (0.05)	1 (0.95)	0	1

- Higher frequencies of continuous and discontinuous VPCs in Adam's data correlate to higher frequencies in the mother's data as well.
- Cases that show a regular distribution in Adam are primarily discontinuous in the mother's VPCs.

INTERPRETATION OF RESULTS RQ 3 (CONT.)

CONSEQUENCES OF VPC TYPE'S ROLE IN PARTICLE PLACEMENT

- So, how can we account for the aberrant items' distribution?
 - Ambience language? ✓
 - **Incipient productivity**



- **Exposure** allows children to become **attuned to alternation contexts**.
- Position of the particle becomes **increasingly principle-based**, prompting growth towards the adult target.

CONCLUSIONS

- This study has established:
 - The **gradual development of particle positioning** in a single child between the ages of 2;3 and 4;10.
 - At least two variables govern the changing distribution of particles (**NP type** and **VPC meaning**).
 - Both variables reflect higher degrees of **abstract cognition**.
 - **Non-spatial meaning** is a factor in the overall **growth of the continuous VPC**.
 - **VPC-types with predictable and unpredictable order distribution coexist** in the corpus.
 - New **evidence for a usage-based approach** to language acquisition (Tomasello 2003, Behrens 2009).
 - Child VPCs reflect the interaction between **observation of adult frequency**, and the gradual **systematization and abstraction of pragmatic, cognitive and formal principles**.