

NOUNS AND VERBS IN EARLY CHILD LANGUAGE

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	1di	1pi	1de	1pe	2s	2d	2p	3s	3us	intransitive
					tupnaʔã tupnaʔãniŋ tupnehé matuproknehé	tupnaʔãce tupnaʔãceninŋ tupnace matuproknaace	tupnaʔãni tupnaʔãninŋ tupnanihé matuproknaanihé	tubukunŋ tubukuninŋ tubihé matupyoktuhé	tubukucunŋ tubukucuninŋ tubucihé matupyoktucihé	tupnaʔã tupnaʔãniŋ tubehé matupyoktehé
								tupcoke tupcokeoninŋ tubace matupyoktace	tubuncum tubuncummaninŋ tubuncumhé matupyoktumcumhé	tupceke tupcekeninŋ tubace matupyoktace
					tupnaʔãnciyã tupnaʔãnciyãniŋ tupnanciyehé matupyoknanciyehé			tupcokeŋa tupcokeŋaninŋ tubacehé matupyoktacehé	tubuncumma tubuncummaninŋ tubuncumnehé matupyoktumcumnehé	tupcekeŋa tupcekeŋaninŋ tubacehé matupyoktacehé
iaʔã iaʔãniŋ hé ipyoktehé								atuboko atubokoninŋ atube amatupyokte	atubukuce atubukuceninŋ atubuce amatupyoktuce	atupno atupnikinŋ atube amatupyokte
iaʔancinŋ iaʔancinŋinŋ geihé ipyoktaŋcihé			amatupeke amatupekeninŋ amatubace amamatupyoktace	amatupno amatupnikinŋ amatube amamatupyokte				atupcoke atupcokeoninŋ atubace amatupyoktace	atubuncum atubuncummaninŋ atubuncumhé amatupyoktumcumhé	atupeke atupekeninŋ atubace amatupyoktace
iaʔaniŋ iaʔaniŋinŋ ŋuihé ipyoktaŋnihé								atubukum atubukummaninŋ atubumhé amatupyoktumhé		atubiki atubikinŋ atubihé amatupyoktihé
iaʔã iaʔãniŋ hé ipyoktehé								tubuko tubokoninŋ tube matupyokte	tubukuce tubukuceninŋ tubuce matupyoktuce	tupno tupnikinŋ tube matupyokte
iaʔancinŋ iaʔancinŋinŋ geihé ipyoktaŋcihé	matupeke matupekeninŋ matubace mamatupyoktace	matupno matupnikinŋ matube mamatupyokte	matupeke matupekeninŋ matubace mamatupyoktace	matupno matupnikinŋ matube mamatupyokte	natupno natupnikinŋ natube namatupyokte	natupeke natupekeninŋ natubace namatupyoktace	natubiki natubikinŋ natubihé namatupyoktihé	utupeko utupekoninŋ utubace umatupyoktace	utubukuce utubukuceninŋ utubuce umatupyoktuce	utupeke utupekeninŋ utubace umatupyoktace
iaʔaniŋ iaʔaniŋinŋ ŋuihé ipyoktaŋnihé								utuboko utubokoninŋ utube umatupyokte		utupno utupnikinŋ utube umatupyokte

Early vocabulary composition: Why is it important?

- Questions:
- What are the first words they learn? Can the meaning and the form of these words tell us something about acquisition strategies?
- Is there a common development in how children learn words or what kind of variation do we find (qualitative and/or quantitative)?
- Are there differences across languages? If yes, what are the relevant factors for these differences?

Why is it interesting to study early vocabulary?

- Some skills to learn new words:
 - Individuation
 - Symbol recognition
 - Object and event representation
 - Object permanence
 - Generalization to other instances
 - Categorization and many more

Examples of first words (across a variety of languages)

- **People:** *mama, dada, papa,*
- **Animals:** *dog, cat, bird, cow*
- **Food:** *water, juice, milk, bread, cookie*
- **Body parts** *head, arm, eye*
- **Clothing:** *shoe, sock, pants*
- **Vehicles:** *car, boat, train*
- **Household items:** *cup, spoon, bottle*
- **Toys:** *ball, doll, teddy*
- **Space & Motion:** *up, down*
- **Routines:** *thank you, hello, bye-bye*

First words in Greenlandic

- Polysynthetic language
- Fortesque (1985) showed in a case study on Greenlandic that the child he looked at (age 2;23) used 40 inflectional endings and 24 derivational suffixes. First words are internally complex single word utterances

TABLE 3.4
L's Productive Affixes and Endings

<i>Verbal Endings</i>	
<i>vungel/punga</i>	1SG:INDIC
<i>poq</i>	3SG:INDIC
<i>giti/rit</i>	2SG:IMP
<i>ta</i>	1PL:IMP
<i>(g)luk</i>	2SG:3SG:IMP
<i>pa</i>	3SG:INT
<i>rami</i>	4SG:CAUS
<i>llutit</i>	2SG:CONTEMP
<i>nagu</i>	3SG(OBJ):NEG.CONTEMP
<i>(t)soq</i>	3SG:INTR.PART
<i>Nominal Endings</i>	
<i>ra</i>	1SG:POSS (SG)
<i>kka</i>	1SG:POSS (PL)
<i>mik</i>	INSTR.SG
<i>Affixes</i>	
<i>ssa</i>	FUT
<i>ter</i>	'be about to'
<i>nikuu</i>	'have done' (experiential PERF)
<i>niar</i>	'do X' (IMP MOD)
<i>nngit</i>	NEG
<i>nngor</i>	'become'
<i>araqjaraq</i>	'little'
<i>ssaq</i>	FUT (thing)
<i>Enclitics</i>	
<i>una</i>	'it'
<i>toq</i>	'I wonder/I wish'

First words in Turkish (Aksu-Koc & Slobin 1985)

- SOV with lots of variation for pragmatic purposes
- morphology is agglutinating (extremely regular)
- production of affixes at very early ages.

getir -me -di -n
bring NEG PST 2SG
'You didn't bring' (2;1)

How to measure early vocabulary?

- Diaries
- Standardized questionnaire: Bates- Mac Arthur Communicative Development Inventories (CDI)
 - age range of children tested (8-30 months)
 - 2 versions of the questionnaire:
 - for infants (8 - 16 months) 659 babies tested
 - for toddlers (16 - 30 months) , 1130 toddlers

Variation in early vocabulary: 8-16 months

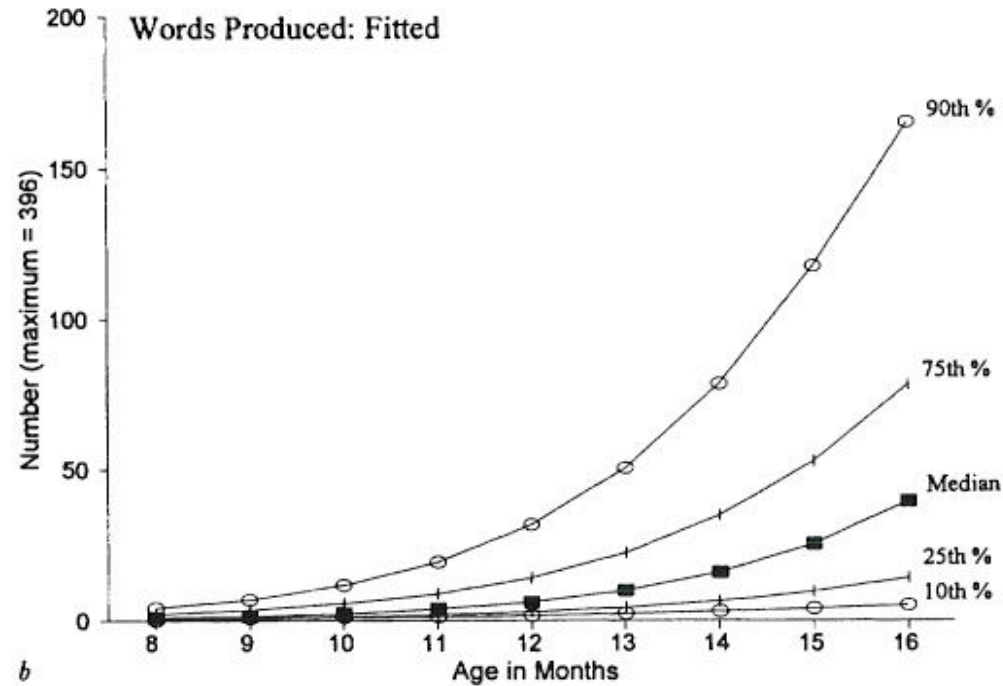


FIG. 3.—Number of words on the Infant form reported to be produced by children at each month—median values and spread of score distributions. *a*, Observed values. *b*, Fitted values. A portion of this figure is adapted from Fenson et al. (1993, p. 104), with permission of the Singular Publishing Group, Inc.

Variation in early vocabulary: 16-30 months

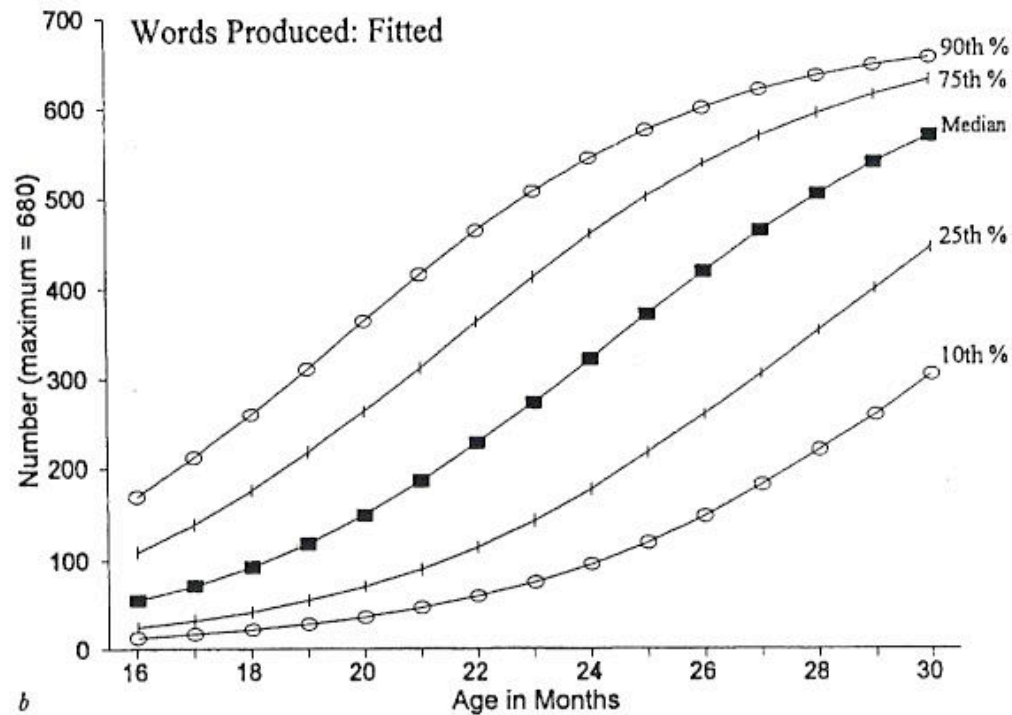


FIG. 5.—Number of words on the Toddler form reported to be produced by children at each month—median values and spread of score distributions. *a*, Observed values. *b*, Fitted values. A portion of this figure is adapted from Fenson et al. (1993, p. 108), with permission of the Singular Publishing Group, Inc.

Variation in early vocabulary: 16-30 months

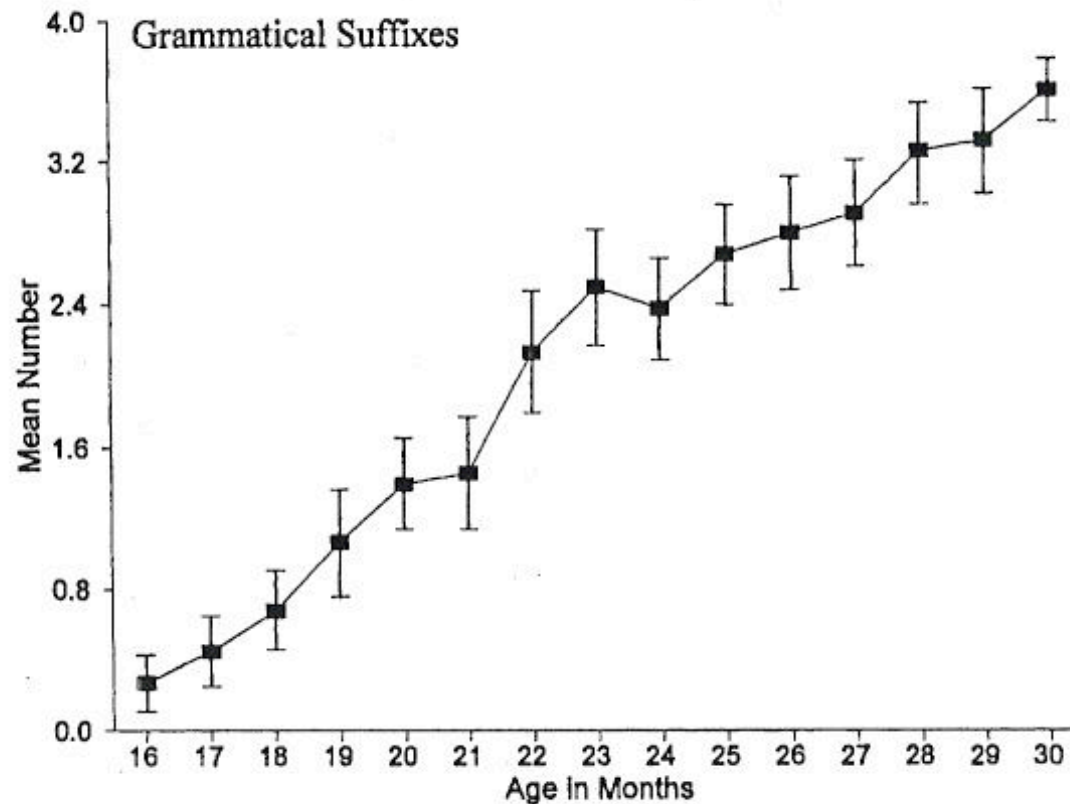


FIG. 6.—Number of grammatical suffixes on the Toddler form reported to be produced by children at each month—mean values and standard errors of score distributions. This figure is adapted from Fenson et al. (1993, p. 56), with permission of the Singular Publishing Group, Inc.

Variation in early vocabulary development

- Goldfield & Reznick (1990), 18 English learning children, diary records and vocabulary checklist (parts of the MCDI).
- Results: no unique strategy but two patterns
 - 13 children showed a vocabulary spurt (lasting up to 3 months), 3/4 nouns before they had acquired 50 words (8 first-born, 5 later-born)
 - 5 children showed period of more gradual word learning, more varied lexicon (all of the children were later-born), steadier pace

Variation in early vocabulary development

- After a slow beginning of adding approx. 1 word a day (age 1-2), faster pace later on
- Vocabulary spurt (between 1;5 and 1;7 around 50 word level of prod., Bloom 1973; Nelson, 1973)
 - criterion for vocabulary spurt unclear
 - Lifter & Bloom (1987): 1st three week interval in which 12 or more new words are added.
 - Goldfield & Reznick (1996): 3-5 continuous 2.5 week intervals in which 10 or more words were added per interval.

English

- Noun preference in early vocabulary, shown in a variety of studies using different methods.

TABLE 1. *Nouns and verbs in production*

	Type of data	n	% nouns	% verbs and action words
Fenson, Dale, Reznick, Bates, Thal, & Pethick (1994)	MacArthur CDI checklist of first 50 words produced by 50% of normative sample; cross-sectional	1789	54.0	0.0
Fenson <i>et al.</i> (1994)	MacArthur CDI checklist of first 188 words produced by 50% of normative sample; cross-sectional	1789	63.2	8.5
Goldin-Meadow, Seligman & Gelman (1976)	Elicited production of 70 nouns & 30 verbs; cross-sectional	12	88.3 ^a	11.7 ^b
Nelson (1973)	Diary record of first 50 words; longitudinal	18	50.0 ^c	13.0
Goldfield (1986)	Diary & observation of first 50 words; longitudinal	12	48.0	16.0
Benedict (1979)	Diary & observation of first 50 words; longitudinal	8	50.0 ^c	19.0

^a Calculated as number of nouns produced/number of nouns and verbs produced.

^b Calculated as number of verbs produced/number of nouns and verbs produced.

^c Based on general nominals category, excluding pronouns.

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GOLDFIELD

Nouns and verbs: a cross-linguistic study

- Background: Reports from English diaries: nouns dominate (Greenfield & Smith 1976; Huttenlocher 1974; Nelson 1973).
- Gentner (1982): Cross-linguistic study on vocabulary acquisition:
 - German
 - Kaluli
 - Japanese
 - Mandarin
 - Turkish
 - English

Question of Gentner's study (1982)

- Do children acquiring different languages use all the same strategy or are there language or cultural specific strategies that guide them?
- What do they learn first, nouns or predicates?

Nouns and verbs: a cross-linguistic study

TABLE 11.4
Proportions of Form Classes in Early Vocabularies

Language	Child	Age	Sex	Total Number of Words	Proportion of Form Classes			
					Nominals	Predicates	Expressives	Indeterminate/Other
Mandarin Chinese	Ming Ming	1; 5	M	20	.65	.30	0	.05
	Xiao Jing	1; 6	F	37	.59	.24	.02	.14
Japanese	Masatsugu	2; 5	M	15	.73	.13	.07	.07
	Mikiko	2; 0	F	16	.81	.13	0	.06
	Shunsuke	1; 2	M	19	.68	.26	.05	0
	Sayaka	1; 11	F	110	.69	.25	.07	.05
Kaluli	Suella	1; 8	F	16	.50	.31	.06	.13
	Wanu	1; 11	M	54	.61	.20	.11	.07
German	Johannes	1; 6	M	4	.50	0	.50	0
	Martin	1; 8	M	33	.67	.27	.03	.03
English	Tad	1; 4	M	13	.85	.08	0	.08
	Mollie	1; 2	F	39	.69	.13	.13	.05
	Scooter	1; 10	M	79	.75	.11	.08	.06
	Dewey A.	1; 7	M	115	.60	.35	.05	0
Turkish	Turkish 1	1; 2	F	27	.71	.18	.04	.07
	Turkish 2	1; 4	F	42	.57	.24	.07	.12

Nouns used in the 6 languages of Gentner's sample

TABLE 11.5
First Words Spoken by Children, Including Numbers (Proportions) of
Nominals, Predicates, Expressives, and Indeterminate Terms

Language	German	English	Turkish	Japanese	Kaluli	Mandarin
Child	Martin	Mollie	Turkish 2	Masatsugo	Suelia	Xiao-Jing
Sex	Male	Female	Female	Male	Female	Female
Age and Vocabulary Size	1; 8 (33)	1; 2 (39)	1; 4 (42)	2; 5 (15)	1; 8 (16)	1; 6 (37)
NOMINALS						
<i>Proper Nouns</i>	22 (.67)	27 (.69)	24 (.57)	11 (.73)	8 (.50)	22 (.59)
<i>Individuals</i>	Mommy Papa Gaga Geli	Mommy Daddy Babar Aba	Mama Daddy Aba Dayim Nejati Auntie Name of someone	Mommy Daddy Grandmother Grandfather	Mother Daibo Abi Waye Mage yo Magey Baubi	Mommy Papa Grandmother (paternal) Aunt Grandfather Cousin Grainie Uncle Gu (aunt)
<i>Common Nouns</i>						
<i>Animate beings</i>	baby dog bird cat	baby dog dolly kitty gid bear	baby	mouse dog cat	pig	horse chicken
<i>Food</i>	milk juice cheese breakfast	milk apple juice cheese raisin bottle cracker egg	food pacifier apple banana chocolate bread cake (1) cake (2) ball shoe sock	water lunch/dinner		uncooked rice cooked rice noodles orange
<i>Toys</i>	ball	book				
<i>Clothes</i>		shoe sock				
<i>Body Parts</i>	nose	eye				
<i>Vehicles</i>		car choo choo bus truck		car		
<i>Other</i>	moon stars tree sea light nail leaf newspaper	moon star	pencil towel mirror radio	spoon		flower red envelope hand clock wall clock lamp electric cord TV

Predicates used in the 6 languages of Gentner's sample

TABLE 11.5 Continued

Language	German	English	Turkish	Japanese	Kaluli	Mandarin
Child	Martin	Mollie	Turkish 2	Masatsugo	Suello	Xiao-Jing
Sex	Male	Female	Female	Male	Female	Female
Age and Vocabulary Size	1; 8 (33)	1; 2 (39)	1; 4 (42)	2; 5 (15)	1; 8 (16)	1; 6 (37)
PREDICATES	9 (.27)	5 (.13)	10 (.24)	2 (.13)	5 (.31)	9 (.24)
<i>Verb Word</i>						
Action	cry	run	cry stir-stir beat (with fork)			
Change of State	come	all gone more down	come put on all done	go	all gone more give	go come go (to work)
Action plus Change of State	eat	eat	eat		eat	pick up, walk
	sleep get up spill clean want		went pooh wash want	want	want	not want afraid correct be at work not yet 1 (.02) thank you
Experience						
Stative	hot					
EXPRESSIVES	1 (.03) no	5 (.13) no hi thanks bye-bye please	3 (.07) hello good-good bleble (pulling cars)	1 (.07) no	1 (.06) no	
OTHERS, MULTIPLE OR INDETERMINATE	1 (.03) doo doo	2 (.05) doo doo pee pee	5 (.12) outside where pencil cover bugum-buve (when thirsty) not	1 (.07) writing	2 (.13) there, that (emphatic) this	5 (.14) pee 1, 2, 3, 4

Results Gentner (1982)

- All languages of this sample show a preference for nouns.
- Wide variety of languages, with strong cultural differences.
- Potential factors for differences played no role:
 - Frequency
 - Saliency / word order
 - Morphological transparency
 - Patterns of language teaching

Gentner's explanation for a 'Universal' noun preference

- Nouns, as object-reference terms, can easily be mapped to the perceptual world: *Natural Partition Hypothesis*
- “Object concepts are given to us by the world.” (Gentner, 1982: 328)
- Predicate concepts are more complex and language specific, i.e. part of a system that needs to be discovered.

Word learning strategies

- Lexical principles or constraints
 - ‘Whole object bias’ (Markman 1990, 1991, 1992, 1994)
 - facilitate acquisition to narrow down word meaning
 - universal

Results of subsequent studies on the distribution of nouns and verbs

	Questionnaire (mostly MCDI)	Naturalistic Data
English	N>V	N>V
Italian	N>V	N=V
Korean	N>V	N=V
Mandarin	N>V	V>N
Ngas	V>N	not tested
Tzeltal	not tested	N=V

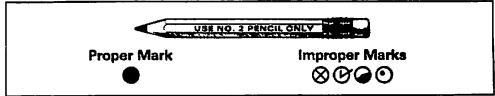
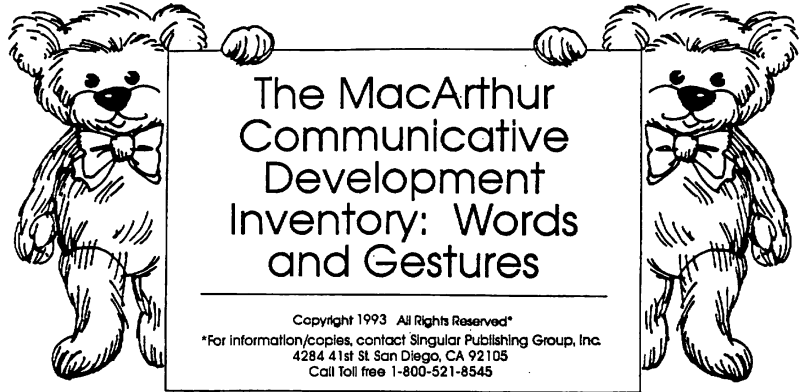
Methods used to study noun/verb distributions

- Diaries
- Questionnaires
- Spontaneous speech recordings
 - Cross-sectional
 - Longitudinal

Method: Questionnaire

- Comparing results obtained by the MCDI and results from observational data (Pine, Lieven & Rowland, 1996):
 - Nouns tend to be over-represented in questionnaires.
- Tardif, Gelman & Xu (1999) comparing results from the MCDI and transcripts:
 - Caretakers systematically under-reported verbs and over-reported nouns.

Child's Name _____ Sex _____
 Birthdate _____ Today's Date _____



PART I EARLY WORDS

A. FIRST SIGNS OF UNDERSTANDING

Before children begin to speak, they show signs of understanding language by responding to familiar words and phrases. Below are some common examples. Does your child do any of these?

	Yes	No
1. Respond when name is called. (e.g., by turning and looking at source)	<input type="radio"/>	<input type="radio"/>
2. Respond to "no no" (by stopping what he/she is doing, at least for a moment).	<input type="radio"/>	<input type="radio"/>
3. React to "there's mommy/daddy" by looking around for them.	<input type="radio"/>	<input type="radio"/>

B. PHRASES (28)

In the list below, please mark the phrases that your child seems to understand.

understands	understands	understands
Are you hungry? <input type="radio"/>	Don't touch. <input type="radio"/>	Open your mouth. <input type="radio"/>
Are you tired/sleepy? <input type="radio"/>	Get up. <input type="radio"/>	Sit down. <input type="radio"/>
Be careful. <input type="radio"/>	Give it to mommy. <input type="radio"/>	Spit it out. <input type="radio"/>
Be quiet. <input type="radio"/>	Give me a hug. <input type="radio"/>	Stop it. <input type="radio"/>
Clap your hands. <input type="radio"/>	Give me a kiss. <input type="radio"/>	Time to go night night. <input type="radio"/>
Change diaper. <input type="radio"/>	Go get _____. <input type="radio"/>	Throw the ball. <input type="radio"/>
Come here/come on. <input type="radio"/>	Good girl/boy. <input type="radio"/>	This little piggy. <input type="radio"/>
Daddy's/mommy's home. <input type="radio"/>	Hold still. <input type="radio"/>	Want to go for a ride? <input type="radio"/>
Do you want more? <input type="radio"/>	Let's go bye bye. <input type="radio"/>	
Don't do that. <input type="radio"/>	Look/look here. <input type="radio"/>	

C. STARTING TO TALK

1. Some children like to "parrot" or imitate things that they've just heard (including new words that they are just learning, and/or parts of sentences, for example, repeating "work now" after mother says "Mommy's going to work now.") How often does your child imitate words? Never Sometimes Often
2. Some children like to go around naming or labeling things, as though proud of knowing the names and wanting to show this. How often does your child do this?

D. VOCABULARY CHECKLIST

The following is a list of typical words in young children's vocabularies. For words your child understands but does not yet say, place a mark in the first column (understands). For words that your child not only understands but also uses, place a mark in the second column (understands and says). If your child uses a different pronunciation of a word (for example, "raffe" for "giraffe" or "sketti" for "spaghetti") mark the word anyway. Remember, this is a "catalogue" of words that are used by many different children. Don't worry if your child knows only a few right now.

1. SOUND EFFECTS AND ANIMAL SOUNDS (12)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
baa baa	<input type="radio"/>	<input type="radio"/>	meow	<input type="radio"/>	<input type="radio"/>	uh oh	<input type="radio"/>	<input type="radio"/>
choo choo	<input type="radio"/>	<input type="radio"/>	moo	<input type="radio"/>	<input type="radio"/>	vroom	<input type="radio"/>	<input type="radio"/>
cockadoodledoo	<input type="radio"/>	<input type="radio"/>	ouch	<input type="radio"/>	<input type="radio"/>	woof woof	<input type="radio"/>	<input type="radio"/>
grr	<input type="radio"/>	<input type="radio"/>	quack quack	<input type="radio"/>	<input type="radio"/>	yum yum	<input type="radio"/>	<input type="radio"/>

2. ANIMALS NAMES (Real or Toy) (36)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
animal	<input type="radio"/>	<input type="radio"/>	duck	<input type="radio"/>	<input type="radio"/>	penguin	<input type="radio"/>	<input type="radio"/>
bear	<input type="radio"/>	<input type="radio"/>	elephant	<input type="radio"/>	<input type="radio"/>	pig	<input type="radio"/>	<input type="radio"/>
bee	<input type="radio"/>	<input type="radio"/>	fish	<input type="radio"/>	<input type="radio"/>	pony	<input type="radio"/>	<input type="radio"/>
bird	<input type="radio"/>	<input type="radio"/>	frog	<input type="radio"/>	<input type="radio"/>	puppy	<input type="radio"/>	<input type="radio"/>
bug	<input type="radio"/>	<input type="radio"/>	giraffe	<input type="radio"/>	<input type="radio"/>	sheep	<input type="radio"/>	<input type="radio"/>
bunny	<input type="radio"/>	<input type="radio"/>	goose	<input type="radio"/>	<input type="radio"/>	squirrel	<input type="radio"/>	<input type="radio"/>
butterfly	<input type="radio"/>	<input type="radio"/>	horse	<input type="radio"/>	<input type="radio"/>	teddy bear	<input type="radio"/>	<input type="radio"/>
cat	<input type="radio"/>	<input type="radio"/>	kitty	<input type="radio"/>	<input type="radio"/>	tiger	<input type="radio"/>	<input type="radio"/>
chicken	<input type="radio"/>	<input type="radio"/>	lamb	<input type="radio"/>	<input type="radio"/>	turkey	<input type="radio"/>	<input type="radio"/>
cow	<input type="radio"/>	<input type="radio"/>	lion	<input type="radio"/>	<input type="radio"/>	turtle	<input type="radio"/>	<input type="radio"/>
deer	<input type="radio"/>	<input type="radio"/>	monkey	<input type="radio"/>	<input type="radio"/>			
dog	<input type="radio"/>	<input type="radio"/>	mouse	<input type="radio"/>	<input type="radio"/>			
donkey	<input type="radio"/>	<input type="radio"/>	owl	<input type="radio"/>	<input type="radio"/>			

3. VEHICLES (Real or Toy) (9)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
airplane	<input type="radio"/>	<input type="radio"/>	car	<input type="radio"/>	<input type="radio"/>	stroller	<input type="radio"/>	<input type="radio"/>
bicycle	<input type="radio"/>	<input type="radio"/>	firetruck	<input type="radio"/>	<input type="radio"/>	train	<input type="radio"/>	<input type="radio"/>
bus	<input type="radio"/>	<input type="radio"/>	motorcycle	<input type="radio"/>	<input type="radio"/>	truck	<input type="radio"/>	<input type="radio"/>

4. TOYS (8)								
	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
ball	<input type="checkbox"/>	<input type="checkbox"/>	book	<input type="checkbox"/>	<input type="checkbox"/>	pen	<input type="checkbox"/>	<input type="checkbox"/>
balloon	<input type="checkbox"/>	<input type="checkbox"/>	bubbles	<input type="checkbox"/>	<input type="checkbox"/>	toy	<input type="checkbox"/>	<input type="checkbox"/>
block	<input type="checkbox"/>	<input type="checkbox"/>	doll	<input type="checkbox"/>	<input type="checkbox"/>			

5. FOOD AND DRINK (30)								
	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
apple	<input type="checkbox"/>	<input type="checkbox"/>	chicken	<input type="checkbox"/>	<input type="checkbox"/>	meat	<input type="checkbox"/>	<input type="checkbox"/>
banana	<input type="checkbox"/>	<input type="checkbox"/>	coffee	<input type="checkbox"/>	<input type="checkbox"/>	milk	<input type="checkbox"/>	<input type="checkbox"/>
bread	<input type="checkbox"/>	<input type="checkbox"/>	cookie	<input type="checkbox"/>	<input type="checkbox"/>	noodles	<input type="checkbox"/>	<input type="checkbox"/>
butter	<input type="checkbox"/>	<input type="checkbox"/>	cracker	<input type="checkbox"/>	<input type="checkbox"/>	orange	<input type="checkbox"/>	<input type="checkbox"/>
cake	<input type="checkbox"/>	<input type="checkbox"/>	drink	<input type="checkbox"/>	<input type="checkbox"/>	peas	<input type="checkbox"/>	<input type="checkbox"/>
candy	<input type="checkbox"/>	<input type="checkbox"/>	egg	<input type="checkbox"/>	<input type="checkbox"/>	pizza	<input type="checkbox"/>	<input type="checkbox"/>
carrots	<input type="checkbox"/>	<input type="checkbox"/>	fish	<input type="checkbox"/>	<input type="checkbox"/>	raisin	<input type="checkbox"/>	<input type="checkbox"/>
cereal	<input type="checkbox"/>	<input type="checkbox"/>	food	<input type="checkbox"/>	<input type="checkbox"/>	spaghetti	<input type="checkbox"/>	<input type="checkbox"/>
cheerios	<input type="checkbox"/>	<input type="checkbox"/>	ice cream	<input type="checkbox"/>	<input type="checkbox"/>	toast	<input type="checkbox"/>	<input type="checkbox"/>
cheese	<input type="checkbox"/>	<input type="checkbox"/>	juice	<input type="checkbox"/>	<input type="checkbox"/>	water	<input type="checkbox"/>	<input type="checkbox"/>

6. CLOTHING (19)								
	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
beads	<input type="checkbox"/>	<input type="checkbox"/>	hat	<input type="checkbox"/>	<input type="checkbox"/>	shoe	<input type="checkbox"/>	<input type="checkbox"/>
bib	<input type="checkbox"/>	<input type="checkbox"/>	jacket	<input type="checkbox"/>	<input type="checkbox"/>	shorts	<input type="checkbox"/>	<input type="checkbox"/>
boots	<input type="checkbox"/>	<input type="checkbox"/>	jeans	<input type="checkbox"/>	<input type="checkbox"/>	sock	<input type="checkbox"/>	<input type="checkbox"/>
button	<input type="checkbox"/>	<input type="checkbox"/>	necklace	<input type="checkbox"/>	<input type="checkbox"/>	sweater	<input type="checkbox"/>	<input type="checkbox"/>
coat	<input type="checkbox"/>	<input type="checkbox"/>	pajamas	<input type="checkbox"/>	<input type="checkbox"/>	zipper	<input type="checkbox"/>	<input type="checkbox"/>
diaper	<input type="checkbox"/>	<input type="checkbox"/>	pants	<input type="checkbox"/>	<input type="checkbox"/>			
dress	<input type="checkbox"/>	<input type="checkbox"/>	shirt	<input type="checkbox"/>	<input type="checkbox"/>			

7. BODY PARTS (20)								
	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
arm	<input type="checkbox"/>	<input type="checkbox"/>	finger	<input type="checkbox"/>	<input type="checkbox"/>	nose	<input type="checkbox"/>	<input type="checkbox"/>
belly button	<input type="checkbox"/>	<input type="checkbox"/>	hair	<input type="checkbox"/>	<input type="checkbox"/>	owie/boo boo	<input type="checkbox"/>	<input type="checkbox"/>
cheek	<input type="checkbox"/>	<input type="checkbox"/>	hand	<input type="checkbox"/>	<input type="checkbox"/>	tooth	<input type="checkbox"/>	<input type="checkbox"/>
ear	<input type="checkbox"/>	<input type="checkbox"/>	head	<input type="checkbox"/>	<input type="checkbox"/>	toe	<input type="checkbox"/>	<input type="checkbox"/>
eye	<input type="checkbox"/>	<input type="checkbox"/>	knee	<input type="checkbox"/>	<input type="checkbox"/>	tongue	<input type="checkbox"/>	<input type="checkbox"/>
face	<input type="checkbox"/>	<input type="checkbox"/>	leg	<input type="checkbox"/>	<input type="checkbox"/>	tummy	<input type="checkbox"/>	<input type="checkbox"/>
foot	<input type="checkbox"/>	<input type="checkbox"/>	mouth	<input type="checkbox"/>	<input type="checkbox"/>			

8. FURNITURE AND ROOMS (24)								
	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
bathroom	<input type="checkbox"/>	<input type="checkbox"/>	drawer	<input type="checkbox"/>	<input type="checkbox"/>	refrigerator	<input type="checkbox"/>	<input type="checkbox"/>
bath tub	<input type="checkbox"/>	<input type="checkbox"/>	garage	<input type="checkbox"/>	<input type="checkbox"/>	rocking chair	<input type="checkbox"/>	<input type="checkbox"/>
bed	<input type="checkbox"/>	<input type="checkbox"/>	high chair	<input type="checkbox"/>	<input type="checkbox"/>	sink	<input type="checkbox"/>	<input type="checkbox"/>
bedroom	<input type="checkbox"/>	<input type="checkbox"/>	kitchen	<input type="checkbox"/>	<input type="checkbox"/>	stairs	<input type="checkbox"/>	<input type="checkbox"/>
chair	<input type="checkbox"/>	<input type="checkbox"/>	living room	<input type="checkbox"/>	<input type="checkbox"/>	stove	<input type="checkbox"/>	<input type="checkbox"/>
couch	<input type="checkbox"/>	<input type="checkbox"/>	oven	<input type="checkbox"/>	<input type="checkbox"/>	table	<input type="checkbox"/>	<input type="checkbox"/>
crib	<input type="checkbox"/>	<input type="checkbox"/>	play pen	<input type="checkbox"/>	<input type="checkbox"/>	TV	<input type="checkbox"/>	<input type="checkbox"/>
door	<input type="checkbox"/>	<input type="checkbox"/>	potty	<input type="checkbox"/>	<input type="checkbox"/>	window	<input type="checkbox"/>	<input type="checkbox"/>

9. SMALL HOUSEHOLD ITEMS (36)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
blanket	<input type="radio"/>	<input type="radio"/>	glasses	<input type="radio"/>	<input type="radio"/>	plate	<input type="radio"/>	<input type="radio"/>
bottle	<input type="radio"/>	<input type="radio"/>	hammer	<input type="radio"/>	<input type="radio"/>	purse	<input type="radio"/>	<input type="radio"/>
bowl	<input type="radio"/>	<input type="radio"/>	keys	<input type="radio"/>	<input type="radio"/>	radio	<input type="radio"/>	<input type="radio"/>
box	<input type="radio"/>	<input type="radio"/>	lamp	<input type="radio"/>	<input type="radio"/>	scissors	<input type="radio"/>	<input type="radio"/>
broom	<input type="radio"/>	<input type="radio"/>	light	<input type="radio"/>	<input type="radio"/>	soap	<input type="radio"/>	<input type="radio"/>
brush	<input type="radio"/>	<input type="radio"/>	medicine	<input type="radio"/>	<input type="radio"/>	spoon	<input type="radio"/>	<input type="radio"/>
clock	<input type="radio"/>	<input type="radio"/>	money	<input type="radio"/>	<input type="radio"/>	telephone	<input type="radio"/>	<input type="radio"/>
comb	<input type="radio"/>	<input type="radio"/>	paper	<input type="radio"/>	<input type="radio"/>	toothbrush	<input type="radio"/>	<input type="radio"/>
cup	<input type="radio"/>	<input type="radio"/>	penny	<input type="radio"/>	<input type="radio"/>	towel	<input type="radio"/>	<input type="radio"/>
dish	<input type="radio"/>	<input type="radio"/>	picture	<input type="radio"/>	<input type="radio"/>	trash	<input type="radio"/>	<input type="radio"/>
fork	<input type="radio"/>	<input type="radio"/>	pillow	<input type="radio"/>	<input type="radio"/>	vacuum	<input type="radio"/>	<input type="radio"/>
glass	<input type="radio"/>	<input type="radio"/>	plant	<input type="radio"/>	<input type="radio"/>	watch	<input type="radio"/>	<input type="radio"/>

10. OUTSIDE THINGS AND PLACES TO GO (27)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
backyard	<input type="radio"/>	<input type="radio"/>	park	<input type="radio"/>	<input type="radio"/>	snow	<input type="radio"/>	<input type="radio"/>
beach	<input type="radio"/>	<input type="radio"/>	party	<input type="radio"/>	<input type="radio"/>	star	<input type="radio"/>	<input type="radio"/>
church*	<input type="radio"/>	<input type="radio"/>	pool	<input type="radio"/>	<input type="radio"/>	store	<input type="radio"/>	<input type="radio"/>
flower	<input type="radio"/>	<input type="radio"/>	rain	<input type="radio"/>	<input type="radio"/>	sun	<input type="radio"/>	<input type="radio"/>
garden	<input type="radio"/>	<input type="radio"/>	rock	<input type="radio"/>	<input type="radio"/>	swing	<input type="radio"/>	<input type="radio"/>
home	<input type="radio"/>	<input type="radio"/>	school	<input type="radio"/>	<input type="radio"/>	tree	<input type="radio"/>	<input type="radio"/>
house	<input type="radio"/>	<input type="radio"/>	shovel	<input type="radio"/>	<input type="radio"/>	water	<input type="radio"/>	<input type="radio"/>
moon	<input type="radio"/>	<input type="radio"/>	sky	<input type="radio"/>	<input type="radio"/>	work	<input type="radio"/>	<input type="radio"/>
outside	<input type="radio"/>	<input type="radio"/>	slide	<input type="radio"/>	<input type="radio"/>	zoo	<input type="radio"/>	<input type="radio"/>

* or word used in your family

11. PEOPLE (20)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
aunt	<input type="radio"/>	<input type="radio"/>	grandma*	<input type="radio"/>	<input type="radio"/>	teacher	<input type="radio"/>	<input type="radio"/>
baby	<input type="radio"/>	<input type="radio"/>	grandpa*	<input type="radio"/>	<input type="radio"/>	uncle	<input type="radio"/>	<input type="radio"/>
babysitter	<input type="radio"/>	<input type="radio"/>	lady	<input type="radio"/>	<input type="radio"/>			
babysitter's name	<input type="radio"/>	<input type="radio"/>	man	<input type="radio"/>	<input type="radio"/>			
boy	<input type="radio"/>	<input type="radio"/>	mommy*	<input type="radio"/>	<input type="radio"/>			
brother	<input type="radio"/>	<input type="radio"/>	child's own name	<input type="radio"/>	<input type="radio"/>			
child	<input type="radio"/>	<input type="radio"/>	people	<input type="radio"/>	<input type="radio"/>			
daddy*	<input type="radio"/>	<input type="radio"/>	person	<input type="radio"/>	<input type="radio"/>			
girl	<input type="radio"/>	<input type="radio"/>	sister	<input type="radio"/>	<input type="radio"/>			

* or word used in your family

12. GAMES AND ROUTINES (19)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
bath	<input type="radio"/>	<input type="radio"/>	night night	<input type="radio"/>	<input type="radio"/>	yes	<input type="radio"/>	<input type="radio"/>
breakfast	<input type="radio"/>	<input type="radio"/>	no	<input type="radio"/>	<input type="radio"/>			
bye or bye bye	<input type="radio"/>	<input type="radio"/>	patty cake	<input type="radio"/>	<input type="radio"/>			
dinner	<input type="radio"/>	<input type="radio"/>	peekaboo	<input type="radio"/>	<input type="radio"/>			
don't	<input type="radio"/>	<input type="radio"/>	please	<input type="radio"/>	<input type="radio"/>			
hello	<input type="radio"/>	<input type="radio"/>	shh/shush/hush	<input type="radio"/>	<input type="radio"/>			
hi	<input type="radio"/>	<input type="radio"/>	thank you	<input type="radio"/>	<input type="radio"/>			
lunch	<input type="radio"/>	<input type="radio"/>	wait	<input type="radio"/>	<input type="radio"/>			
nap	<input type="radio"/>	<input type="radio"/>	wanna/want to	<input type="radio"/>	<input type="radio"/>			

13. ACTION WORDS (55)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
bite	<input type="radio"/>	<input type="radio"/>	help	<input type="radio"/>	<input type="radio"/>	show	<input type="radio"/>	<input type="radio"/>
blow	<input type="radio"/>	<input type="radio"/>	hit	<input type="radio"/>	<input type="radio"/>	sing	<input type="radio"/>	<input type="radio"/>
break	<input type="radio"/>	<input type="radio"/>	hug	<input type="radio"/>	<input type="radio"/>	sleep	<input type="radio"/>	<input type="radio"/>
bring	<input type="radio"/>	<input type="radio"/>	hurry	<input type="radio"/>	<input type="radio"/>	smile	<input type="radio"/>	<input type="radio"/>
bump	<input type="radio"/>	<input type="radio"/>	jump	<input type="radio"/>	<input type="radio"/>	splash	<input type="radio"/>	<input type="radio"/>
clean	<input type="radio"/>	<input type="radio"/>	kick	<input type="radio"/>	<input type="radio"/>	stop	<input type="radio"/>	<input type="radio"/>
close	<input type="radio"/>	<input type="radio"/>	kiss	<input type="radio"/>	<input type="radio"/>	swim	<input type="radio"/>	<input type="radio"/>
cry	<input type="radio"/>	<input type="radio"/>	look	<input type="radio"/>	<input type="radio"/>	swing	<input type="radio"/>	<input type="radio"/>
dance	<input type="radio"/>	<input type="radio"/>	love	<input type="radio"/>	<input type="radio"/>	take	<input type="radio"/>	<input type="radio"/>
draw	<input type="radio"/>	<input type="radio"/>	open	<input type="radio"/>	<input type="radio"/>	throw	<input type="radio"/>	<input type="radio"/>
drink	<input type="radio"/>	<input type="radio"/>	play	<input type="radio"/>	<input type="radio"/>	tickle	<input type="radio"/>	<input type="radio"/>
drive	<input type="radio"/>	<input type="radio"/>	pull	<input type="radio"/>	<input type="radio"/>	touch	<input type="radio"/>	<input type="radio"/>
eat	<input type="radio"/>	<input type="radio"/>	push	<input type="radio"/>	<input type="radio"/>	watch	<input type="radio"/>	<input type="radio"/>
fall	<input type="radio"/>	<input type="radio"/>	put	<input type="radio"/>	<input type="radio"/>	walk	<input type="radio"/>	<input type="radio"/>
feed	<input type="radio"/>	<input type="radio"/>	read	<input type="radio"/>	<input type="radio"/>	wash	<input type="radio"/>	<input type="radio"/>
finish	<input type="radio"/>	<input type="radio"/>	ride	<input type="radio"/>	<input type="radio"/>	wipe	<input type="radio"/>	<input type="radio"/>
get	<input type="radio"/>	<input type="radio"/>	run	<input type="radio"/>	<input type="radio"/>	write	<input type="radio"/>	<input type="radio"/>
give	<input type="radio"/>	<input type="radio"/>	say	<input type="radio"/>	<input type="radio"/>			
go	<input type="radio"/>	<input type="radio"/>	see	<input type="radio"/>	<input type="radio"/>			

14. WORDS ABOUT TIME (8)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
day	<input type="radio"/>	<input type="radio"/>	night	<input type="radio"/>	<input type="radio"/>	tomorrow	<input type="radio"/>	<input type="radio"/>
later	<input type="radio"/>	<input type="radio"/>	now	<input type="radio"/>	<input type="radio"/>	tonight	<input type="radio"/>	<input type="radio"/>
morning	<input type="radio"/>	<input type="radio"/>	today	<input type="radio"/>	<input type="radio"/>			

15. DESCRIPTIVE WORDS (37)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
all gone	<input type="radio"/>	<input type="radio"/>	empty	<input type="radio"/>	<input type="radio"/>	old	<input type="radio"/>	<input type="radio"/>
asleep	<input type="radio"/>	<input type="radio"/>	fast	<input type="radio"/>	<input type="radio"/>	pretty	<input type="radio"/>	<input type="radio"/>
bad	<input type="radio"/>	<input type="radio"/>	fine	<input type="radio"/>	<input type="radio"/>	red	<input type="radio"/>	<input type="radio"/>
big	<input type="radio"/>	<input type="radio"/>	gentle	<input type="radio"/>	<input type="radio"/>	scared	<input type="radio"/>	<input type="radio"/>
blue	<input type="radio"/>	<input type="radio"/>	good	<input type="radio"/>	<input type="radio"/>	sick	<input type="radio"/>	<input type="radio"/>
broken	<input type="radio"/>	<input type="radio"/>	happy	<input type="radio"/>	<input type="radio"/>	sleepy	<input type="radio"/>	<input type="radio"/>
careful	<input type="radio"/>	<input type="radio"/>	hard	<input type="radio"/>	<input type="radio"/>	soft	<input type="radio"/>	<input type="radio"/>
clean	<input type="radio"/>	<input type="radio"/>	hot	<input type="radio"/>	<input type="radio"/>	thirsty	<input type="radio"/>	<input type="radio"/>
cold	<input type="radio"/>	<input type="radio"/>	hungry	<input type="radio"/>	<input type="radio"/>	tired	<input type="radio"/>	<input type="radio"/>
cute	<input type="radio"/>	<input type="radio"/>	hurt	<input type="radio"/>	<input type="radio"/>	wet	<input type="radio"/>	<input type="radio"/>
dark	<input type="radio"/>	<input type="radio"/>	little	<input type="radio"/>	<input type="radio"/>	yucky	<input type="radio"/>	<input type="radio"/>
dirty	<input type="radio"/>	<input type="radio"/>	naughty	<input type="radio"/>	<input type="radio"/>			
dry	<input type="radio"/>	<input type="radio"/>	nice	<input type="radio"/>	<input type="radio"/>			

16. PRONOUNS (11)

	under-stands	under-stands and says		under-stands	under-stands and says		under-stands	under-stands and says
her	<input type="radio"/>	<input type="radio"/>	me	<input type="radio"/>	<input type="radio"/>	this	<input type="radio"/>	<input type="radio"/>
his	<input type="radio"/>	<input type="radio"/>	mine	<input type="radio"/>	<input type="radio"/>	you	<input type="radio"/>	<input type="radio"/>
I	<input type="radio"/>	<input type="radio"/>	my	<input type="radio"/>	<input type="radio"/>	your	<input type="radio"/>	<input type="radio"/>
it	<input type="radio"/>	<input type="radio"/>	that	<input type="radio"/>	<input type="radio"/>			

17. QUESTION WORDS (6)					
	under-stands	under-stands and says		under-stands	under-stands and says
how	<input type="radio"/>	<input type="radio"/>	when	<input type="radio"/>	<input type="radio"/>
what	<input type="radio"/>	<input type="radio"/>	where	<input type="radio"/>	<input type="radio"/>
			who	<input type="radio"/>	<input type="radio"/>
			why	<input type="radio"/>	<input type="radio"/>

18. PREPOSITIONS AND LOCATIONS (11)					
	under-stands	under-stands and says		under-stands	under-stands and says
away	<input type="radio"/>	<input type="radio"/>	inside	<input type="radio"/>	<input type="radio"/>
back	<input type="radio"/>	<input type="radio"/>	off	<input type="radio"/>	<input type="radio"/>
down	<input type="radio"/>	<input type="radio"/>	on	<input type="radio"/>	<input type="radio"/>
in	<input type="radio"/>	<input type="radio"/>	out	<input type="radio"/>	<input type="radio"/>
			there	<input type="radio"/>	<input type="radio"/>
			under	<input type="radio"/>	<input type="radio"/>
			up	<input type="radio"/>	<input type="radio"/>

19. QUANTIFIERS (8)					
	under-stands	under-stands and says		under-stands	under-stands and says
all	<input type="radio"/>	<input type="radio"/>	none	<input type="radio"/>	<input type="radio"/>
another	<input type="radio"/>	<input type="radio"/>	not	<input type="radio"/>	<input type="radio"/>
more	<input type="radio"/>	<input type="radio"/>	other	<input type="radio"/>	<input type="radio"/>
			same	<input type="radio"/>	<input type="radio"/>
			some	<input type="radio"/>	<input type="radio"/>

PART II ACTIONS AND GESTURES

A. FIRST COMMUNICATIVE GESTURES

When infants are first learning to communicate, they often use gestures to make their wishes known. For each item below, mark the line that describes your child's actions right now.

	Not Yet	Sometimes	Often
1. Extends arm to show you something he/she is holding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Reaches out and gives you a toy or some object that he/she is holding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Points (with arm and index finger extended) at some interesting object or event.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Waves bye-bye on his/her own when someone leaves.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Extends his/her arm upward to signal a wish to be picked up.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Shakes head "no".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Nods head "yes".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Gestures "hush" by placing finger to lips.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Requests something by extending arm and opening and closing hand.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Blows kisses from a distance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Smacks lips in a "yum yum" gesture to indicate that something taste good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Shrugs to indicate "all gone" or "where'd it go".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B. GAMES AND ROUTINES

Does your child do any of the following?

	Yes
1. Play peekaboo.	<input type="radio"/>
2. Play patty cake.	<input type="radio"/>
3. Play "so big".	<input type="radio"/>
4. Play chasing games.	<input type="radio"/>
5. Sing.	<input type="radio"/>
6. Dance.	<input type="radio"/>

Method: Questionnaire

- strong N bias (0.81 noun-to-verb ratio) within the MCDI
 - 11 N categories with suggestive semantic fields as titles
 - 1 category for “action words” without any semantic subdivision
- ==> Possibility of N report bias needs to be taken into account in evaluating the MCDI, i.e. the opportunity of occurrence needs to be part of the statistics

Nouns and verbs in Ngas

- Ngas (Chadic, Afro-Asiatic), approx. 400,000 speakers.
- Subjects:
 - 8 children (1;0 - 1;5, M age = 1;2)
 - 8 children (1;7 - 2;7, M age = 2;1)
- Method: MCDI

Ngas (Angas)

- spoken in Nigeria



Linguistic features of Ngas

- Frequent argument ellipsis
- Tonal tense / aspect / person on pre-V auxiliaries
- Verbs never in initial position because of pre-V auxiliaries ==> not in a very salient position
- Verb stems invariant
- extremely regular morphology: the child hears the verb repeatedly in one form and only the separate morpheme indicating tense / aspect / person changes.

Linguistic features of Ngas

- Some examples (met 'go'):
 - ngá met 'I will go'
 - ngàà met 'I have gone'
 - ngā met 'I went'

Results

TABLE 3. *Children's comprehension and production: proportion (S.D.) of words reported by each word type*

task word type	Time 1		Time 2	
	age group		age group	
	younger	older	younger	older
comprehension				
nouns	0.19 (0.13)	0.43 (0.12)	0.35 (0.07)	0.51 (0.08)
verbs	0.33 (0.24)	0.81 (0.15)	0.51 (0.19)	0.79 (0.14)
production				
nouns	0.07 (0.08)	0.35 (0.16)	0.17 (0.14)	0.43 (0.14)
verbs	0.08 (0.15)	0.46 (0.49)	0.16 (0.16)	0.46 (0.28)

Nouns and Verbs in Italian (Casselli, Bates, Casidio et al. 1995)

- Comparison of 195 Italian children with 659 English children between 8 - 16 month
- Method: MCDI
- English and Italian differ according to:
 - Referential density
 - Saliency of verbs (E: rigid SVO, more variations in Italian)
 - Agreement contrast, morphology

Italian

- Expectation: Italian children should use less N than English children.
- Results: In both languages children used more N than V. Also if opportunity has been taken into account.

Potential factors responsible for difference between Ngas vs. Italian/English

- type and token frequency
- utterance position (saliency)
- morphological complexity / transparency
- pragmatic issues / 'language teaching'

Naturalistic samples (Tardif, Shatz & Naigles 1997)

- English, Italian, Mandarin
 - Method: naturalistic samples
 - 6 English-speaking toddlers (2;0)
 - 6 Italian-speaking toddlers (1;11)
 - 10 Mandarin-speaking toddlers (1;10)
 - Questions:
 - Is there a difference in the noun-verb distributions in the children of these three languages as suggested by variation in input according to type / token frequency, morphology etc.
 - If there are differences, do children mirror the distributions of their input?

Results

- Adults:
 - Mandarin: $V > N$ (types and tokens)
 - English and Italian: no statistic difference between N and V in types, but more V tokens than N tokens
- Children:
 - Mandarin children: $V > N$ (types and tokens)
 - English and Italian children: no statistic difference

Possible reasons

- Italian drops subject only, but Mandarin shows both subject and object ellipsis.
- Italian has more verb morphology than noun morphology
- Italian verbs don't have the same saliency as Mandarin verbs which are always at the end of utterances and thus are in a very salient position. Italian verbs occur in various positions of the utterance.
- The contexts of recording in the three languages might have differed.

Context as a factor for noun/verb distributions (Tardif, Gelman & Xu 1999)

- Comparison between 24 English- and 24 Mandarin-speaking toddlers (M age = 20 months) and their mothers
- 3 methods
 1. Controlled observations in 3 contexts (10 min. each):
 - book reading (noun eliciting context)
 - mechanical toy play (verb eliciting context)
 - regular toy play (neutral context)
 2. MCDI (more verbs included than in the original version)
 3. Mothers reporting of first words

Context as a factor for noun/verb distributions

- Question:
 - Are there cross-linguistic differences in the proportions of nouns and verbs in English-and Mandarin speaking children across both methods (observational and maternal report measures)?
 - Do we find cross-linguistic differences in the use of nouns and verbs under controlled activity contexts (same for both groups)?

Context as a factor for noun/verb distributions

Table 1 Adults' Overall Mean Noun and Verb Types and Ratios

	Nouns	Verbs	$\frac{\text{Nouns}}{\text{Nouns} + \text{Verbs}}$
English			
<i>Mean</i>	80.1	61.4	.56
<i>SD</i>	19.8	12.9	.04
Mandarin			
<i>Mean</i>	58.8	71.1	.45
<i>SD</i>	12.6	10.1	.05

Results: Adults

626 Child Development

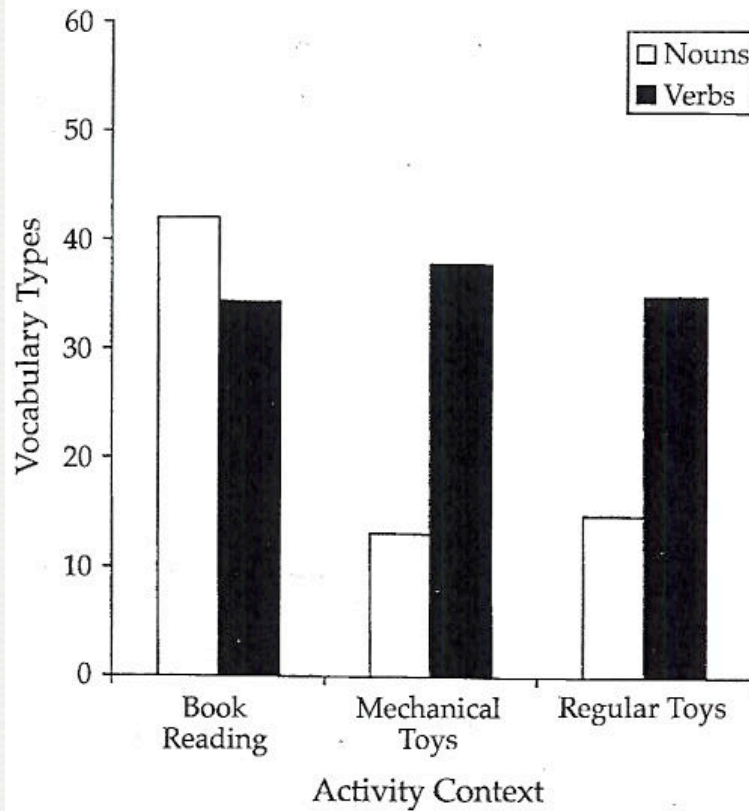


Figure 1 Mandarin-speaking mothers' mean vocabulary types.

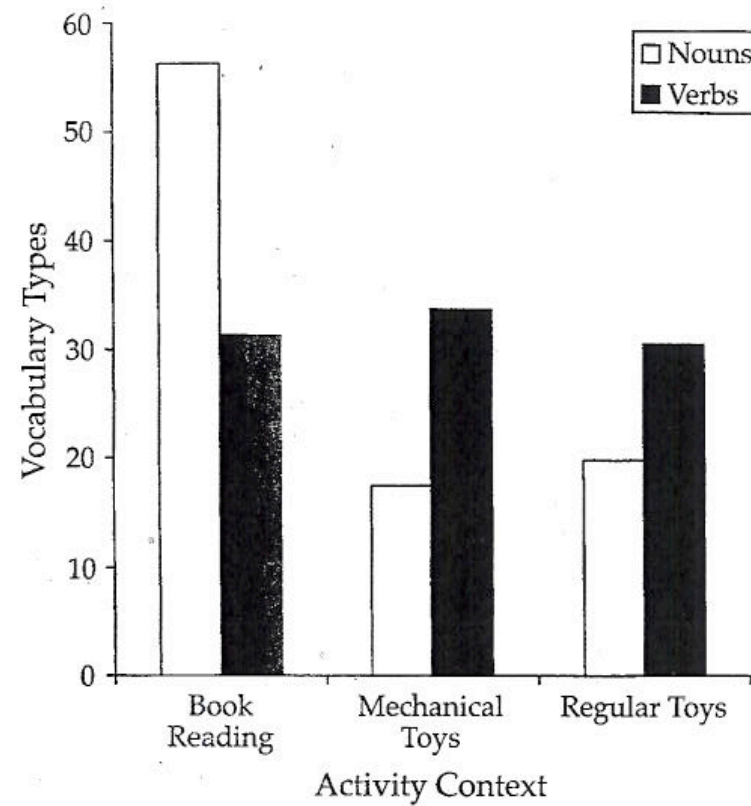


Figure 2 English-speaking mothers' mean vocabulary types.

Results: Children

Table 2 Children's Overall Mean Noun and Verb Types and Ratios

	Nouns	Verbs	$\frac{\text{Nouns}}{\text{Nouns} + \text{Verbs}}$
Productive speech			
English			
<i>Mean</i>	20.4	9.9	.68*
<i>SD</i>	14.3	8.2	.15
Mandarin			
<i>Mean</i>	20.6	15.0	.56
<i>SD</i>	14.2	11.7	.19
Excluding test question replies			
English			
<i>Mean</i>	16.0	9.4	.63*
<i>SD</i>	11.3	8.2	.18
Mandarin			
<i>Mean</i>	8.7	10.3	.47
<i>SD</i>	6.6	8.6	.18

*Denotes that the Nouns/(Nouns + Verbs) ratio is significantly different from .50, $ps < .005$.

Results: Children

Table 4 Individual Children's Patterns of Vocabulary Use, by Context

Context	No. of Children More Nouns	No. of Children More Verbs	Equal Number of Nouns and Verbs
Picture Book*			
English	23	0	1
Mandarin	19	4	1
Regular Toys*			
English	10	11	3
Mandarin	4	18	2
Mechanical Toys			
English	5	15	4
Mandarin	1	17	6

* Indicates significant differences for the two languages, $p < .05$.

Results: MCDI

- Noun bias in Mandarin- and English-speaking children
- But: the English speaking children had a sign. higher ratio of nouns to verbs than the Mandarin-speaking children.
- Both context and method are a factor in studying the distribution of nouns and verbs

Results: children

Table 5 Number of Children Reported to Produce One or More of the Following Word Types among Their "First Words"

Language	Proper Names and Kinship Terms	Common Nouns	Verbs or Verb Phrases	Other Predicates, Social, Ambiguous
English (<i>n</i> = 23)	18	12	1	5
Mandarin (<i>n</i> = 24)	13	9	15	7

Potential factors responsible for different outcome

- Type and token frequency
- Utterance position (saliency)
- Morphological complexity / transparency
- Pragmatic issues / 'language teaching'

Open issues

- Role of morphology for the acquisition of nouns and verbs? Repetition factor of one and the same form. The more forms a word has, the less each individual form is repeated. Thus, we expect that morphology in combination with frequency is an important factor.
- To check the role of morphology, we need a language with the same argument dropping pattern as Mandarin (and thus saliency factor), but a very different morphology, i.e. complex morphology.

	1s	1di	1pi	1de	1pe	2s	2d	2p	3s	3ns	intransitive				
1s						<i>tupna?ā</i>	<i>tupna?āce</i>	<i>tupna?āni</i>	<i>tubukuj</i>	<i>tubukujcuj</i>	<i>tupma?ā</i>				
1di										<i>tupna?āniŋ</i>	<i>tupna?āceŋ</i>	<i>tupna?āniŋ</i>	<i>tubukujniŋ</i>	<i>tubukujcujniŋ</i>	<i>tupma?āniŋ</i>
1pi										<i>tupnehē</i>	<i>tupnace</i>	<i>tupnanihē</i>	<i>tubuhē</i>	<i>tubujcihē</i>	<i>tubehē</i>
1de										<i>matupyoknehē</i>	<i>matupyoknace</i>	<i>matupyoknanihē</i>	<i>matupyoktuhē</i>	<i>matupyoktuciŋhē</i>	<i>matupyoktehē</i>
1pe													<i>tupcoko</i>	<i>tubumcum</i>	<i>tupceke</i>
									<i>tupcokonij</i>	<i>tubumcumniŋ</i>	<i>tupcekenij</i>				
									<i>tubace</i>	<i>tubumcumhē</i>	<i>tubace</i>				
									<i>matupyoktace</i>	<i>matupyoktumcumhē</i>	<i>matupyoktace</i>				
									<i>tubukum</i>		<i>tubiki</i>				
									<i>tubukumniŋ</i>		<i>tubikiniŋ</i>				
									<i>tubumhē</i>		<i>tubihē</i>				
									<i>matupyoktumhē</i>		<i>matupyoktiŋhē</i>				
									<i>tupcokoŋa</i>		<i>tupcekeŋa</i>				
									<i>tupcokoŋaniŋ</i>		<i>tupcekeŋaniŋ</i>				
									<i>tubacehē</i>	<i>tubumcumma</i>	<i>tubacehē</i>				
									<i>matupyoktacehē</i>	<i>tubumcummaniŋ</i>	<i>matupyoktacehē</i>				
									<i>tubukumma</i>	<i>tubumcummeŋhē</i>	<i>tubikiŋa</i>				
									<i>tubukummaniŋ</i>	<i>matupyoktumcummeŋhē</i>	<i>tubikiniŋ</i>				
									<i>tubummeŋhē</i>		<i>tubieŋhē</i>				
									<i>matupyoktummeŋhē</i>		<i>matupyoktieŋhē</i>				
2s	<i>atupma?ā</i>								<i>atuboko</i>	<i>atubukuce</i>	<i>atupno</i>				
2d	<i>atupma?āniŋ</i>									<i>amatupceke</i>	<i>amatupno</i>		<i>atubokonij</i>	<i>atubukuceniŋ</i>	<i>atupnikniŋ</i>
2p	<i>atubehē</i>									<i>amatupcekenij</i>	<i>amatupnikniŋ</i>		<i>atube</i>	<i>atubuce</i>	<i>atube</i>
	<i>amatupyoktehē</i>		<i>amatubace</i>	<i>amatube</i>	<i>amamatupyokte</i>		<i>amatupyokte</i>	<i>amatupyokte</i>							
	<i>atupma?āncij</i>	<i>maitupceke</i>	<i>maitupno</i>	<i>matupceke</i>	<i>matupno</i>		<i>atupcoko</i>	<i>atupceke</i>	<i>atubumcum</i>	<i>atubumcumniŋ</i>	<i>atupcekenij</i>				
	<i>atupma?āncijniŋ</i>	<i>maitupcekenij</i>	<i>maitupnikniŋ</i>	<i>matupcekenij</i>	<i>matupnikniŋ</i>		<i>atupcokonij</i>	<i>atupcekenij</i>	<i>atubumcumhē</i>	<i>atubumcumhē</i>	<i>atupcekenij</i>				
	<i>atubaŋcihē</i>	<i>maitubace</i>	<i>maitube</i>	<i>matubace</i>	<i>matube</i>		<i>atubace</i>	<i>atubace</i>	<i>amatupyoktace</i>	<i>amatupyoktace</i>	<i>amatupyoktace</i>				
	<i>amatupyoktaŋcihē</i>	<i>maimatupyoktace</i>	<i>maimatupyokte</i>	<i>mamatupyoktace</i>	<i>mamatupyokte</i>		<i>amatupyoktace</i>	<i>amatupyoktace</i>							
	<i>atupma?āniŋ</i>						<i>atubukum</i>	<i>atubiki</i>			<i>atubiki</i>				
	<i>atupma?āniŋniŋ</i>						<i>atubukumniŋ</i>	<i>atubikiniŋ</i>			<i>atubikiniŋ</i>				
	<i>atubaŋniŋhē</i>						<i>atubumhē</i>	<i>atubieŋhē</i>			<i>atubieŋhē</i>				
	<i>amatupyoktaŋniŋhē</i>						<i>amatupyoktumhē</i>	<i>amatupyoktieŋhē</i>			<i>amatupyoktieŋhē</i>				
3s	<i>utupma?ā</i>								<i>tuboko</i>	<i>tubukuce</i>	<i>tupno</i>				
3d	<i>utupma?āniŋ</i>									<i>matupceke</i>	<i>matupno</i>		<i>tubokonij</i>	<i>tubukuceniŋ</i>	<i>tupnikniŋ</i>
3p	<i>utubehē</i>									<i>matupcekenij</i>	<i>matupnikniŋ</i>		<i>tube</i>	<i>tubuce</i>	<i>tube</i>
	<i>umatupyoktehē</i>		<i>matubace</i>	<i>matube</i>	<i>mamatupyokte</i>		<i>matupyokte</i>	<i>matupyokte</i>							
	<i>utupma?āncij</i>	<i>maitupceke</i>	<i>maitupno</i>	<i>matupceke</i>	<i>matupno</i>		<i>utupcoko</i>	<i>utupceke</i>	<i>utubumcum</i>	<i>utubumcumniŋ</i>	<i>utupcekenij</i>				
	<i>utupma?āncijniŋ</i>	<i>maitupcekenij</i>	<i>maitupnikniŋ</i>	<i>matupcekenij</i>	<i>matupnikniŋ</i>		<i>utupcokonij</i>	<i>utupcekenij</i>	<i>utubumcumhē</i>	<i>utubumcumhē</i>	<i>utupcekenij</i>				
	<i>utubaŋcihē</i>	<i>maitubace</i>	<i>maitube</i>	<i>matubace</i>	<i>matube</i>		<i>utubace</i>	<i>utubace</i>	<i>umatupyoktace</i>	<i>umatupyoktace</i>	<i>umatupyoktace</i>				
	<i>umatupyoktaŋcihē</i>	<i>maimatupyoktace</i>	<i>maimatupyokte</i>	<i>mamatupyoktace</i>	<i>mamatupyokte</i>		<i>umatupyoktace</i>	<i>umatupyoktace</i>							
	<i>utupma?āniŋ</i>						<i>utuboko</i>	<i>utupno</i>			<i>utupno</i>				
	<i>utupma?āniŋniŋ</i>						<i>utubokonij</i>	<i>utupnikniŋ</i>			<i>utupnikniŋ</i>				
	<i>utubaŋniŋhē</i>						<i>utube</i>	<i>utube</i>			<i>utube</i>				
	<i>umatupyoktaŋniŋhē</i>						<i>umatupyokte</i>	<i>umatupyokte</i>			<i>umatupyokte</i>				

Table 1: Chintang agreement paradigm of the verb *tupma* ‘to meet’, with stem *tup* (identical in all forms) (Vertical axis: subject agreement; horizontal axis: object agreement. Within each cell, the forms denote (in vertical order) nonpast affirmative, nonpast negative, past affirmative, and past negative tenses, respectively. *Abbreviations*: s ‘singular’, d ‘dual’, p ‘plural’, ns ‘nonsingular (dual or plural)’, i ‘inclusive of addressee’, e ‘exclusive of addressee’, 1-3 denote persons.)

Agreement in Chintang

Intransitive verbs:

- (1) *hunɡoi? athom=ta ti-a-c-e-hẽ.* CLLDCh1R02S04b.1602
there before=EMPH come-PAST-DUAL-PAST-[1]EXCLUSIVE
'We two (exclusive) came here before.' (Adult speaker)

Transitive verbs:

- (2) *gakkaŋ yogoi? na-khaŋ-ce-ke.* CLLDCh1R01S01.032
after.a.while over.there 3A.2[SG]P-see-DUAL[A]-NONPAST
'After a while they (dual) see you (singular) over there.' (Adult speaker)

Detransitivized verbs:

- (3) *ŋaliŋ tep-ma-?ã.* CLLDCh1R03S02.0004
face wash-1SG-NONPAST
'I am washing my face.' (or: 'I am face-washing.') (Adult speaker)

Imperatives

- (4) *thapt-a-n-u-mh-a* CLLDCh4R11S10.082
bring.across-IMP-2PL.A-3SG.P-2PL.A-IMP
'(You guys) bring it over there!' (Adult speaker)

Noun Morphology in Chintang

<i>Label</i>	<i>Form</i>	<i>Meaning</i>
NOM	∅	S, O, T, G, predicate nominals; with some experiential verbs, also A (experiencers)
ERG, INS, ABL	-ŋa ~ -yã	A (but not with first person and only optionally with second person pronouns), instruments, causes, forces, sources, manners
GEN	-ko	possessors, attributive nouns in NPs
COM	-niŋ	accompanying referents (NPs) or situations (clauses)
MED	-lam(ma) ~ -lamŋa	'via, through, from, in (e.g. language X)'
ALL	-samma (< Nep.)	'until, up to'
DIR	-ni	'towards, in the direction of'
LOC	-be(?) ~ -i? ~ -bak ~ ∅ (spatial nouns)	'at, in, on, to'
UP	-ndu	'up at, in, on, to'
DOWN	-mu	'down at, in, on, to'
ACROSS	-ya	'across at, in, on, to'

Chintang noun-to verb ratio (Stoll, Bickel, Lieven et al. under revision)

- Expectation about the noun-verb distribution in child surrounding speech: *Adults will produce more verbs than nouns, i.e. the noun/verb ratio will be small.*
- Expectation about the noun-verb distribution in child speech: *Children will start out with more nouns than we would expect from the input.*
- Reason: *extremely complex verb morphology*
- Hypothesis: *First, in early development, children will prefer nouns because of the complex verb morphology. As soon as they get more productive with verb morphology they will adapt to the adult pattern and use more verbs than nouns.*

Chintang noun-to-verb ratio

- All nouns were included, also proper nouns and nouns used in cursing

- Noun-to-verb ratio both for types and tokens:

$$R_{N/V} = \frac{N(\text{nouns})}{N(\text{nouns}) + N(\text{verbs})}$$

- Type and token ratios were measured for each child per recording cycle and for the surrounding adults (pooled).

Verbs	Frequencies	Nouns	Frequencies
<i>khat-</i> (intr.) ‘go’	2078	<i>kanchi</i> ‘youngest female’	482
<i>yun-</i> (intr.) ‘be, live, sit, stay’	1268	<i>kancho</i> ‘youngest male’	397
<i>ca-</i> ~ <i>ci-</i> (trans.) ‘eat’	1198	<i>ma</i> ‘mother, woman’	375
<i>lut-</i> (trans.) ‘call, say, speak, tell’	1098	<i>Ram</i> ‘(proper name)’	367
<i>pit-</i> (trans.) ‘give, allow’	983	<i>kok</i> ‘cooked rice’	327
<i>numd-</i> (trans.) ‘do’	749	<i>pa</i> ‘father, man’	318
<i>cekt-</i> (trans.) ‘say, speak’	668	<i>Khel</i> ‘(proper name)’	317
<i>mett-</i> (trans.) ‘do, make’	574	<i>na</i> ~ <i>ne</i> ‘elder sister’	291
<i>thap-</i> (intr.) ‘come across’	561	<i>nunu</i> ‘baby’	269
<i>kat-</i> (intr.) ‘come up’	506	<i>kancha</i> ‘youngest male sibling’	248

Table 2: The ten most frequent nouns and verbs among adults

Age group	Verbs	Freq.	Nouns	Freq.
(2;1, 2;7]	<i>khat-</i> (intr.) 'go'	296	<i>ma</i> 'mother, woman'	633
	<i>ca- ~ ci-</i> (trans.) 'eat'	190	<i>Ram</i> '(proper name)'	145
	<i>yur-</i> (intr.) 'be, live, sit, stay'	133	<i>pa</i> 'father, man'	132
	<i>ten-</i> (trans.) 'beat, hit'	63	<i>na ~ ne</i> 'elder sister'	92
	<i>pit-</i> (trans.) 'give, allow'	62	<i>saili</i> 'third born female'	77
	<i>thap-</i> (intr.) 'come across'	54	<i>cuwa</i> 'water'	53
	<i>khatt-</i> (trans.) 'carry, take'	48	<i>Som</i> '(proper name)'	48
	<i>tha- ~ thi-</i> (intr.) 'come/go/fall down'	41	<i>daju</i> 'elder brother'	40
	<i>lik-</i> (intr.) 'enter, go inside'	40	<i>bhale</i> 'cock'	38
	<i>hit-</i> (intr.) 'be able, be well; finish'	36	<i>mei</i> 'thing'	35
(2;8, 3;2]	<i>khat-</i> (intr.) 'go'	91	<i>ma</i> 'mother, woman'	287
	<i>ca- ~ ci-</i> (trans.) 'eat'	83	<i>macikne</i> '[abusive]'	86
	<i>yur-</i> (intr.) 'be, live, sit, stay'	71	<i>muji</i> '[abusive]'	79
	<i>mett-</i> (trans.) 'do, make'	57	<i>pa</i> 'father, man'	60
	<i>pit-</i> (trans.) 'give, allow'	44	<i>na ~ ne</i> 'elder sister'	49
	<i>thap-</i> (intr.) 'come across'	44	<i>cikne</i> '[abusive]'	39
	<i>khatt-</i> (trans.) 'carry, take'	43	<i>didi</i> 'elder sister'	34
	<i>or-</i> (trans.) 'hit by throwing, strike, shoot'	42	<i>Kalpana</i> '(proper name)'	31
	<i>kir-</i> (intr.) 'overturn, roll/fall down'	41	<i>Ram</i> '(proper name)'	30
	<i>tha- ~ thi-</i> (intr.) 'come/go/fall down'	36	<i>gucca</i> 'marble'	26
(3;3, 3;9]	<i>khat-</i> (intr.) 'go'	220	<i>ma</i> 'mother, woman'	279
	<i>yur-</i> (intr.) 'be, live, sit, stay'	181	<i>pa</i> 'father, man'	103
	<i>ca- ~ ci-</i> (trans.) 'eat'	167	<i>gucca</i> 'marble'	87
	<i>pit-</i> (trans.) 'give, allow'	94	<i>didi</i> 'elder sister'	83
	<i>mett-</i> (trans.) 'do, make'	79	<i>Pirithibi</i> '(proper name)'	83
	<i>tha- ~ thi-</i> (intr.) 'come/go/fall down'	73	<i>macikne</i> '[abusive]'	82
	<i>khons-</i> (trans.) 'play'	72	<i>bhale</i> 'cock'	73
	<i>lis-</i> (intr.) 'be'	70	<i>cikne</i> '[abusive]'	71
	<i>hit-</i> (intr.) 'be able, be well; finish'	65	<i>muji</i> '[abusive]'	61
	<i>lond</i> (intr.) 'appear, come out'	60	<i>besara</i> 'eagle'	56
(3;10, 4;4]	<i>khat-</i> (intr.) 'go'	71	<i>Kamala</i> '(proper name)'	114
	<i>kat-</i> (intr.) 'come up'	34	<i>Besara</i> '(proper name)'	54
	<i>yur-</i> (intr.) 'be, live, sit, stay'	31	<i>gol</i> 'ball'	36
	<i>mett-</i> (trans.) 'do, make'	28	<i>Asa</i> '(proper name)'	29
	<i>lik-</i> (intr.) 'enter, go inside'	27	<i>didi</i> 'elder sister'	26
	<i>ca- ~ ci-</i> (trans.) 'eat'	26	<i>chepule</i> 'pisser, bed-wetter'	23
	<i>thapt-</i> (trans.) 'bring across'	25	<i>Bisal</i> '(proper name)'	20
	<i>putt-</i> (trans.) 'pick, pluck'	23	<i>Asu</i> '(proper name)'	19
	<i>pit-</i> (trans.) 'give, allow'	21	<i>dhara</i> 'water tap, well'	19
	<i>khur-</i> (trans.) 'carry'	20	<i>Jit</i> '(proper name)'	18

Table 3: The ten most frequent nouns and verbs per age group

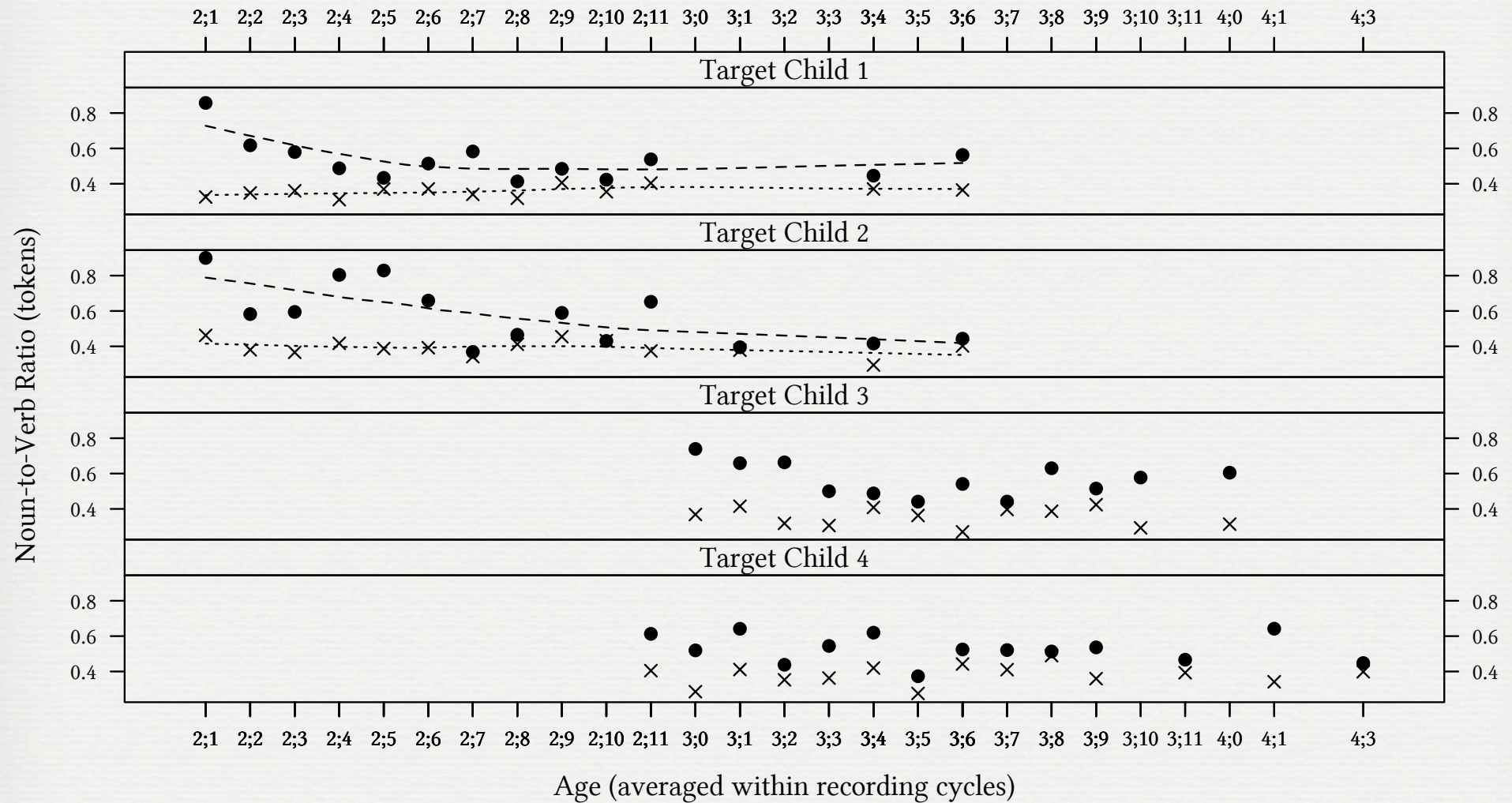


Figure 1: Noun-to-verb ratios in tokens (Dots (•) and dashed lines represent children; crosses (×) and dotted lines adults)

Morphological productivity

- To test our Hypothesis, we need a measure for morphological productivity
- No commonly accepted measure for productivity in acquisition research but various different approaches (e.g., Brown, 1973; Aguado-Orea & Pine, *subm.*)
- Our approach:
 - Shannon entropy on paradigms (Moscoso del Prado Martín, Kostic, & Baayen, 2004).
 - The more variation (more types, less skewing in frequencies), the higher the entropy.

Morphological productivity

- Entropy captures the intuition that a child masters a paradigm the better the more distinct forms she uses and the less she prefers some over others.
- Entropy H for a paradigm \mathcal{P} with forms f :

$$H(\mathcal{P}) = - \sum_{f_i \in \mathcal{P}} \pi(f_i) \cdot \log_2 \pi(f_i),$$

- Measure of uncertainty in a system. The more variation the higher the entropy. Predictability of a form choice decreases with the size of the paradigm and also with the degree to which the probability distribution of all forms together becomes more uniform.

Morphological productivity

- Estimating probabilities from the relative frequencies of forms in the corpus (Maximum Likelihood Estimation)
- This yields entropy estimates that are directly based on the range of forms and associated frequency distributions that a specific speaker produces at a specific time of recording.

Morphological productivity

- Estimate is relative to the total frequencies of using the paradigm to begin with.
- Estimate does not depend on the number of utterances recorded.
- Inflectional entropy would normally be computed for each stem separately, but stem frequencies may not be sufficiently independent of the conversational topic.
- No conjugation classes in Chintang, so structure of the affix strings is therefore independent of the stem.
- Thus, we assumed a single **macro-paradigm** across stems and estimated morphological entropy on this macro-paradigm.

Morphological productivity

- *luma, lud-* ‘to tell’ *putma, putt-* ‘to pick’
- *lud-u-ku-η* *putt-u-ku-η*
tell-3sP-NPST-1sA pick-3sP-NPST-1sA
- *a-lud-e* *a-putt-e*
2sA-tell-PST[3sP] 2sA-pick-PST[3sP]
- Σ -*u-ku-η* (Σ ranges over all possible stems)
- *a- Σ -e*

Example

\Speaker UR
\agegroup child, \age 12;0
\tx caklet acano? hä
\mph cakleta a-ca-no hä
\mgl chocolate.n 2sA.gm-eat.vt-NPST.gm yes.interj
\eng Do you eat chocolate? Yes?
\nep चक्लेट खान्छौ हँ?

\Speaker KHEL
\agegroup child, \age 14;0
\tx caŋa?ãmo luducana
\mph ca-ŋa-?ã mo lud-u-ce-a na
\mgl eat.vt-1sS.gm-1sNPST.gm REP.gm tell.vt-3P.gm-3nsP.gm-IMP.gm EMPH.gm
\eng Tell them 'I eat'!
\nep खान्छु भन न!

\Speaker LDCh1,
\agegroup child, \age 2;2
\tx ŋa?ã
\mph -ŋa-?ã
\mgl -1sS.gm-1sNPST.gm
\gram Instead of caŋa?ã, he says ŋa?ã

Example

```
\Speaker KHEL  
\agegroup child, \age 14;0  
\tx ɲaʔǎ  
\gw ɲaʔǎ  
\mph -ɲa-ʔǎ  
\mgl -1sS.gm-1sNPST.gm  
\lg -C-C  
\eng I  
\nep  
\cxt Kheɭ teases Khem repeating Khem's words
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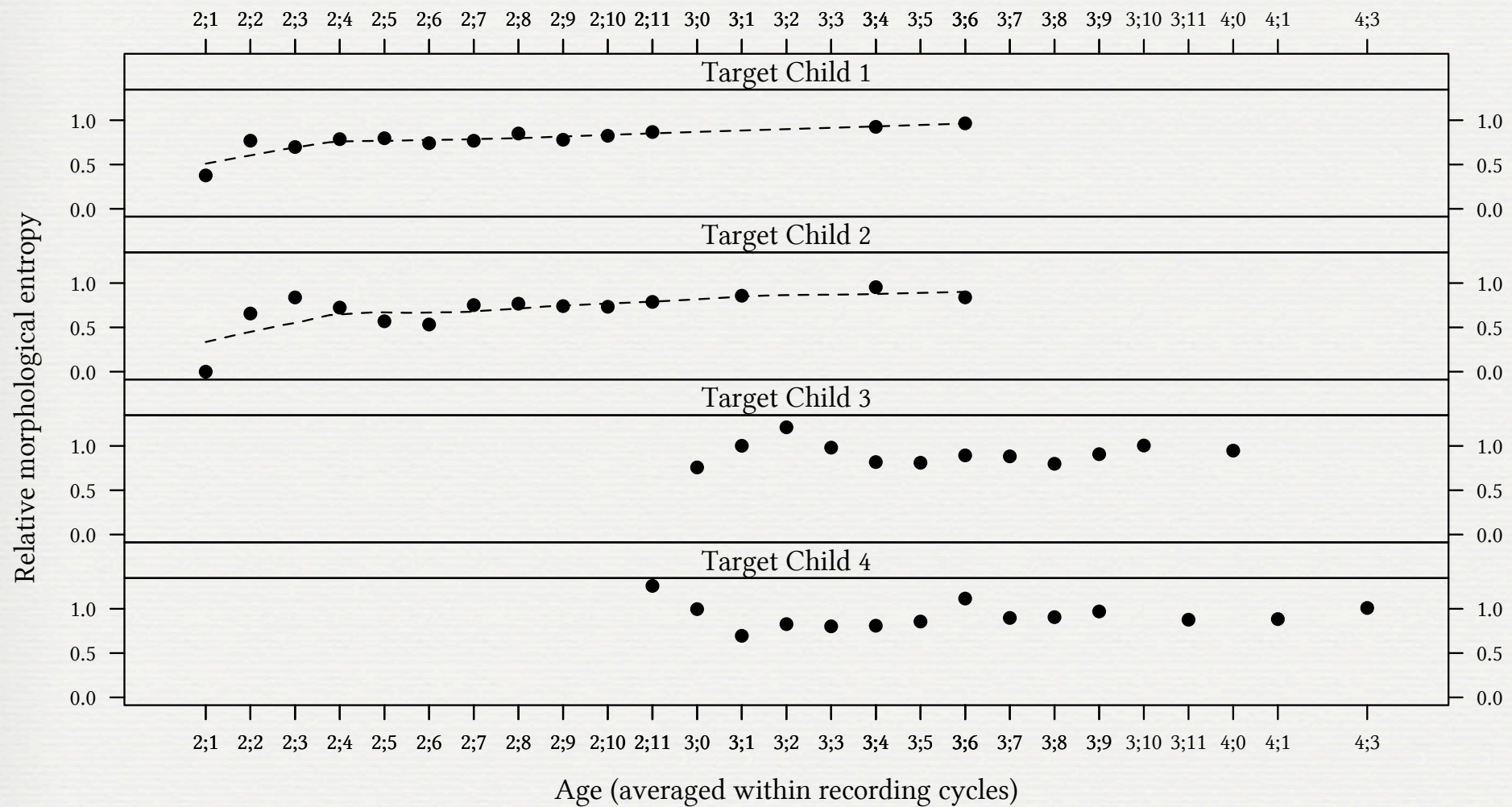
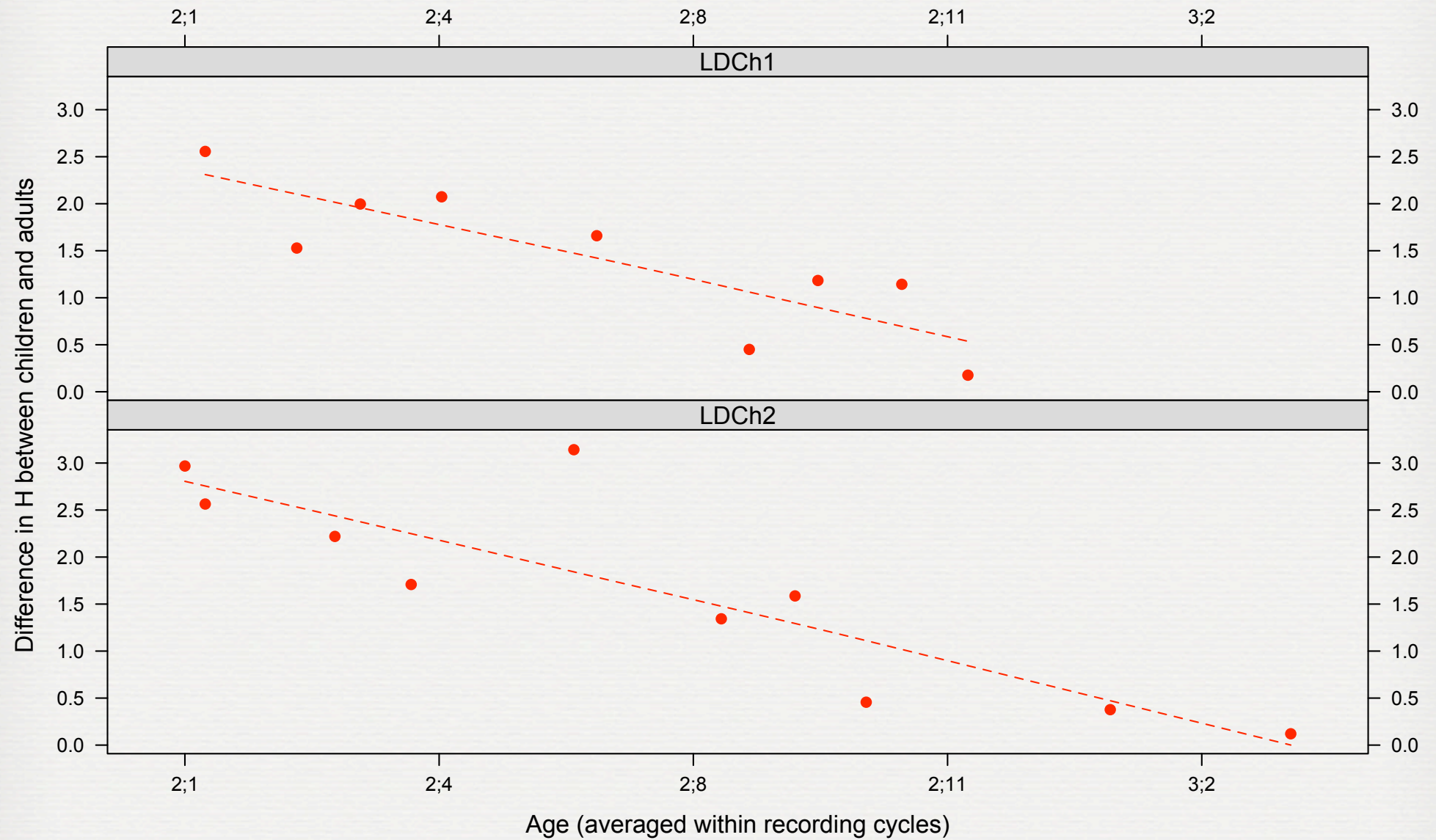



Figure 3: Children's morphology entropy relative to the morphological entropy in the surrounding adult speech



Chintang Conclusions

- Morphology (at least for Chintang) seems to be an important factor in the development of the noun-to-verb distributions: **only when the children are similar in their morphological productivity to the adults they also show a similar noun-to-verb ratio.**

Productivity or proficiency?

- productivity was assessed through relative entropy of the forms used.
- evidence that this might be only one aspect of productivity.
- Aguado-Orea (2004), Krajewski et al. (2010) showed that even though the overall distributions of the children are similar to the adult distributions (error rates of children are very low) but the system is not fully in place yet. Specific combination of errors show this.

General conclusions

- Children learning different languages differ in whether they use more nouns and verbs in their early speech. There is NO universal strategy.
- Factors in the input relevant:
 - Frequency of nouns and verbs in the input
 - Morphology
 - Saliency of nouns or verbs in an utterance
 - Teaching strategies
- No direct imitation of the distributions in the input!