

Describing typical language development in early childhood in South Africa: Harnessing local knowledge through online technologies.



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#### AIMS

1. Advance knowledge about children's language development in South African languages.

2. Develop linguistically and culturally appropriate tools to track children's language development and diagnose developmental language disorders.

3. Measure the impact of poverty and disease on neuro-cognitive development through early cognitive/linguistic assessments.

4. Improve the knowledge and skills of professionals and increase the number of experts in indigenous languages in health, rehabilitation sciences and educational settings.



#### MAJOR FOCUS: EARLY CHILD LANGUAGE DEVELOPMENT

#### AIMS

To advance knowledge about children's early language development in South African languages.

Create tools to measure early language acquisition.

Develop interventions to improve language acquisition and cognitive development in the first three years of life.

#### PROJECT

Documentation of children's typical early language development (8-30 months) in all South African languages.



#### BACKGROUND

South Africa has 11 official languages and many more unofficial ones. (Soon to be 12 - SASL)

It is not unique in its cultural and linguistic diversity, but is unusual because its indigenous people and languages do not constitute a minority.

Speech Language Pathology is a small profession and poorly equipped to serve the needs of the population due to:

- A homogenous composition (largely female, white, English or Afrikaans speaking),
- Lack of data about local people and their languages and cultures, and
- Few resources appropriate for use with the population.



#### South Africa's languages



Number of home-language speakers in 2011.

SouthAfrica-Gateway.com

#### MacArthur-Bates Communicative Development Inventory

#### Aim:

To collect data on children's language development by constructing Communicative Development Inventories (CDIs) – parent completed questionnaires about children's gesture, vocabulary and grammatical abilities – in all official South African languages: Afrikaans, siNdebele, Sepedi, Sesotho, Setswana, South African English, siSwati, Xitsonga, Tshivenda, isiXhosa and isiZulu, and in South African Sign Language.



#### What is the CDI?





Measures gestures, lexical acquisition and early grammatical development

Comprehension and production



Indirect assessment that uses carers' extensive experience with a child



MacArthur-Bates foundation – guidelines and permissions – licence 'Adaptation not translation' Been developed for almost 100 languages around

the world including

two in Kenya and two in Mozambique (Alcock et al., 2015; Vogt et al., 2015)



<u>https://mb-</u> cdi.stanford.edu/

	Copyright © 2007 Th All rights Distributed by Paul H. 1-800-638-3775 www.brookesp	-Bates CDI Sentences	
A. VOCABULARY CHECKI Children understand many in through the list and mark the example, "raffe" instead of of all the words that are use	Der Mark PART I WORDS CHI LIST more words than they say. We are particularly he words you have heard your child use. If you "giraffe" or "sketti" for "spaghetti"), mark the by many different children. Don't worry if y	Improper Marks	ease go ord (for talogue" W.
SOUND EFFECTS AND	ANIMAL SOLINDS (12)		
baa baa	O meow	O uh oh	0
choo choo	O moo	O vroom	0
cockadoodledoo	ouch	O woof woof	
	C august august	O vum vum	0
grrr	duack duack	- Junit Jan	00
grrr	duack duack	OT Jamitan	00
grrr . ANIMALS (Real or Toy	) (43)		00
grrr ANIMALS (Real or Toy alligator	) (43) O duck	O penguin	00
grrr ANIMALS (Real or Toy alligator animal	) (43) O duck O elephant	O penguin O pig	00
grrr ANIMALS (Real or Toy alligator animal ant	(43) duck elephant fish	O penguin O pig O pony	000
grrr 2. ANIMALS (Real or Toy alligator animal ant bear	(43) duck elephant fish frog	O penguin O pig O pony O puppy	0000
grrr 2. ANIMALS (Real or Toy alligator animal ant bear bee	) (43) O duck O elephant O fish O frog O giraffe	O penguin O pig O pony O puppy O rooster	00000
grrr 2. ANIMALS (Real or Toy alligator animal ant bear bee bird	) (43) O duck O elephant O fish O frog O giraffe O goose	O penguin O pig O pony O puppy O rooster O sheep	

Animal sounds	U	U/S		U	U/S	
baa baa	0	0	ouch	0	0	
choo choo	0	0	quack	0	0	
cockadoodledoo	0	0	uh oh	0	0	
grr	0	0	vroom	0	0	
meow	0	0	woof	0	0	
moo	0	0	yum	0	0	
Animals	U	U/S		U	U/S	
animal	0	0	horse	0	0	
bear	0	0	kitten	0	0	
bee	0	0	lamb	0	0	
bird	0	0	lion	0	0	
bunny / rabbit	0	0	monkey	0	0	
butterfly	0	0	mouse	0	0	
cat	0	0	owl	0	0	
chicken	0	0	penguin	0	0	
cow	0	0	pig	0	0	
deer	0	0	pony	0	0	
dog	0	0	puppy	0	0	
donkey	0	0	sheep	0	0	
duck	0	0	spider	0	0	
elephant	0	0	squirrel	0	0	
fish	0	0	tiger	0	0	
frog	0	0	turkey	0	0	

# Categories

- Sound effects
- Animals
- Vehicles
- Toys
- Food/drink
- Clothes
- Body parts
- Actions
- Describing words
- Small household items

- Small household items
- Rooms
- Furniture
- Outside things
- Places
- People
- Games/Routines
- Questions
- Places
- Time



### Why the CDI?

- Easy to use
- Large sample is possible
- Can collect data to get a sense of what is typical at different ages norms
- Value for clinical and research purposes
  - Applied: Validate **tools** for the early identification of children with language difficulties
  - Theoretical: Cross linguistic comparison; understand more about lexical development and its relationship to other domains (e.g. phonology) and modalities (e.g. gestures), syntax, language structure and environment (SES, rural/urban, and other social factors).
- No (or very few) existing language assessments for the local languages
- Language assessments urgently needed by health professionals and early child development interventions

# South African CDI Project

- Phase One (2019-2020) Southern African Communicative Development Inventories for 6 languages – Sesotho, Setswana, Xitsonga, isiXhosa, SA English and Afrikaans (funded by SADiLaR). (2 years)
- Phase Two (2020?) Southern African Communicative Development Inventories for 6 languages – Sepedi, Tshivenda, SeNdebele, SeSwati, isiZulu, and SASL (South African Sign Language). (3 years)





# Method: Main steps

#### Pre-pilot

Pilot 1

#### Pilot 2 and validation

Norming (later stage)

Every team follows exactly the same protocol

Adaptation of the CDI by three first language speakers

Focus groups to check face validity and content of first drafts (L1 speakers: parents and professionals) Audio/Video recordings of 6 children to check grammar and words in the draft CDIs for each language. 30 mintues of recorded speech per child Pilot data collection: The CDIs were administered to 80 parents / carers

- •40 participants for infants (8 to 18 months)
- •40 participants for toddlers (18 to 30 months) Rural and Urban

#### Progress – pre-pilot and pilot 1 completed

#### Pilot data collection

Construction of Pilot 2 instrument CDIs administered to 200 parents / carers 100 participants for infants (8 to 18 months)

100 participants for toddlers (18 to 30 months)

Rural and Urban

#### Validation

Audio/Video recordings of 10 children per language to validate against 5% of the CDI participants for each language

Analysis and Construction of CDI long and short forms for norming

#### Next steps



# Family Background Questionnaire

- Basic demographics (age, ethnicity, language, location)
- Caregiver information (culturally different, mother not always the primary caregiver, age, education)
- Health (pre-term birth, hearing, ear infections, etc)
- People living in the child's home (related and unrelated number of children, adults, and ages, birth order, etc)
- Socio-economic status
  - Number of rooms in the house
  - Education of parents
  - Household income
  - Food expenditure

### Results – Pilot 1

Age in Pilot 1				
INFANT				
	Minimum	Maximum	Mean	Standard Deviation
Afrikaans	9	22	14.15	3.417
isiXhosa	7	18	13.10	3.482
SAE	8	24	15	4.022
Sesotho	9	21	14.12	3.119
Xitsonga	8	18	12.60	2.739
TODDLER				
Afrikaans	19	37	26.93	4.894
isiXhosa	16	30	22.67	4.358
SAE	15	34	25.35	6.720
Sesotho	16	34	24.88	5.110
Xitsonga	13	36	23.10	5.334

### Gestures, actions and phrases - examples

Extends arm to show you something he/she is holding

Extends his/her arms upward to signal a wish to be picked up

Gestures "hush" by placing finger on lips

Greets "hello" with their hand by waving, shaking hands, or another "hello" greeting such as doing a fist bump or a thumbs up.

Nods head "yes"

Points (with arm and index finger extended) at some interesting object or event

Reaches out and gives you a toy or some object that he/she is holding

Requests something by extending arm and opening and closing hand

Shakes head "no"

 Actions with objects
 C

 Have you seen the child do, or try to do, any of the following?
 C

 Blow to indicate something is hot
 C

 Brush teeth
 C

 Comb or brush own hair
 C

Drink from an open cup containing liquid

Clap you	ur hands
Come h	ere / Come on
Daddy/r	mommy's home
Do you	want more?
Don't de	o that
Don't to	buch
Get up	
Give it t	o mommy
Give me	e a hug
Give me	e a kiss

#### Gestures and phrases (8-18 months)



Age

### Cultural adaptations

- Waves hello became Greets with the hand (by waving, handshake, thumbs up or whatever is culturally appropriate)
- Plays peekaboo became Plays a hiding game (by hiding their face or body behind their hands or something else)
- Push in buggy became Push in pram or carry on the back
- Vacuum/hoover was removed and added as an alternative to sweeping

#### Vocabulary





Age

# Choosing words to include in Pilot 2:

Using frequency, correlation with age, and with sca

- Correlation with age p <.05 INCLUDE
- Does not correlate with scale at < .3 EXCLUDE
- High frequency > .9 EXCLUDE (But 2-3 high frequency words retained for the youngest infants)
- Low frequency < .1 and correlation with age p > .05 EXCLUDE



# Included in version Pilot 2

- Baa
- Brr
- Choo choo
- Woof
- Yum yum
- Ant
- Bee
- Puppy
- Snake
- Aeroplane
- Ambulance
- Taxi
- Apple
- Jam
- Mealie pap

- Sugar
- Eye
- Face
- Hand
- Phone
- Lady
- Man
- Wait
- Bite
- Know
- Look
- Open
- All
- Yes
- Can

### Words excluded on version – Pilot 2

- Quack
- Owl
- Zebra
- Turtle
- Wolf
- Puzzle
- Avocado
- Jelly
- Nut
- DVD
- Fan

- Heater
- Pavement
- Helicopter
- Fire engine
- Zoo
- Picnic
- Movies/Cinema
- No ducks in dry country?

### Grammar

- West Germanic languages English and Afrikaans
- Bantu languages
  - Nguni family Xhosa, Zulu, Ndebele, Swati
  - Sotho family Sesotho, Sepedi, Setswana
  - Tswa-Ronga Tsonga
  - Venda isolate
- Bantu languages noun class system
  - Mother cooks
  - Umama uyapheka; Abafana bayadlala; Umfana wami uyadlala; Ibhola yami
  - Noun classes differ in number between languages

### Grammar – general questions

• ZA01 We use certain sounds or certain beginnings in words for example u-bhabha, u-mama, um-ntwana. Has your child started to use these sounds or these beginnings?

### Grammar – noun class prefixes

In each group of words, please tell me what is most similar to what your child is talking about now. (Sesotho)

ZB01 woman sadi

osadi

mosadi

ZB02 boys

shemane

ashemane

bashemane

#### Grammar - structure

	In which way does your child speak?
ZB09	after your child kicks a ball, which word would they use?
	l kicked
ZB10	if someone opens a door, what would your child say?
	opened
ZB11	if the child doesn't want something, what would they say?
	don't want

Ngwana wa hao o bua ka tsela efeng?
Ha ngwana wa hao a qeta ho raha bolo, a ka sebedisa lentswe lefeng?
raha
rahi
rahile
Ha motho emong a ka bula lemati, ngwana wa hao a ka reng?
bula
bulile
butse
Ha ngwana a sa batle se itseng, a ka reng?
batle
ha batle
ha ke batle

### MLU – Mean Length of Utterance

ZC01	Has the child begun to combine words such as "dog bite" or "want food"?
	Not yet
	Sometimes
	Often
	[If the child is not combining words into sentences, do not go any further.]
	Please give me three of the longest sentences that you've heard the child say this week
ZC02	example 1
ZC03	example 2
ZC04	example 3

#### Sentence complexity

In each group of words, please tell me what is most similar to how your child is talking now. If your child has a long or more difficult sentence on the two, choose the last one.

want tea

I want tea

I want more tea

I want more tea exclamation

turn off the lights

turn off the lights I am sleeping

turn off the lights I want to sleep

Don't touch

don't touch car

do not touch the car

tea hot

tea is hot

that tea is hot

I want bread

I want bread AND a drink

Dihlopheng tsa dipolelo tse latelang, kgetha eo ngwana wa hao a ka e buang hajwale. Ha ngwana wa hao a bolela dipolelo tse telele ho feta tsena, kgetha karabo ya ho qetela (e qetellong)

batla metsi ke batla metsi nna ke batla metsi nna ke batla metsi mama tima lebone tima lebone ke ya robala tima lebone ke batla ho robala o ska tshwara o seke wa tshwara o seke wa tshwara koloi tee tjhesa tee e ya tjhesa tee ena e ya tjhesa ke batla borotho

#### Sentences/grammar



#### Challenge – Language variation



### Pilot 2



#### LanguageARC



Your Name

Scientific Name Urocyon cinereoargenteus

CommonGrey fox; Mainland Gray Fox; North AmericanNameGray Fox; Tree Fox

Start Stop

Submit	Skip	Report	

# Scientific impact

- Build on the work of pioneers in language acquisition in Southern African languages (e.g., Demuth, 1989; Smouse, 2003; Tsonope, 1987)
- How language, cross-cultural factors and environment impact language development
  - Language structure
  - Caregiver-child interaction (language input and elicitation)
  - Rural vs urban, SES, caregiver age and education
- New insights from understudied languages and cultures
- New insights on practices of language socialization and their impact
- Language assessments, language acquisition in multilingual language contact contexts

# Applied impact

- Norming data for typical development: <u>prevent over- and</u> <u>underdiagnosis</u>
- Development of <u>more refined language measurement tools</u> using the CDI to validate
- Reliable measurement tools and remedial resources (online)
- Reach more <u>professionals</u> and <u>primary healthcare services</u>, <u>NGOs</u>, etc.
- Child healthcare <u>HIV exposed children</u> and other diseases as well as <u>children in poverty</u>
- <u>Early diagnosis</u> and remediation of children <u>better life</u> <u>outcomes</u>
- More <u>indigenous knowledge on language and culture</u> in training curricula
- Increase the number of mother tongue African language experts
- Provide <u>equal</u> speech therapy services to <u>all</u> South Africans



### Conclusion



We are undertaking Africa's first large-scale, multilingual language acquisition project in South African languages with hearing and Deaf infants and toddlers



We will have a large database on child language development, collected with comparable instruments – the first ever in Africa and for these under-researched languages



This will allow for decolonisation of undergraduate and postgraduate curricula on child language acquisition in South Africa



We would have trained a new generation of scholars who are diverse in many respects



CDI Team at a Scientific Workshop 3<sup>rd</sup> -7<sup>th</sup> June 2019 University of Cape Town

- We have involved organisations across South Africa, including: University of Cape Town, Stellenbosch University, Sefako Makgato Health Sciences University, University of Kwa-Zulu Natal, and ECD NGOs.
- We co-operate with colleagues at the University of Botswana.
- We consult with experts in other countries (England, Norway, Sweden, USA).
- The team is multidisciplinary, with staff and students from Speech Therapy, Linguistics, African Languages and Psychology.

# Acknowledgements

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- IRSES Marie Curie European Union

SARChI Migration, Language and Social Change – Rajend Mesthrie

#### LDC - UPenn