Determinants of School Readiness in South African Preschoolers

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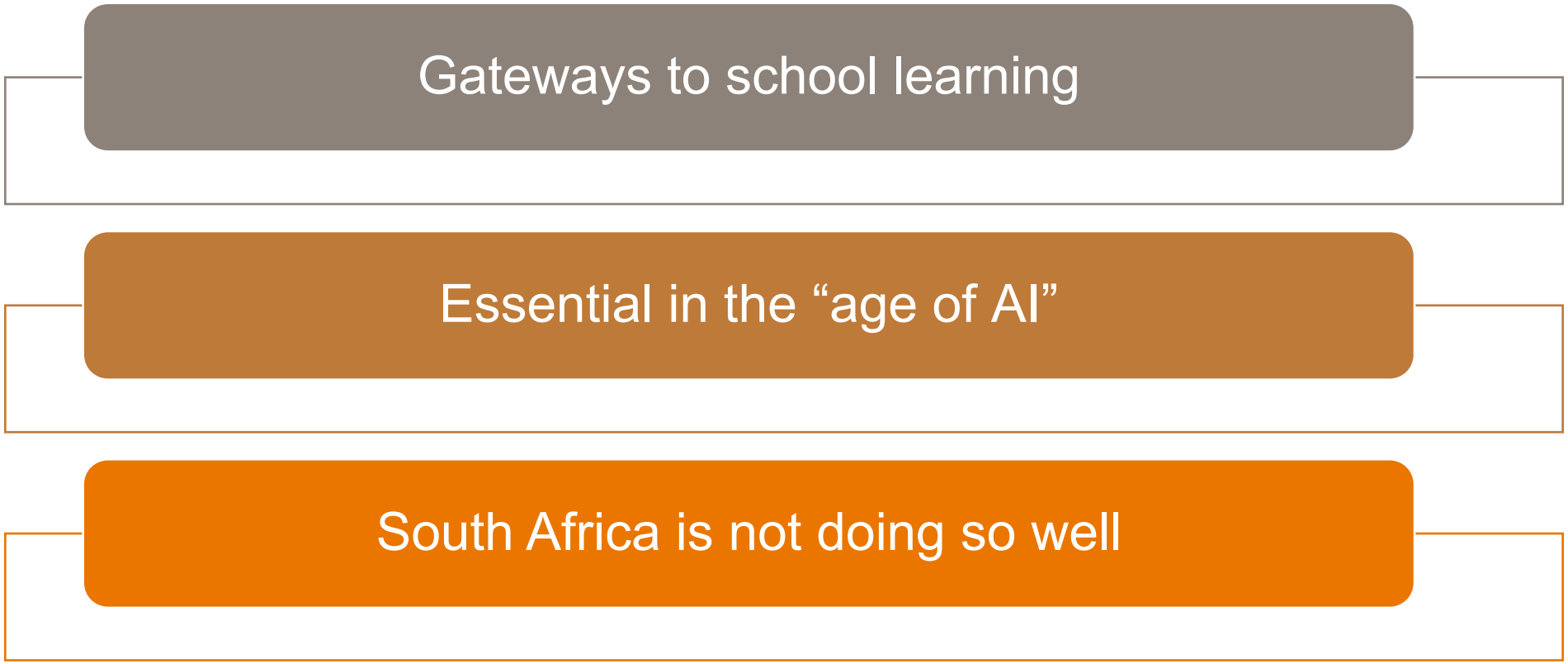
Our Works In South Africa

Cognition lab at U. Johannesburg

- Longitudinal study of mathematical development
- Cross-cultural study of mathematical development in South Africa and UK
- Neuroimaging study of bilingualism on mathematical learning
- Neuroimaging study of fraction understanding in children and adults

Prof Elizabeth Henning

Why Numeracy And Literacy



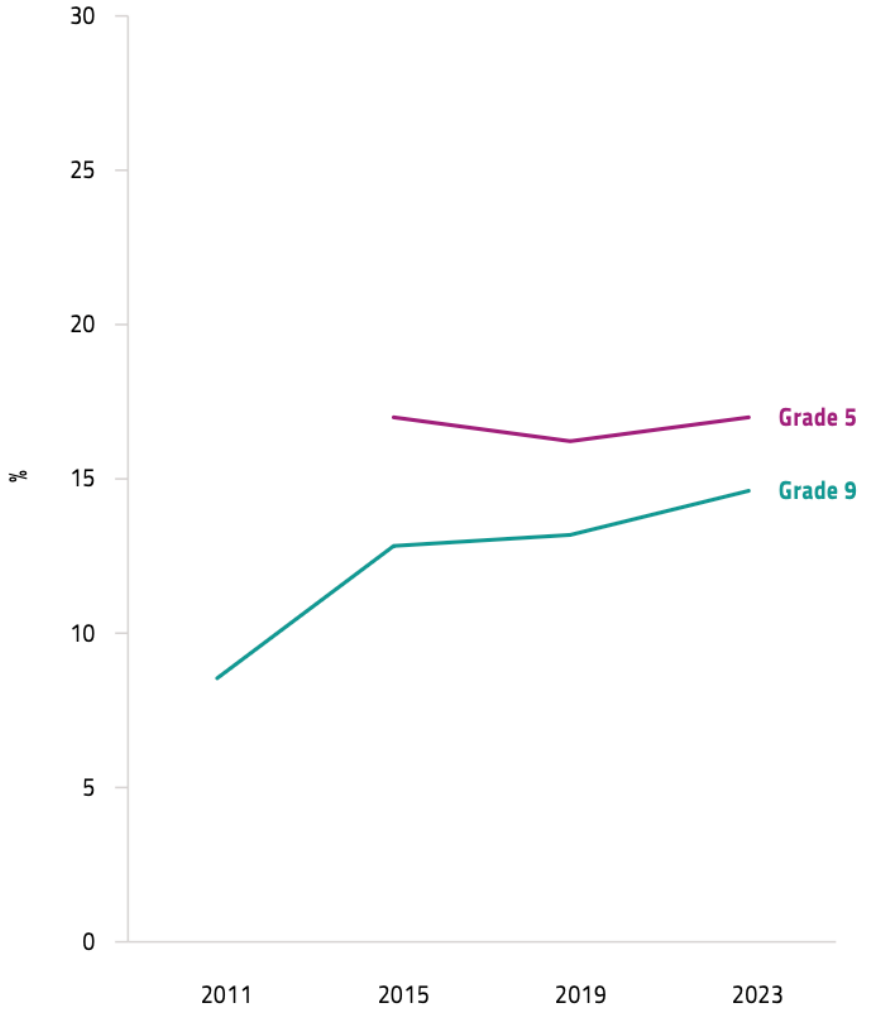
Numeracy Problems

Trends in International Mathematics and Science Study (TIMSS):

Below 20% are performing at their grade level.

In South Africa, the percentage of grade 5 students who achieved minimum proficiency in mathematics has not changed in 8 years

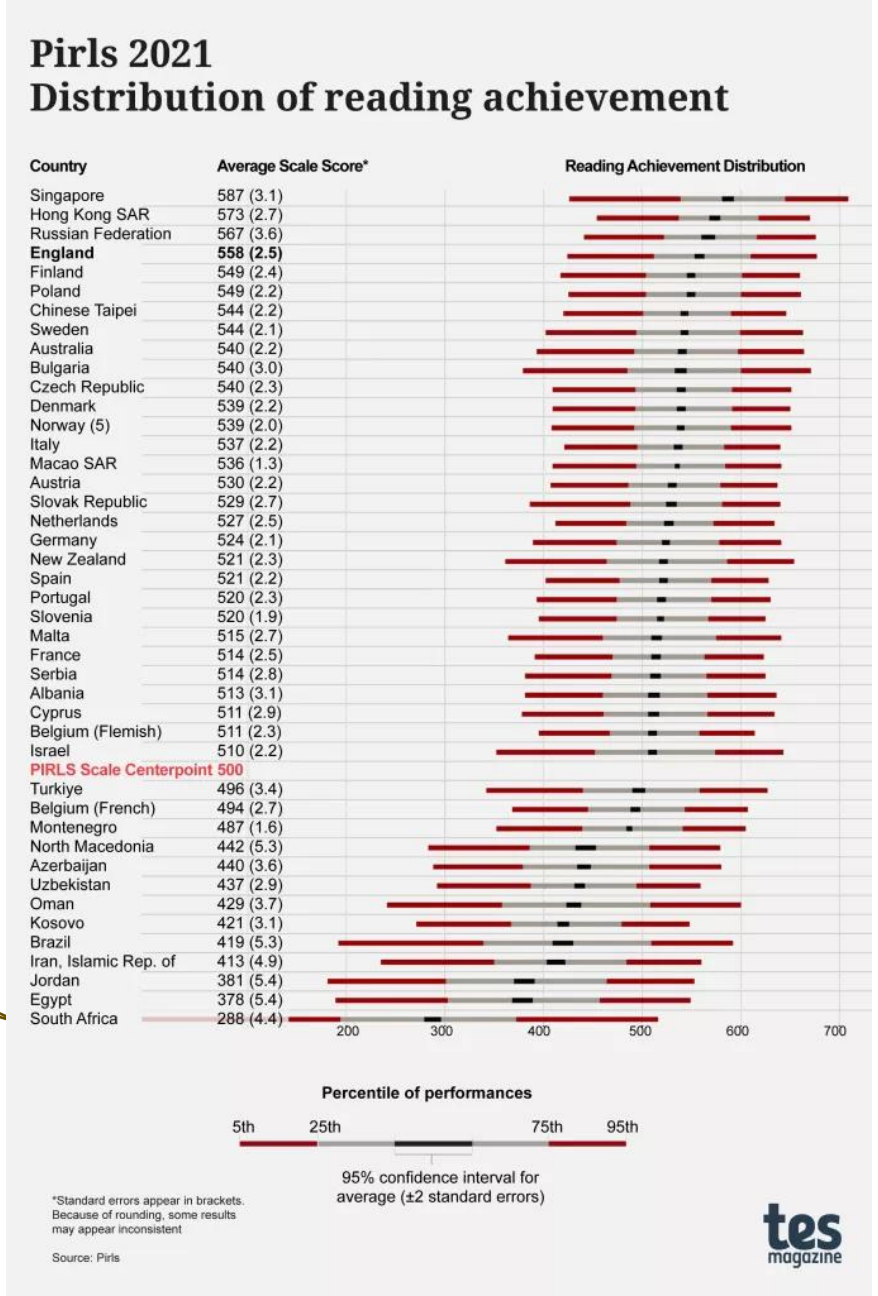
Share of grade 5 and 9 students who achieved the intermediate benchmark in mathematics, 2011–23



Literacy Problems

Progress in International Reading Literacy Study (PIRLS):

Below 20% are performing at their grade level.



What To Do

‘If you don’t get early years right, children are unlikely to catch up’: why South Africa is trying to reboot its school system

With 80% of 10-year-olds unable to read for meaning, the government is prioritising literacy and numeracy among pre-school pupils as it tackles its education problems

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About this content

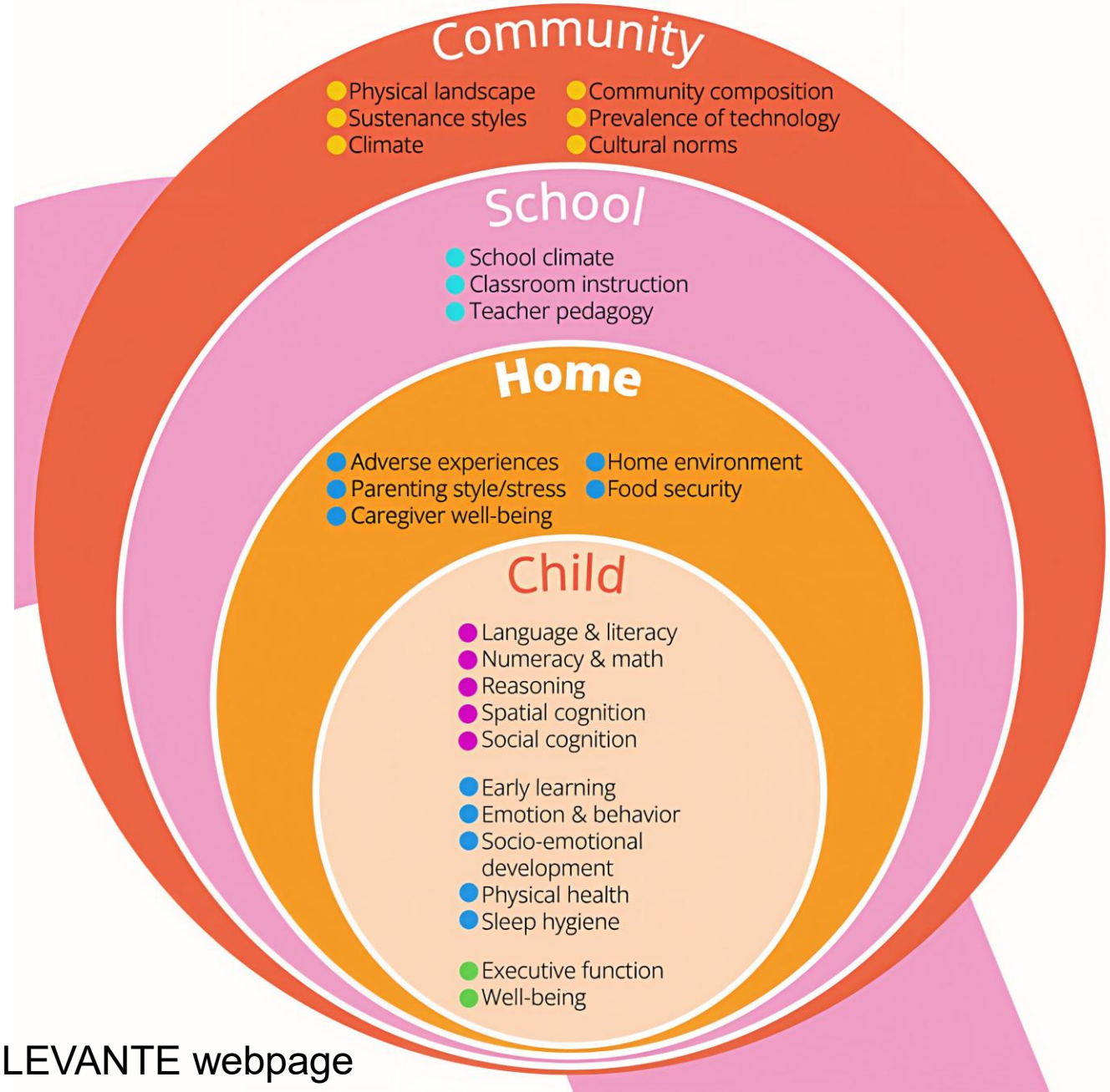
Rachel Savage *in Soweto*

Tue 11 Mar 2025 06.00 GMT

Research Question

Which factors determine school readiness (numeracy & literacy) in South African preschoolers?

Potential Factors – Bronfenbrenner's social-ecological model

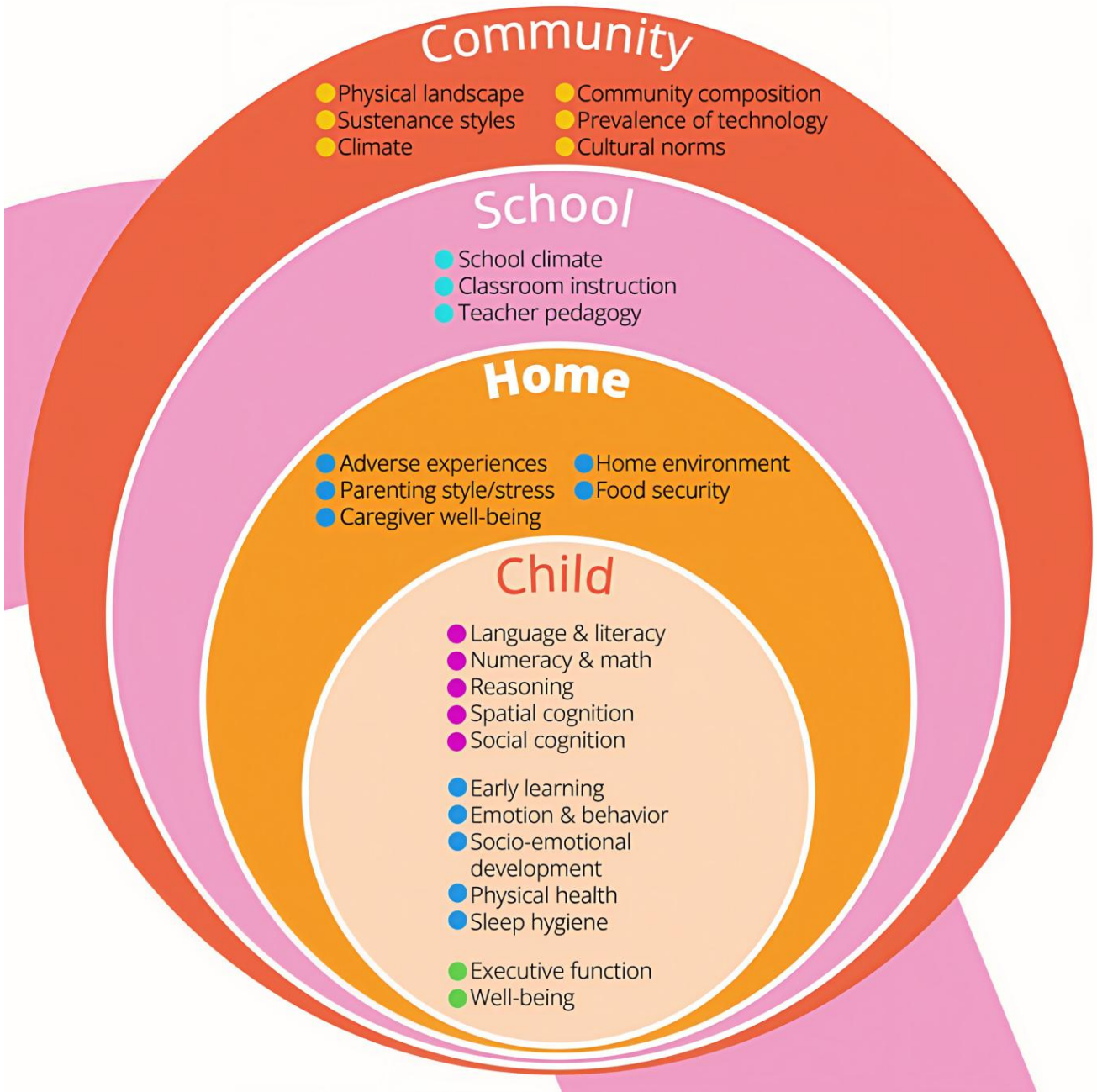


LEVANTE webpage

Research Question

Which factors influence numeracy and literacy readiness for school?

- Child: Individual capacities
- Home: Learning environment
- School: Learning program



Methodology

432
Wards visited, across nine provinces.
Reaching 11% of all wards in South Africa

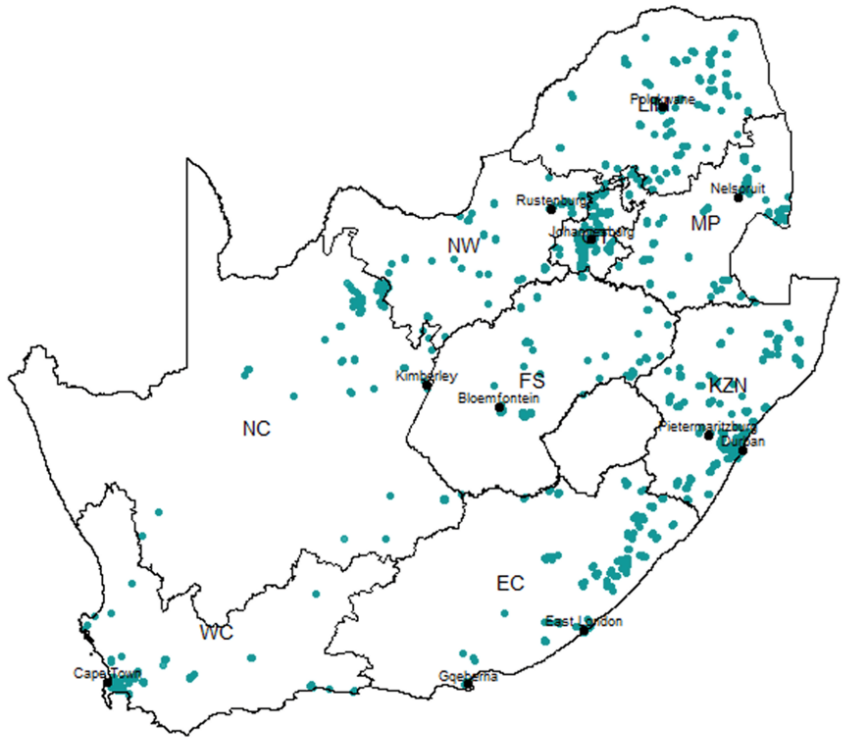
5,000+
Enrolled children assessed. A nationally representative snapshot of developmental status at age four

22,000+
Households visited to identify 4-year-old children not enrolled in an ELP.

250+
Non-enrolled children assessed. Including children outside formal early learning programmes

4,000+
Primary caregivers interviewed. Gaining insight into children's home environments, caregiving practices, and daily routines

1,300+
ELPs observed and assessed. Evaluating programme quality, daily practices, and staffing realities on the ground



Map of ELPs included in the 2024 Index

Analytical Approach

Mixed Multivariate Logistic Regression Model

It predicts the odds ratio (OR) of an event happening vs. not happening for each predictor, while adjusting for the other predictors.

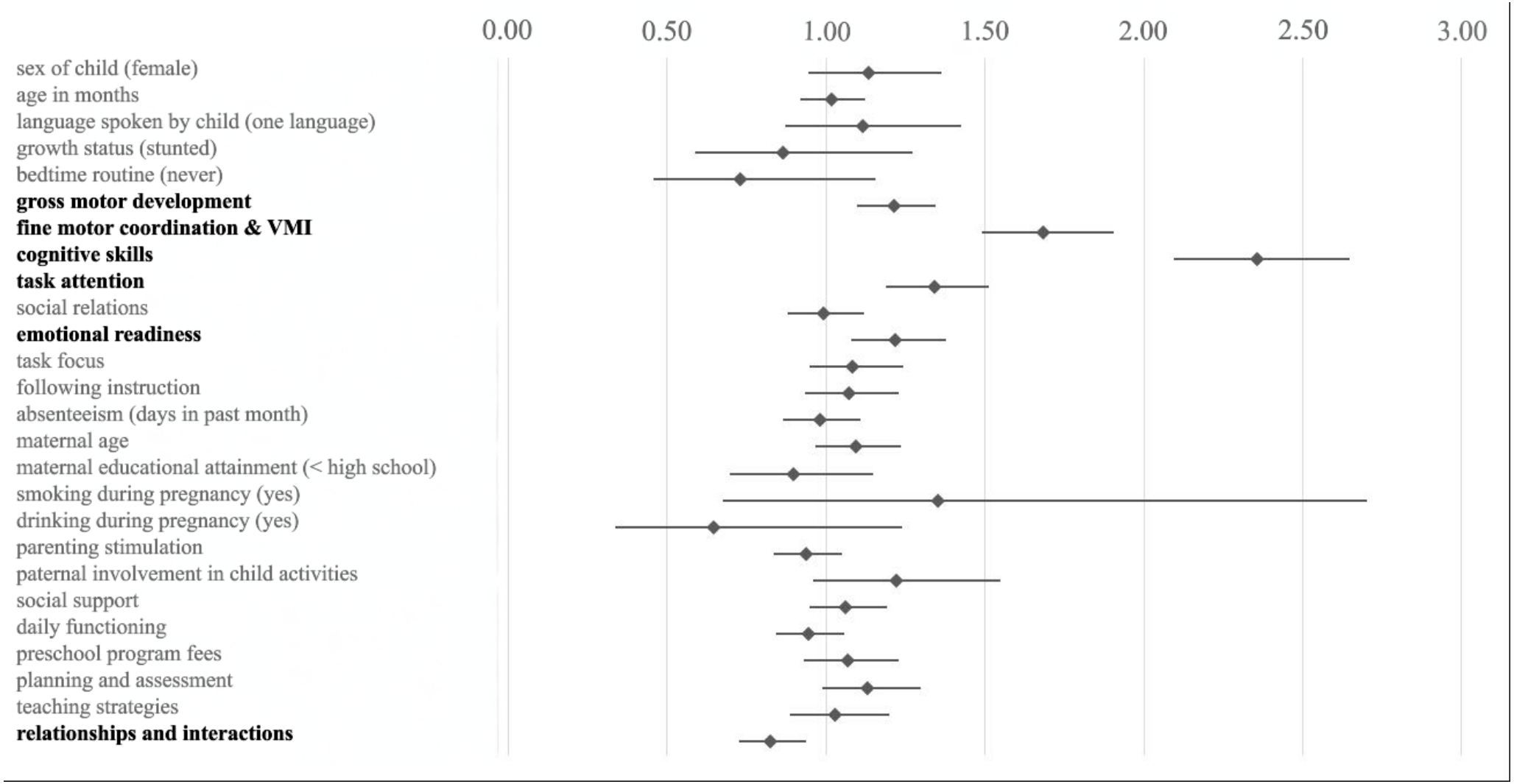
For example: OR of age for being on track vs. not on track in numeracy or literacy.

OR can be transformed to Probability = OR/(OR+1)

OR of age = 1 means (1/(1+1) = 0.5 (50% or 50-50) for being on track
OR of age = 3 means (3/(3+1) = 0.75 (75% or 25% higher chance) for being on track

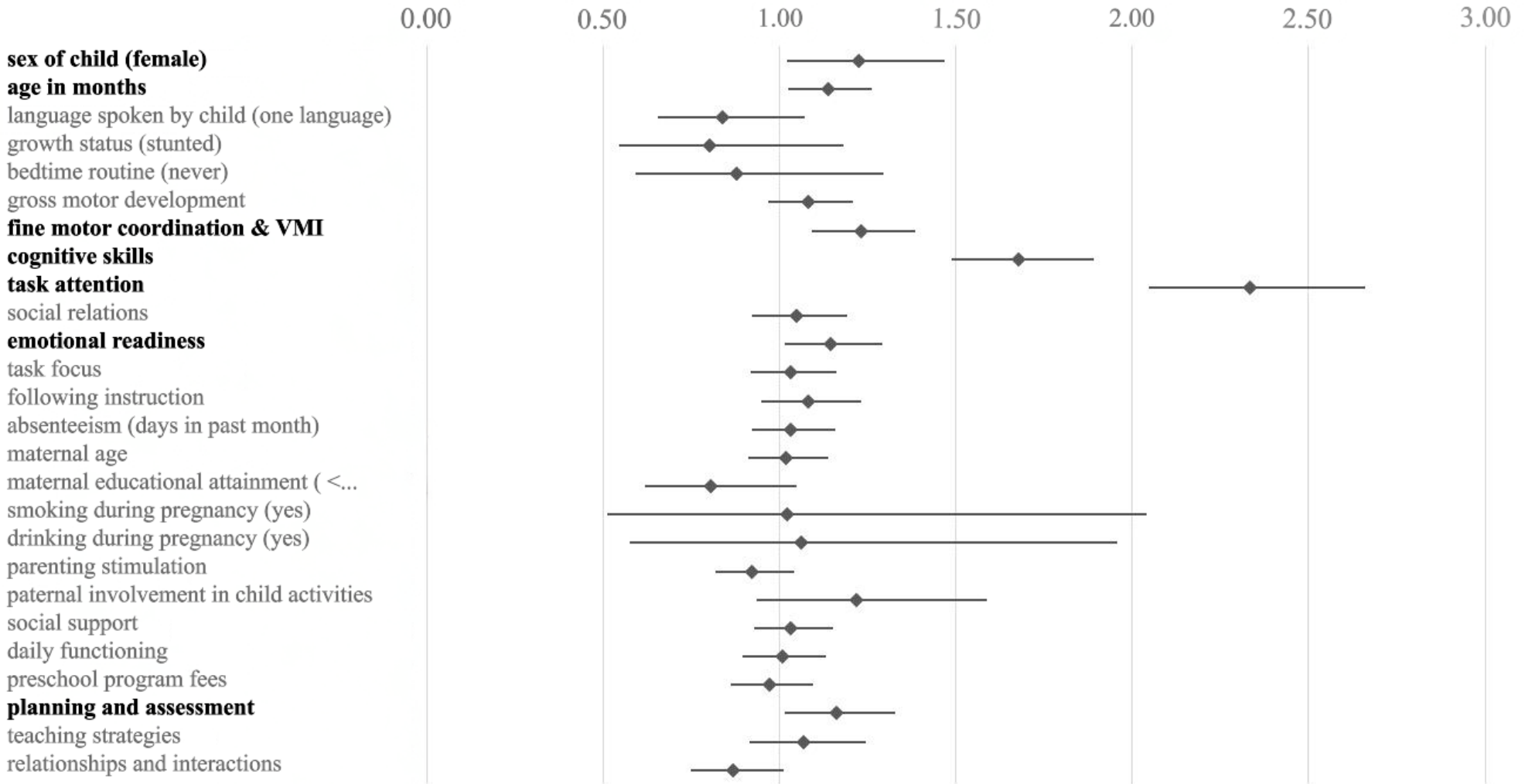
Findings – Numeracy

26% of being on track for numeracy



Findings – Literacy

25% of being on track for literacy



Findings

How to read the results: For example, better fine motor skills predict being on track for both numeracy and literacy.

		Numeracy	Literacy
Child	sex of child (female)		✔
	age		✔
	language spoken by child		
	growth status		
	bedtime routine		
	gross motor development	✔	
	fine motor coordination & VMI	✔	✔
	cognitive skills	✔	✔
	social relations		
	emotional readiness	✔	✔
	task attention	✔	✔
	task focus		
	following instruction		
	absenteeism from childcare		
Home/Family	maternal age		
	maternal educational attainment		
	smoking during pregnancy		
	drinking during pregnancy		
	parenting stimulation		
	paternal involvement in child activities		
	social support		
	daily functioning		
School	preschool program fees		
	planning and assessment		✔
	teaching strategies		
	relationships and interactions	✔	

Sex

Being female was associated with a higher likelihood of being on track for literacy, but not for numeracy.

This aligns with global literature suggesting that language and literacy development may advance slightly earlier in girls.

Age

Older age was associated with a higher likelihood of being on track for literacy, but not for numeracy.

It suggests the sensitivity of these skills to maturation within the preschool period.	Literacy develops more naturally in young children, whereas numeracy requires more direct instruction.	This seems to be important as about 53% are on track for literacy, but only 33% on track for numeracy.

Gross Motor Development

Predictive of being on track for early numeracy, but not literacy.

It aligns with the sensorimotor perspective and embodied cognition.

It suggests numerical cognition is associated with body movements in space rather than solely abstract symbol manipulation.

Fine Motor Coordination & VMI

The second strongest predictor of being on track for both literacy and numeracy.

It emphasises the practical link between eye-hand coordination (e.g., holding a pencil, tracking with a finger) and a child's capacity to engage with written letters and numerical symbols.

Cognitive Skills

The most salient predictor of being on track for both early numeracy and literacy.

This age is a milestone for development of executive functions (e.g., memory and impulse control).

They have been frequently shown to be essential the development of early numeracy and literacy before school entry.

Emotional Readiness

Predictor of being on track for both literacy and numeracy.

Emotional security helps children express needs, manage feelings, and engage effectively in classroom interactions and learning tasks.

Task Attention

Predictor of being on track for both early numeracy and literacy.

A child's ability to maintain focus, persist distractions, and show interest during learning activities plays a crucial role in learning outcomes.

Planning and Assessment

Predictor of being on track for early literacy only.

It highlights the importance of structured teaching that responds to children's developmental needs.

Relationships and Interactions

Predictor of not being on track for numeracy.

It includes relationships with the teacher and somehow contradicts the literature.

It may refer to good "friendship" which might be related to distraction rather than learning in the classroom.

What about home and families?

They are not influential!

70% of South African parents are worried about their role in children's education (UNESCO).

It seems that parents are aware of their potential roles, though they overestimated the child's skills.

We need to provide training for parents (social media, ECD centres).

What about ECDs?

They are a bit influential!

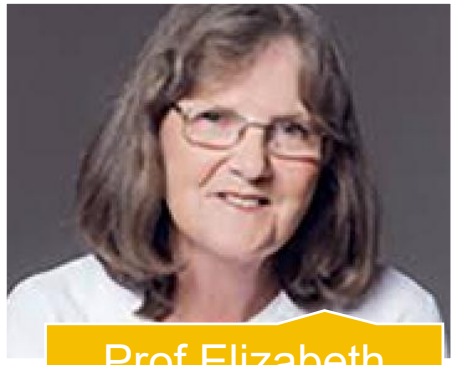
There is no alignment in curricula, textbooks, teacher guides and assessments (UNESCO).	More evidence like TB5 is needed to help revisiting those materials (e.g. direct and indirect training).	Regular low-cost training for practitioners and assessment of their knowledge and performance helps.

Thanks for your attention.

Dr Parvin Nemati

Dr Gabrielle Garon-Carrier

Annie Lemieux



Prof Elizabeth Henning

If you are interested in collaboration or have questions or comments, please get in touch

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