Benchmarking early grade reading skills in Nguni languages

Cally Ardington, Nangamso Mtsatse & Gabrielle Wills

Joint work with Elizabeth Pretorius, Nicola Deghaye, Nompumelelo Mohohlwane, Alicia Menendez and Servaas van der Berg

UNIVERSITEIT iYUNIVESITHI STELLENBOSCH UNIVERSITY 100 1918·2018

RESEP Research on Socio-Economic Policy

NORC at the University of Chicago

basic education
Department: Basic Education
REPUBLIC OF SOUTH AFRICA

SALDRU Southern Africa Labour and Development Research Unit

University of Cape Town · iYunivesithi yaseKapa · Universiteit van Kaapstad

Report funders

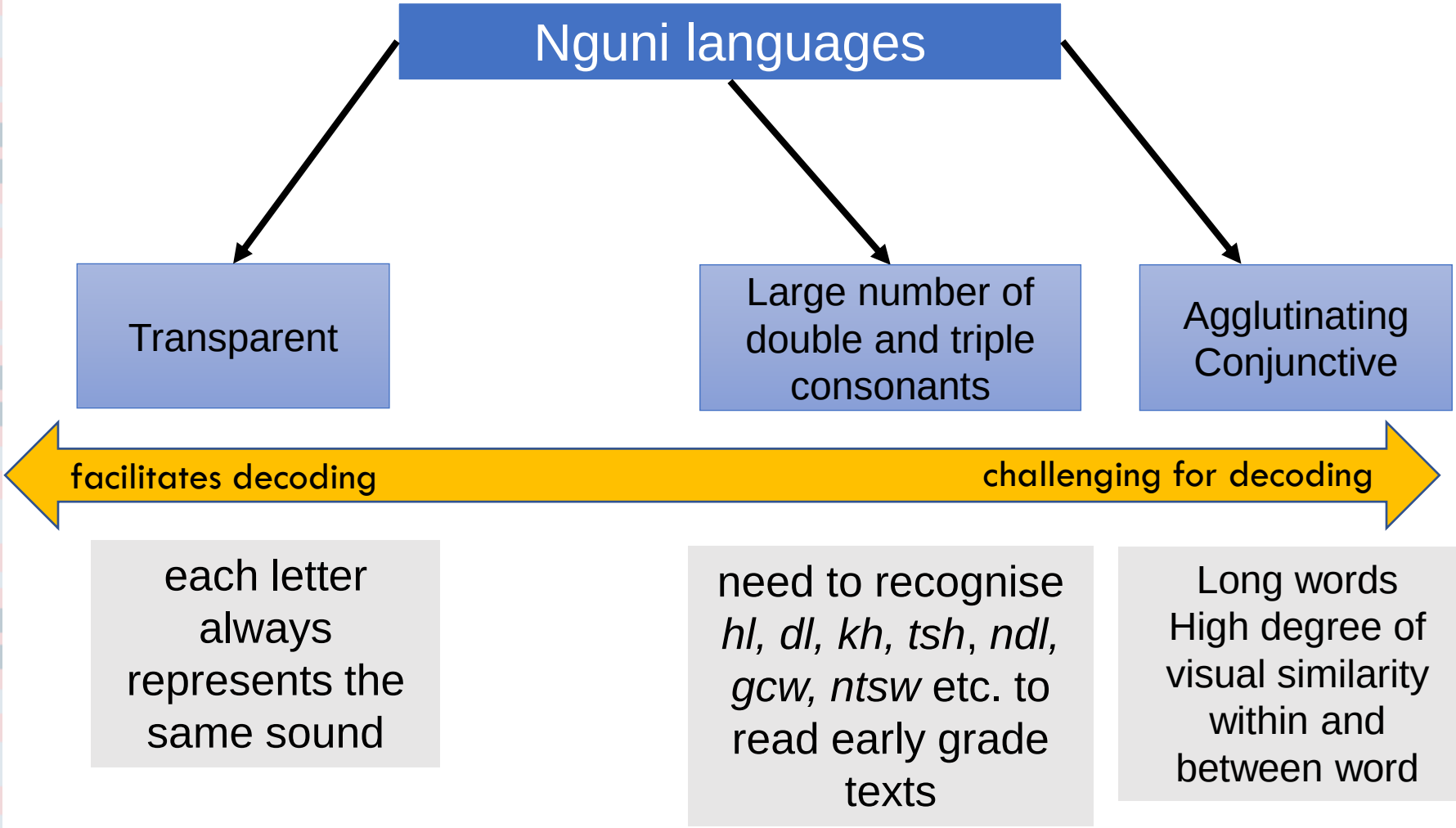
Research jointly supported by the ESRC and DFID

Funders of EGRA studies used as data for this report

Research jointly supported by the ESRC and DFID

A) Background

Why do we need language specific benchmarks?



How do we set benchmarks?

- Which skill is benchmarked and the level are which it is set is determined by **data**
- Based on exploratory analysis of largest existing early grade reading assessment data for Nguni languages
- Makes **no assumptions** about the accuracy-speed and fluency-comprehension relationships for each language
- Sensitive to current realities of learning
- Cognisant of curriculum requirements
- Grounded in theoretical understanding of reading development

What data did we use?

- Collated 5 studies collecting early grade reading assessment data between 2017 and 2019
- Almost 16,400 unique learners in more than 660 schools
- Three Nguni languages - siSwati, isiXhosa, isiZulu

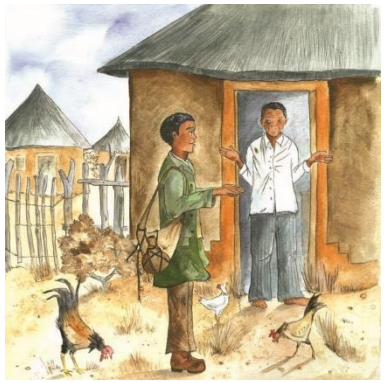
Characteristics:

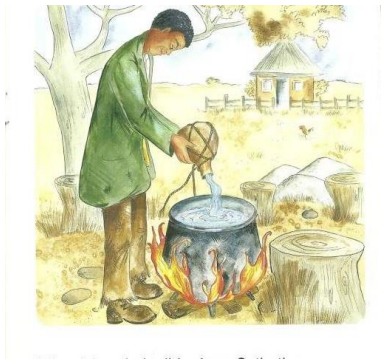
Four provinces - Eastern Cape, KwaZulu-Natal, Gauteng , Mpumulanga

99% Quintile 1 to 3 schools

86% rural schools

98% of learners were tested in a Nguni language which matched the Foundation Phase LOLT in their school and their home language





Isobho Lamatshe

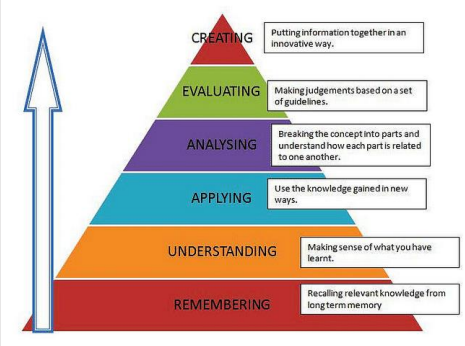
Kukhona isihambi esilambe kakhulu.
Sahamba sicela emizini yabantu. Abantu babengenakho ukudla.
Isihambi sathola isu. Isihambi sathola ibhodwe.
Sathatha amatshe sawafaka ebhodweni. Sathela amanzi. Sabasa umlilo, sabeka ibhodwe eziko.
Sama salinda ibhodwe laze labila.
Kwafika intombazane yacela ukwazi ukuthi siphekani isihambi eziko.
“Ngipheka isobho elimnandi lamatshe. Kodwa kumele ngilifake into ukuze linongeke,” kusho isihambi.
“Nginezaqathe mina,” wabe esenika isihambi. Sazifaka ebhodweni.

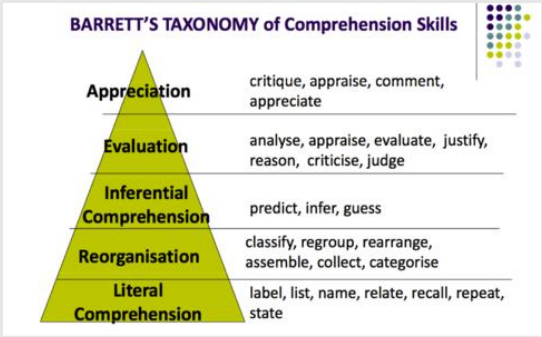
Example questions:

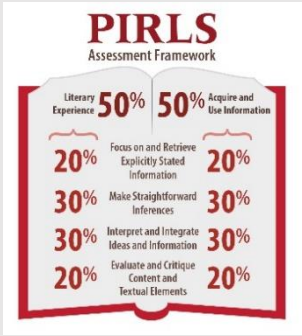
Yini indaba izakhamuzi zazingasiniki sihambi ukudla?
[Why did the village residents not give the traveller any food?]

Senzani isihambi gamatshe?
[What did the traveller do with the stones?]

Various taxonomies of comprehension: We focus on PIRLS







PIRLS classifications:

i) Focus on and Retrieve Explicitly Stated Information

ii) Make Straightforward Inferences

iii) Interpret and Integrate Ideas and Information

iv) Evaluate and Critique Content and Textual Elements

Proportion answering each question correctly, examples from our EGRA data

Note: This is for learners attempting all questions

Notice the wide range of difficulty *within* the **literal** questions.

Some **literal** questions are more challenging than **inferential** questions.

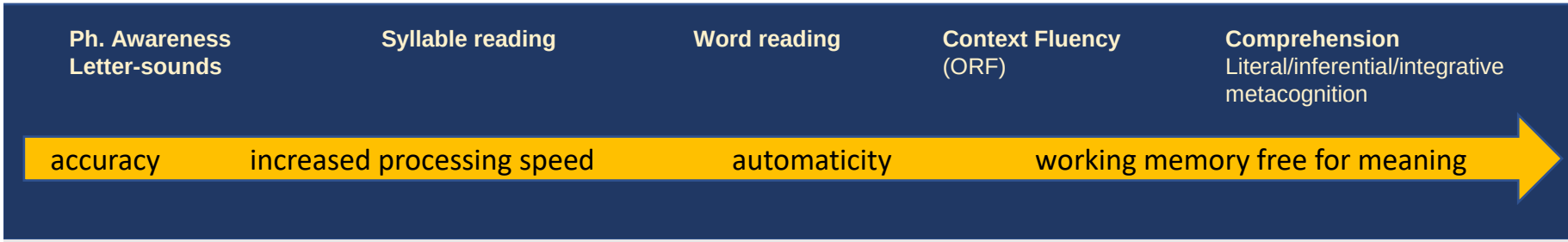
I.e. there is a wide range of difficulty within comprehension process, and no clear ordering between processes.

Similar result to PIRLS

B) Establishing benchmarks

Data driven but grounded in theory

- Details in technical report
- Reading comprehension is a complex phenomenon with different processes come into play as reading proficiency increases.
  - Within each process, accuracy tends to develop first followed by speed.
  - We explicitly analyse both **accuracy** and **speed** and their interrelationship.



Our analytical approach aligns with the **decoding threshold hypothesis** put forward by Wang et al. (2019)

- Until decoding occurs above a lower bound threshold level, reading comprehension is unlikely to develop/remain stagnant.
- There may also be an upper threshold, beyond which there are no additional gains in comprehension for increased decoding skills.
- Suggests that the relationship between fluency & comprehension will break down at low and high levels of fluency.

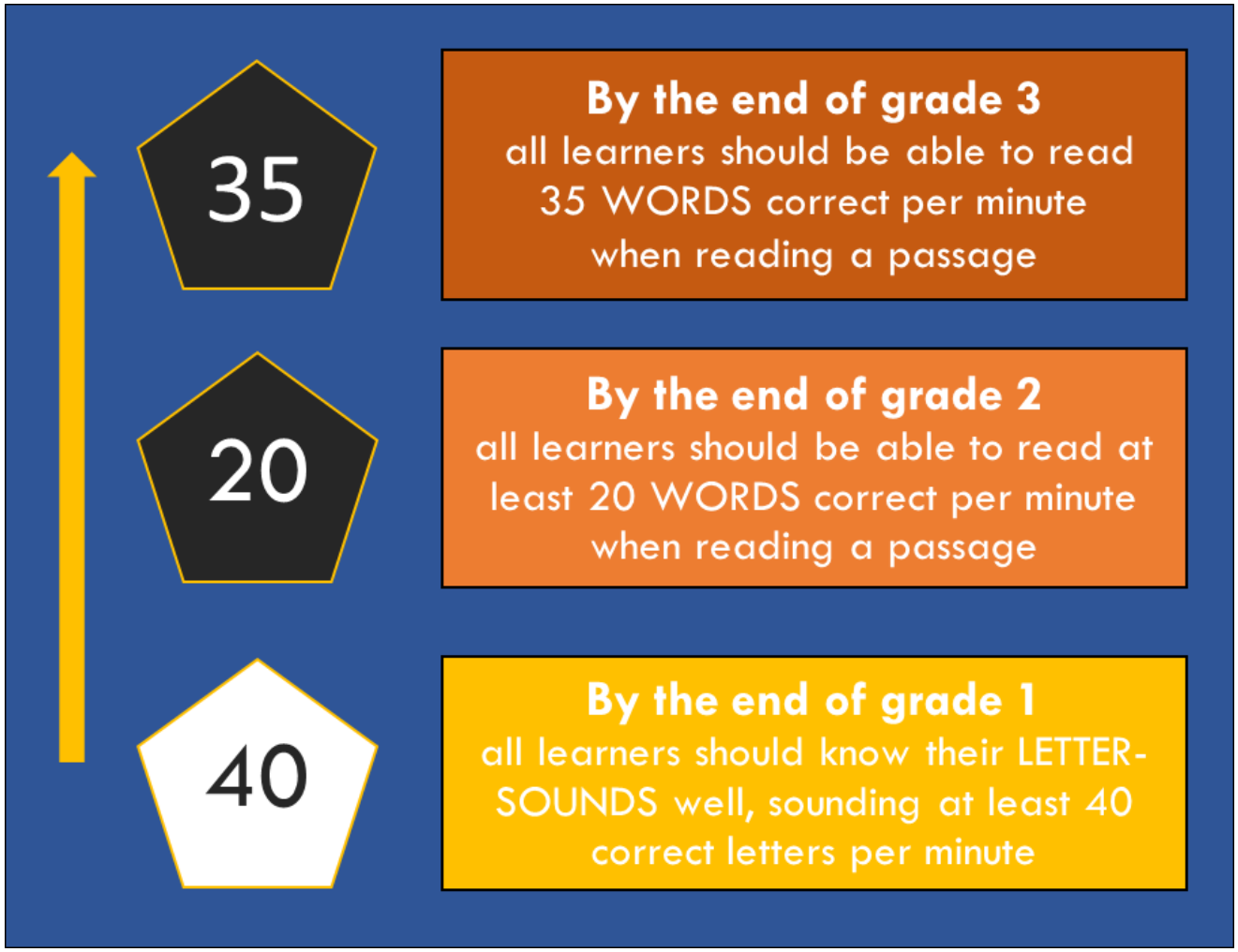
Which skills do we benchmark?

- **Letter-sound knowledge** which refers to alphabetic knowledge of the written code

- **Oral reading fluency** (ORF) refers to the ability to read words in context with speed, accuracy and prosody.

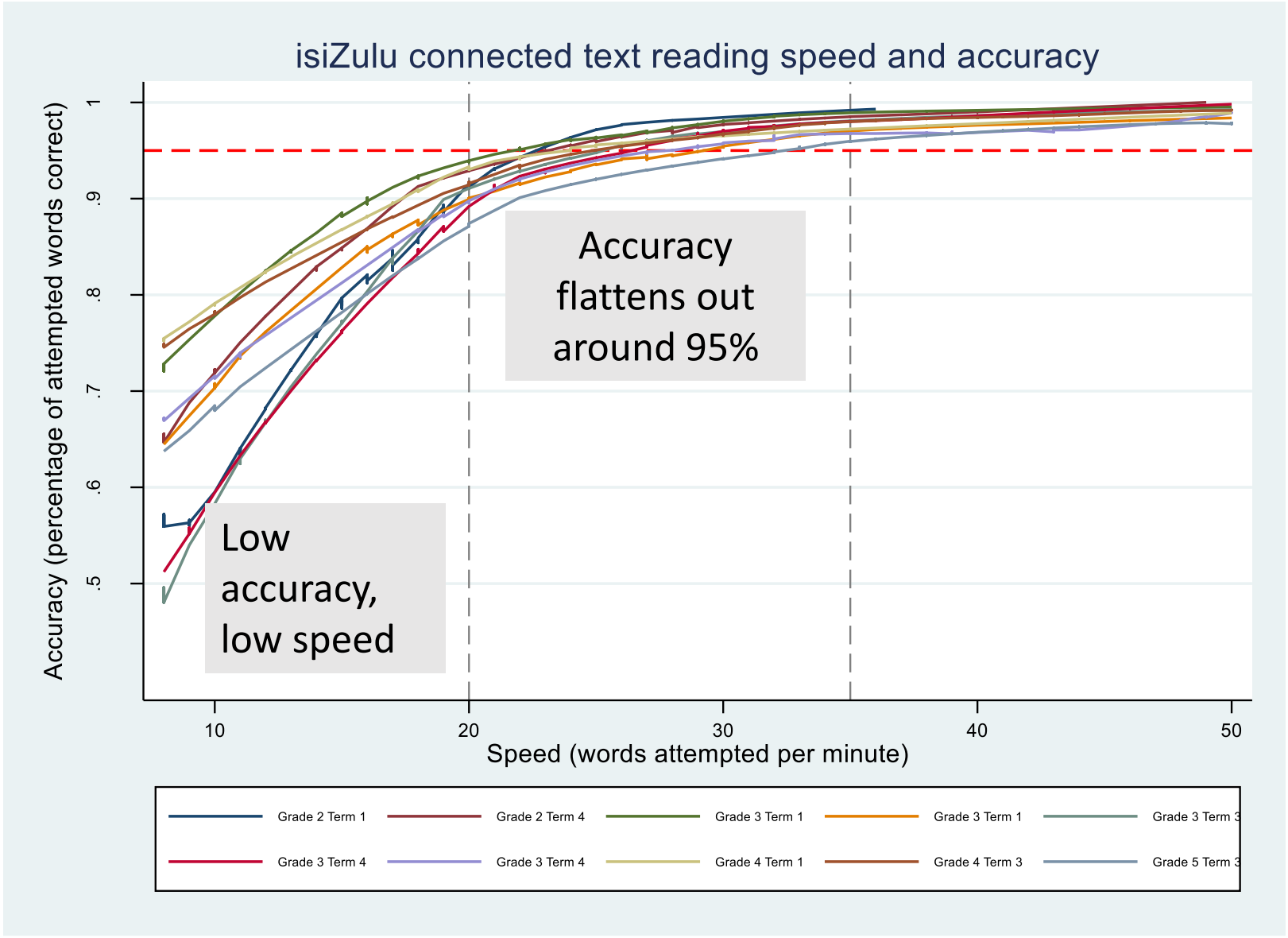
Accuracy*	Speed*	Prosody
• The percentage of words that are read correctly	• The number of words that are attempted in a time period	• How natural reading sounds (how it conforms to speech rhythms & intonation patterns & reflects punctuation conventions

What are the thresholds/ benchmarks?

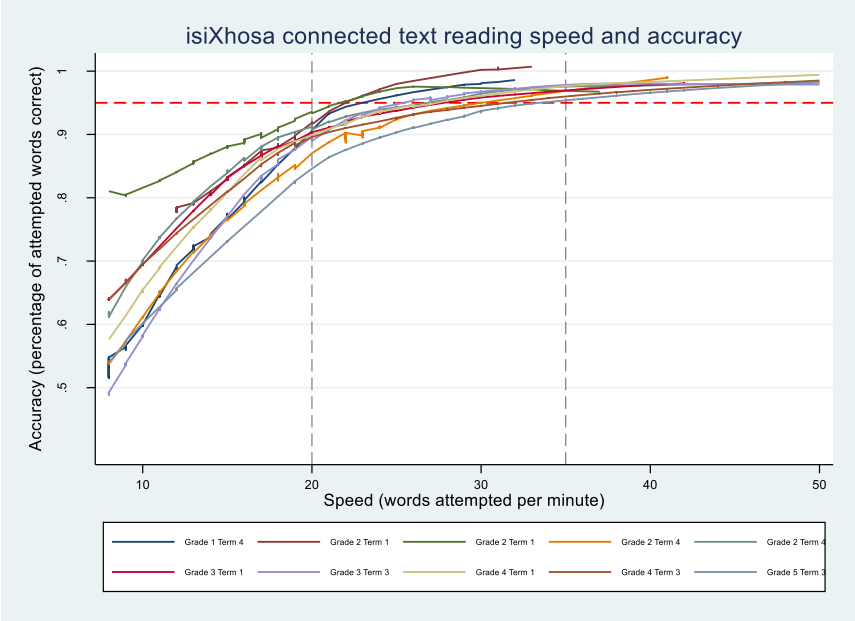


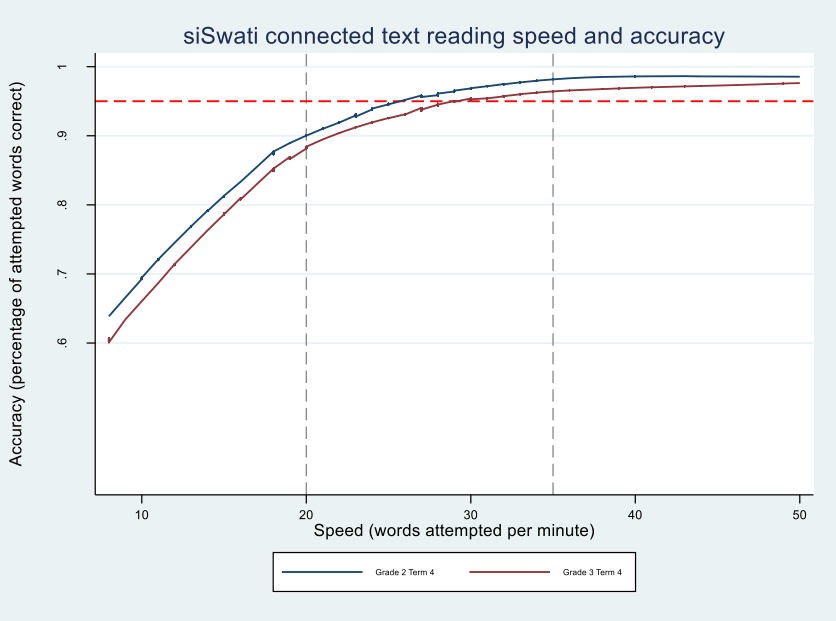
C) Establishing fluency thresholds and benchmarks

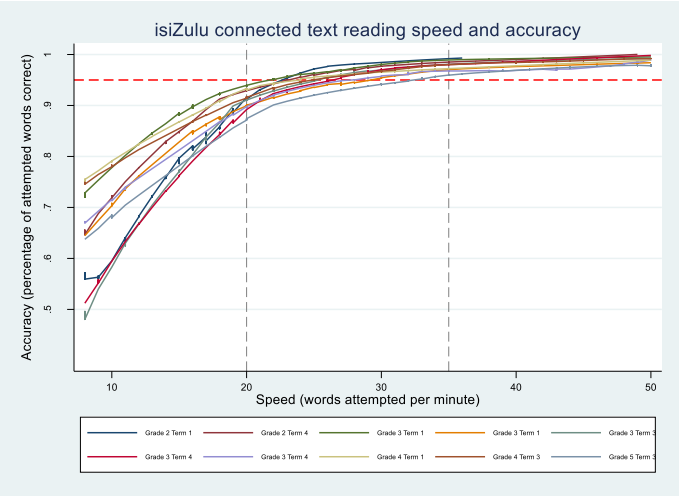
How are accuracy & speed related?



What does the speed-accuracy relationship look like across languages?



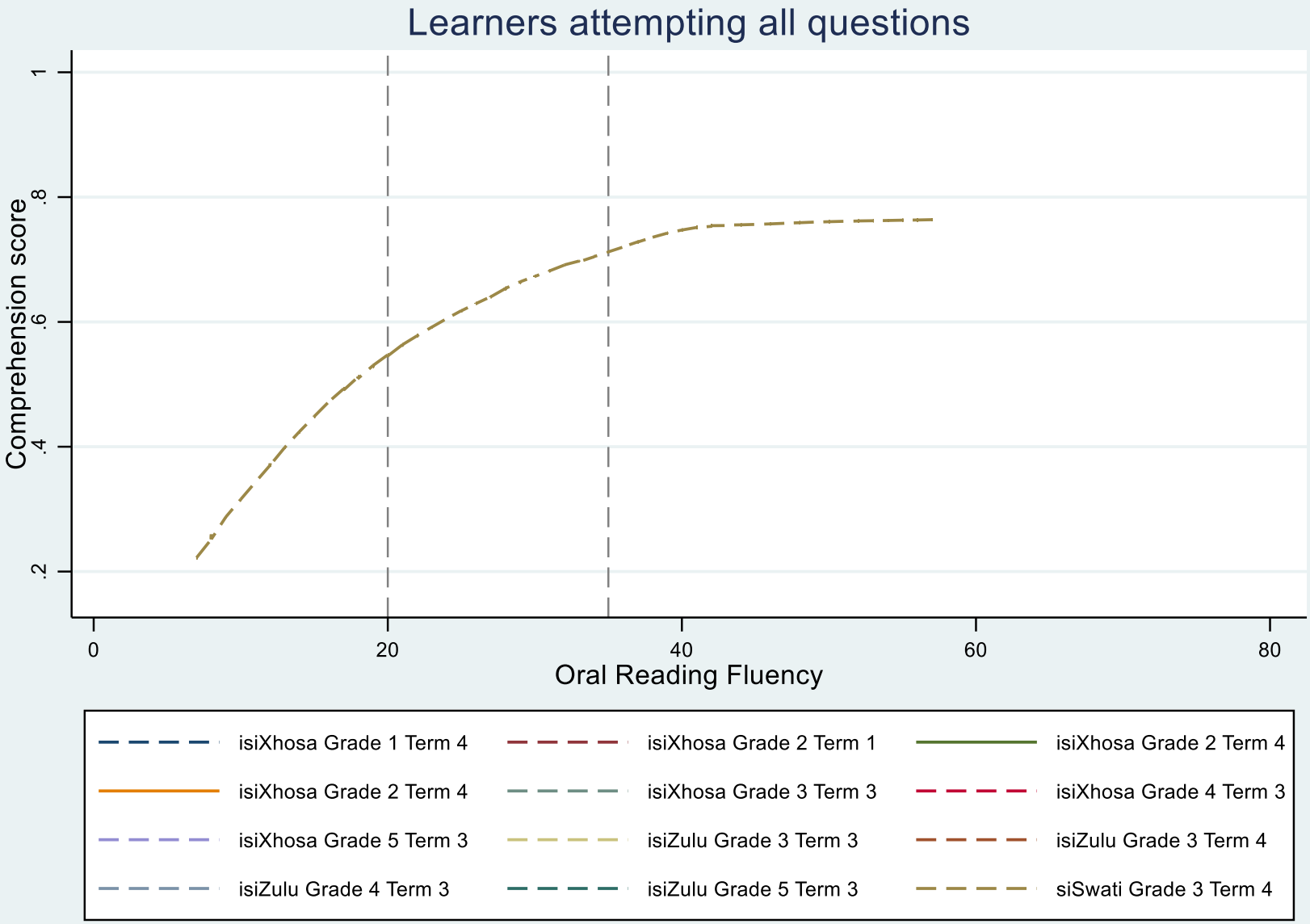




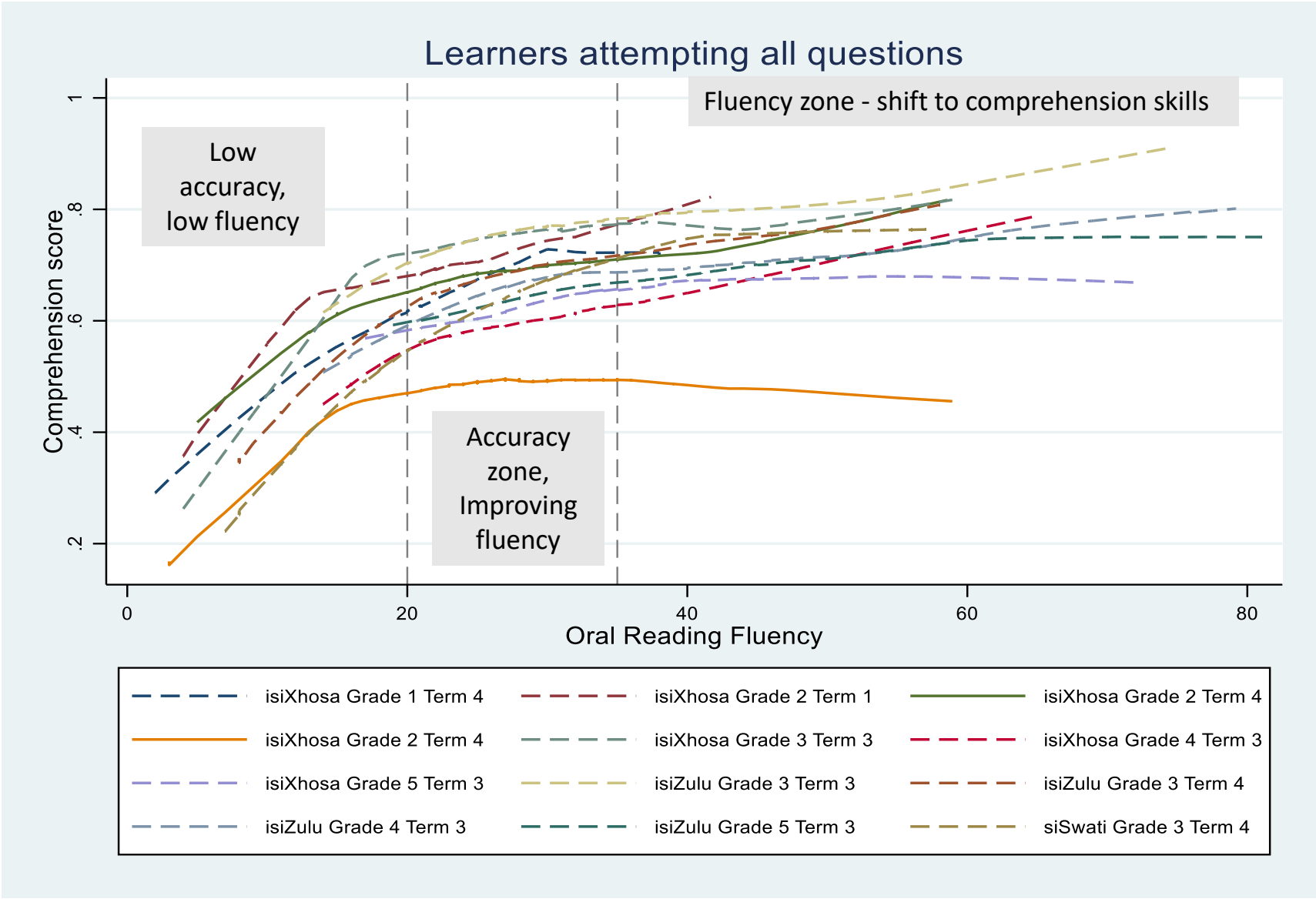
Across all the samples, accuracy of 95% is associated with speeds ranging from 22 to 34 words per minute

What about slow but accurate readers?
By the end of Grade 3, between 90% & 97% of accurate readers are reading faster than 20 words per minute

What is the relationship between fluency & comprehension? (1)



What is the relationship between fluency & comprehension? (2)



What is the learner profile in each reading zone?

Reading classification zones provide meaningful distinctions in accuracy and comprehension across learners

	isiXhosa	isiZulu	siSwati
Cannot read one word: ORF=0			
Mean correct letter-sounds per minute	12.8	10.8	18.3
% unable to sound one letter	12%	20%	10%
Below lower threshold: ORF=1-19 cwpm			
% with at least 95% accuracy	19%	25%	19%
Comprehension (% of total correct)	21%	18%	21%
Comprehension (% of attempted correct)	47%	51%	32%
Meets lower threshold: ORF=20-34 cwpm			
% with at least 95% accuracy	71%	78%	76%
Comprehension (% of total correct)	46%	46%	53%
Comprehension (% of attempted correct)	65%	73%	62%
Meets benchmark: ORF=35+ cwpm			
% with at least 95% accuracy	87%	90%	84%
Comprehension (% of total correct)	59%	62%	74%
Comprehension (% of attempted correct)	73%	78%	74%

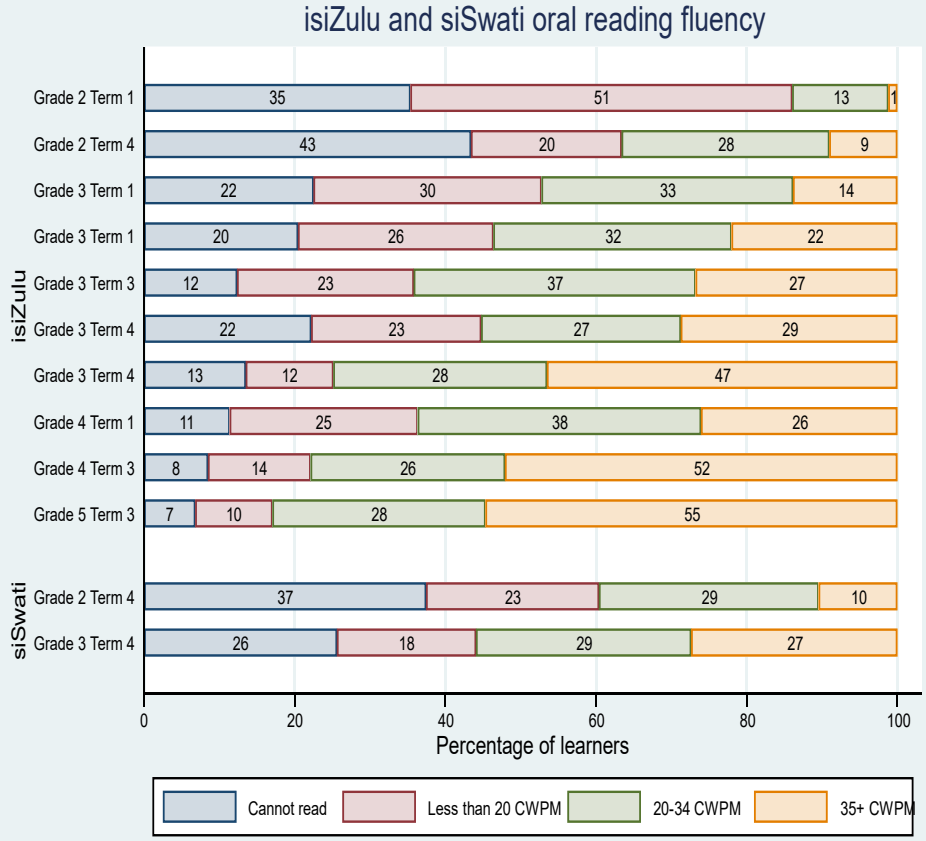
Low letter-sound knowledge

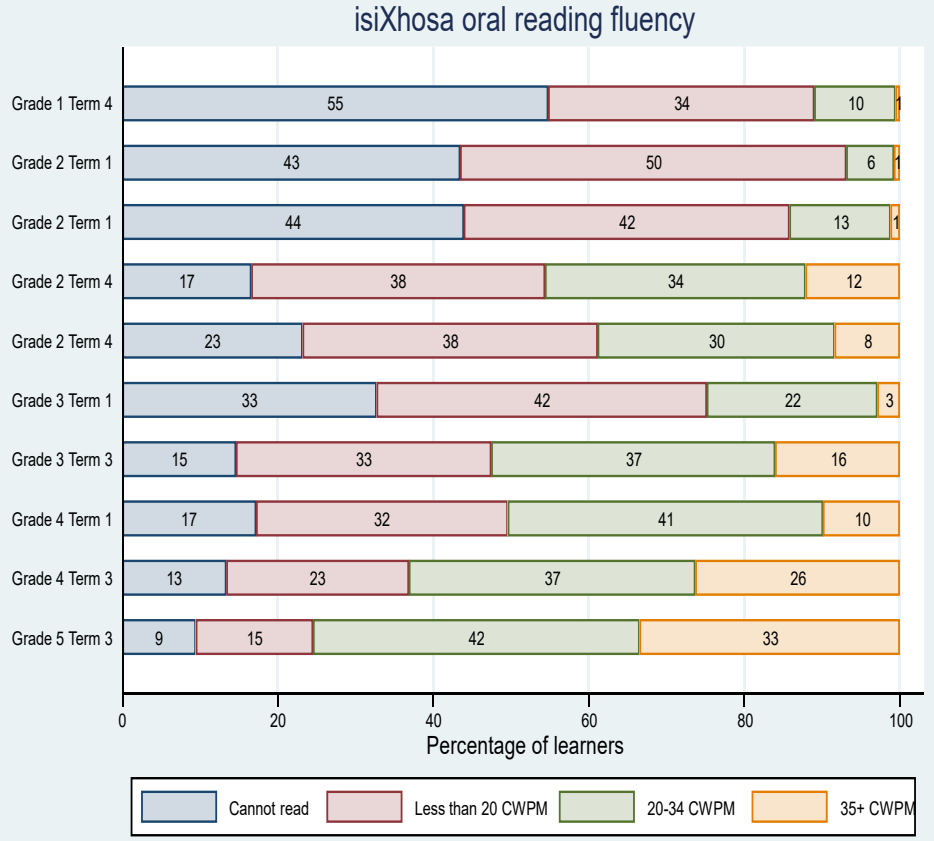
Low accuracy, low comprehension

Developing accuracy, emergent comprehension

Developed accuracy, developing comprehension

How many learners are currently reaching the threshold and benchmark?





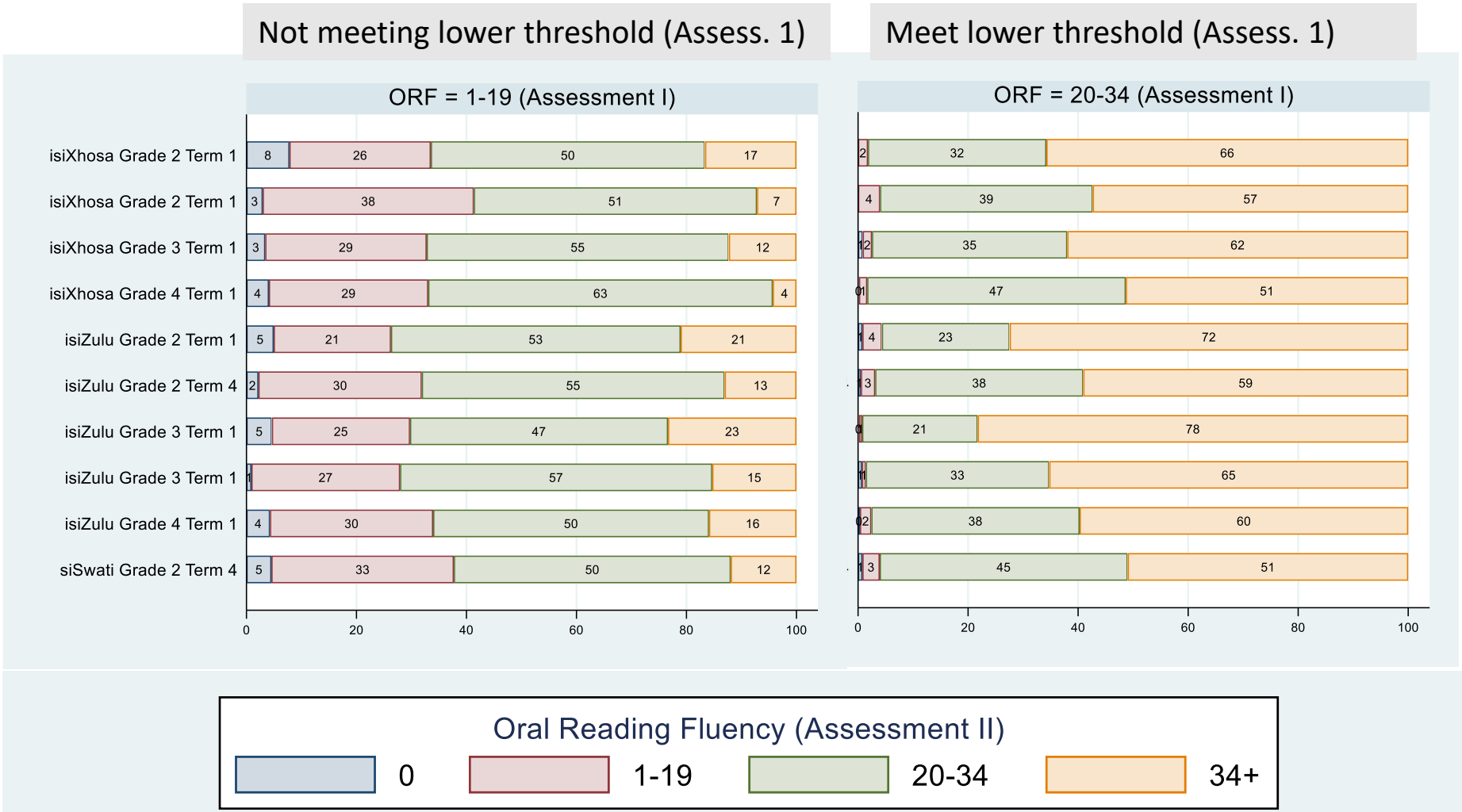
Thresholds set low enough that large enough proportions can meet these thresholds/benchmarks but are still ambitious enough to support reading development.

How do the thresholds/benchmarks relate to oral reading fluency progression?

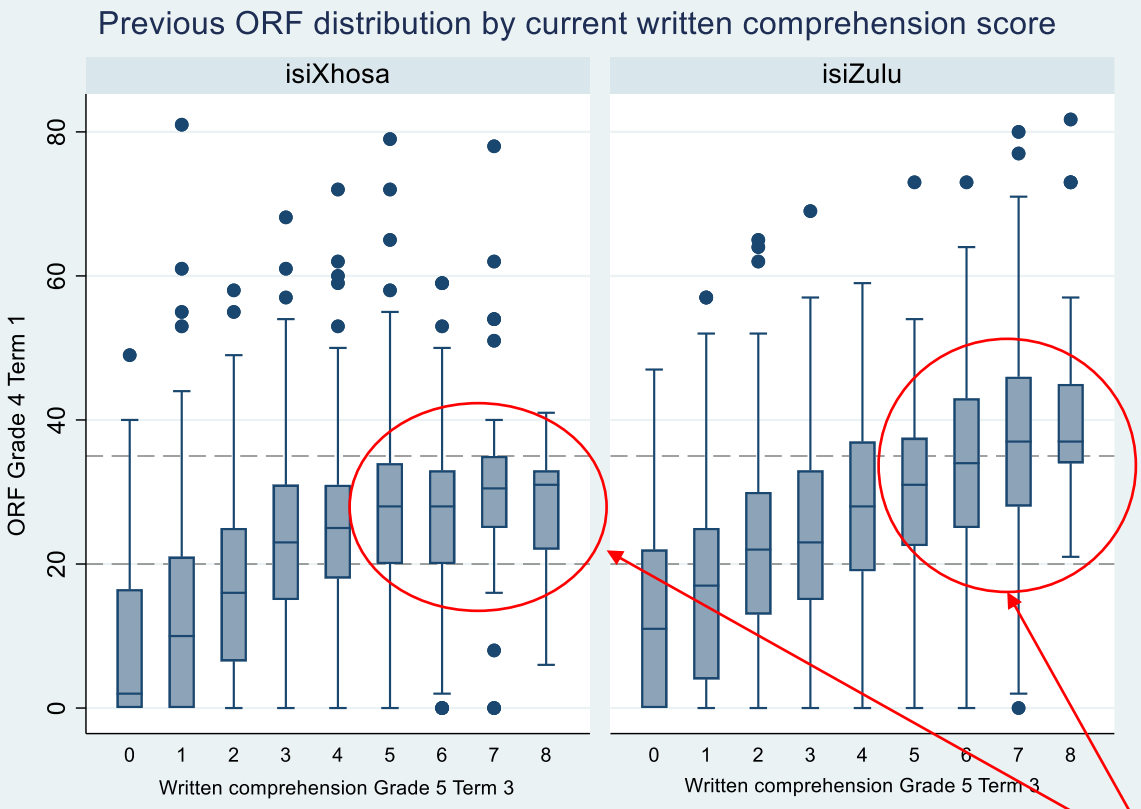
- We have longitudinal data that allows us to follow learners as they progress through school.
- We can compare their performance at the 2nd assessment depending on whether they were meeting the reading threshold or benchmark at their 1st assessment.
- The time between the 1st and 2nd assessment ranges from 12 to 18 months.

How do the thresholds/benchmarks relate to oral reading fluency progression? (2)

The ORF thresholds and benchmark predict later fluency: Most learners who meet the threshold meet the benchmark the next time they are assessed



How do the thresholds/benchmarks relate to written comprehension?



Shows distribution of ORF score at the beginning of grade 4, by grade 5 term 3 written comprehension.

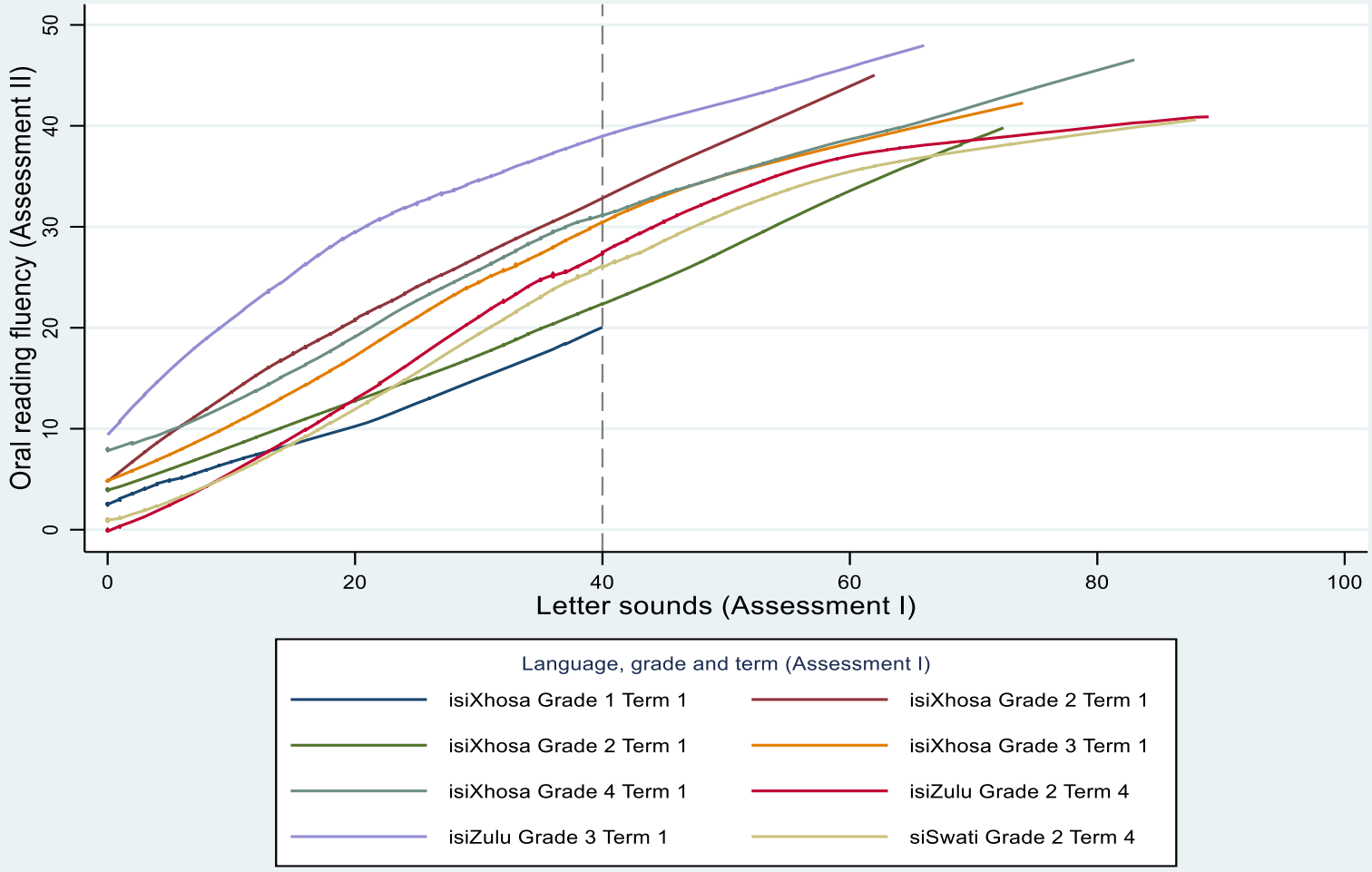
Learners not meeting the lower threshold (cwpm < 20) by the beginning of grade 4 have very poor written comprehension skills in grade 5

Learners achieving at least 5 out of 8 questions correct in Grade 5 were typically reading above 20 words per minute at the beginning of Grade 4.

D) Establishing a letter-sound benchmark

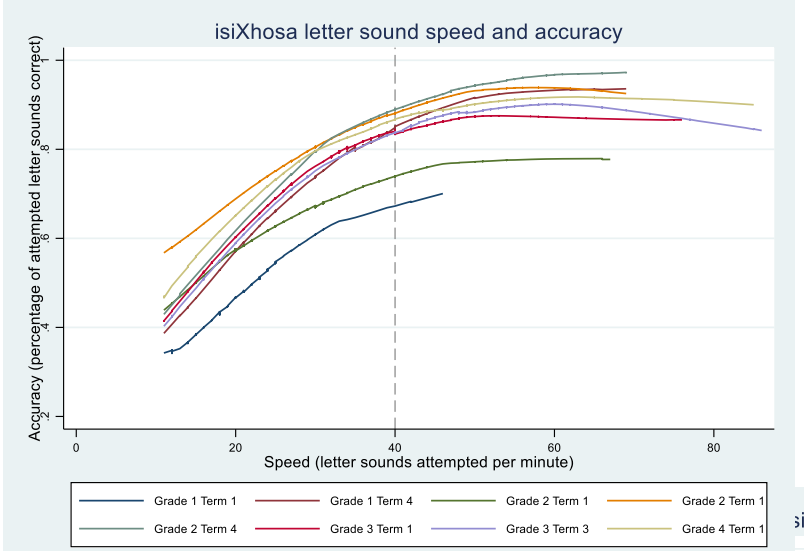
Why should letter-sounds be benchmarked?

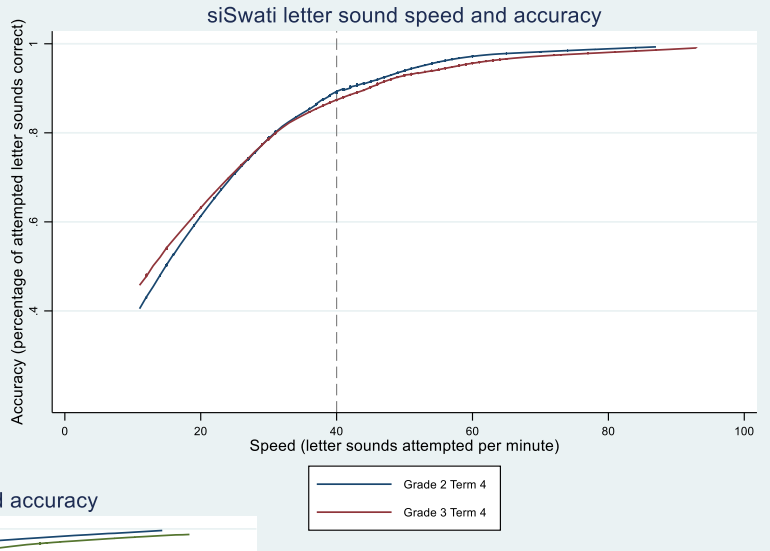
Letter-sounds predict future oral reading fluency

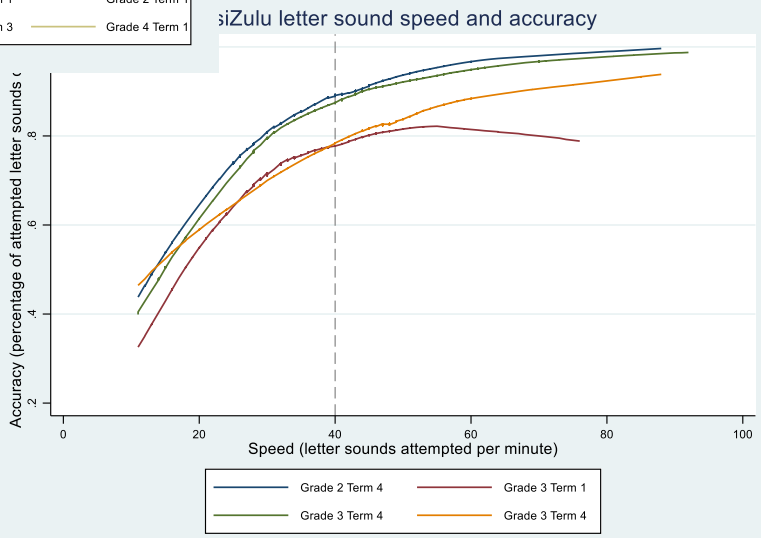


At what level should we set the letter-sound benchmark?

Accuracy and speed increase steadily and then accuracy flattens out

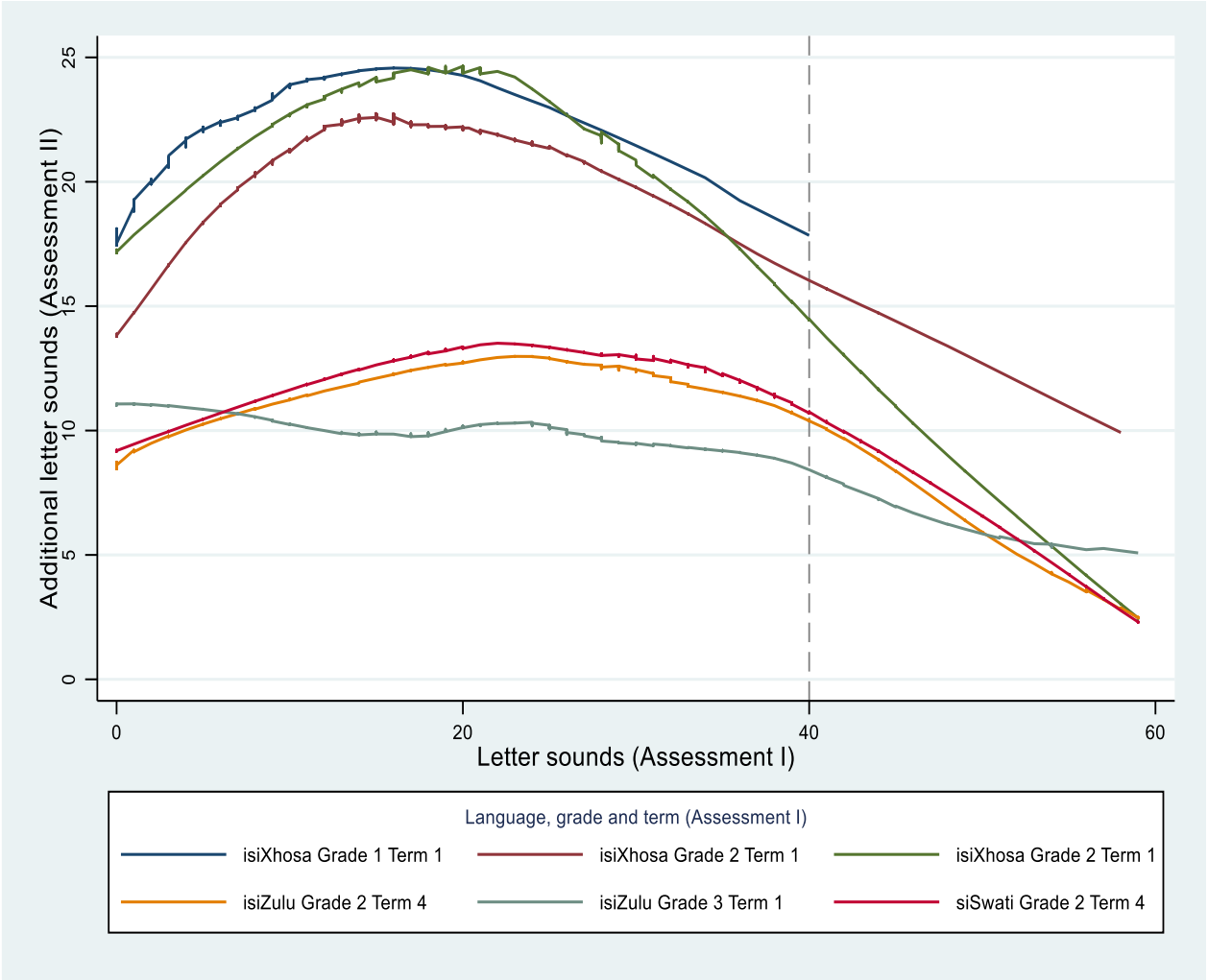




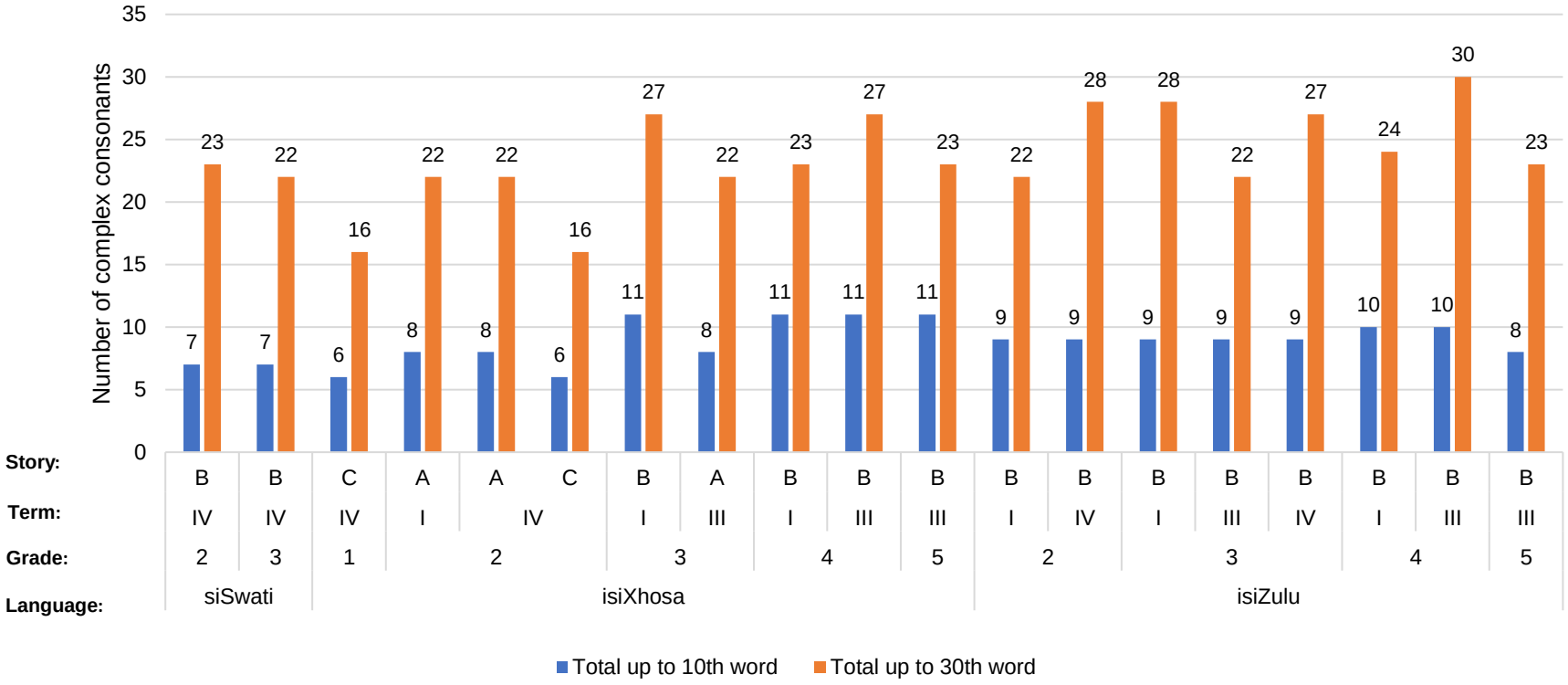


At what level should we set the letter-sound benchmark?

There are diminishing improvements in letter-sounds

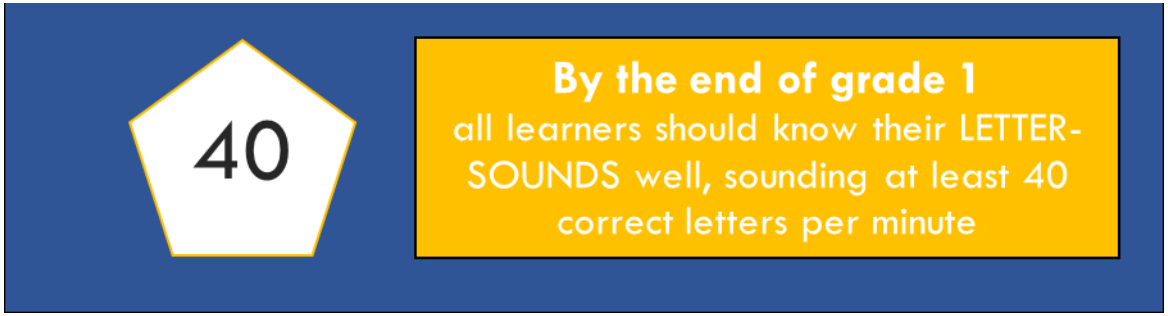


Why are double and triple consonants important?



We don’t provide benchmarks for double or triple consonants, but knowledge of them is vital to be able to read any Foundation Phase text. Currently very few learners at the end of grade 1 can sound these. Double and triple consonants should be taught and assessed as a distinct task.

E) Q&A panel

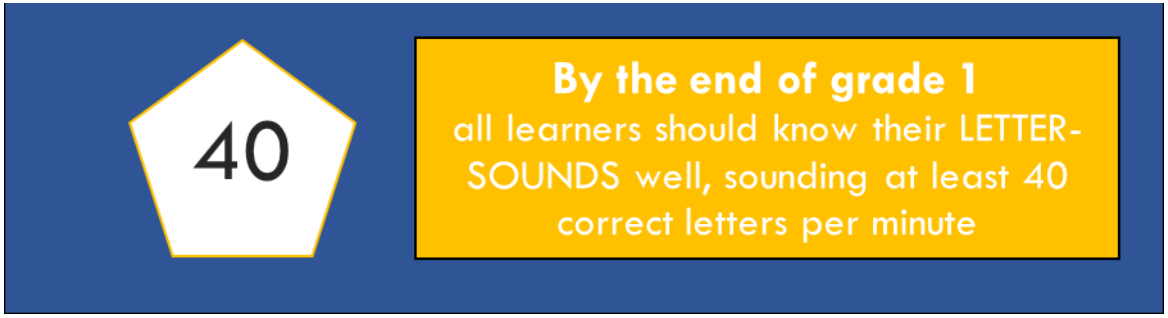


Why?

- Good early predictor of oral reading fluency (ORF) later in Foundation Phase.
- Improvements in letter-sound speed stagnate around this point
- Needs to be low enough to measure incremental progress
- Needs to be ambitious enough to support curriculum demands and improved reading outcomes

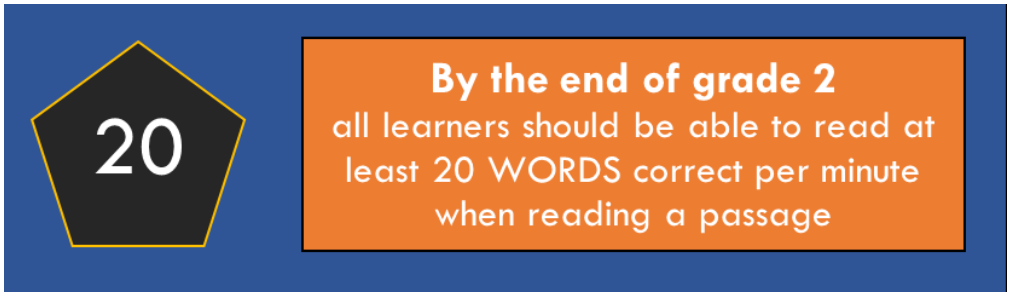
What does the benchmark look like in practice?

S		v		n		g		L	
	y		Z		h		W		m
k		th		G		b		c	
	hl		q		d		z		a



- **Instructional focus?**
  - learners not reaching benchmark: letter identification and phoneme-grapheme recognition
  - learners meeting benchmark: word identification to improve decoding skills

- **Who is currently meeting this benchmark?**
  - By the beginning of grade 2, between 10% and 45% of learners in this sample had reached this benchmark

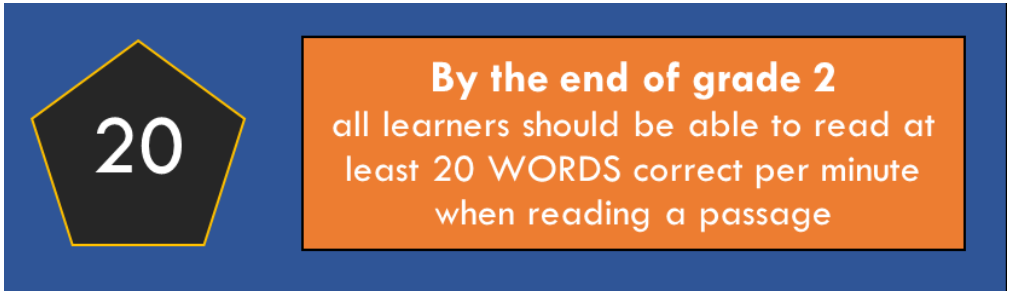


Why?

- Below this threshold, accuracy is poor & we find little evidence that learners can comprehend what they have read.
- This is a *minimum* threshold. If learners do not reach this level of fluency, higher order reading skills are very unlikely to develop.

What does the threshold look like in practice?

Kunesihambi esa[illegible]mbile Sahamba sicela emizini yabantu. Abantu babengenakho. ukudla Isihambi sathola isu Isihambi s[illegible]hola ibhodwe. Sathatha amatshe sawafaka ebhodweni. Sathela amanzi. Sabasa umlilo, sabeka ibhodwe eziko. Sama salinda ibhodwe laze labila. Kwafika intombazane yacela ukwazi ukuthi siphekani isihambi eziko. “Ngipheke isobho elimnandi lamatshe. Kodwa kumele ngilifake into ukuze linongeke,” kusho isihambi. “Nginezaqathe mina,” wabe esenika isihambi. Sazifaka ebhodweni.

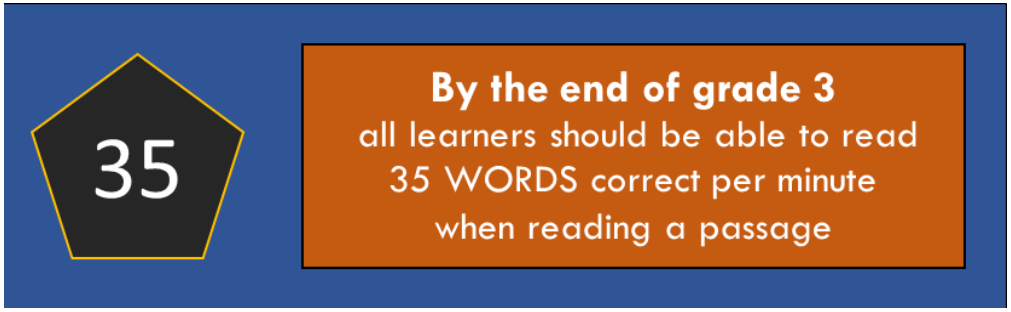


Instructional focus for learners meeting threshold

- practice with text to recognize words more quickly, as well as to improve their comprehension

Who is currently reaching this threshold?

- By the end of grade 3, between 53% and 76% of the learners in this sample had reached this grade 2 threshold.



Why?

- At this level of fluency reading comprehension becomes increasingly possible when learners read on their own.
- Once learners reach this level of fluency, it appears that poor comprehension skills become the limiting factor to further literacy development.

What does this benchmark look like in practice?

SISWATI

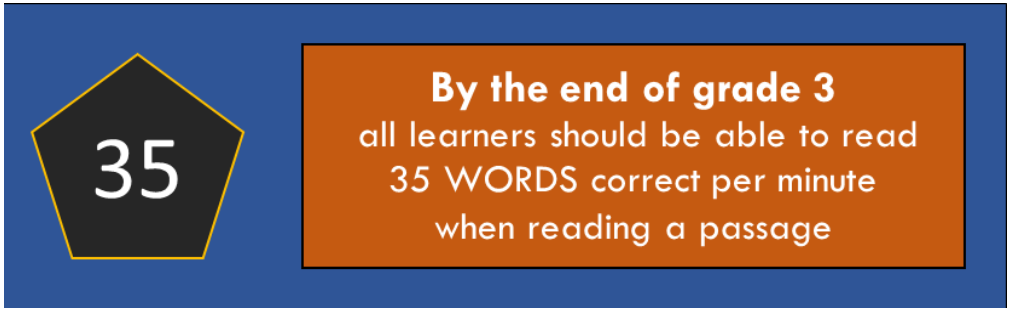
Kunesihambi lesilambile Sahamba sicela emitini yebantfu. Bantfu bebete kudla. Sihambi satfola lisu. Sihambi satfola libhodo. Satsatsa ematje sawafaka ebhodweni. Satsela emanti. Sabasa umlilo, sabeka libhodo etiko. Sema salindza libhodo labila. Kwefika intfombatane yacela kwati kutsi

ISIZULU

Kunesihambi esasilambile Sahamba sicela emizini yabantu. Abantu babengenakho. ukudla Isihambi sathola isu Isihambi sathola ibhodwe. Sathatha amatshe sawafaka ebhodweni. Sathela amanzi. Sabasa umlilo, sabeka ibhodwe eziko. Sama salinda ibhodwe laze labila. Kwafika intombazane yacela ukwazi

ISIXHOSA

Kwakukho umhambi owayelambe kunene. Wahamba engena ecela amalizo. Kwakungekho kutya, kwanto tu kwaphela emizini. Umhambi wachola imbiza. Wachola namatye agudileyo wawafaka embizeni. Wagalela amanzi wabasa umlilo wapheka. Wachopha walinda de yabila imbiza. Kwafika umfazana wafuna



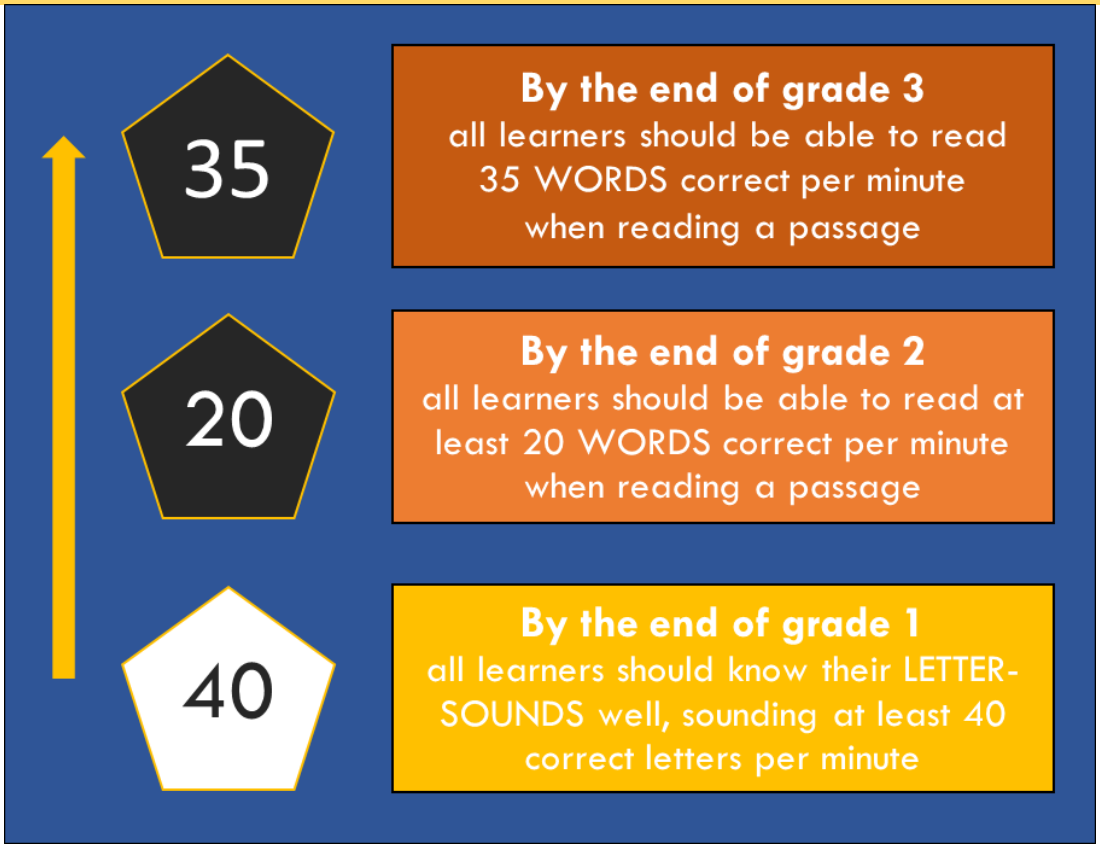
Instructional focus for learners meeting this benchmark:

- skills and strategies to improve their understanding of and engagement with the text
- encouraging vocabulary development to support comprehension
- fluency skills should continue to improve from this milestone.

Who is currently meeting this benchmark?

- By the end of grade 3, approximately only a quarter of learners had reached the benchmark.

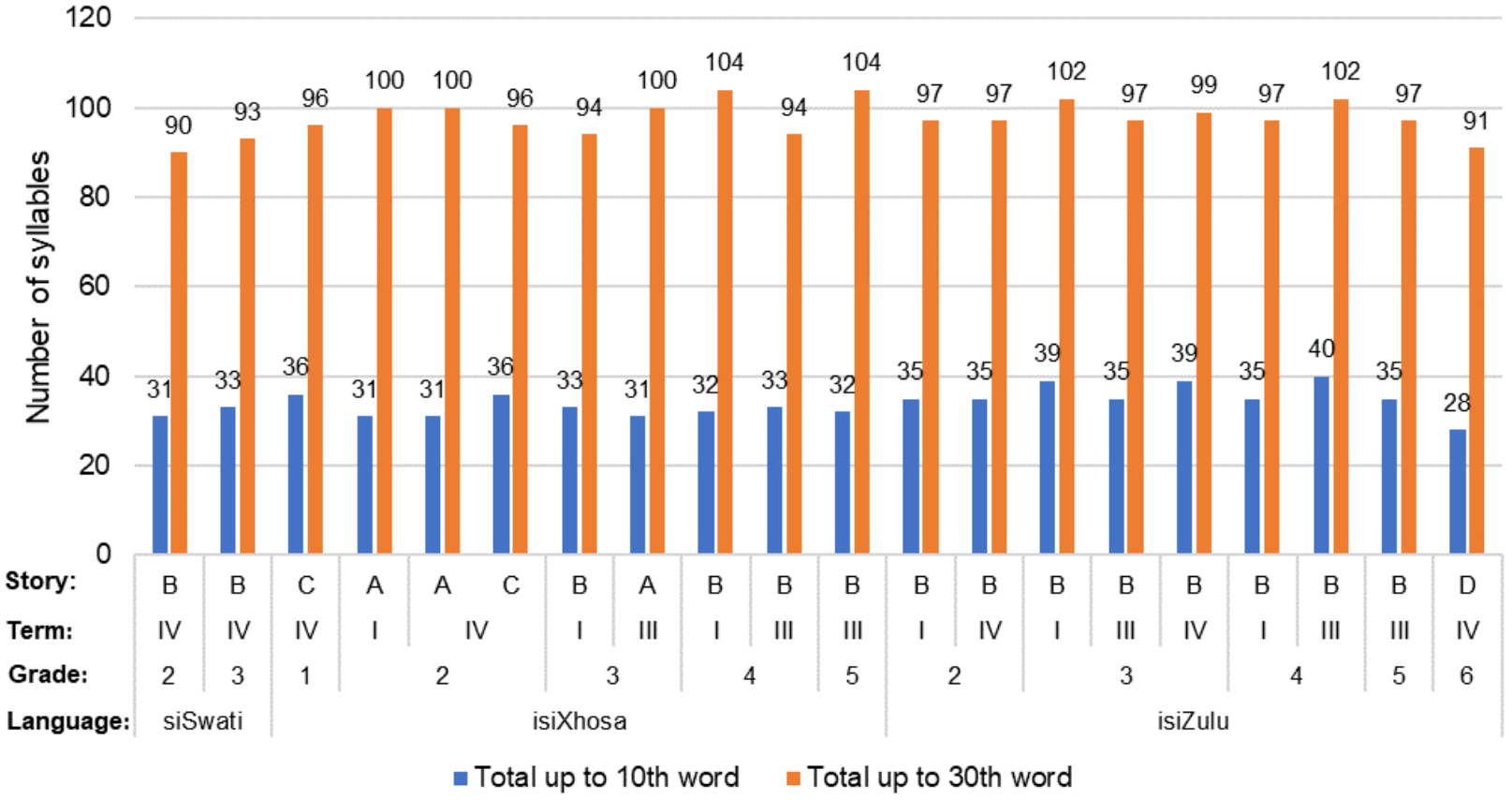
Further questions?



FOUNDATION PHASE				INTERMEDIATE PHASE	
Grade R	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Non-reader	Emerging reader	Developing proficiency reader		Competent reader	Skilled reader

Additional slides

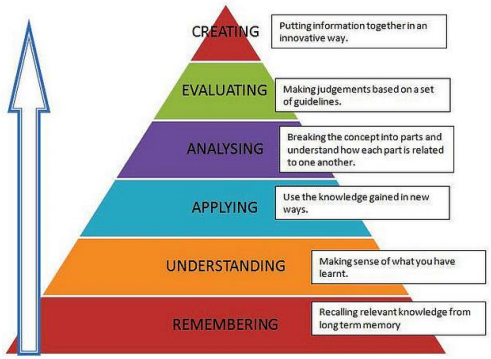
How comparable were the different passages?

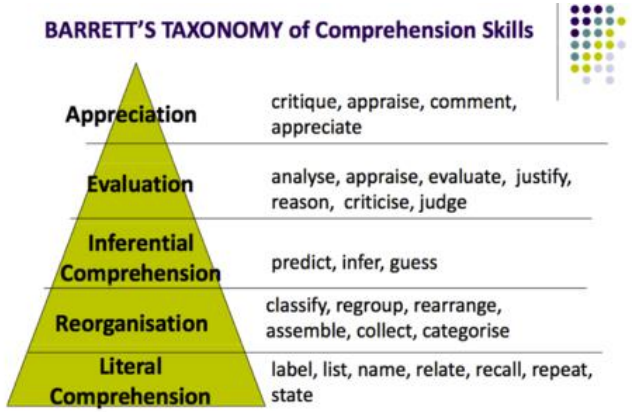


Notes:

- A, B, C, D reflect which story was used
- Project/Study: EGRSII, SPS, FW, LFL
- Term reflected by I, II, IV
- Language reflected by S = Siswati, X = isiXhosa, Z= isiZulu

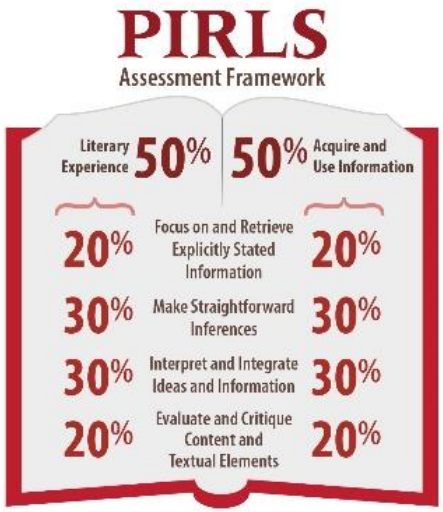
What do we mean by comprehension?



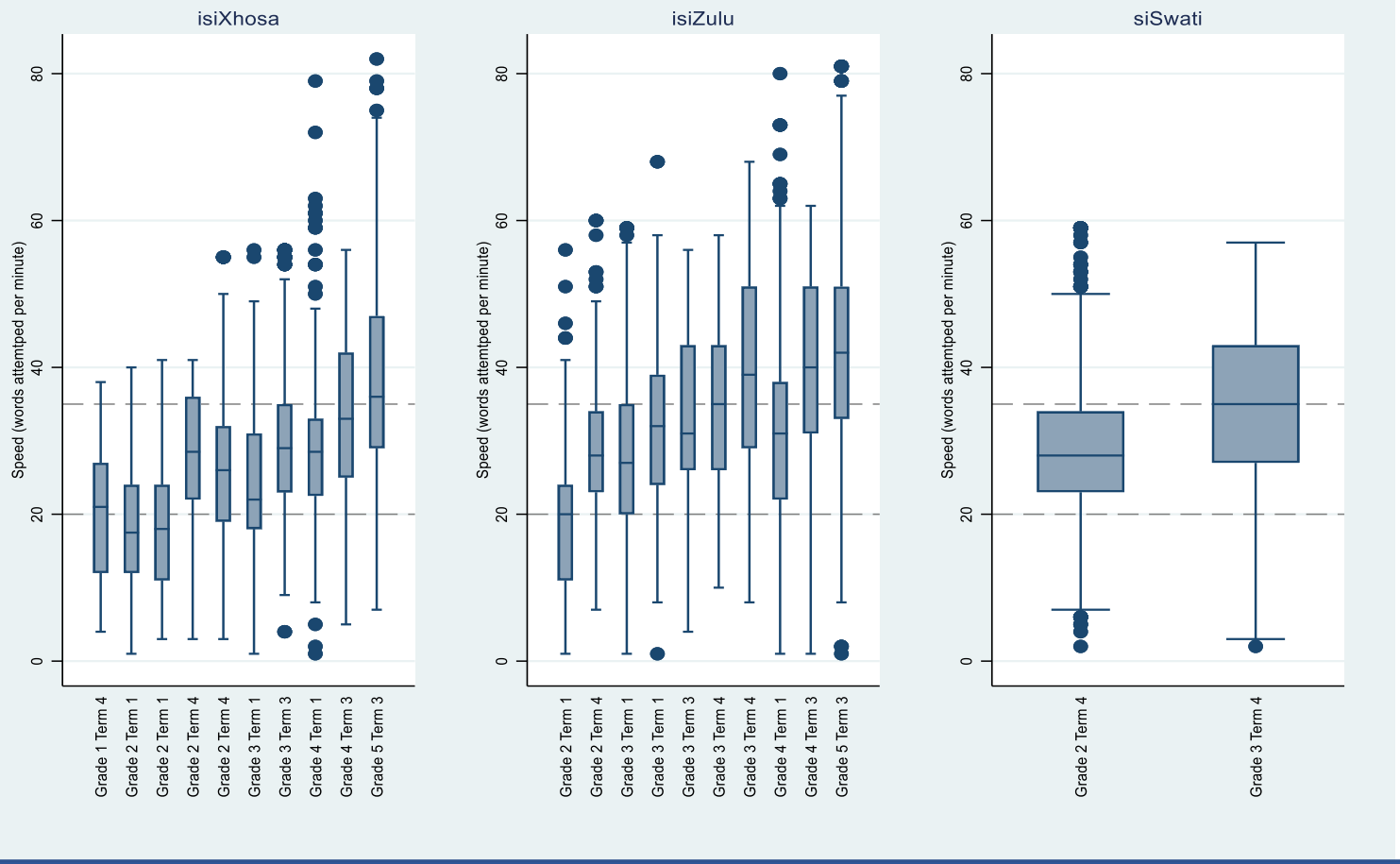


CAPS Foundation Phase Home Language refers to the following comprehension levels:

- **Literal**
- **Reorganisation**
- **Inferential**
- **Evaluation**
- **Appreciation**

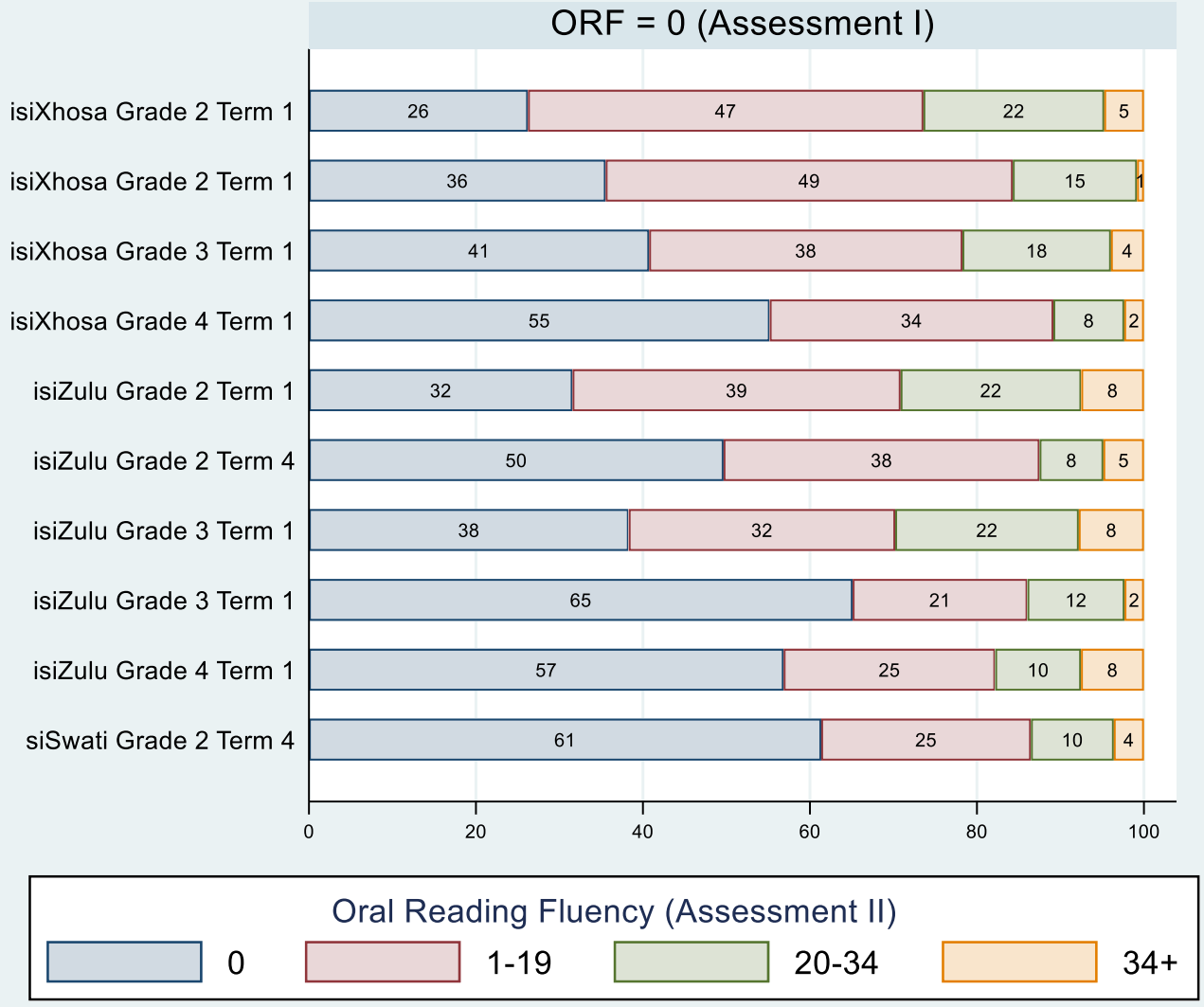


What about slow but accurate readers?



By the end of Grade 3, between 90% and 97% of accurate readers are reading faster than 20 words per minute

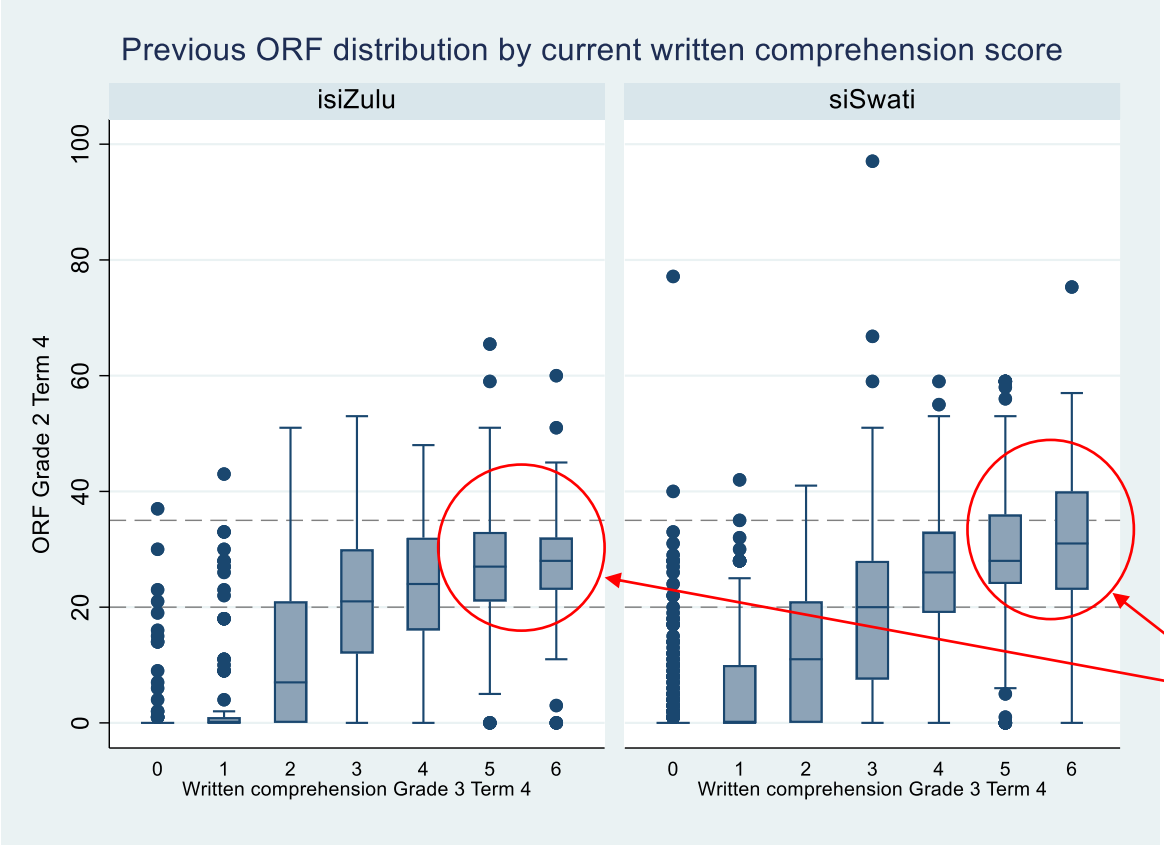
How do the thresholds/benchmarks relate to oral reading fluency progression?



Start with learners who could not read one word at the first assessment.

What do they look like when we see them 12 – 18 months later?

How do the thresholds/benchmarks relate to written comprehension?



Learners not meeting the lower threshold by the end of grade 2 have very poor written comprehension skills in grade 3

Learners achieving at least 5 out of 6 questions correct in Grade 3 were typically reading above 20 words per minute at the end of Grade 2.

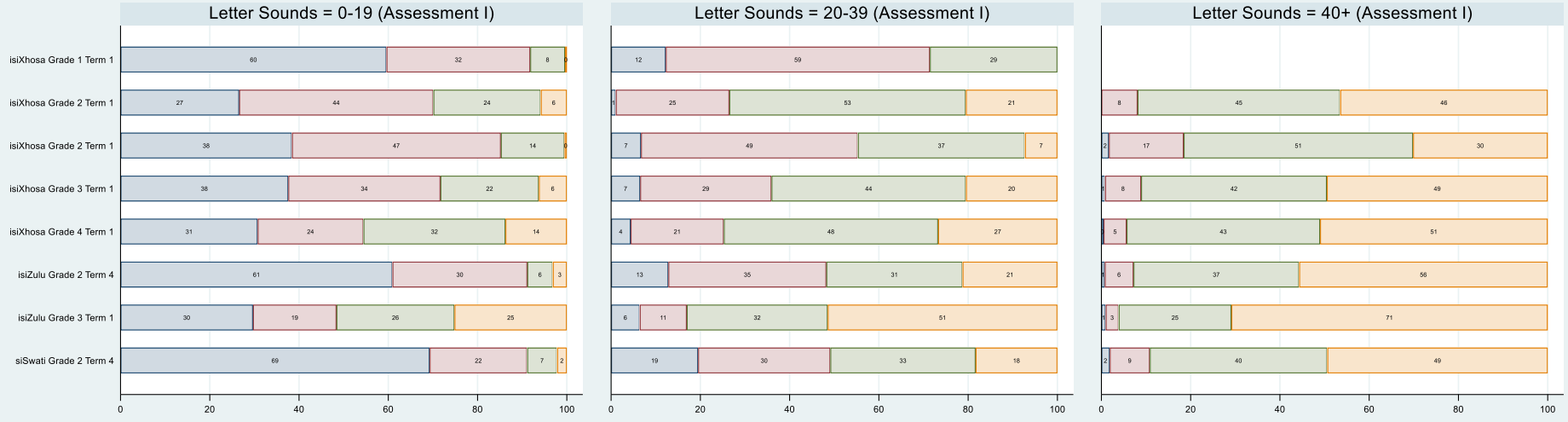
Shows distribution of ORF score at the end of grade 2, by grade 3 term 4 written comprehension.

How does the letter sounds benchmark relate to future oral reading fluency?

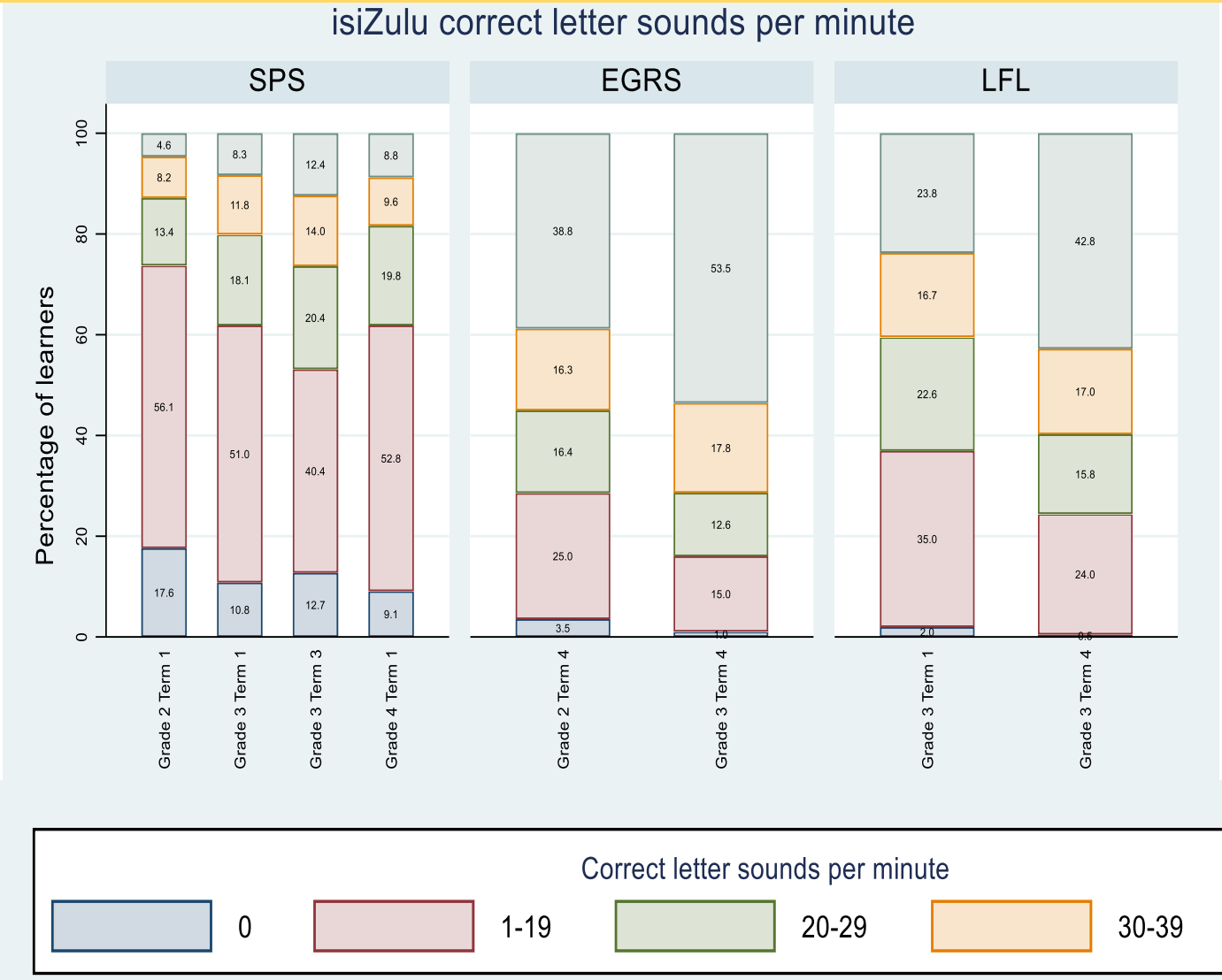
Less than 20 letter sounds per minute (Assess. 1)

20-39 letter sounds per minute (Assess. 1)

Meets benchmark of 40+ (Assess. 1)

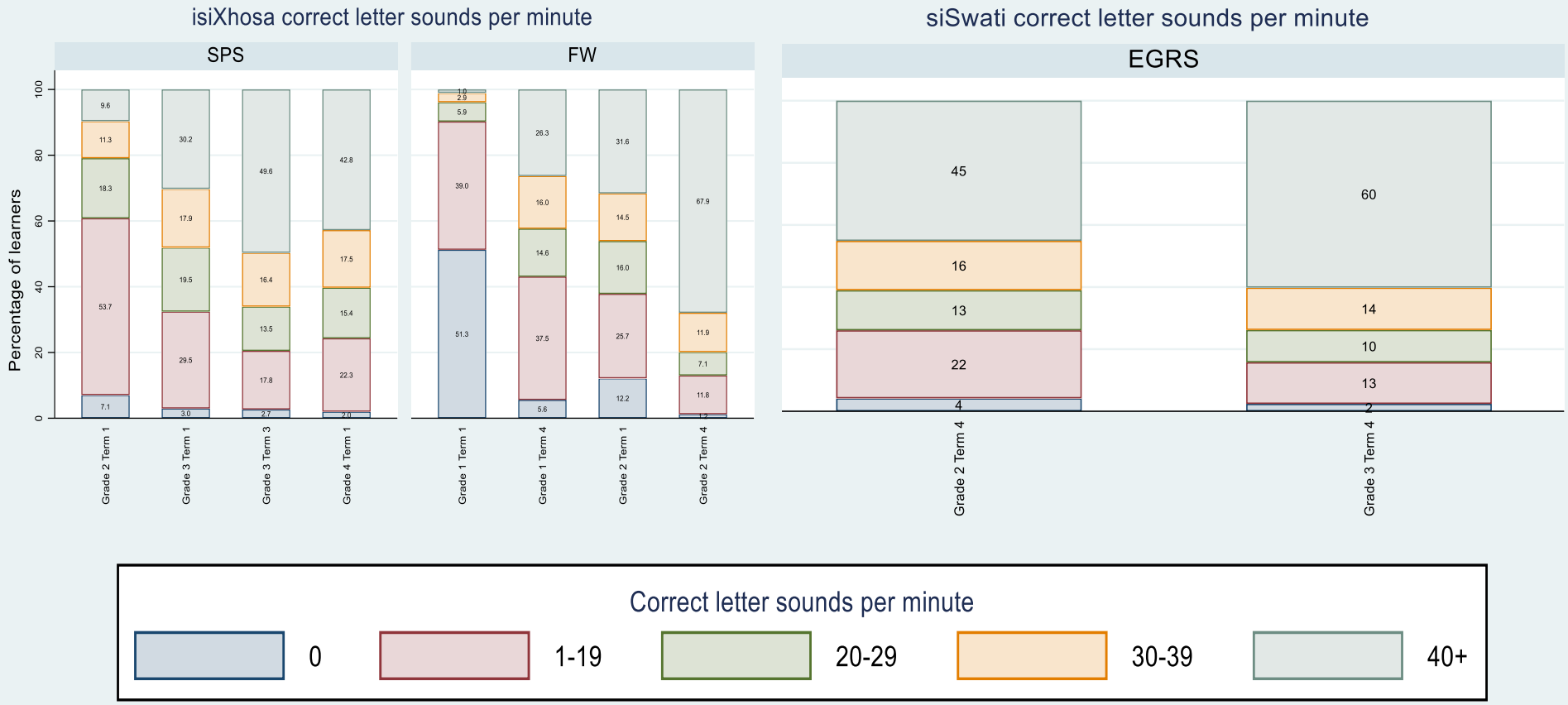


Who is meeting the letter-sounds benchmark? (1)



Large variation across studies

Who is meeting the letter-sounds benchmark? (2)



Do learners know their complex consonant sequences?