



NATIONAL RESEARCH
UNIVERSITY

19th annual AEA-Europe conference
“Building Bridges to Future Educational Assessment”

A Possibility for Cross-Country Comparisons of Early Reading for Children Starting School in Russia and in UK

Elena Kardanova
Alina Ivanova
Peter Tymss
Christine Merrell

*National Research University Higher School of Economics, Russia
Durham University, United Kingdom*



International comparative studies

PIRLS, TIMSS, PISA (since mid-1990s)

Are differences in performance between countries which are observed in these studies already presented when children start school, and what is the impact of educational policy and school effectiveness?

What do we know about the relative effectiveness of different countries' early years education policies?

There is currently no such an international comparative study of children's development when starting school.



Challenges in international assessment of children starting school

- Challenges of young children assessment (Merrell, 2017)
 - Language acquisition
 - Emotional maturity
 - Reading ability
 - Short concentration span
- Additional challenges of international studies (especially in reading):
 - Hard but possible to compare reading internationally when children *can already read* (PIRLS)
 - Language differences greatly affect the literacy of students when students *only learn to read* (Ercikan, Roth, Asil, 2015)



Some examples of existing international studies of pre-school or primary school children

- EDI, Early Development Instrument (Janus et al, 2007)
- ECERS, Early Childhood Environment Rating Scales and SACERS, School-age Care Environment Rating Scales (Harms, Clifford, Cryer, 2015; Harms, 2013)
- Study on Early Learning and Child Well-being (OECD, 2018)

Basic methods: observation, teachers' survey, expert evaluation.

- **iPIPS, international Performance Indicators in Primary School**
(Tymms, 1999; Tymms, Merrell, Wildy, 2015)

Basic methods: observation, teachers' survey, but also student's assessment.



The iPIPS assessment

- Based on PIPS (Performance Indicators in Primary School) , Durham University, UK
- Baseline and Follow-up Assessments of students in the first year of schooling
- Individual assessment of kids, computer testing (with stopping rules)

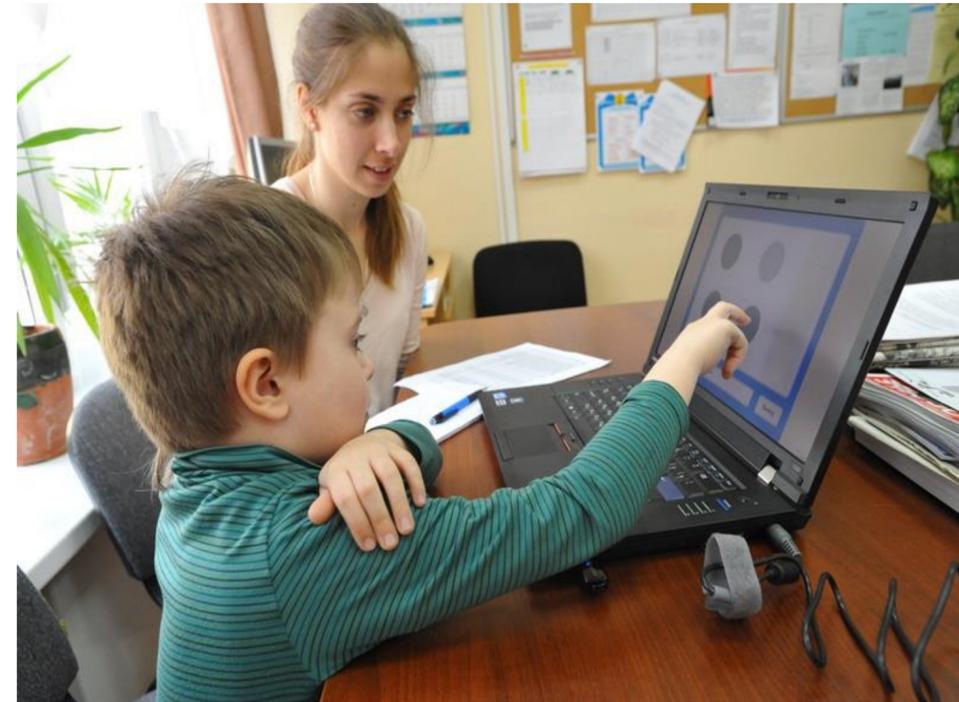


Vocabulary

Phonological awareness

Reading

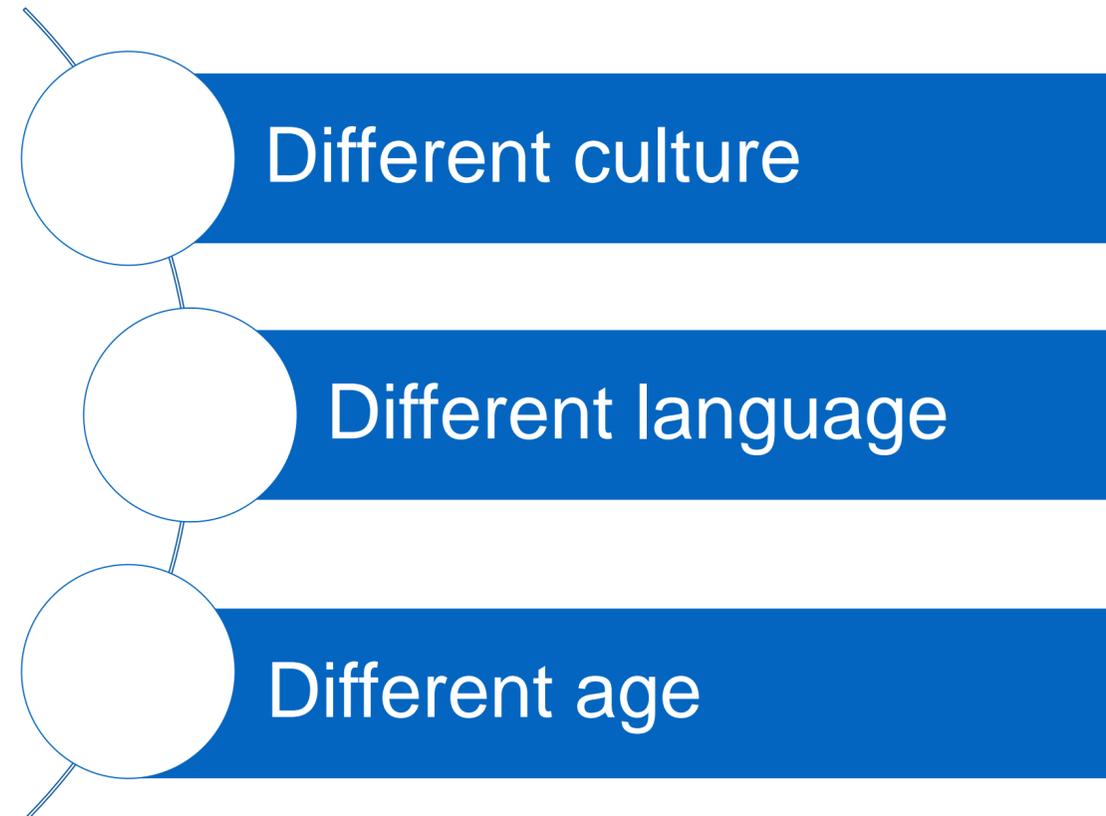
Mathematics



- Also assessment of social-emotional development of kids (teacher's survey)

Main research question

- iPIPS translated into different languages (German, Chinese, Serbian, Slovenian, Portuguese, Russian, etc.)



In Russia children start school at the age of 7

Is it possible to compare what children from different countries know and can do at the start of schooling?

For this study: Russia, England, Scotland



Development of Russian iPIPS: adaptation process

Test adaptation includes many activities from deciding whether or not a test could measure the same construct in a different language and culture, to checking equivalence of the initial and adapted test versions (Hambleton, 2005).

Successive test
adaptation process

Equivalence of
measurement

The validity of comparisons using adapted tests critically depend on the degree to which the adapted versions of tests indeed measure the intended constructs and provide comparable measurements (Ercikan, 2013)

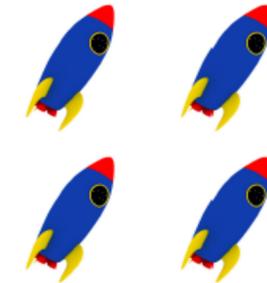
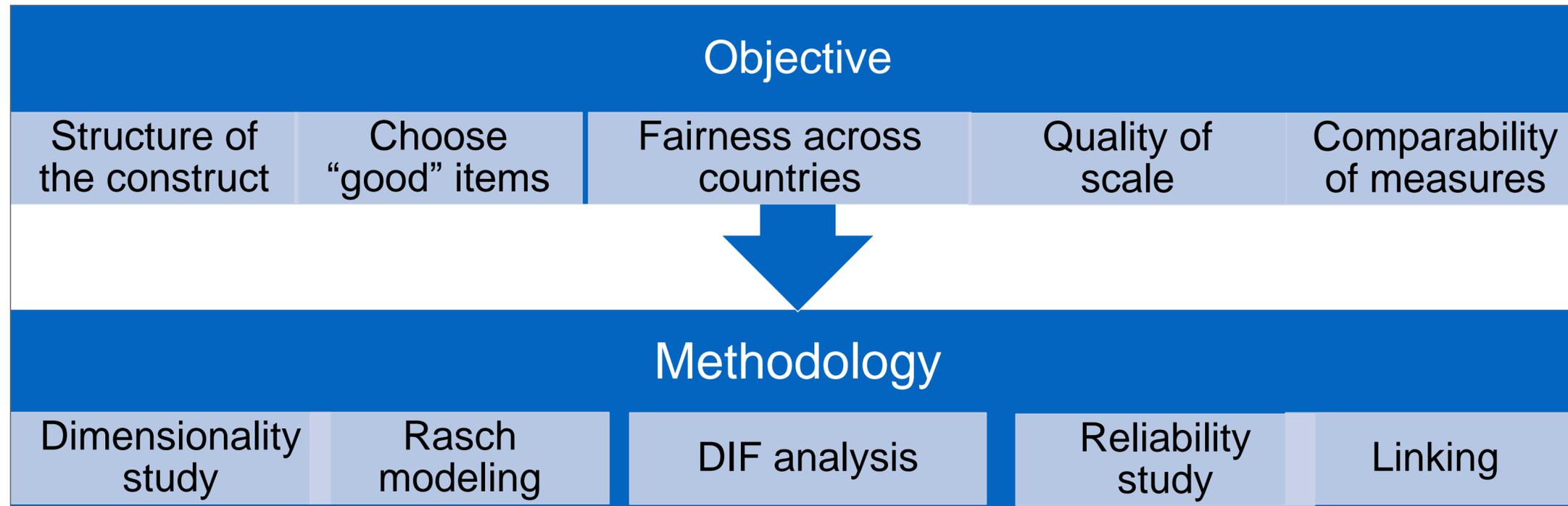
Equivalence of
constructs

Equivalence of
instruments

Equivalence of
procedures



Math: constructing a common scale between the countries



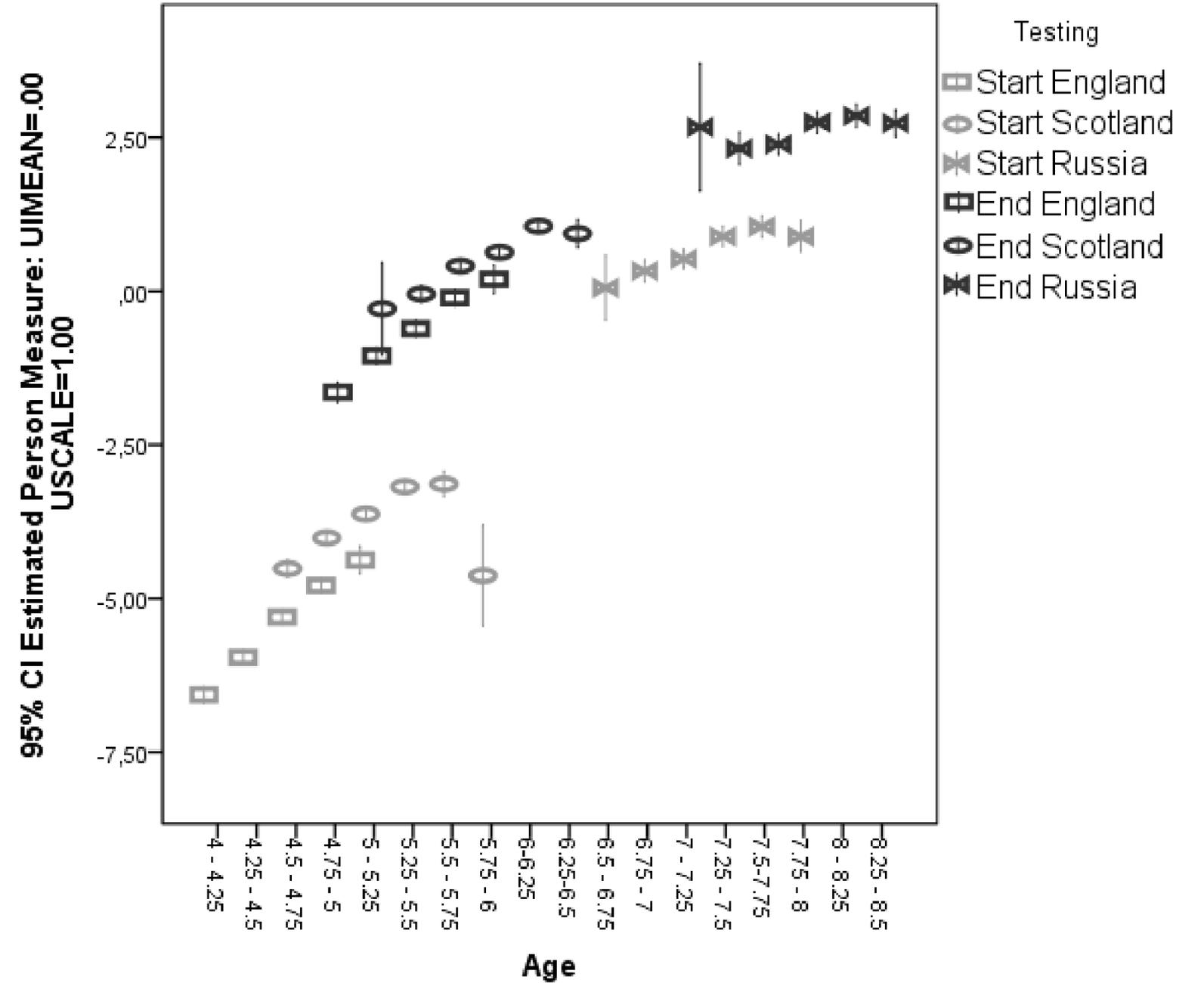
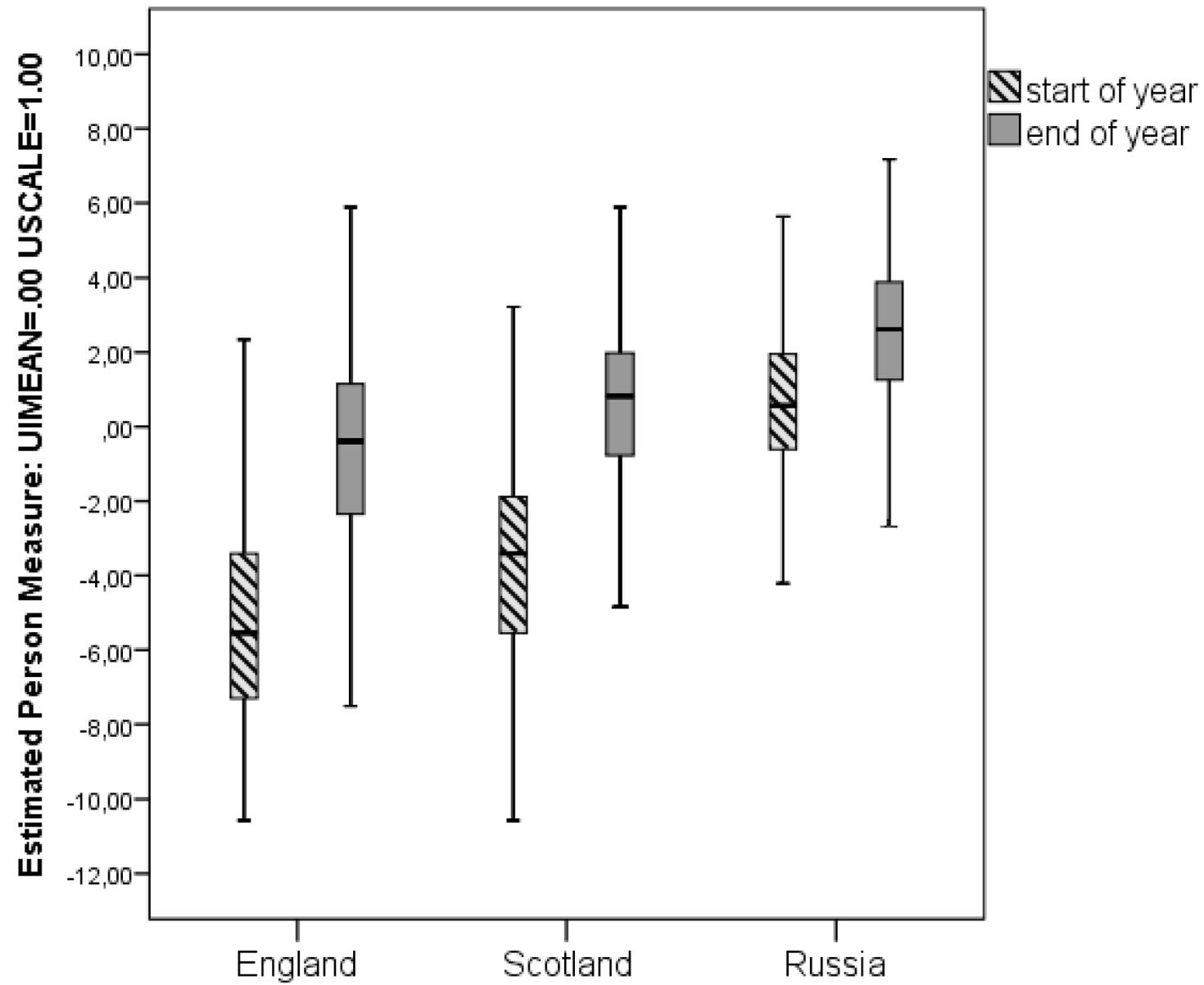
Here are four rockets. If you put another three rockets in the picture how many would there be?

It is possible to construct a common Math scale across the three countries (Ivanova, A., Kardanova, E., Merrell, C., Tymms, P., & Hawker, D., 2018):

- Despite - different languages, different ages, partly different tests
- Person reliability 0.94



Math: direct comparison of three countries





Development of the Russian version of iPIPS: reading

The Russian and English languages have very particular properties that lead to severe limitations in adaptation

- ✓ The language units (phrases and sentences) are longer in Russian language
- ✓ There are fewer words with identical and similar graphic and phonetic shells in Russian than in English
- ✓ No articles and very few auxiliary verbs in the Russian-language text
- ✓ Free order of words in the Russian sentence and flexible syntactic models

➤ English version

*“ This kind of frog only leaves its burrow when
it / there / the is raining outside ”*

➤ Russian version

*“ Лягушка покидает свое жилье только тогда,
когда пройдет / уйдет / выйдет дождь ”*

It is impossible just to translate and slightly correct the original test items to create the equivalent Russian version of test items



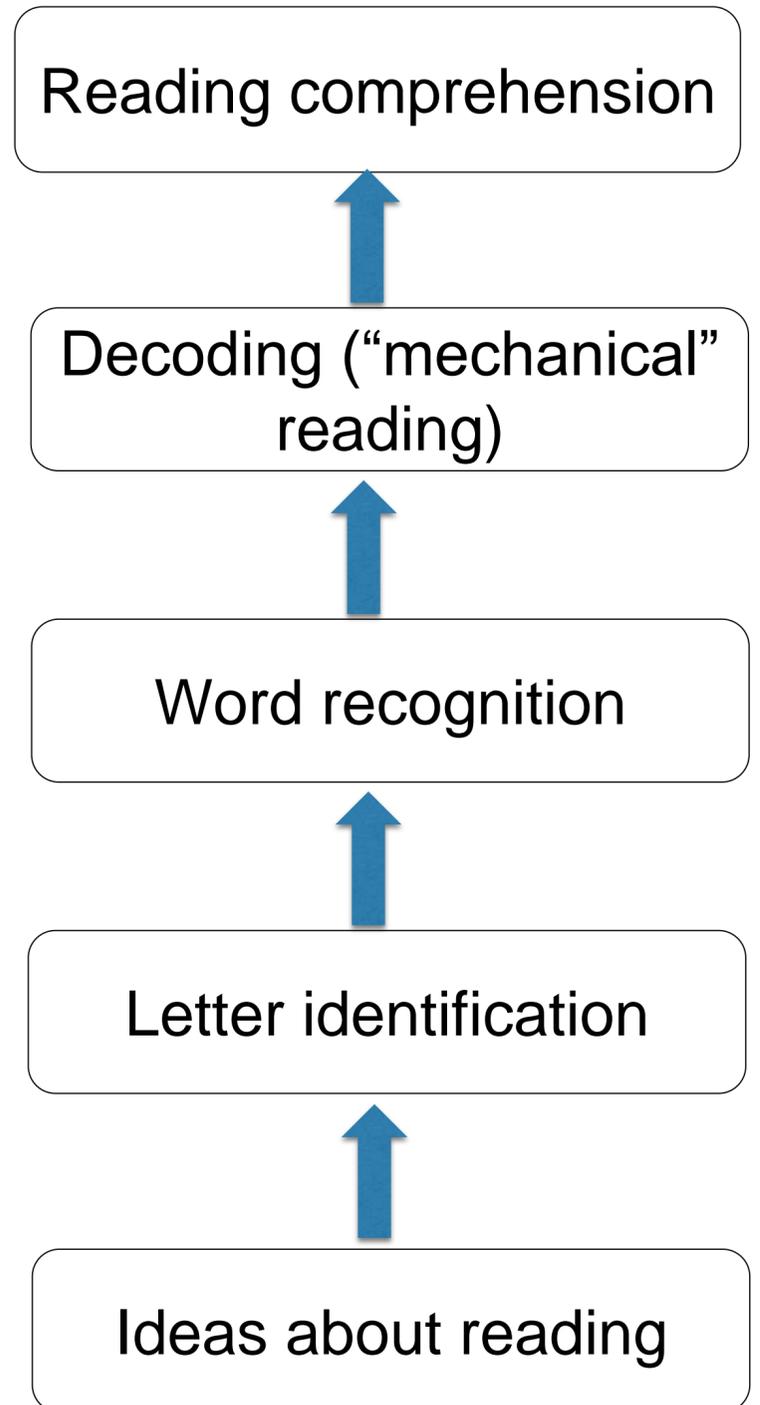
Russian iPIPS version in reading

Principles of reading version development:

- ✓ The same theoretical model
- ✓ The same structure of the test
- ✓ The same types of items
- ✓ The same visual representation of items

Russian items have been developed

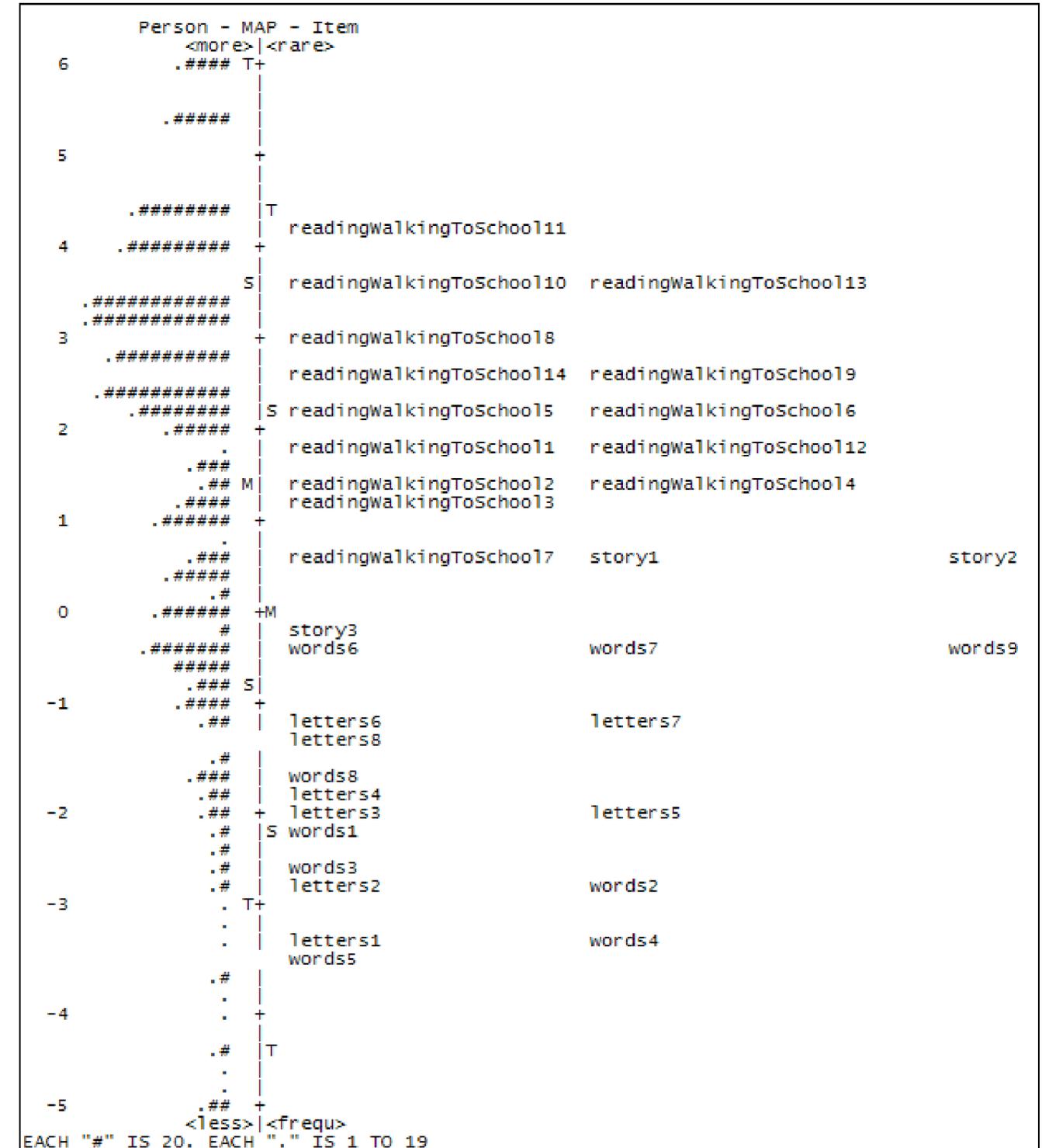
- ✓ taking into account linguistic characteristics of the original items
- ✓ correlating in content with the original version





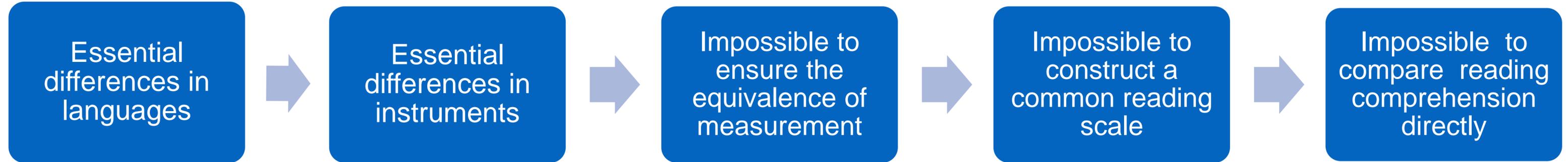
Russian iPIPS version in reading*

- ✓ Scale is essentially unidimensional
- ✓ Good overall fit the Rasch model
- ✓ High Reliability: Alpha 0.97
- ✓ Item distribution meets theoretical expectations
- ✓ Similar hierarchy of items with the English version
- ✓ Evidences of the construct, content, criterion validity of the Russian version have been gathered.



* Sample: 3,460 first graders

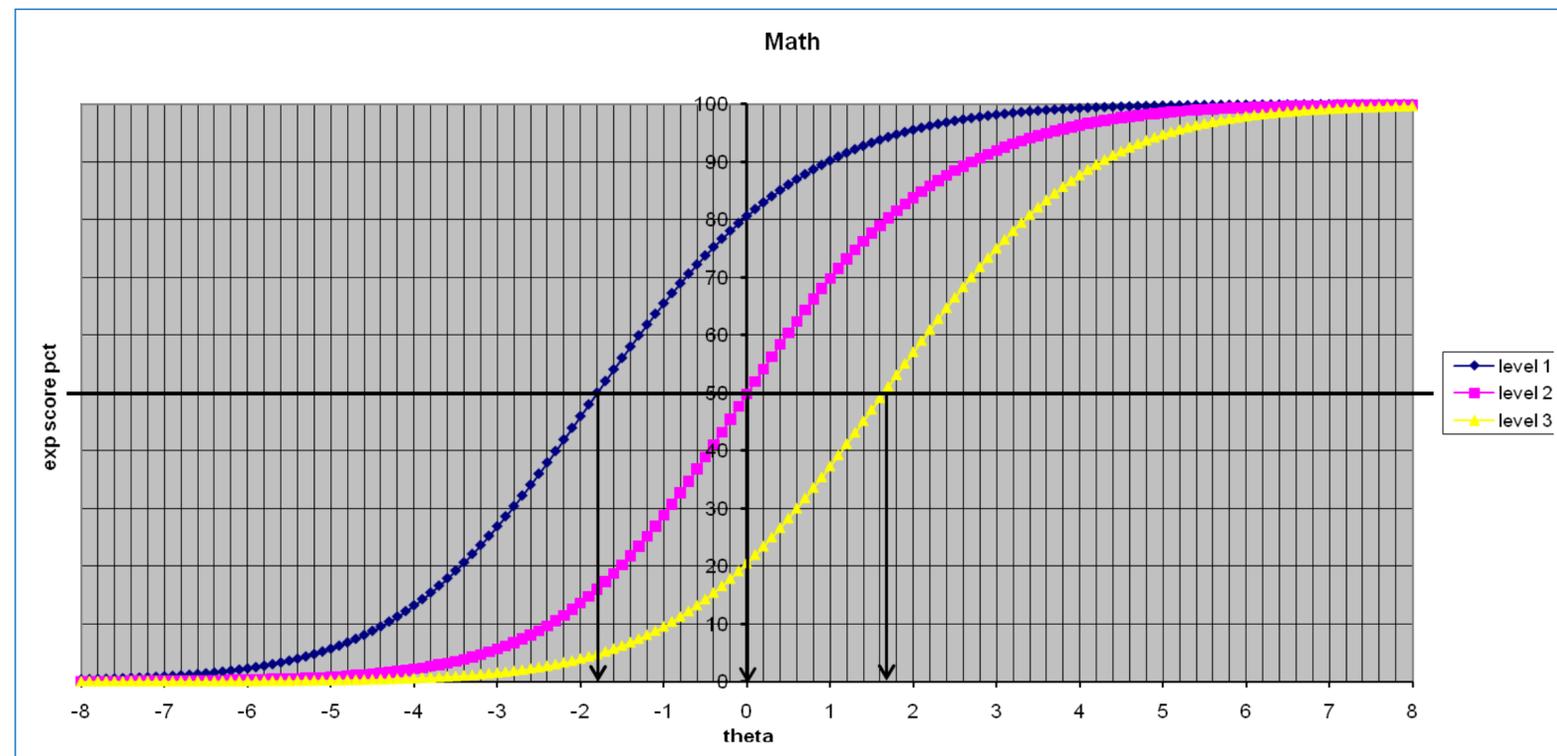
How to compare students' achievements in reading?



Our solution: Indirect cross-country comparisons by means of internationally comparable benchmarks based on iPIPS theoretical framework and Rasch modeling

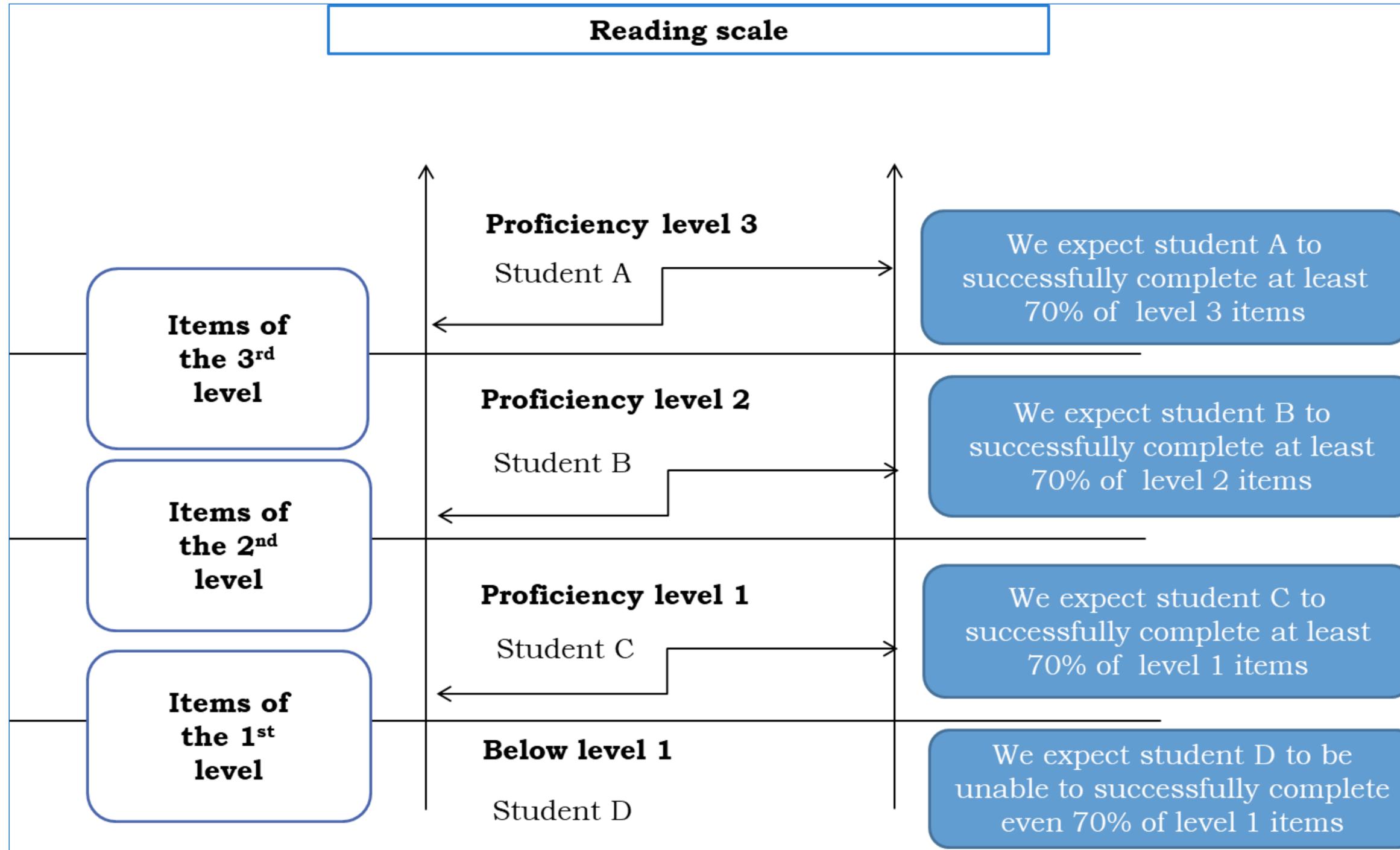
Proficiency levels of reading comprehension

Level	Description
Level 3	Ability to read with understanding (reading comprehension)
Level 2	Ability to read without deep understanding (technical reading)
Level 1	Recognition of letters and high-frequency words
Below level 1	Very basic perception of ideas about reading



For each country the benchmarks are set separately but using the same proficiency levels

Scale of reading comprehension



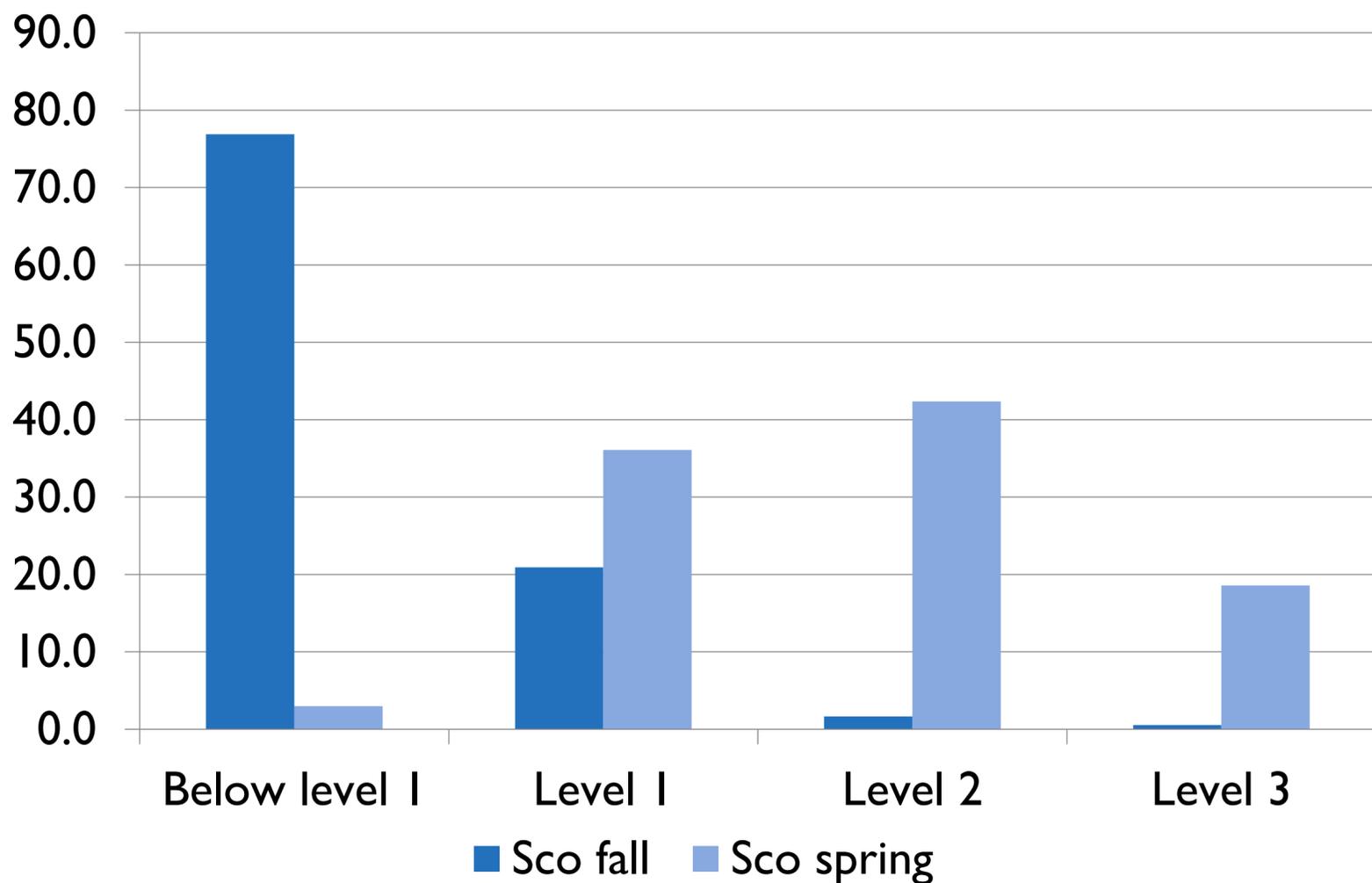
Items of the 3rd level:
reading with
understanding

Items of the 2nd
level: technical
reading

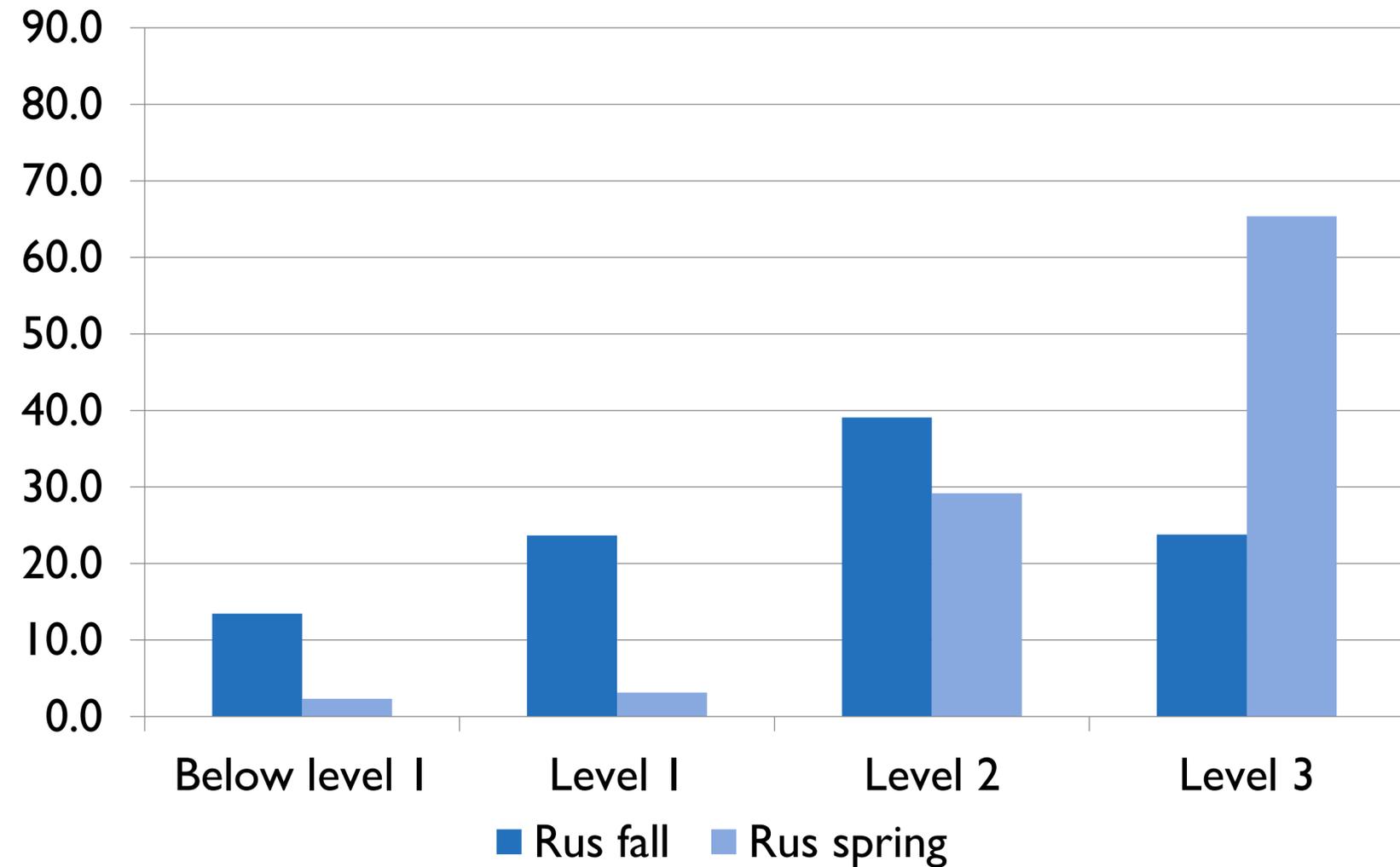
Items of the 1st
level: letters and
high-frequency
words

Proficiency levels of reading comprehension

Scotland



Russia



Conclusions

- It is possible to use the instrument's theoretical framework for reasonable benchmarks setting
- The benchmarks allow to see what children know and can do in reading when they start school
- The approach can be used to measure reading progress of students for the first year of schooling inside and across the countries



NATIONAL RESEARCH
UNIVERSITY

Thank you!