

# The study of international Performance Indicators for Primary Schools (iPIPS): a trial in Russia



NATIONAL RESEARCH  
UNIVERSITY

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# What is PIPS?

- A monitoring project started in the UK in 1994
- Baseline and follow up assessments
- Computer adaptive, child friendly
- High reliability (0.98 test-retest; 0.92 Cronbach's alpha)
- Good predictive validity (0.6-0.7 correlations to performance at age 7 and 11)
- Provides diagnostic feedback to schools, as well as data for policy makers
- Used in school effectiveness research in UK and elsewhere

# When do the differences start?

- At home, before children start school?
- In pre-school?
- At school?

Nobody knows!

# Five key questions

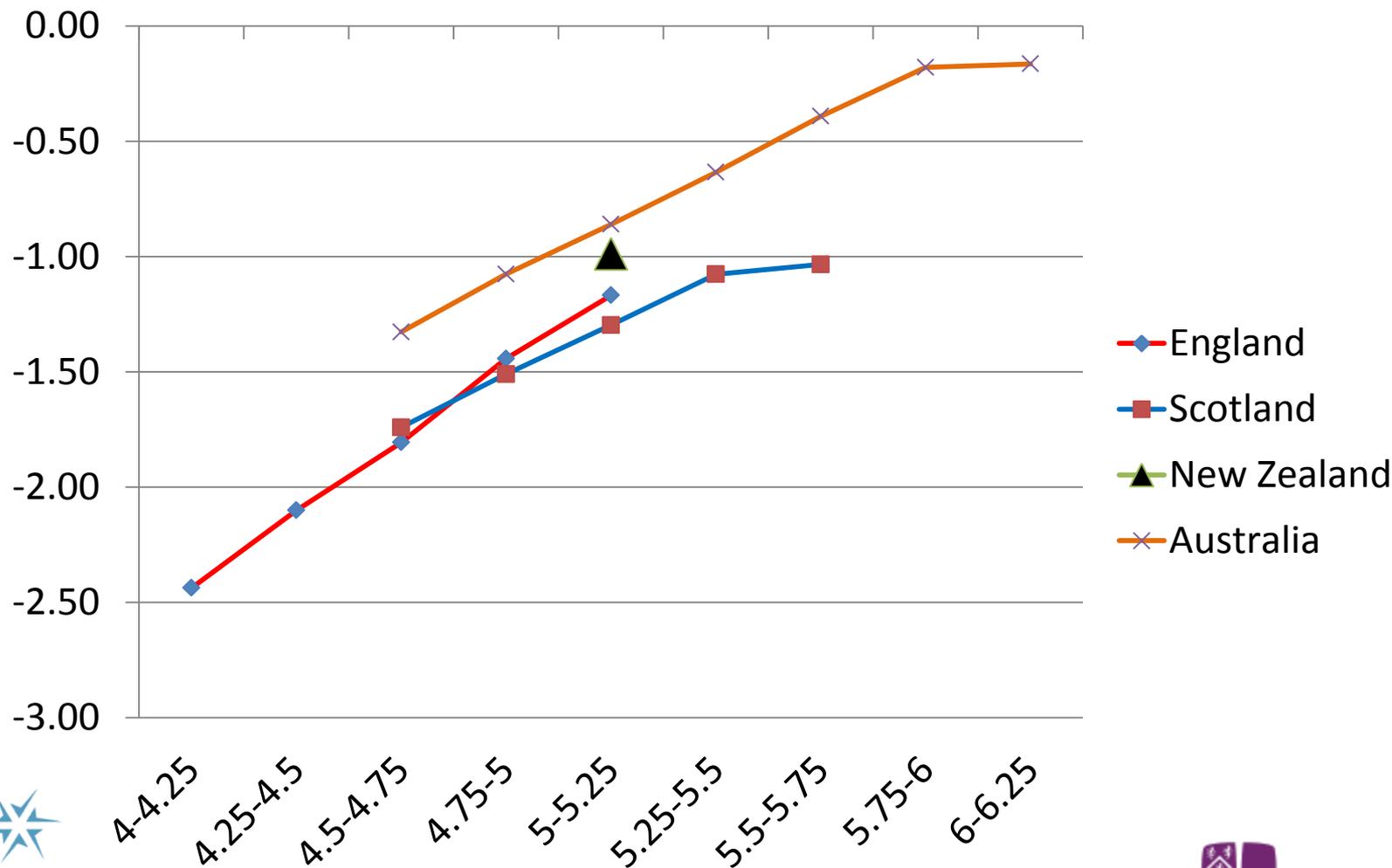
1. What is the value for money and relative effectiveness of different early years programs?
2. How much do children learn in their first year at school and how effective is the teaching?
3. How do different factors influence children's learning?
4. How can teachers and schools improve?
5. What are the best policies for long term effectiveness in children's learning?

# How will baseline assessment help?

1. **ECEC Value for money** – it will highlight differences in children’s starting points, and relate these to their pre-school experience
2. **Learning in the first year of school** – it will measure children’s progress by running the same assessment at the end of the year
3. **Influence of different factors** – it will relate data on a range of external and internal factors to children’s learning and progress
4. **Pedagogical improvement** – it will provide diagnostic information to schools, and comparative information to policy makers, highlighting differences in practice between successful systems and less successful ones
5. **Long term effectiveness** – it will provide a baseline for later assessments: the early starters don’t necessarily win in the end.

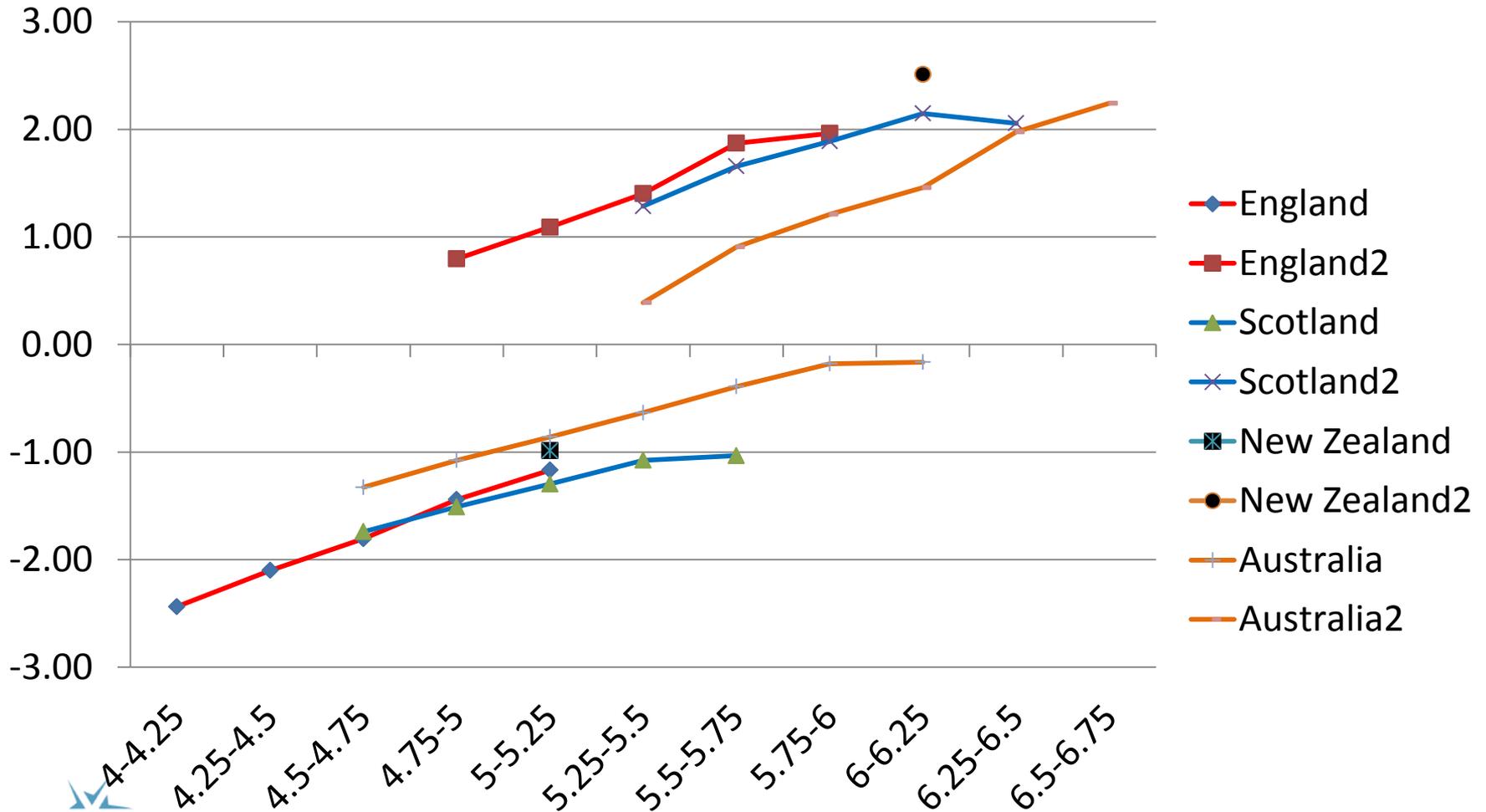
# Reading Development on entry

(Illustrative data– not fully representative)



# Reading Development over the year

(Illustrative data– not fully representative)



# The iPIPS project

- An international monitoring survey of children starting school, using PIPS as the baseline and follow up assessment
- Designed to provide answers to the five key questions
- Partnership of research institutes, pooling expertise
- Links with OECD
- Information for policy makers, experts and schools

# iPIPS: What is Planned

- Adapt existing PIPS assessment specifically for international comparative use
- Sample based monitoring of 3000 children's developing abilities at start and end of first year in school per country/region
- International and country/regional analyses
- Data for schools to use diagnostically (not accountability or performance management)
- Pilots in 6-8 countries 2014-16
- To be offered more widely thereafter

# Russia: Why iPIPS?

- Baseline assessment and assessment of individual progress in the end of the first year of schooling
- The object of the study: the range of children's skills and abilities, both cognitive and non-cognitive
- Individual assessment
- Standardized assessment with established psychometric properties and validity (on British sample), recognized in the world
- Special measurement technique lets evaluate an individual progress of a child over the first year
- Computer adaptive test
- Gentle and precise assessment of each child
- Unique for the Russian school system

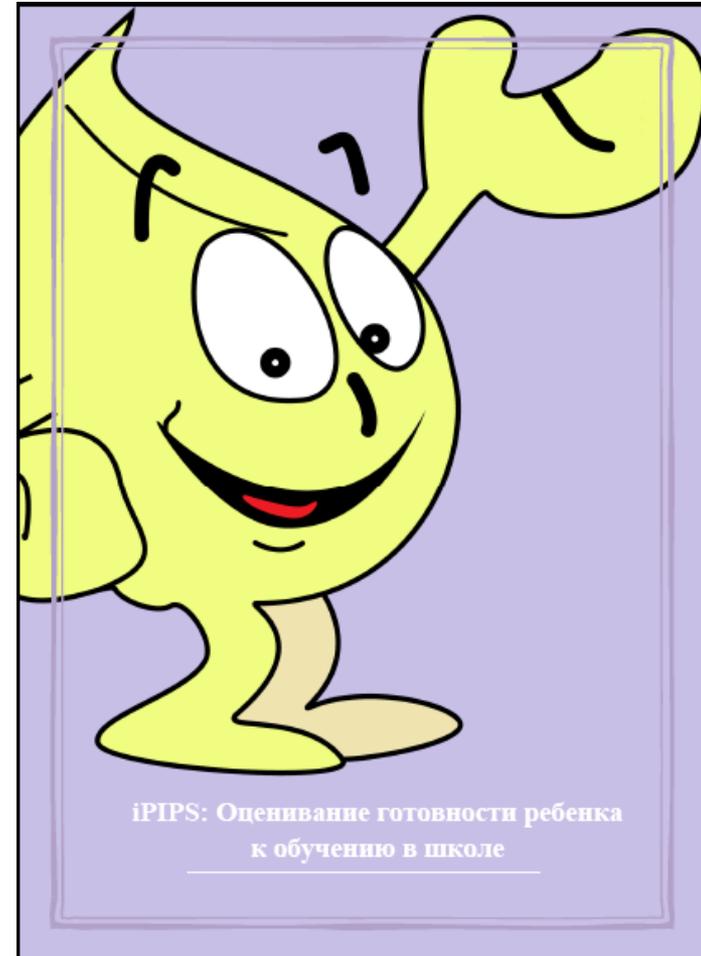
# Adaptation of iPIPS in Russia

- Development of the Russian language test version of iPIPS
- Development of the procedures and carrying out two assessment cycles (testing children and collecting the context data), such as the baseline assessment and the first class end assessment
- The research on adaptation, including psychometric analysis of item properties comparing to the international database of iPIPS
- Validity study of the Russian version of iPIPS
- Development of the assessment method and a common scale construction for two cycles which is compatible with the international scale
- Primary data analysis

Center for monitoring of the quality of education (Institute of Education, NRU-HSE) performs the work on adaptation and validization of iPIPS in the Russian Federation, according to the agreement with Durham University.

# iPIPS structure

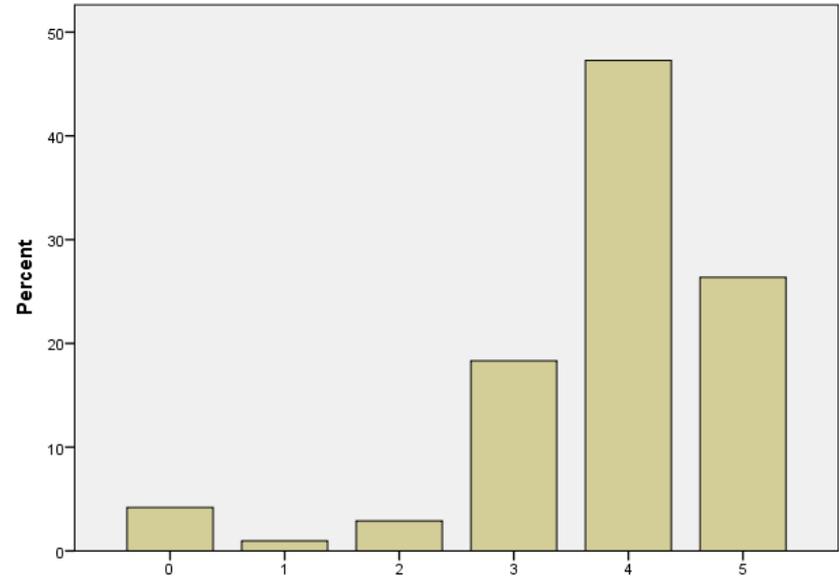
- A booklet with items for children (verbal part, math, attitudes)
- A questionnaire for parents
- A questionnaire for teachers:
  - Survey of social and emotional development of a child
  - Survey of teachers



# Writing

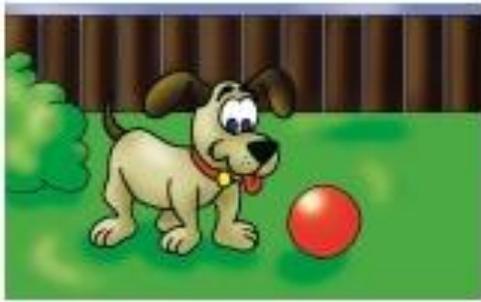
		
1x		
2x	КОМА	БОРОД <span style="float: right;">x</span>
3x	ВАСЯ	ПЕТРОВ <span style="float: right;">x</span>
4x	АМНА <span style="float: right;">x</span>	ЛЮБОВА <span style="float: right;">x</span>
5x	СВЕТА РОГОВА	КРИСТИНА

Попросите ребенка написать на листе бумаги его/ее имя и фамилию.



Попросите ребенка написать на листе бумаги его/ее имя и фамилию.

27% of children can write down their full names correctly and with proper capitalization



**У щенка красный мяч.**



**Щенку очень нравится играть с мячом на траве.**



**После игры ему хочется лечь и поспать.**

## Reading: A short story



All word were read correctly: 31%  
No words were read correctly: 17%

# Examples of math tasks

1) Sasha wants to buy an orange which costs 12 rubles, which coins should he use?



2) What is 3 less than 7?

3) What is a half of 6?



## Attitudes of a child

**"Listening to stories"**

**"Looking at pictures in books".**

**"Drawing pictures"**

**"Building models out of Lego or any construction kit"**

**"Counting"**

**"Being at school"**

**"Playing out in the playground"**

**"Working on the computer"**

# Preparing the research materials

- Translation difficulties:
  - Dual translation
- Selecting the items
  - Using experts for:
    - Item analysis
    - Clinical piloting
  - Correcting the items
- Software testing

# Sample

Region: Velikiy Novgorod, Novgorod Region

Sample size: 311 first year students (5% of the population)



- Stratified random selection: a random selection of a settlement by given parameters, random selection of schools, classes and children in a class

# Training the interviewers

- Selecting interviewers among students of the HSE master programme “Measurement in psychology and education”
- Training:
  - Getting familiar with iPIPS materials
  - Watching video of an example of assessment in the UK
  - Analysis of «difficult» situations during the assessment

# Assessment procedures

- Individual work with each child
- Duration of 20-30 min
- Play-based assessment
- A colourful booklet for a child
- A tablet computer with software for each interviewer

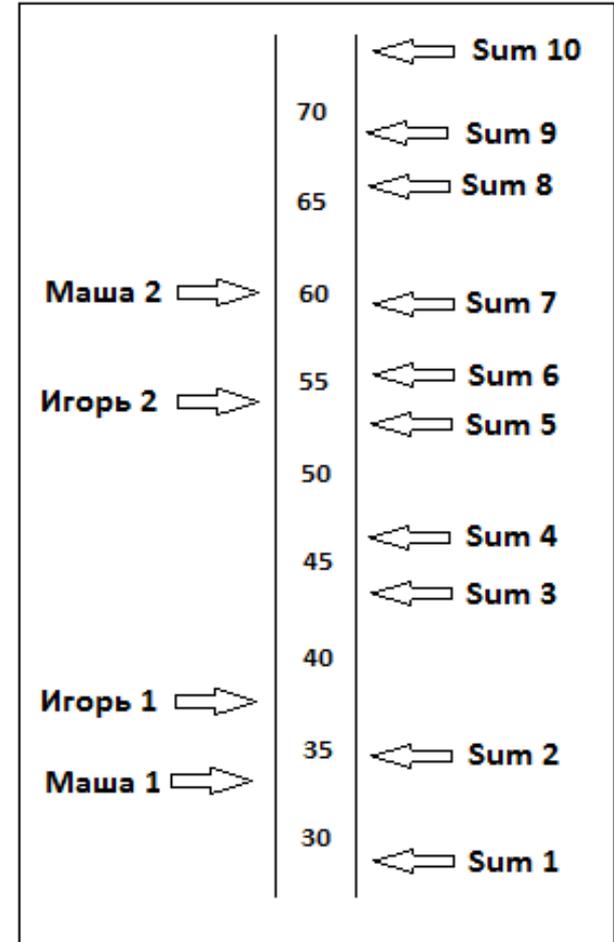


# Diagnostic procedures

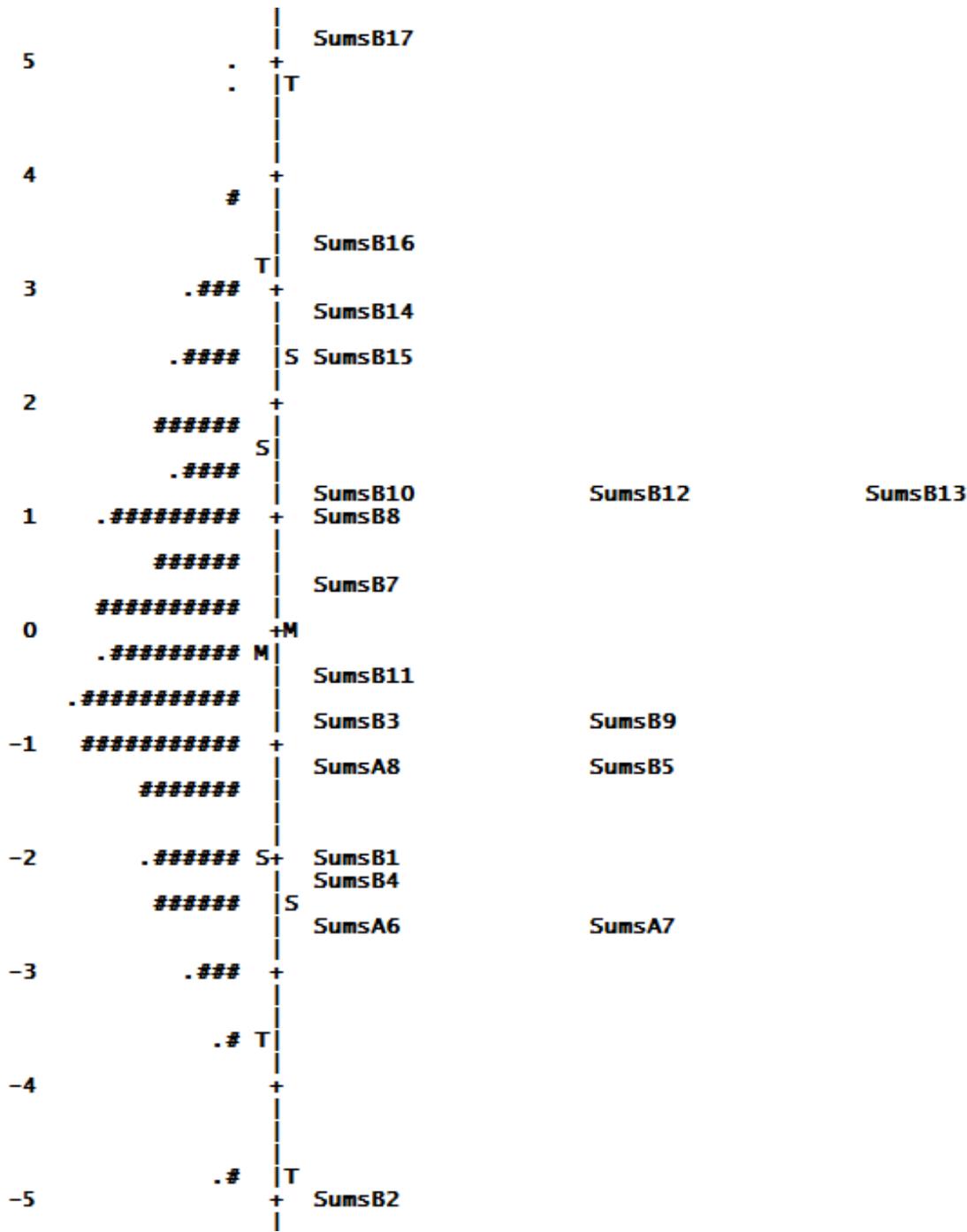
- Survey of parents (filling in a questionnaire)
- Survey of teachers
  - Survey of social and emotional development of a child
  - Teacher's survey

# Data analysis: methodology

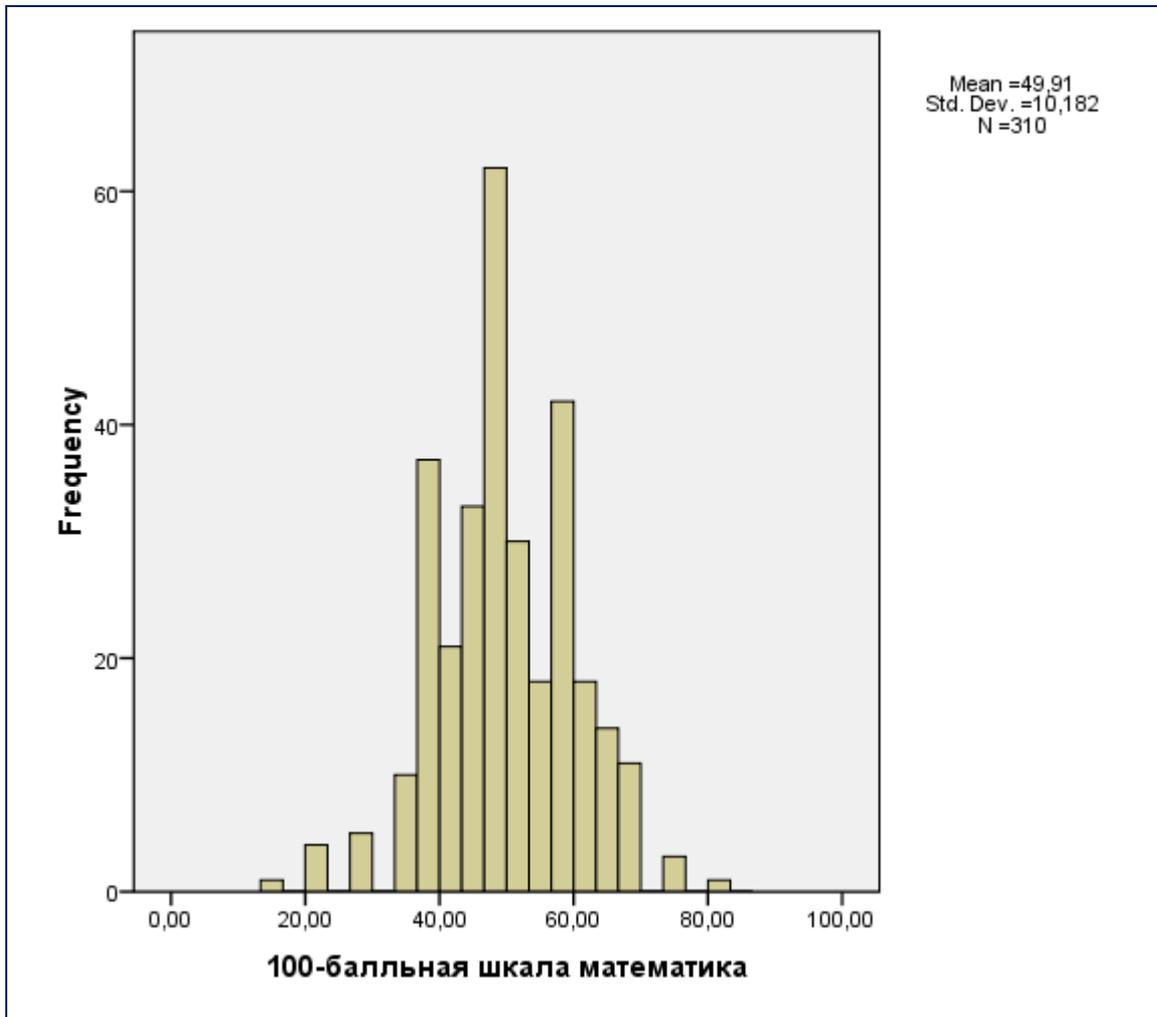
- Comprehensive approach based on modern principles of measurement in education.
- Item Response Theory (IRT) as a theoretic base.
- IRT allows to perform three types of score interpretation: norm-referenced, criterion-referenced and self-referenced
- Family of Rash models was chosen for modeling
- The metric scale allows to compare results of different children and groups of pupils and to use various methods of math statistics to research the data and checking different hypotheses, equate the results of testing from different periods.



# Math scale



# Students estimation

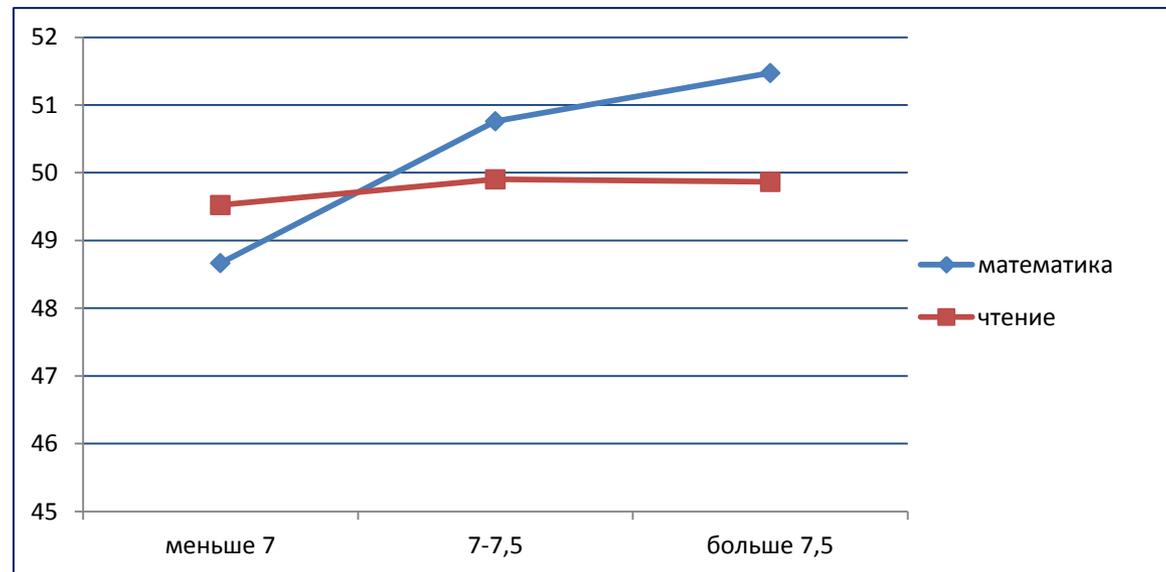


- Convenient 100 - point scale with mean=50 and SD=10

# Primary analysis: results by age

Age	Math	Reading	Number of children
less than 7	48,7	49,5	77
7-7,5	50,8	49,9	167
more than 7,5	51,1	49,7	43

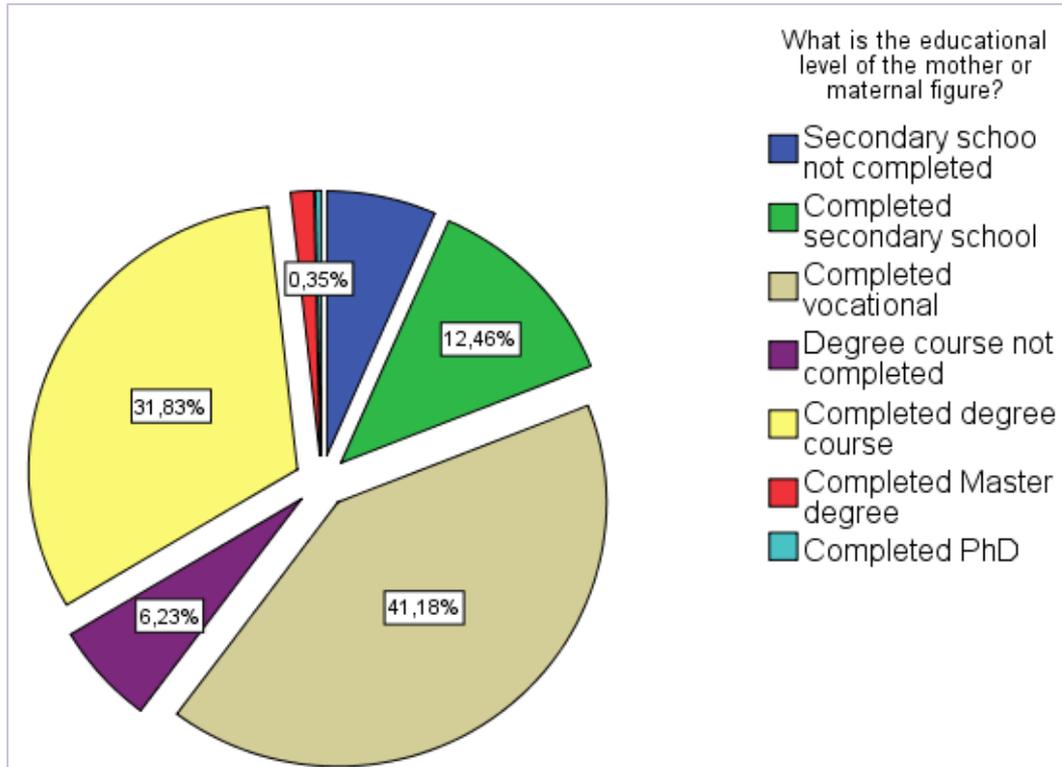
No significant mean differences



# Results of the primary analysis

- **Child's gender:**  
Math results of boys and girls do not differ, while in reading and phonetics girls' scores are slightly higher.
- **Type of school:**  
Students of schools with advanced study of some subjects get the highest scores in all tested areas, while the least scores were received by children from ordinary schools. There are no differences between the results of children from gymnasiums and advanced study schools.
- **Location:**  
There are no differences in math scores between children from different settlements, but there are differences in reading scores.

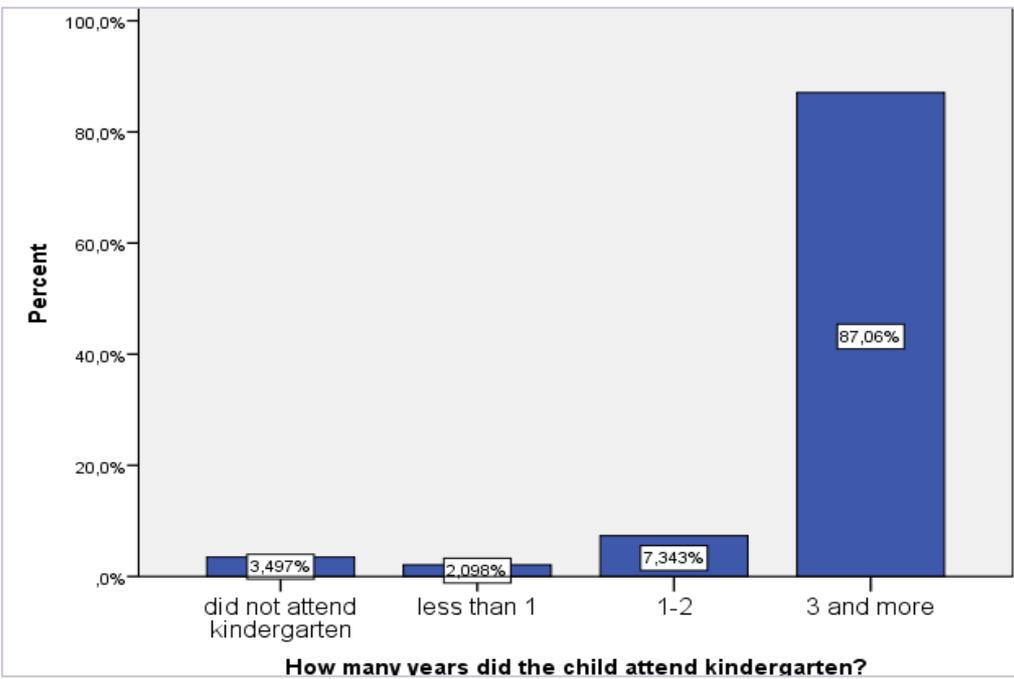
# Educational level of parents



Children whose mothers **have higher education** read better and understand more in math than children whose mothers don't have higher education.

**41% of mothers и 50% of fathers have vocational secondary education**

t-test	Score difference
math	4.51*
reading	7.35*

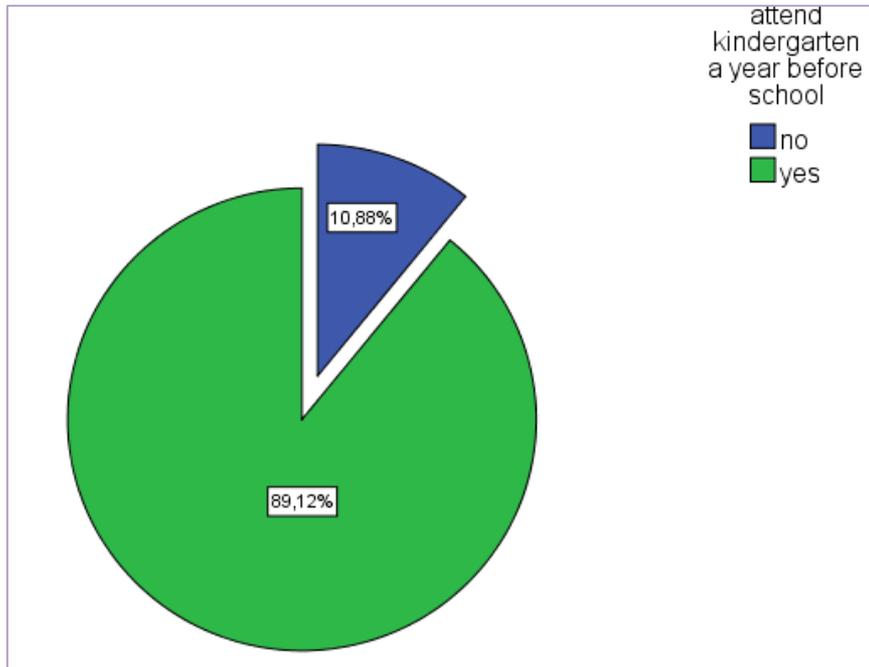


87% of children went to kindergarten for more than 3 years

89% went to kindergarten for one year just BEFORE school

63% went to some centers of development, sections and hobby-groups

55% went to special pre-school classes

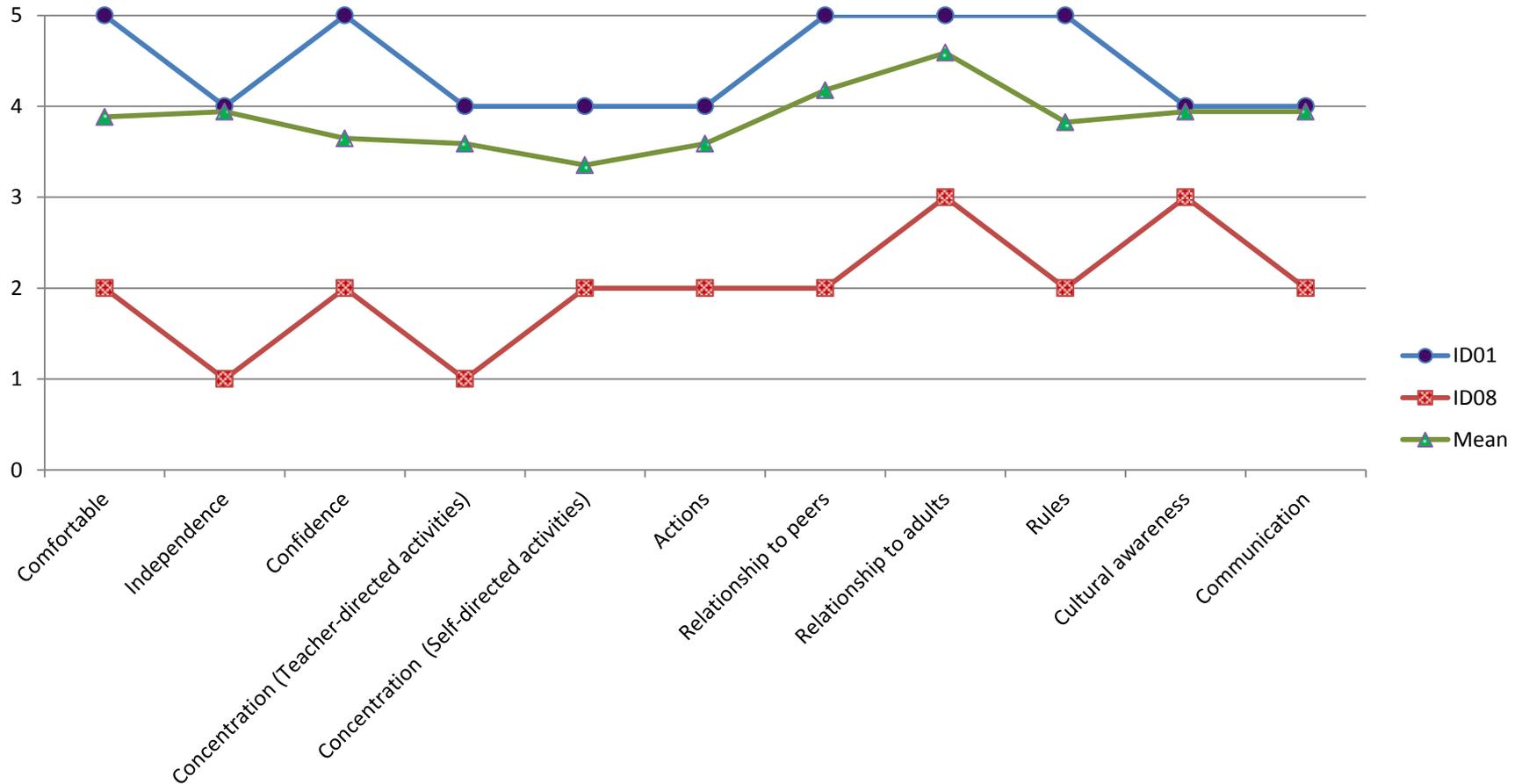


28. Did a child go to kindergarten in the year just BEFORE SCHOOL?		N	Mean	Std. Dev.
Math	да	254	51	9.7
	нет	31	48	11.0
Reading	да	254	51	11.2
	нет	31	44	16.0

# Survey of social and emotional development of a child

	Math	Reading
Adaptation	,297**	,285**
Independence	,301**	,374**
Focus 1 (in teacher-lead activities)	,378**	,348**
Focus 2 (in independent activities)	,395**	,378**
Behaviour	,189**	,272**
Confidence	,332**	,278**
Relationships with adults	,132*	,232**
Relationships with peers	,157**	,194**
Rules	,208**	,237**
Cultural development	,316**	,285**
Communication	,358**	,352**

# Profiles of social and emotional development of a child



# Plans for 2014-2015 гг.

- Second stage of pilot testing (May 2014, the same sample)
  - Creating a common scale
  - Developing the methodology of individual progress assessment
  
- 1st research stage of main study in 2-3 Russian regions  
(September 2014, Sample of 3000 children)
  - Validization of the test
  - International comparative research of readiness to school
  
- 2nd research stage of main study  
(May 2015, the same sample of 3000 children)
  - Individual progress assessment
  - International comparative research of children's progress over the first school year

# Thank You

