



RESILIENCE PATTERNS IN PUBLIC SCHOOLS IN TURKEY

An analysis of PISA 2009 data

BACKGROUND

- Empirically, a strong and robust correlation between socioeconomic background and student learning.
- Most students performing poorly in PISA come from a challenging socio-economic background (OECD, 2011).
- Some of their peers, however, despite coming from a disadvantaged socio-economic background, exhibit relatively high levels of achievement.



BACKGROUND

- Research on these **resilient students** - those who perform high academically despite coming from a disadvantaged socioeconomic background - is very limited.
- These individuals provide policy makers and other education stakeholders with insights into the drivers of achievement among socio-economically disadvantaged students.



CONTENT OF OUR STUDY

- This study presents a descriptive analysis of resilience among 15-year old students in the public school system in Turkey, using the PISA 2009 data.
- The preliminary findings highlight that the probability of being resilient varies by gender, region and school type.
- In addition to this, the association between gender and probability of being resilient varies by subject.



CONTENT OF OUR STUDY

- Certain aspects of school resources, policies, funding and governance correlate with resilience as well.
- Lastly, school disciplinary climate and, to a certain extent, teacher student relations stand out as consistent predictors of being resilient in public high schools in Turkey.



DATA

- PISA 2009 has been selected as the source of data for this study since;
 - it is the most recent data set which is nationally representative for 15-year old student population
 - contains detailed information on students as well as schools



DATA

- PISA includes two key variables that enable the identification of resilient students:
 - an index summarizing the socio-economic background of individual students (ESCS),
 - measurements of students' literacy skills in science, mathematics and reading.



DATA

- ESCS - a comprehensive measure of socio-economic background - includes information on parental occupation and educational level, home possessions (computers, books and Internet).
- Literacy component - evaluates students' ability to apply their knowledge and skills to real-life covering reading, mathematics and science.



METHODOLOGY

- OECD's definition: **the top third high performers in the bottom third of socio-economic scale in a given school**



METHODOLOGY

- Basic logistic regression on the sample of disadvantaged student population:
 - dependent variable is 1 if student is at the bottom third of socio-economic distribution and at the top third of performance distribution
 - is 0 if student is at the bottom third of socio-economic distribution and not at the top third of performance distribution

- Two models:

$$\Pr(\text{resilient} = 1)_{ij} = \frac{1}{1 + e^{-z_{ij}}}, \text{ where } z_{ij} = X_{ij}\beta$$

$$\Pr(\text{resilient} = 1)_{ij} = \frac{1}{1 + e^{-z_{ij}}}, \text{ where } z_{ij} = X_{ij}\beta + P_{ij}\alpha + S_j\gamma$$

where X_{ij} is background characteristics, P_{ij} is student's perceptions of certain school/teacher characteristics and S_j is school characteristics reported by the principal

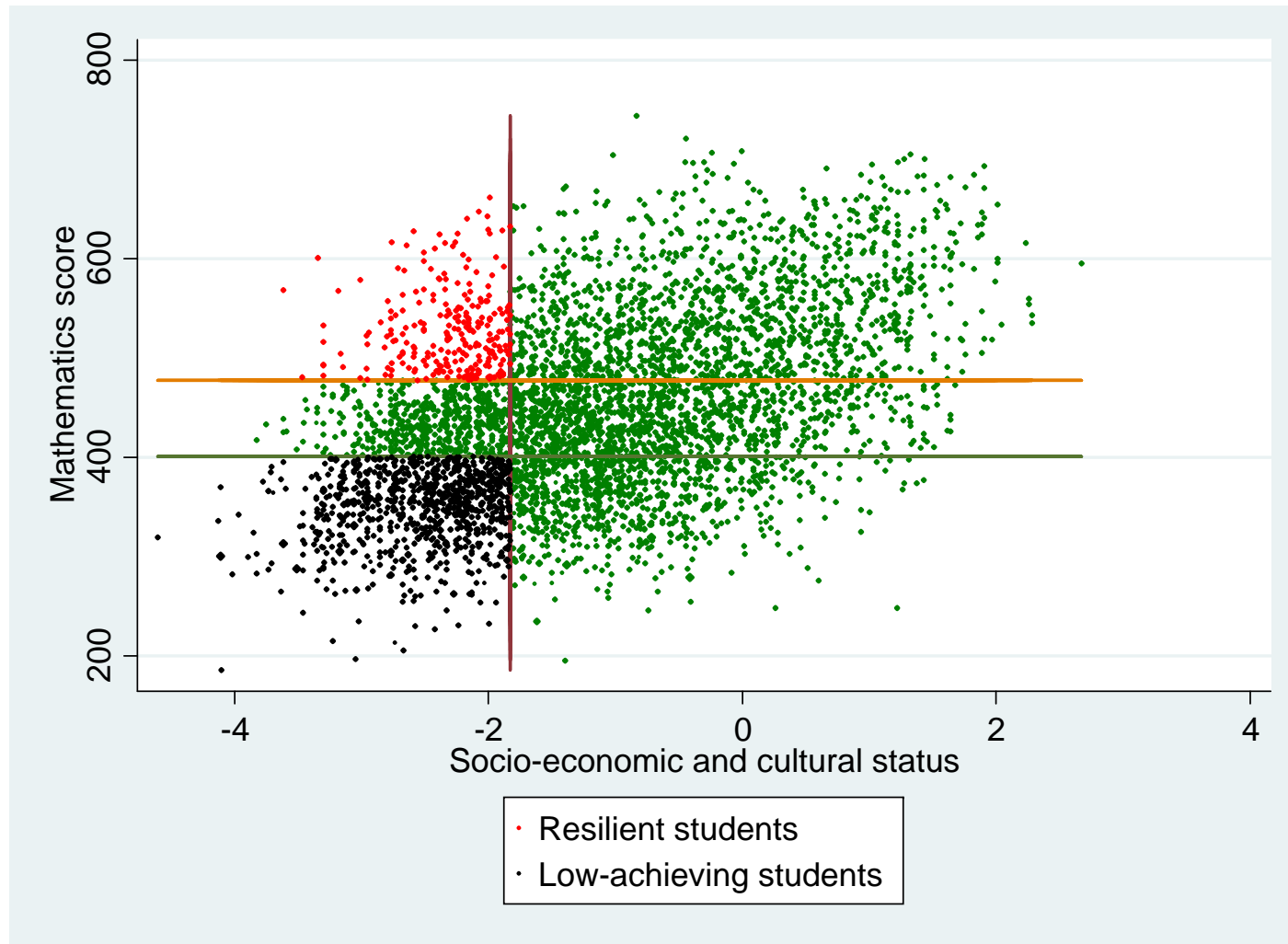


METHODOLOGY

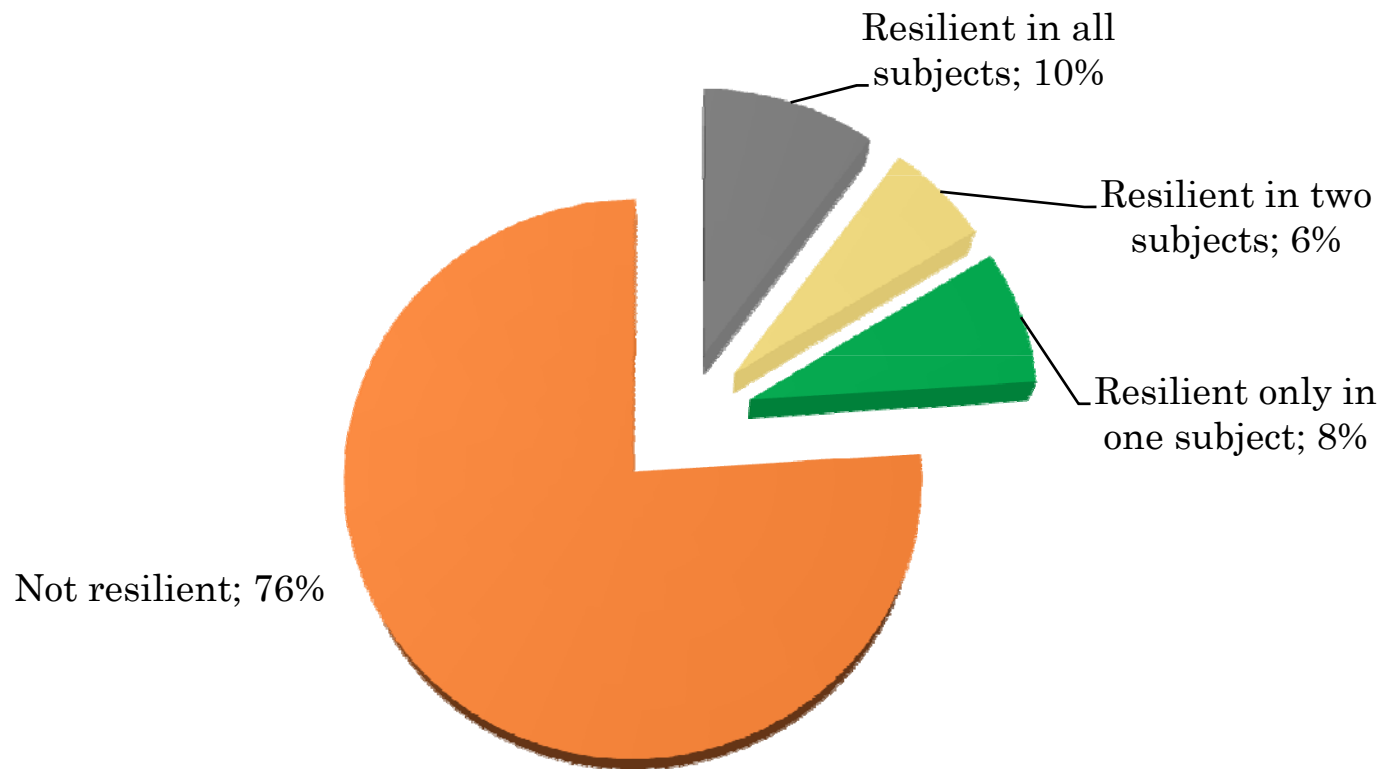
- Experimented with more conservative cut-off points (i.e. 70th and 75th percentiles)
 - Results do not change - qualitatively or quantitatively



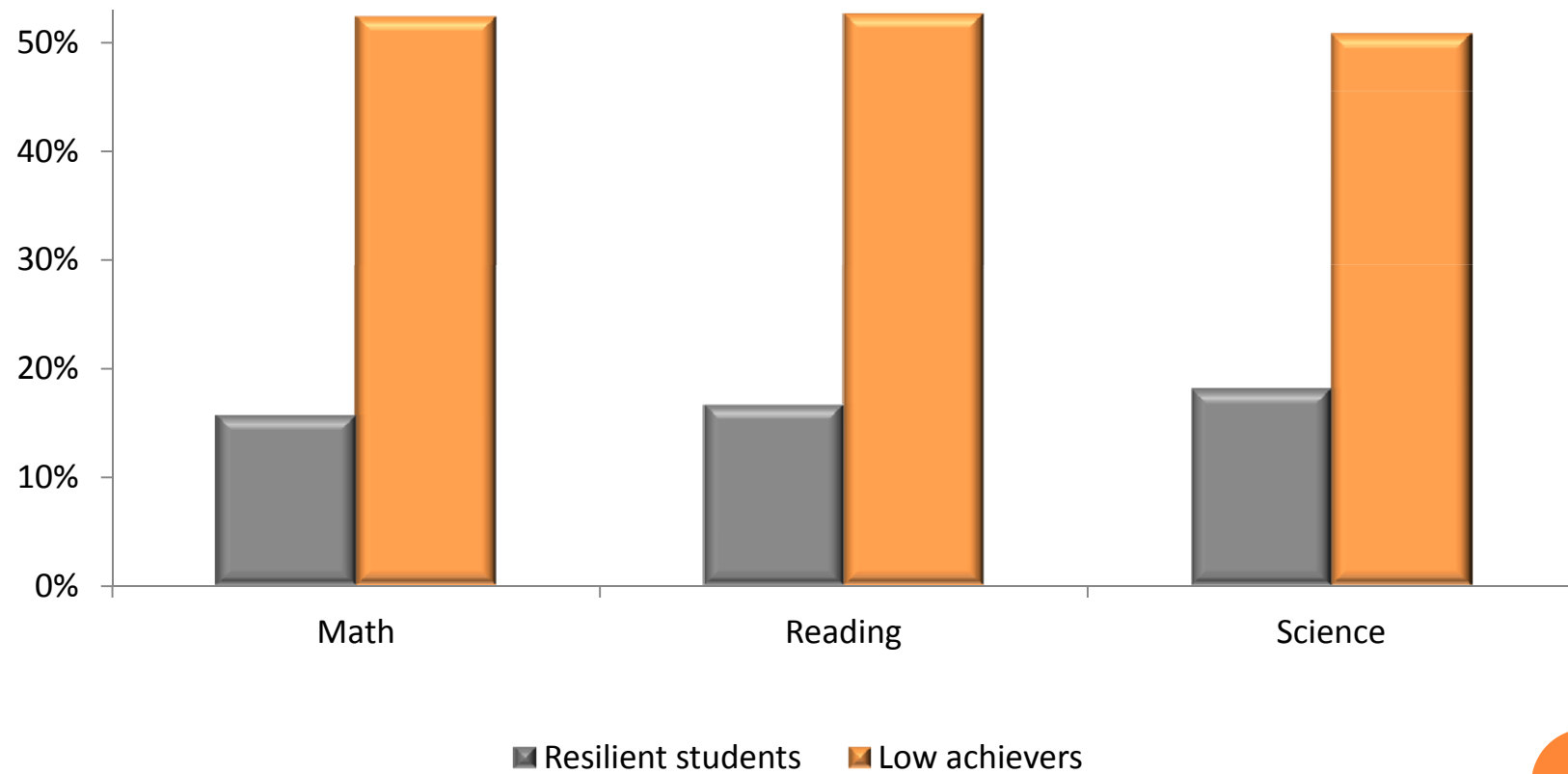
PROFILE OF RESILIENT STUDENTS



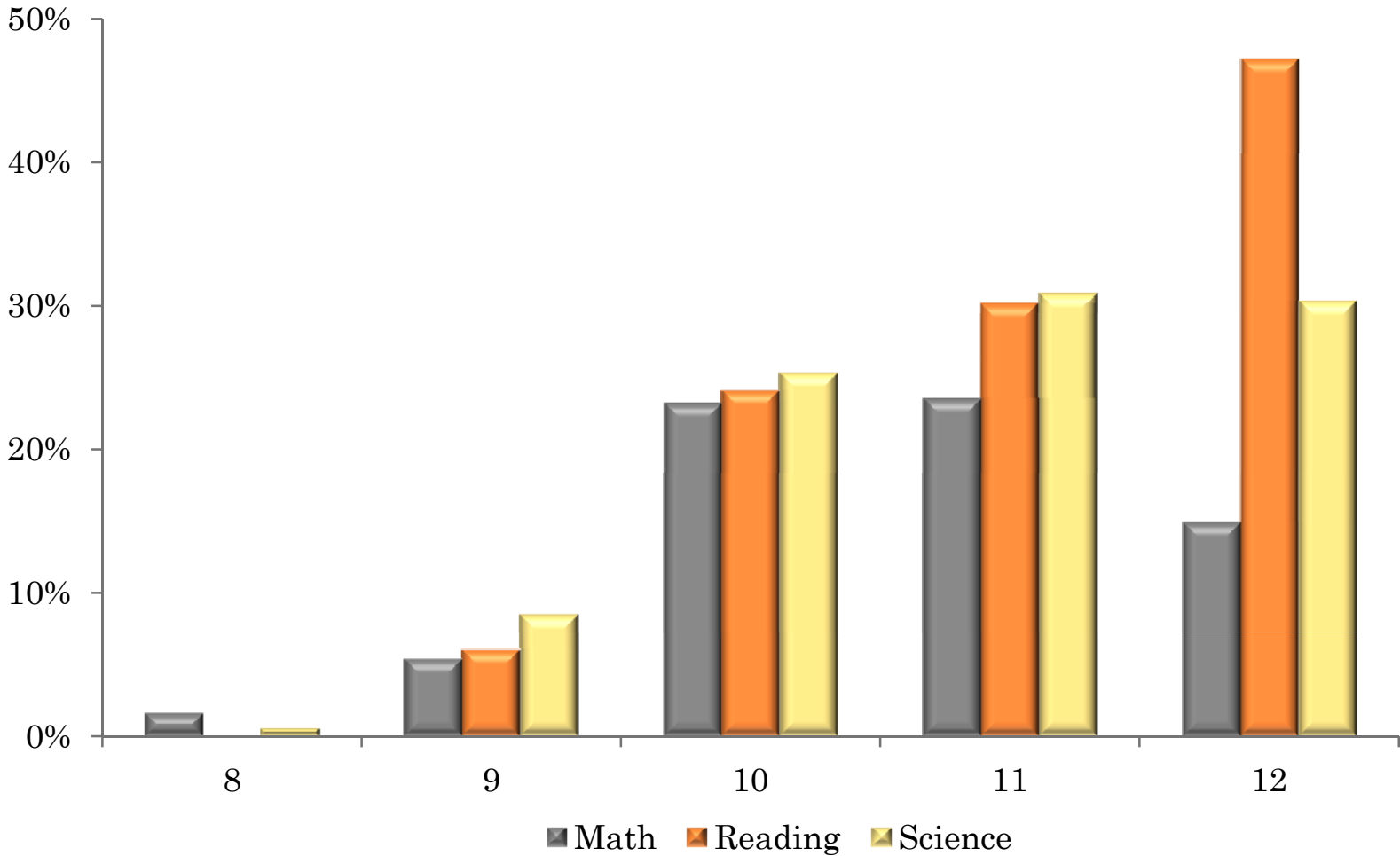
PROFILE OF RESILIENT STUDENTS



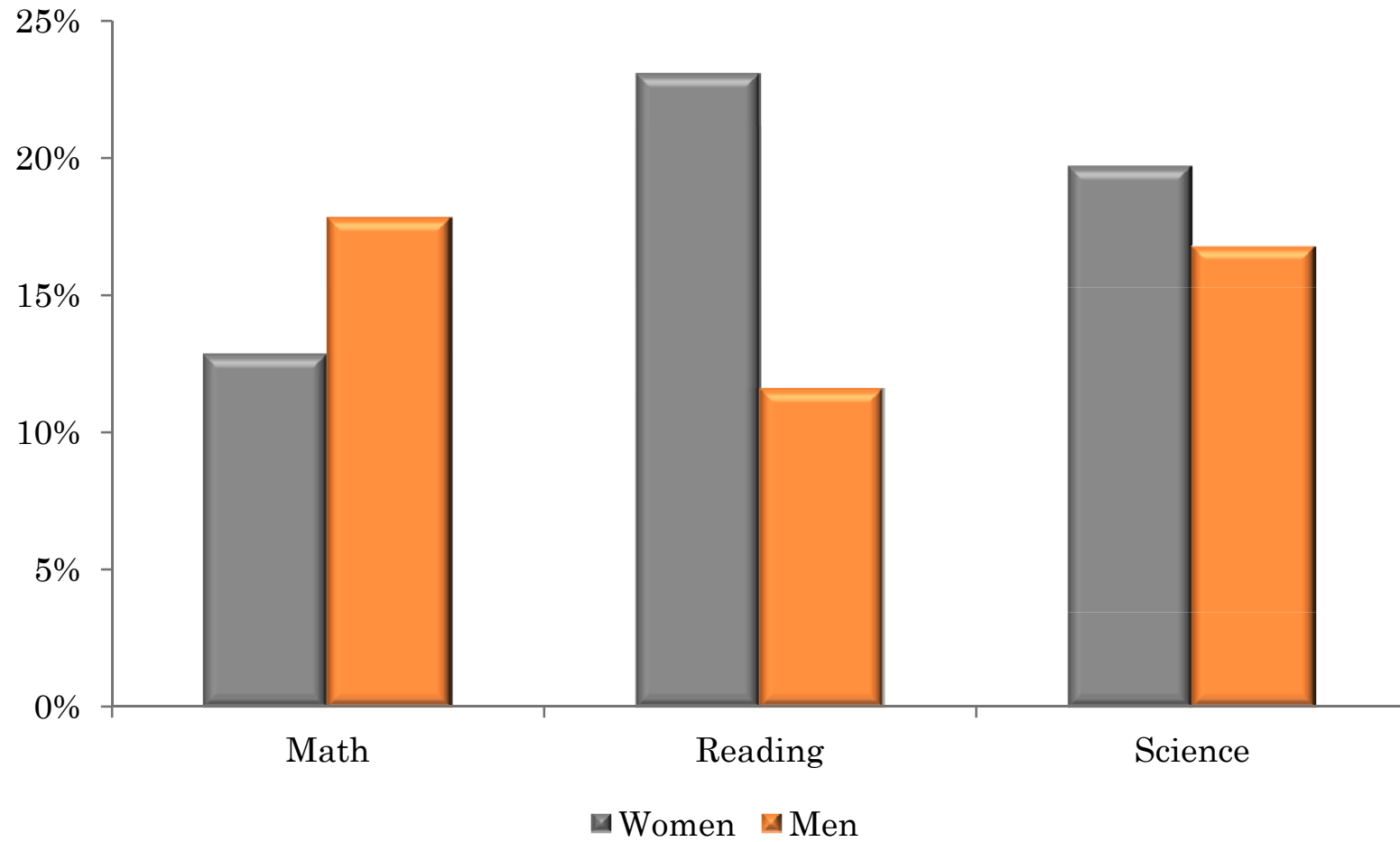
RESILIENCE BY SUBJECT



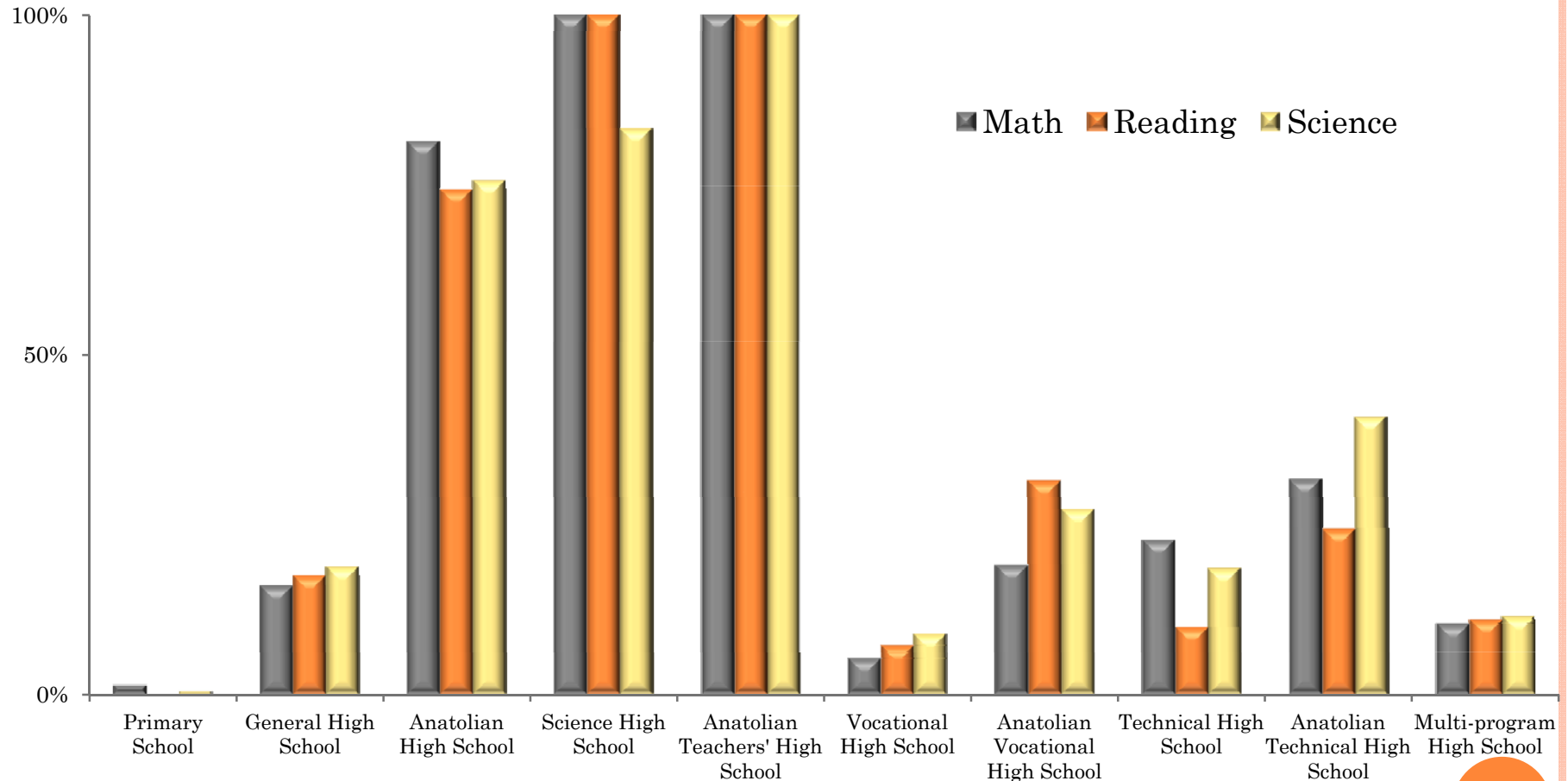
RESILIENCE BY GRADE AND SUBJECT



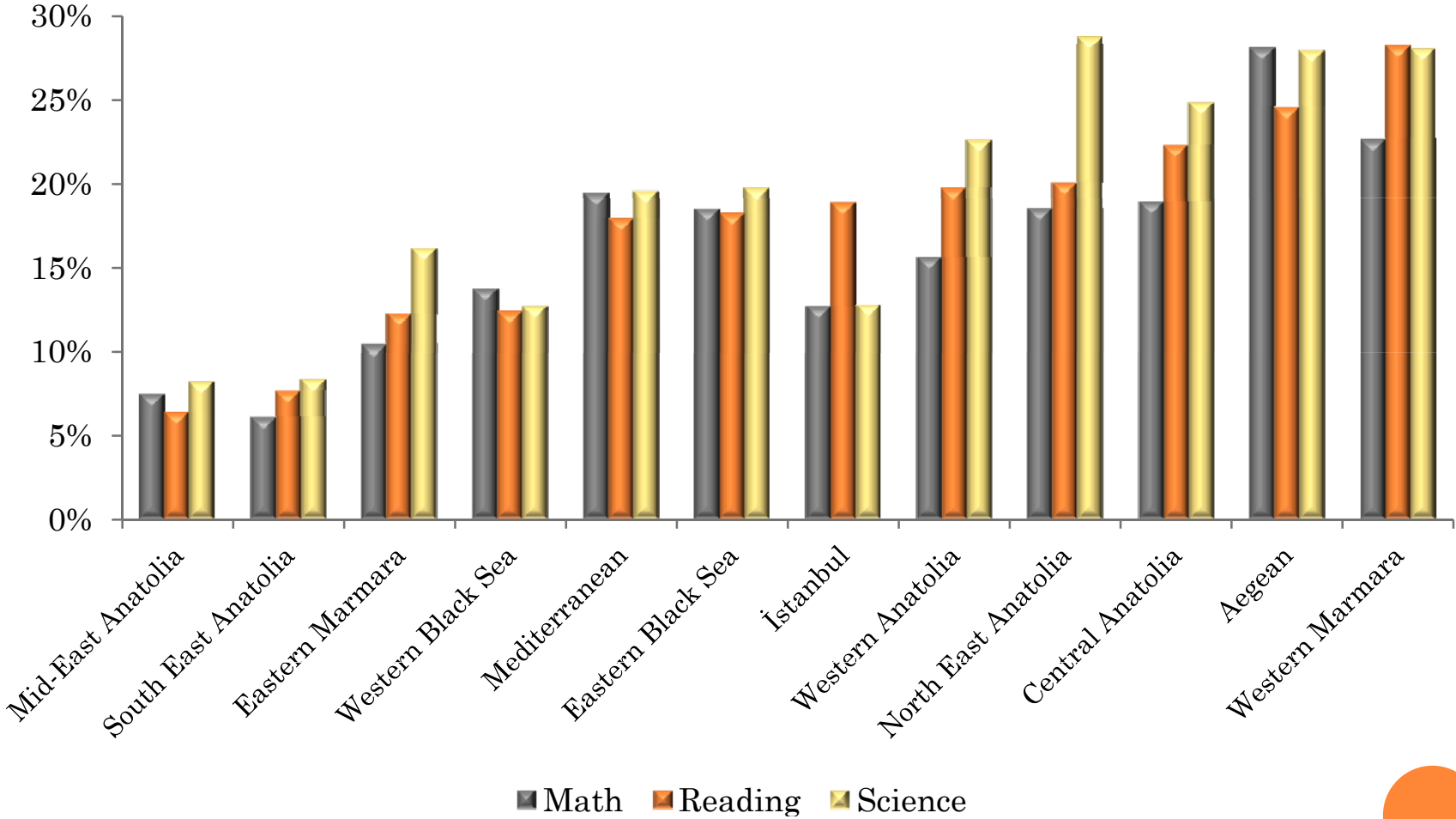
RESILIENCE BY GENDER AND SUBJECT



RESILIENCE BY SCHOOL TYPE



RESILIENCE BY REGION



ODDS RATIOS FROM REGRESSION: STUDENT BACKGROUND

- Males > math; Females > reading (in line with OECD findings)
- ESCS > not statistically significant (in contrast with OECD findings). Seems to matter less if focusing on a sub-population (i.e. disadvantaged students)
- School starting age > negatively associated
 - MoNE & UNICEF (2011) > Late enrollment
- More than one year pre-primary > positively associated
 - No policy priority of pre-primary; Neither free nor compulsory
 - Public effort is low (0.02% of GDP vs. 0.39% of GDP in OECD) (OECD, 2011b)
 - 4+4+4 does not address these issues



ODDS RATIOS FROM REGRESSION: GRADE, PROGRAM TYPE

- Grade progression > positively associated
 - may be related with many unobserved factors (employment, motivation, self efficacy, confidence etc.)
- Program type (base category: non-selective academic)
 - selective academic > positively associated, especially in math
 - estimated odds ratios are mitigated in Model 2
 - school factors may not be uniformly distributed across program types



ODDS RATIOS FROM REGRESSION: LOCATION, REGION

- Regions (NUTS 1) (base category: Istanbul)
 - SouthEast and MidEast Anatolia > negatively associated, especially in math
 - regional differences more pronounced in science
- School location (base category: Village)
 - some differences in Model 1; almost no differences in Model 2
 - school factors may not be uniformly distributed across locations



ODDS RATIOS FROM REGRESSION: SCHOOL RESOURCES

- Student teacher ratio, teacher shortage > negatively associated; but not statistically significant
- Learning time > positively associated; statistically significant estimates for math and science
 - in line with OECD (2011b)
 - an additional 60 minutes in math is associated with a 36% increase in math and a 12% increase in science
 - recent Board of Education decrees
 - increased learning time in math and science at primary schools
 - added electives of math and science to primary curriculum
 - no changes for high schools



ODDS RATIOS FROM REGRESSION: SCHOOL RESOURCES

- Portion of girls > positively associated; statistically significant estimates for math and science
 - may be an indicator of cultural/social factors as well as girls' likelihood of transitioning from primary to secondary institutions
- School ESCS > positively associated
 - may be discussed in conjunction with program types
 - public impression: centralized exams combined with many program types > stratification
 - MONE targets to reduce the program types and abolish centralized exams
 - should we expect a more balanced distribution of ESCS across schools following these policy initiatives?



ODDS RATIOS FROM REGRESSION: FUNDING, GOVERNANCE & POLICIES

- Share of local funding > positively associated; statistically significant for math
 - Medium Term Programme 2013-2015 (Ministry of Development, 2012) announces the plans towards a school-based decentralization in management and finance
- Competition > (base category: two or more schools available)
 - no other available school > negatively associated, statistically significant estimates for math and science
 - we have almost no data or empirical analysis of school choice and competition in Turkey



ODDS RATIOS FROM REGRESSION: FUNDING, GOVERNANCE & POLICIES

- Ability grouping > (base category: no ability grouping)
 - ability grouping for some/all subjects > negatively associated, statistically significant for math and science
 - it is likely that ability grouping primarily targets preparation for university entrance exam
 - if this is the case then it is clear that peer effects will work against disadvantaged students

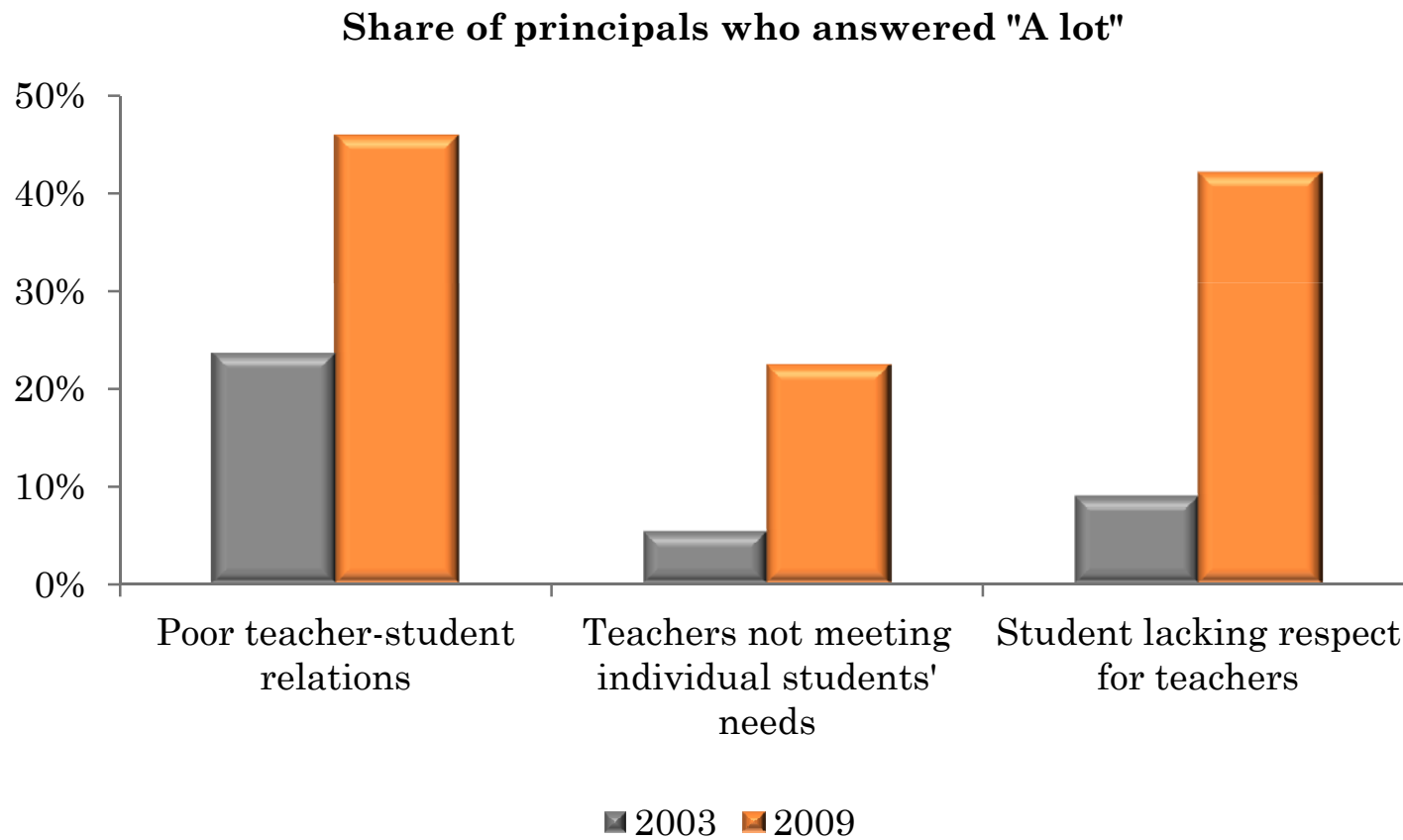


ODDS RATIOS FROM REGRESSION: FUNDING, GOVERNANCE & POLICIES

- Disciplinary climate & teacher-student relations
> positively associated
 - Research highlighting problematic aspects of disciplinary climate and principal-student, teacher-student relations and the likelihood of transitioning from primary to secondary education, and chronic absenteeism (Altinkurt, 2008; Balcı, 2002; Öge, 2009; Pehlivan, 2006)
 - To our knowledge, there are no policy initiatives which aim to improve disciplinary climate and principal-teacher-student relations which appear to be deteriorating at least since 2003.



IN YOUR SCHOOL, TO WHAT EXTENT IS STUDENT LEARNING HAMPERED BY THE FOLLOWING PHENOMENON?



ALL THIS IS IMPORTANT BECAUSE A TYPICAL ...

	Non-resilient student	Resilient student
Reading	<ul style="list-style-type: none"> cannot locate one or more pieces of information, which may need to be inferred and may need to meet several conditions cannot recognize the main idea in a text, understand relationships, or construe the meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences 	<ul style="list-style-type: none"> can locate, and in some cases recognize the relationship between, several pieces of information that must meet multiple conditions can integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase
Math	<ul style="list-style-type: none"> cannot interpret and recognize situations in contexts that require no more than direct inference cannot extract relevant information from a single source and make use of a single representational mode cannot employ basic algorithms, formulae, procedures, or conventions are not capable of direct reasoning and literal interpretations of the results 	<ul style="list-style-type: none"> can execute clearly described procedures, including those that require sequential decisions can select and apply simple problem-solving strategies can interpret and use representations based on different information sources and reason directly from them can develop short communications reporting their interpretations, results and reasoning
Science	<ul style="list-style-type: none"> do not have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations are not capable of direct reasoning and making literal interpretations of the results of scientific inquiry or technological problem solving 	<ul style="list-style-type: none"> can identify clearly described scientific issues in a range of contexts can select facts and knowledge to explain phenomena and apply simple models or inquiry strategies can interpret and use scientific concepts from different disciplines and apply them directly can develop short statements using facts and make decisions based on scientific knowledge

CONCLUSION

- These findings provide useful hints for policymakers aiming to increase educational quality for all.
- However, rigorous experimental/quasi-experimental studies are needed to establish the causal link between these factors and resilience.



THANK YOU!

