

# Evidence-Based Investments in Education

What research tells us about  
strategies to elevate student  
academic performance

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Part 2



# 1. Investments in Tools

▶ Time



▶ Class size

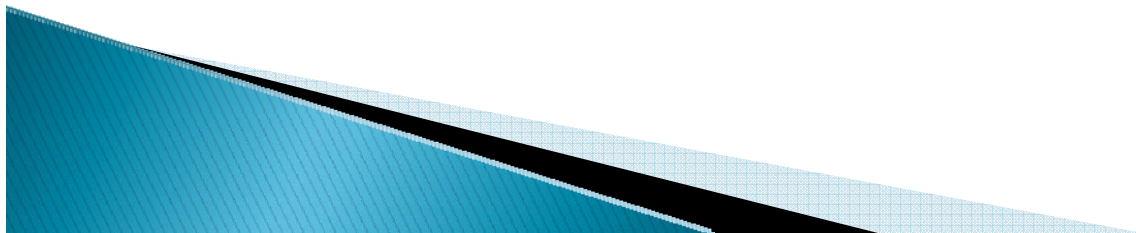


▶ Curriculum



## 2. Investments in Tools: Time

- ▶ Aside from personnel, time is a school's most precious resource
  - Time for teacher learning
  - Time for student learning



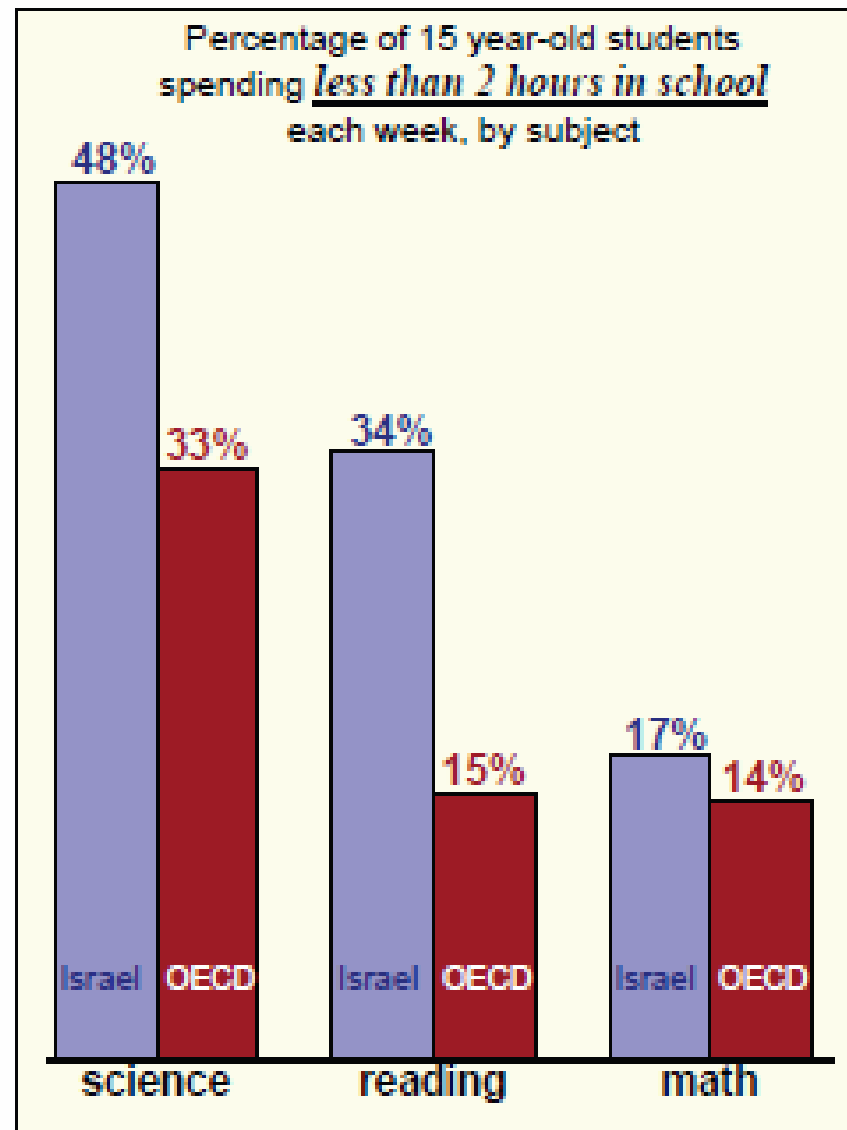
## 2. Investments in Tools: Time for Student Learning

- ▶ Correlational studies indicate increased time for learning leads to higher achievement
- ▶ Largely sustained in experimental studies
  - Comprehensive reforms
    - Success for All
    - Direct Instruction
  - One-on-one tutoring
  - Double time for struggling students
- ▶ *Lack* of time is often the downfall of failed experiments
  - Instructional technology study: 15 minutes/week



## 2. Investments in Tools: Time for Student Learning

Israeli schools spend more time on instruction than typical schools in other nations.

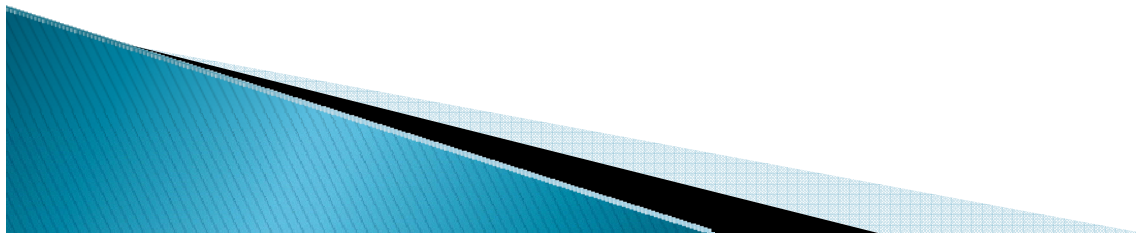


However, the extra time is not spent in core academic subjects.

Source: Ben-David, 2010.

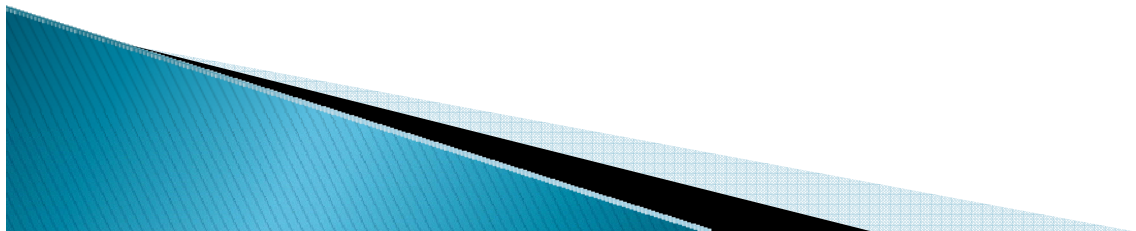
## 2. Investments in Tools: Class Size

- ▶ U.S. research indicates that smaller classes in the early elementary grades promote higher achievement
  - Mechanism: Better classroom management
  - Requires enabling conditions: High-quality teachers and classroom space
- ▶ U.S. class size evidence reflects comparisons of 23 versus 17 students
- ▶ Class sizes in Israel are much larger, so effects of reductions could be greater



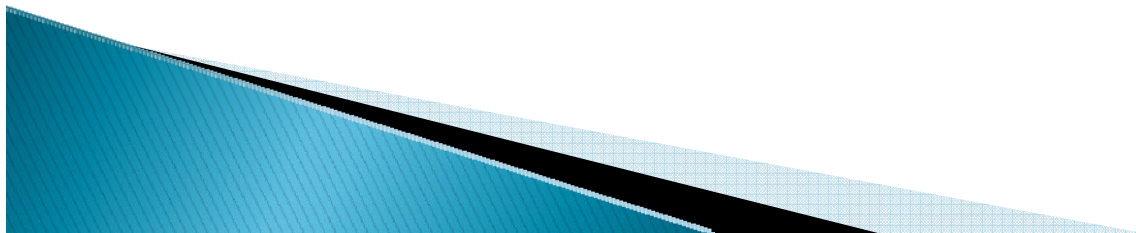
## 2. Investments in Tools: Curriculum

- ▶ International comparisons demonstrate that achievement is higher in countries with curricula that are more:
  - **Focused** -- Fewer content topics per grade level
  - **Coherent** -- Connected across grade levels, topics build upon one another
  - **Rigorous** -- High level of complexity
- ▶ Findings hold in math, science, and reading



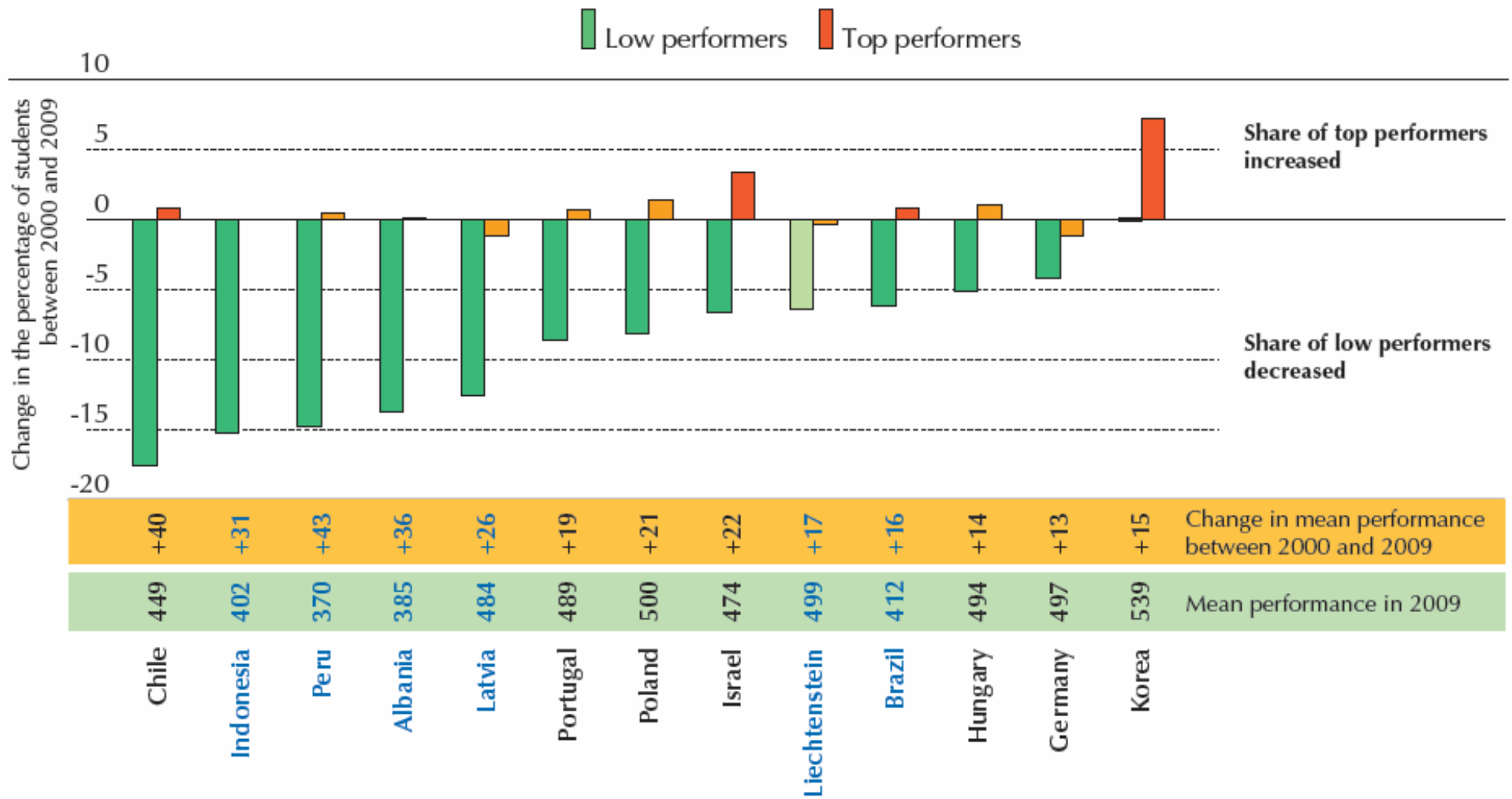
## 2. Investments in Tools: Curriculum

- ▶ Latest example: PISA 2009 reading
- ▶ Many countries improved performance compared to 2000, including Israel
  - Performance improved most for lowest-achieving students
- ▶ OECD: A common curriculum for all students contributes to high performance



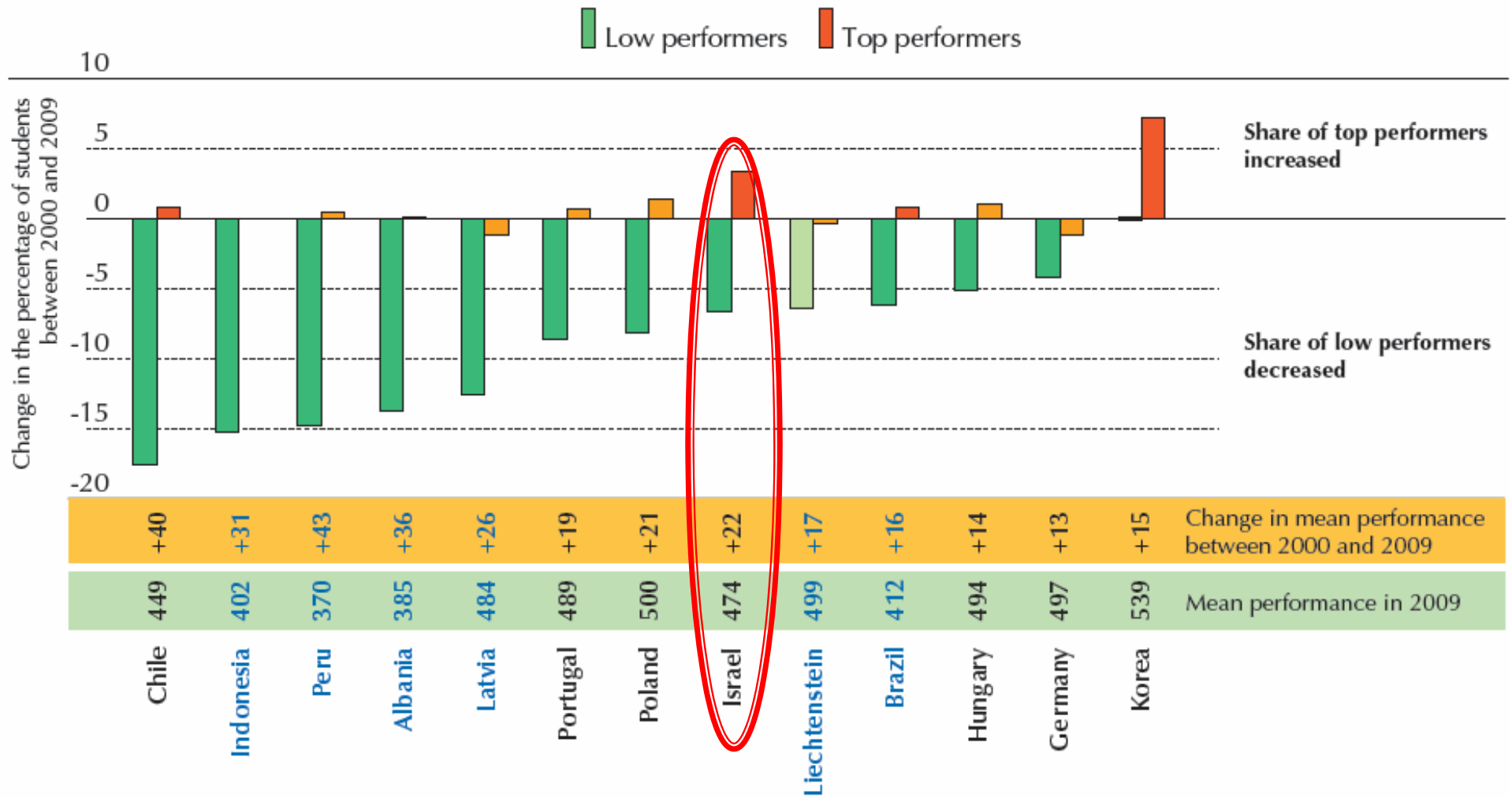


## Change in the percentage of low and top performers in reading since 2000



Source: OECD, 2011

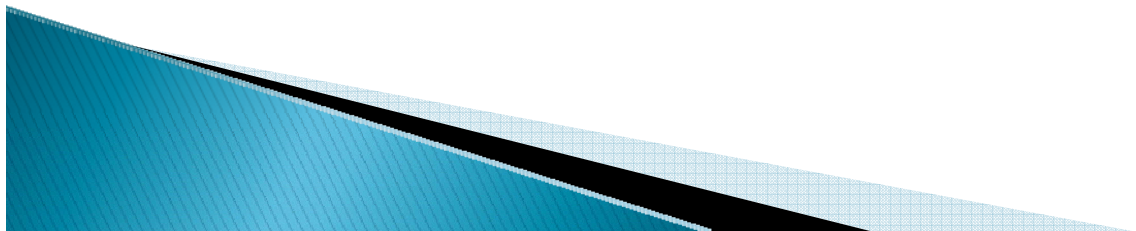
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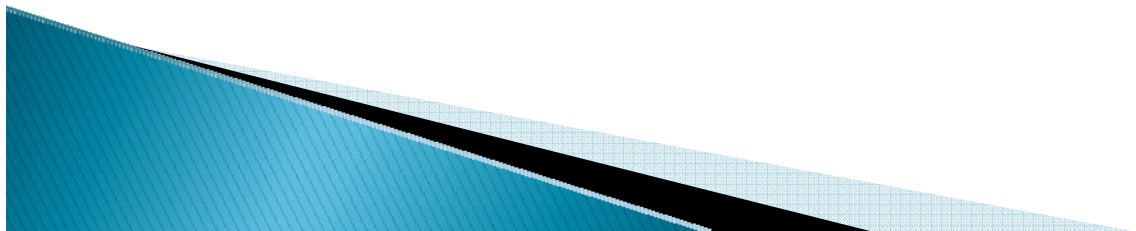
## 2. Investments in Tools: Curriculum

- ▶ Not clear that international differences reflect causal factors
- ▶ Within-country comparisons can help assess the causal role of curricular coherence, rigor, and focus
  - Over time
  - Across administrative regions e.g. states



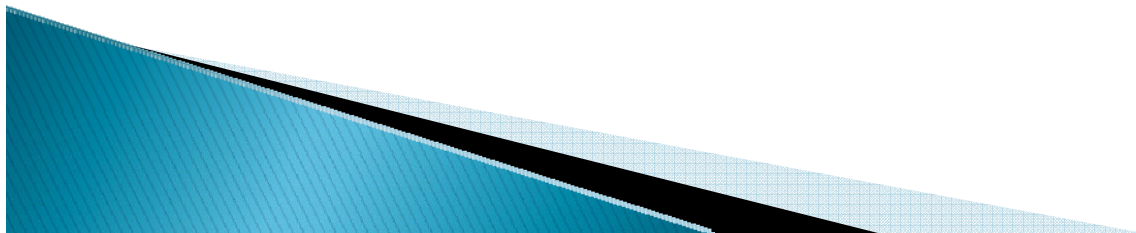
## 2. Investments in Tools: Curriculum

- ▶ Minnesota case study (Bill Schmidt)
  - Increases in curricular focus and coherence between 1995 and 2007 coincided with dramatic rise in TIMSS performance
  - Other states that did not exhibit changes in curricular standards did not experience changes in student performance

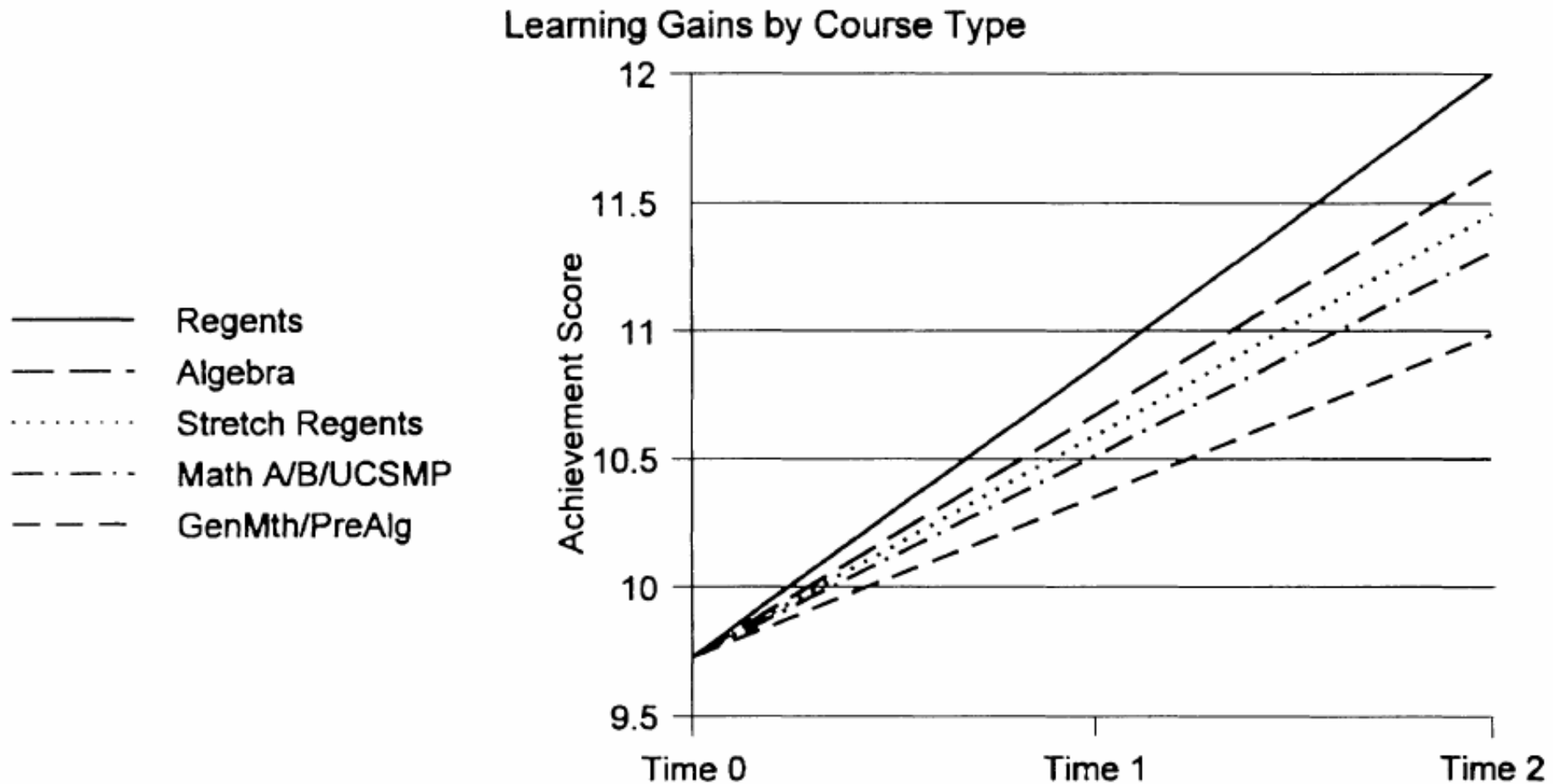


## 2. Investments in Tools: Curriculum

- ▶ Another example: Upgrading the high school mathematics curriculum
- ▶ New York and California
- ▶ Elimination of low-level, dead-end courses
- ▶ Replaced by “transition” courses designed to bridge the gap between elementary and advanced mathematics
- ▶ Found: enhanced performance, attributable to greater curricular coverage

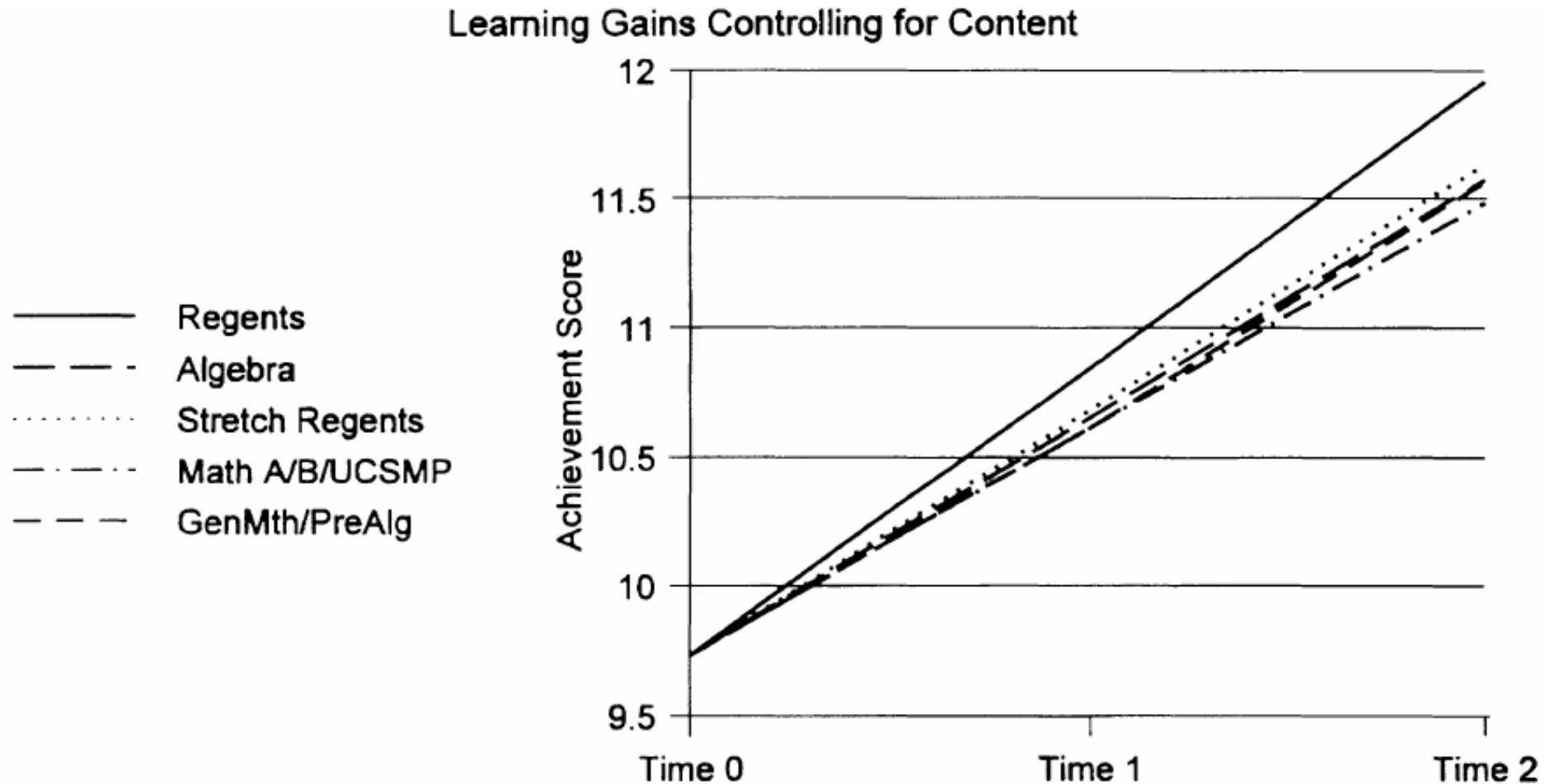


# Increasing Curricular Rigor in U.S. Secondary Math



Source: Gamoran, Porter, Smithson, & White, 1997

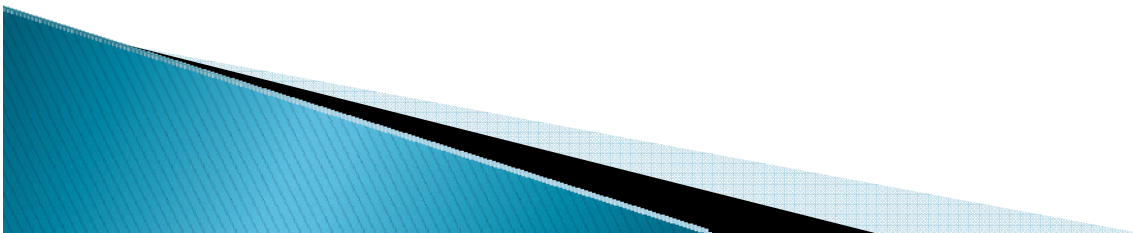
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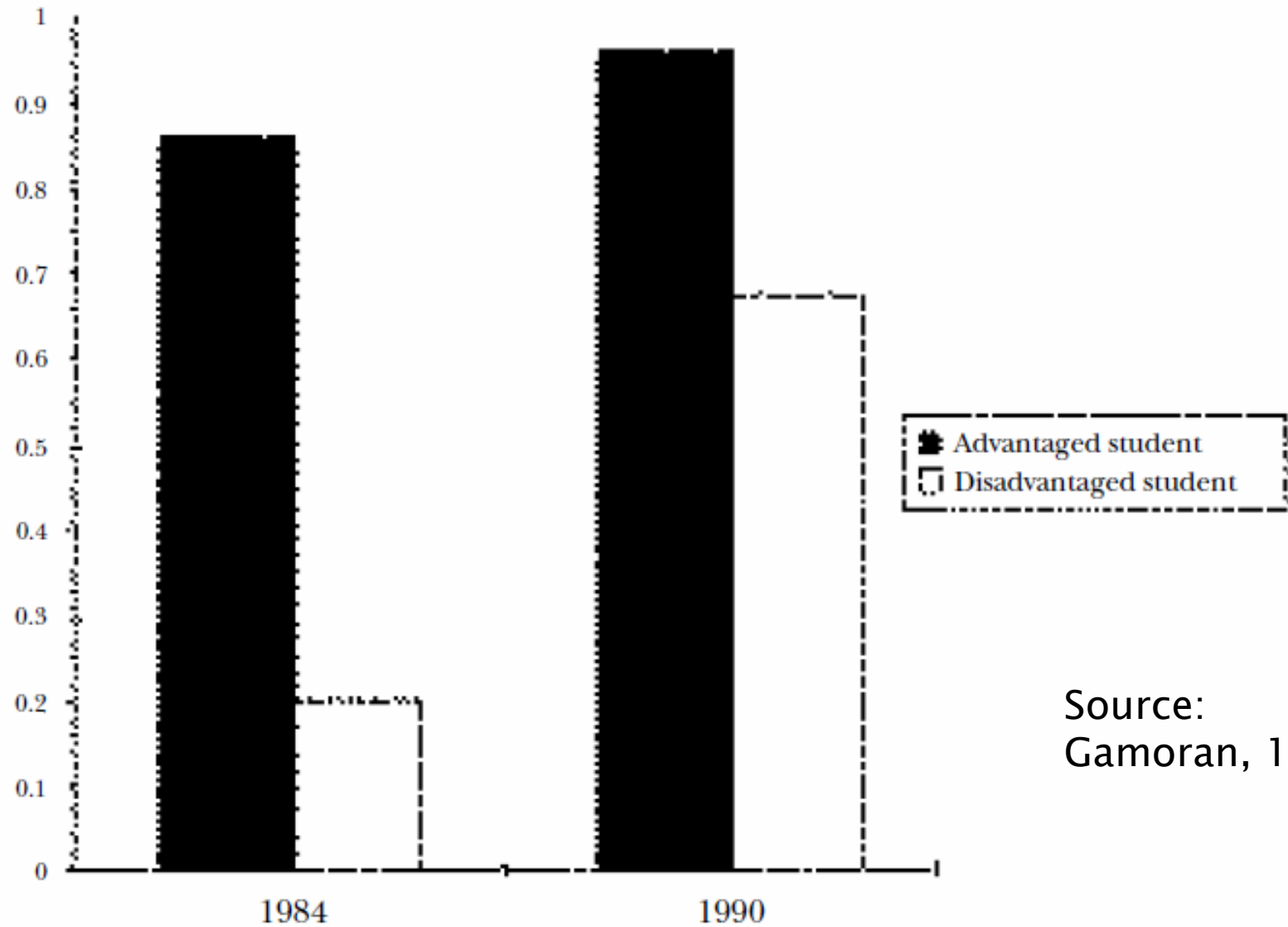
## 2. Investments in Tools: Curriculum

- ▶ Another case: Reform of the Scottish secondary curriculum in the 1980s
- ▶ Increased access to the academic secondary curriculum
- ▶ Boosted academic performance
- ▶ Largest effects for more disadvantaged students





# Increasing Curricular Rigor in Scotland, 1984–1990

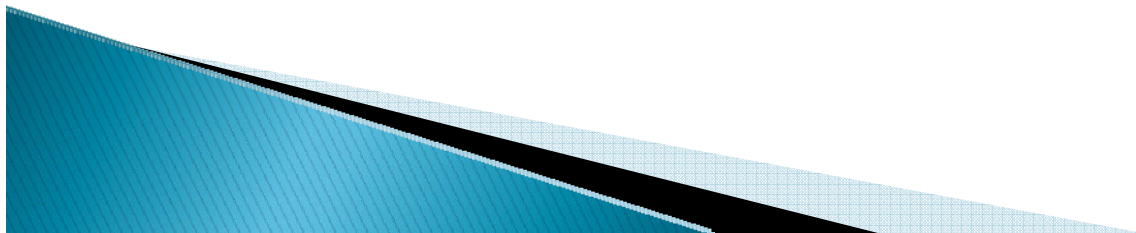


Source:  
Gamoran, 1997

Figure 3. Changes in Probabilities of Obtaining a Mathematics Award at Age 16

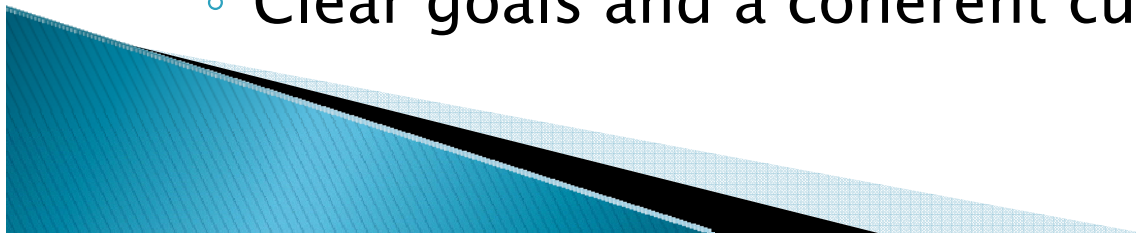
# 3. Investments in Systems

- ▶ Systemic improvements may be necessary to allow teachers to become more productive
  - Organizational conditions that support teaching
  - Climate that supports learning



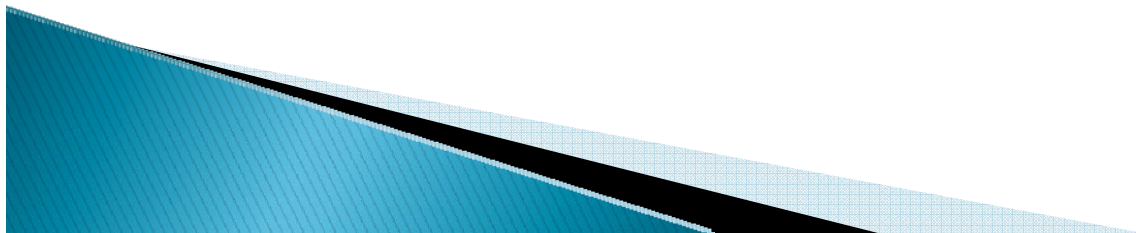
### 3. Investments in Systems: Organizational Conditions

- ▶ Chicago study of organizational supports for learning
- ▶ Findings based on relation between school conditions and value-added achievement growth
- ▶ Five essential supports for learning
  - Leadership that is strategic and focused on instruction
  - Positive parent–community ties
  - High capacity teaching faculty
  - Safe and orderly learning environment
  - Clear goals and a coherent curriculum



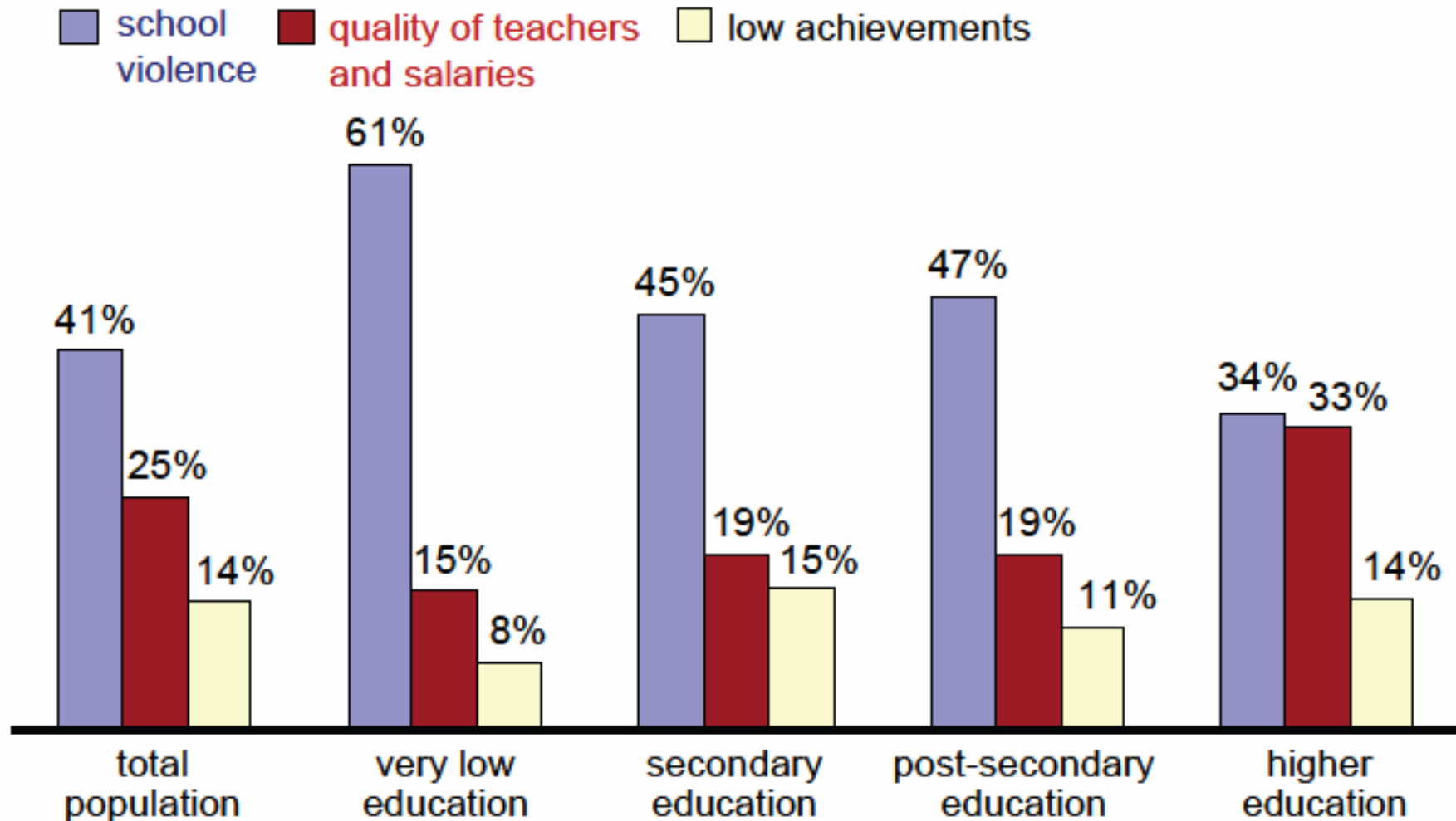
### 3. Investments in Systems: Student Climate

- ▶ When Israeli parents are asked about the biggest problem facing schools, they do not focus on low achievement
- ▶ Particularly among parents from disadvantaged backgrounds, school violence is seen as the greatest problem



# The Education System's Primary Problem\*

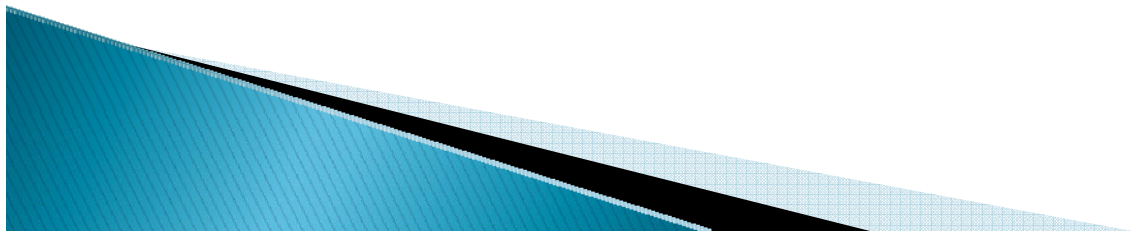
by education level, 2009



Source: Blass & Nachshon-Sharon in Ben-David, 2010.

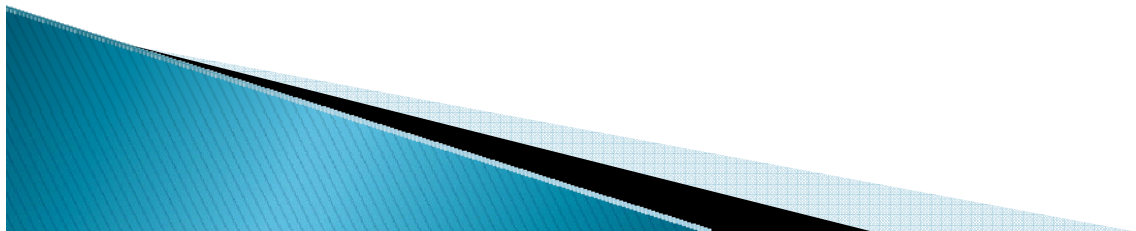
### 3. Investments in Systems: Student Climate

- ▶ Are there effective programs to reduce school violence?
- ▶ What Works Clearinghouse includes a focus on “What works in character education”
- ▶ Several programs improve behavior, including violence reduction
- ▶ Also tend to boost achievement



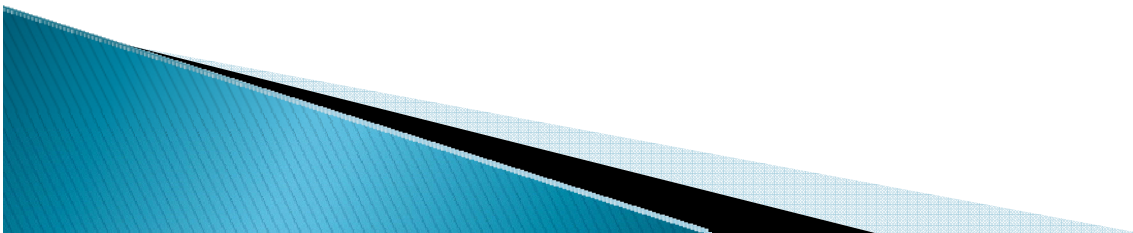
# 3. Investments in Systems: Student Climate

- ▶ Example: *Positive Action*
  - 6 curricular units include classroom discussion and role-play
  - Aim: use positive actions to help students feel good about themselves
  - Experimental studies included 36 schools in Florida and 20 schools in Hawaii
    - Lower rates of violent behavior, fewer suspensions
    - Lower rates of retention in grade
    - Higher academic achievement



# Conclusions

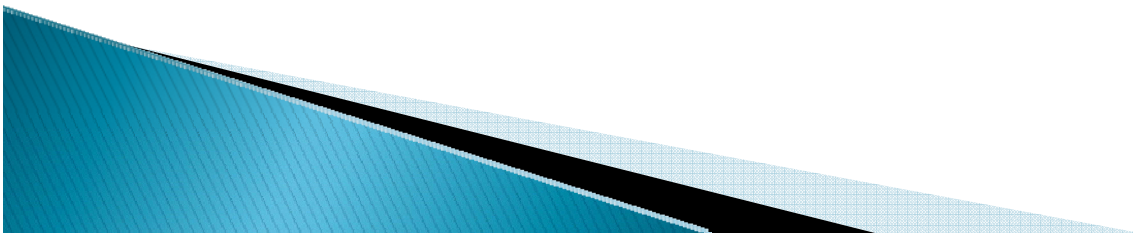
- ▶ Despite advances, research-based knowledge is still limited
- ▶ Investments in teachers and leaders are key
  - Compensation incentives can be *part* of the plan
  - On its own, performance pay is not enough to improve teaching and learning
  - Teacher development holds promise but is difficult to scale up and sustain





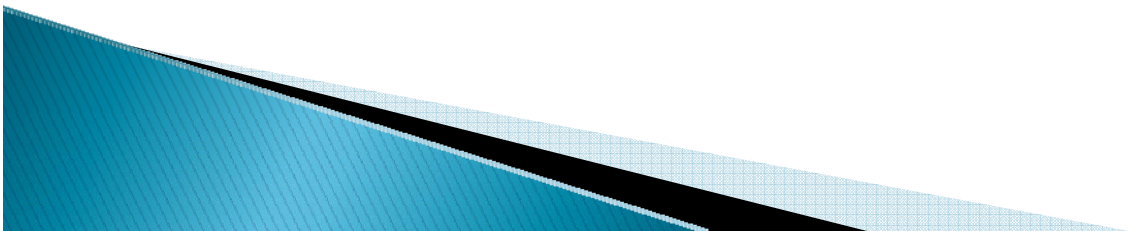
# Conclusions

- ▶ Teaching is more effective when better tools are available
  - More time for instruction
  - Smaller classes in early elementary grades (if space and personnel are available)
  - Curricula that are more focused, coherent, and rigorous



# Conclusions

- ▶ Investments in systems may also pay off
  - Greater learning is more likely in schools with more supportive professional climates
  - Programs are available to address the challenge of school violence
- ▶ Research in all of these areas is needed to identify which programs and policies work for Israel



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