An introduction to the issue of gender & achievement

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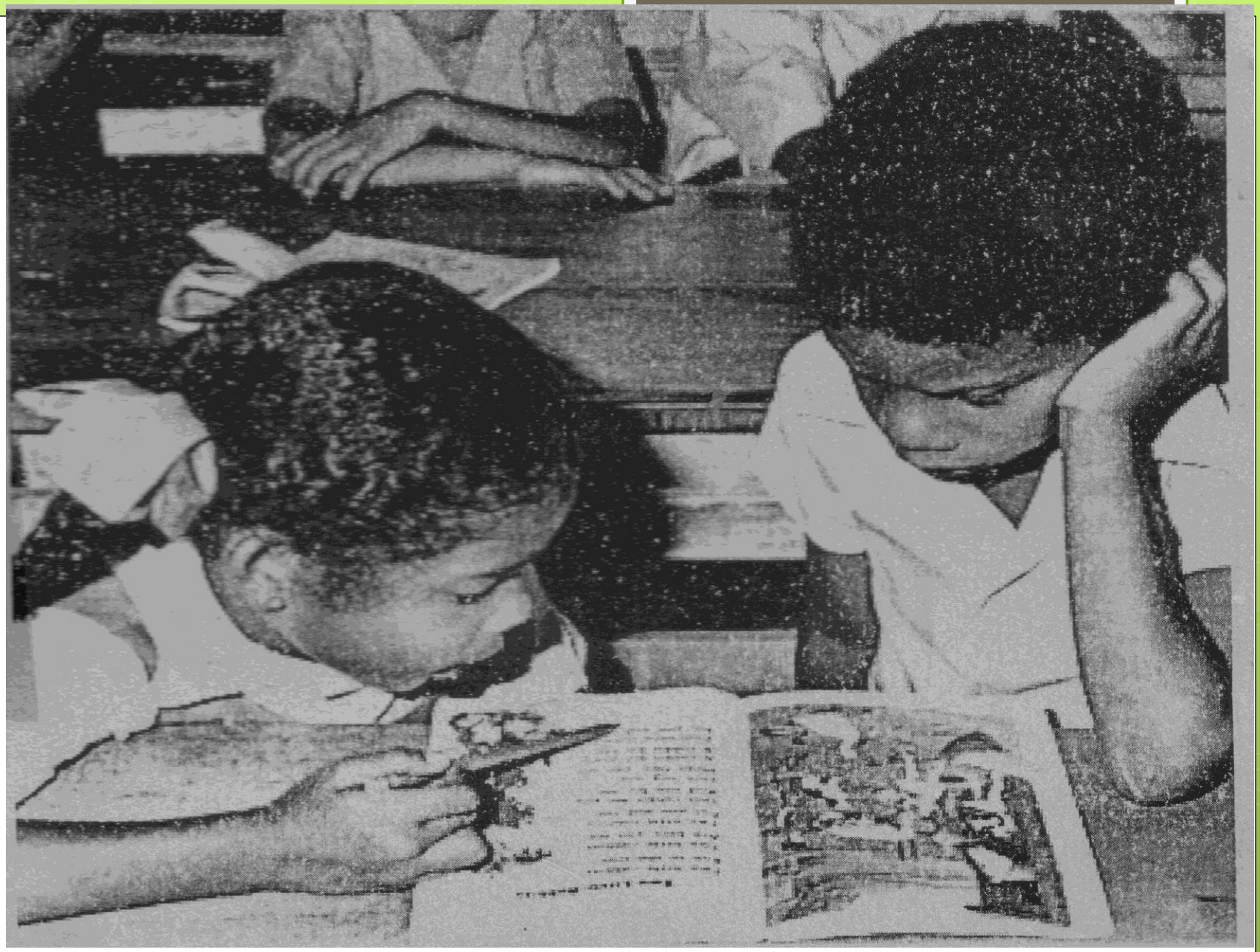


Gender & Achievement

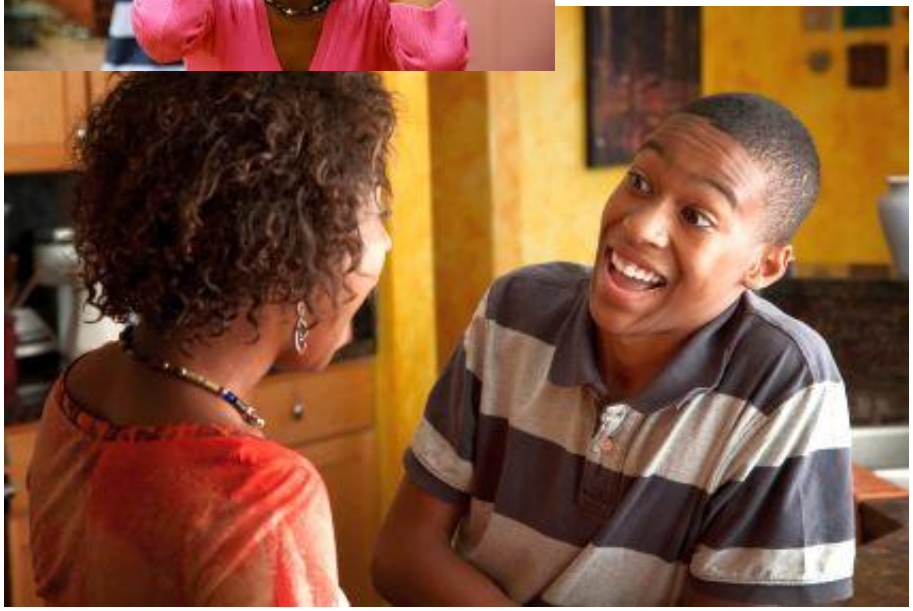
- Gender is one of the many variables that may be associated with differential achievement.
- Gender is considered a variable associated with extraneous circumstance, so that we shouldn't expect large consistent difference between males and females in achievement tests.
- Indeed, no such differences are observed in IQ measures.

Achievement Differences: So what?

- Our concern for gender differentials must not blind us to the existence of other large differences, such as those due to socioeconomic status or location. For instance, a recent parliament report un the UK focuses upon the underachievement of white working class kids.
- Trinidad and Tobago and the Caribbean are very unequal societies and we have grown accustomed to this- so maybe we do not always see differences or we explain them away.

Explain this?

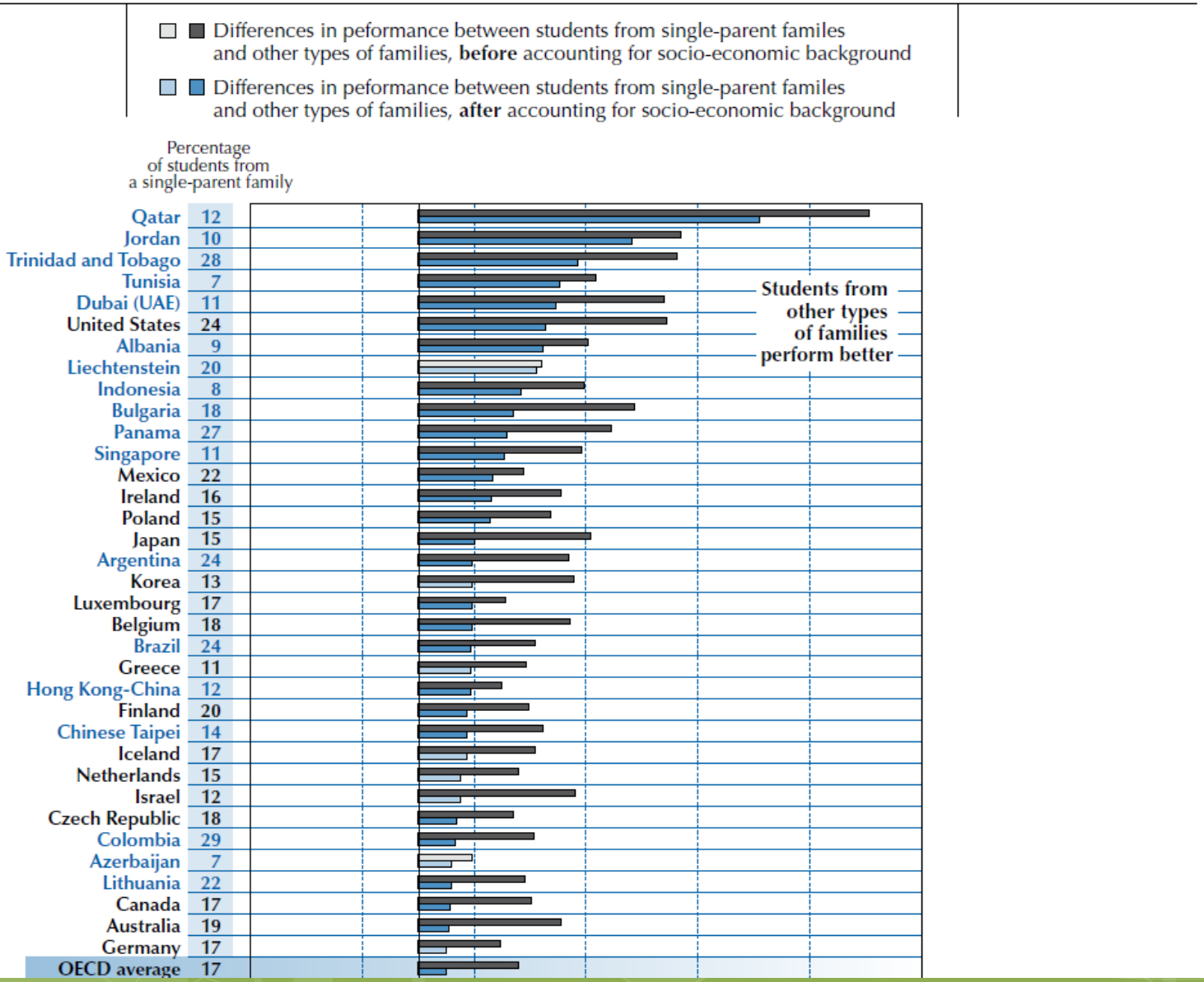
- **PISA 2009 data shows that Children of single parent families do more poorly in Trinidad and Tobago at 15-What are the explanations?**



■ Figure II.2.5 ■

Reading performance difference between students from single-parent families and those from other types of families

Differences in performance before and after accounting for socio-economic background



What about the boys?: More than a binary position

- The apparent academic underachievement of males is sometimes examined only from a binary perspective.
- To be sure, females may do better in some subjects, but still experience several barriers at other levels, including employment discrimination and family-based violence.

Are gender differences a WICKED POLICY ISSUE?

- People like simple, one factor issues and problems; but it is unlikely that gender differences will present in this manner
- There are several emergent influences acting over levels (COMPLEX, MULTIPLEX, EMERGENT)
- Useful to learn from others and to scale up best practice

A significant Anglophone Caribbean Problem?

- There is substantial work throughout the Caribbean and Internationally under gender and achievement.
- Caribbean scholars and practitioners must remember that context matters for both theory and empirical data.
- Many people, including some international academics are comfortable making broad and sweeping generalizations or promoting some interventions-We must be wise

The Tobago Position

- Using National Test Data, Tobago generally reports higher gender differentials favouring females.
- Since the context of Tobago and Trinidad are different, Tobagonians must explore the issue, learn from others and craft their own solutions.

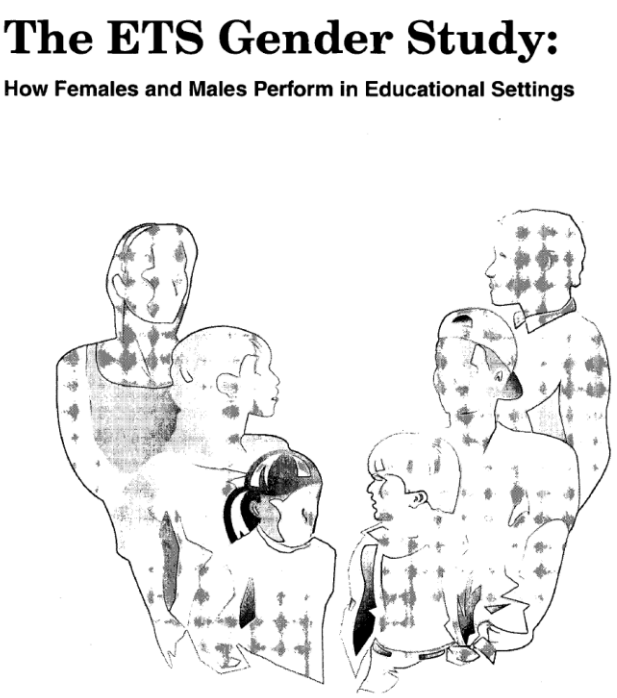
Exploring Gender Differentials

- **What is the situation worldwide?**
  - Evidence from international assessments
- **What is the situation in Trinidad and Tobago?**
  - Evidence from national tests and the SEA
  - Considering CSEC & CAPE
- **What is the situation in Tobago?**
  - A new analysis – Schools or Communities?
  - Why the differences
- **Which males and females are at risk?**
  - Identifying groups at risk

International

- We have much more data worldwide since the advent of international large scale assessments.
- This data allows us to analyse a large sample of students over several contexts.
- The best data bases are from UNESCO, OECD, and the IEA.

An outstanding INTERNATIONAL work



An outstanding work

- Examined various large scale data bases in the US across time (prior to 1997, insufficient use of empirical databases)
- Made sure to use Cohen's d to judge the magnitude of the gender difference
- Also considered work by Halpern on the distribution of scores as an independent factor

Figure 1

Sources of Data for Nationally Representative and Self-selected Samples

Nationally Representative Samples			Self-selected Samples	
			College Applicants	Grad./Prof. Applicants
Grade 4	**Grade 8**	**Grade 12**		
ITBS	ITBS	TAP		
Stanf	Stanf	TASK		
NAEPr	NAEPr	NAEPr		
NAEPt	NAEPt	NAEPt		
IAEP	IAEP			
	DAT	DAT		
	NELS	NELS		
		HS&B		
		NLS		
		ASVAB		
		NALS		
		PSAT Norms	PSAT/NMSQT	
		ITED	ACT	
			AP	
			SAT	GRE-G
			ATP	GRE-S
				MCAT
				GMAT
				LSAT

Figure 2

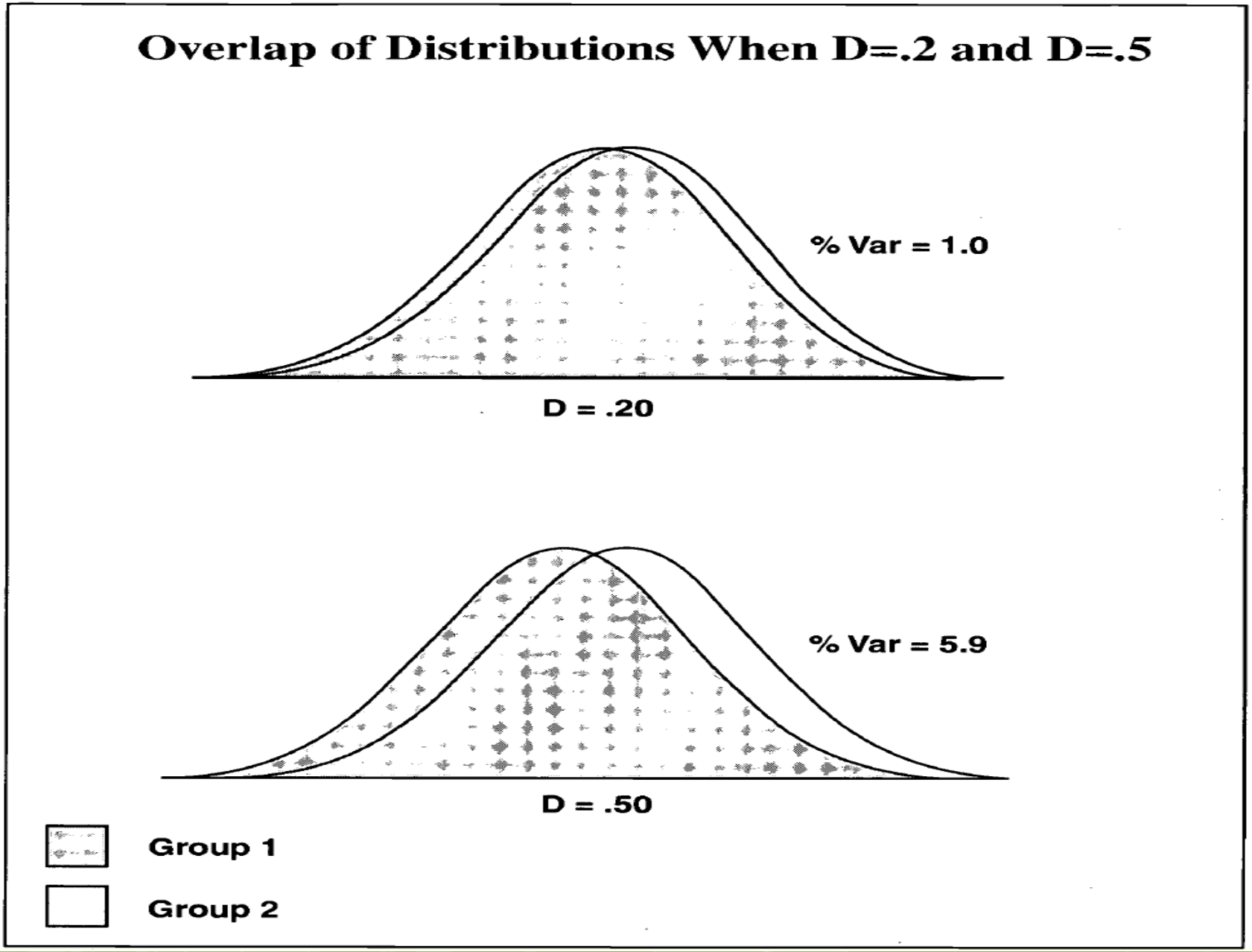
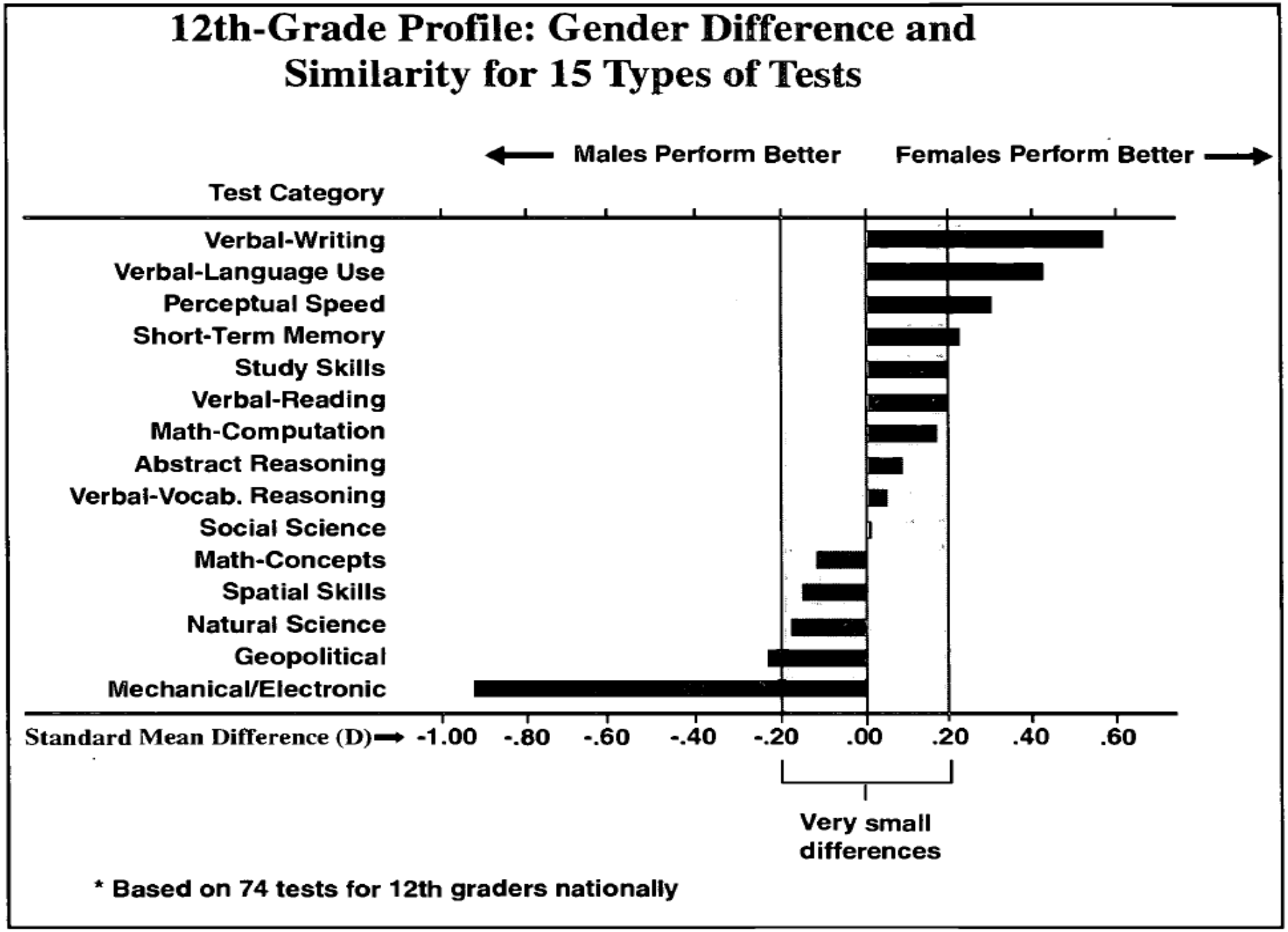
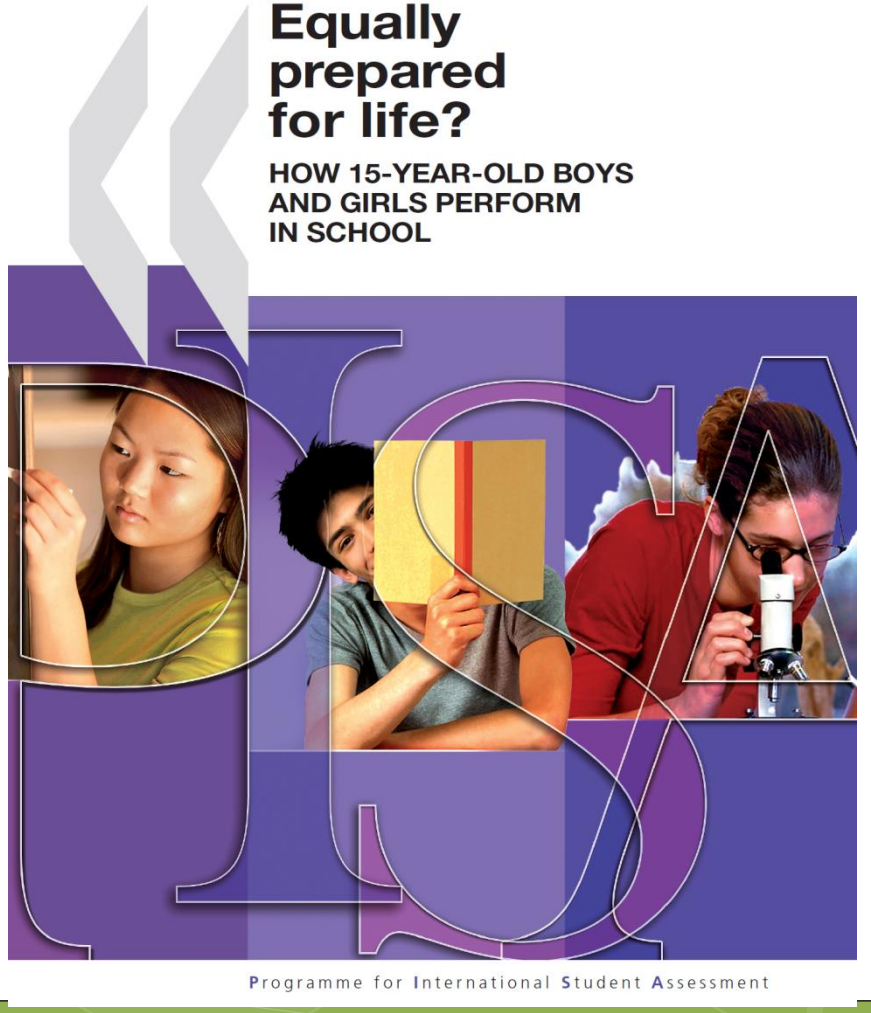

Overlap of Distributions When D=.2 and D=.5
% Var = 1.0
D = .20
% Var = 5.9
D = .50
Group 1
Group 2

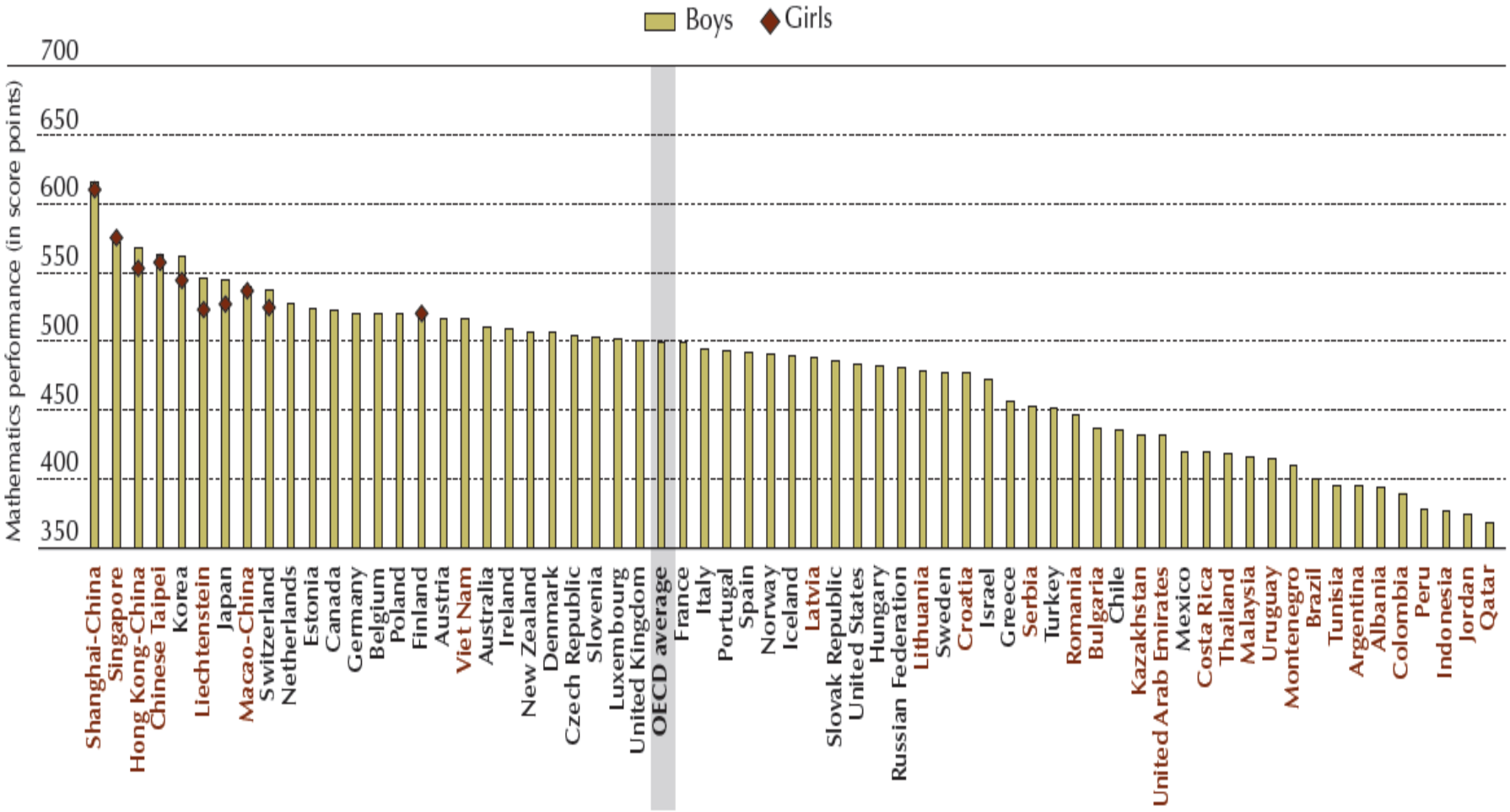
Figure 3


12th-Grade Profile: Gender Difference and Similarity for 15 Types of Tests
Males Perform Better
Females Perform Better
Test Category
Verbal-Writing
Verbal-Language Use
Perceptual Speed
Short-Term Memory
Study Skills
Verbal-Reading
Math-Computation
Abstract Reasoning
Verbal-Vocab. Reasoning
Social Science
Math-Concepts
Spatial Skills
Natural Science
Geopolitical
Mechanical/Electronic
Standard Mean Difference (D)
-1.00
-.80
-.60
-.40
-.20
.00
.20
.40
.60
Very small differences
* Based on 74 tests for 12th graders nationally

International Large Scale Assessment Data



Boys' average performance in mathematics compared with the performance of girls in the 10 countries with the highest average performance among girls



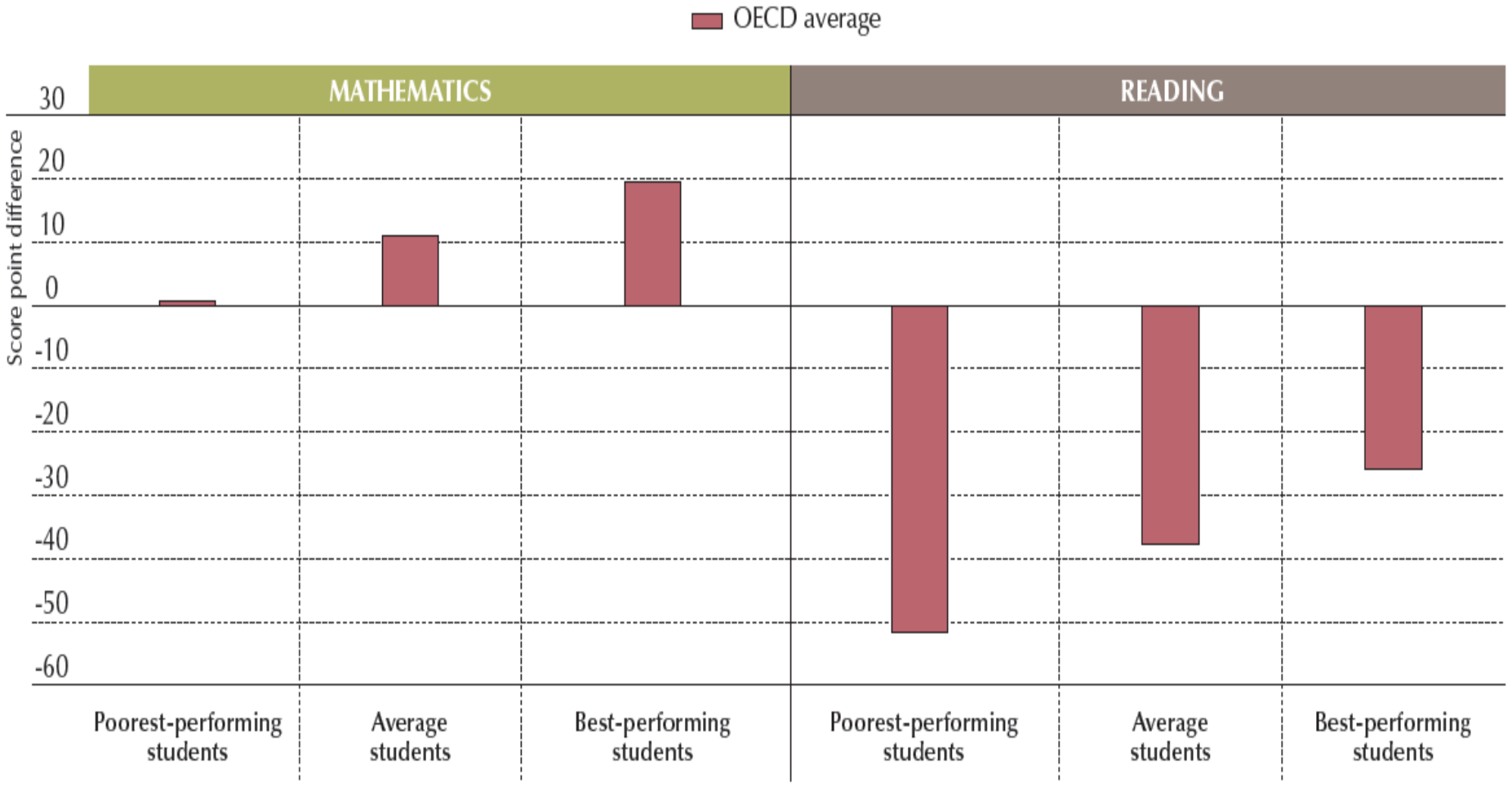
Countries and economies are ranked in descending order of the mean score in mathematics among boys.

Source: OECD, PISA 2012 Database, Table I.2.3a.

Gender gaps in student performance are striking…

PISA 2012 reveals that boys continue to outperform girls in mathematics in 38 participating countries and economies by an average of 11 score points (across OECD countries) – the equivalent of around three months of school. Across OECD countries 15% of boys but only 11% of girls achieve at the highest levels of proficiency in mathematics. By contrast, girls outperform boys in reading in all countries and economies by an average of 38 score points (across OECD countries) – the equivalent of one year of school.

How the gender gap varies across the performance distribution



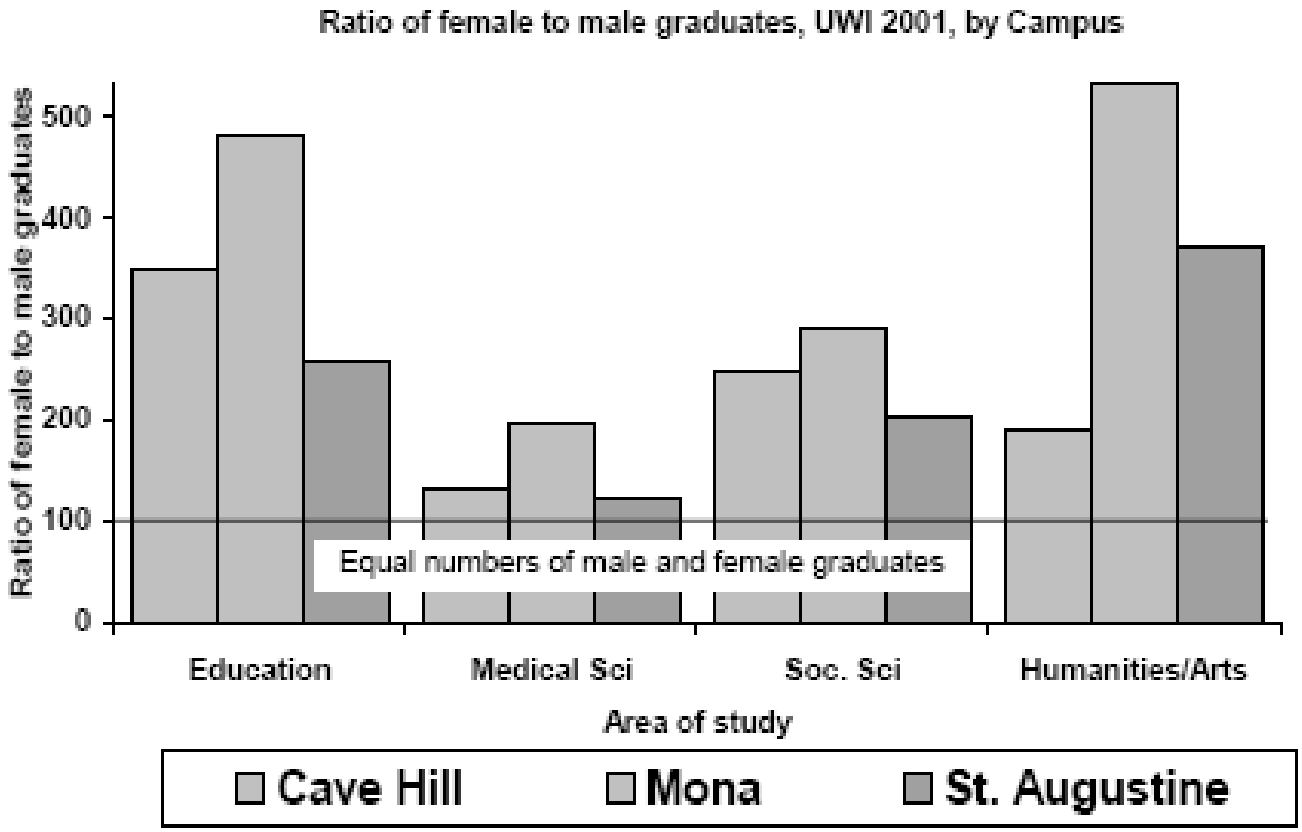
Notes: The gender gap reflects the difference between the performance of boys and the performance of girls.
"Poorest-performing students" refers to the poorest-performing 10% of boys and the poorest-performing 10% of girls.
"Best-performing students" refers to the best-performing 10% of boys and the best-performing 10% of girls.
Source: OECD, PISA 2012 Database.

The regional issue

- There is a lot of theorizing but limited empirical studies. Most of the theories comes from qualitative studies, the majority ethnographic.
- Those studies that look at multiple contexts are particularly weak such as the often quoted work by Odette Parry, A UK researcher who spent time in Jamaica.
- There is little work from CXC on their secure databases and the best large scale studies have come from Trinidad & Tobago.
- It might be that gender differences are larger in some countries.

HIGHER EDUCATION ATTAINMENT BY GENDER, ENROLMENT AND EMPLOYMENT IN THE ANGLOPHONE CARIBBEAN by **Rhonda Chipman-Johnson, Ph.D. & Joan Vanderpool, Ph.D.**

Figure 13 Ratio of female to males at UWI: Mona, Cave Hill and St. Augustine Campuses, 2001



National Large Scale Assessments (National Tests)

- Trinidad and Tobago has monitored the size of the gender gap since the early 2000s using effect size measures.
- The gap is stable but is influenced by the choice of assessment.
- It is negligible to small for Mathematics but small to medium sized for Language Arts and is higher in standard 3.
- The gap results in significant differences in proportions for some key outcomes.

TABLE 33
Gender Differences in Performance for Mathematics Standard 1

Educational District	Male		Female		Effect Size (Cohen's d)
	No.	Mean	No.	Mean	
Caroni	1300	48.45	1230	54.47	Small (.28)
North Eastern	481	42.35	490	48.78	Small (.31)
Port of Spain and Environs	1466	43.52	1547	50.35	Small (.31)
St.George East	1846	48.51	2020	54.10	Small (.28)
St.Patrick	875	48.28	772	54.57	Small (.32)
South Eastern	700	45.08	643	49.36	Small (.20)
Victoria	1154	52.51	1029	56.91	Small (.21)
Tobago	403	44.42	329	48.96	Small (.23)

Overall effect size for entire population d = .24

TABLE 35
Gender Differences in Performance for Language Arts Standard 1

Educational District	Male		Female	Effect Size (Cohen's d)
	Mean	No.	Mean	
Caroni	46.02	1228	54.10	Small (.37)
North Eastern	40.19	488	48.08	Small (.39)
Port of Spain & Environs	43.41	1535	53.14	Small (.45)
St. George East	46.73	2021	55.89	Small (.43)
St. Patrick	47.01	773	56.06	Small (.46)
South Eastern	43.24	644	49.33	Small (.29)
Victoria	50.68	1027	58.77	Small (.37)
Tobago	44.86	329	52.32	Small (.39)

Overall effect size for entire population d =0.4

TABLE 36
Gender Differences in Performance for Language Arts Standard 3

Educational District	Male		Female		Effect Size (Cohen's d)
	No.	Mean	No.	Mean	
Caroni	1357	46.63	1266	54.94	Small (.39)
NorthEastern	500	37.36	473	48.1	Medium (.53)
Port of Spain & Environs	1522	46.24	1473	54.90	Small (.36)
St. George East	1940	46.77	1911	56.99	Small (.49)
St. Patrick	887	45.28	854	53.28	Small (.40)
South Eastern	729	40.24	767	51.77	Medium (.58)
Victoria	1296	49.86	1187	60.28	Small (.47)
Tobago	460	37.88	399	49.28	Medium (.6)

Overall effect size for entire population d = .45

Gender Differences in Language Arts Std 1 NT 2010

District	Mean difference (Cohen's d)
Caroni	0.35
Port of Spain	0.37
North Eastern	0.36
Tobago	0.40
St George East*	0.45
South Eastern	0.37
Port of Spain*	0.53
St George East	0.38
St Patrick	0.63
Victoria	0.37
Total	**0.40**

Interpretation of Mean Difference (Cohen's d)	
0	There is no gender difference
Positive (+) D	Females have a higher average score
Negative (-) D	Males have a higher average score
Less than 0.2	Difference is insignificant
Between 0.2 and 0.5	Difference is small, but worth noting nonetheless
Between 0.5 and 0.8	Difference is medium in size
Greater than 0.8	Difference is large

Gender Differences in Science Std 2 NT 2010

District	Mean difference (Cohen's d)
Port of Spain	0.21
Caroni	0.24
Victoria	0.26
St George East	0.28
South Eastern	0.28
St George East*	0.31
Port of Spain*	0.31
St Patrick	0.32
Victoria*	0.33
North Eastern	0.34
Tobago	0.34
Total	**0.27**

Interpretation of Mean Difference (Cohen's d)	
0	There is no gender difference
Positive (+) D	Females have a higher average score
Negative (-) D	Males have a higher average score
Less than 0.2	Difference is insignificant
Between 0.2 and 0.5	Difference is small, but worth noting nonetheless
Between 0.5 and 0.8	Difference is medium in size
Greater than 0.8	Difference is large

Gender differences in Social Studies Std 2 NT 2010

District	Mean difference (Cohen's d)
St Patrick	0.26
North Eastern	0.28
Port of Spain	0.30
Port of Spain*	0.30
South Eastern	0.31
Victoria	0.32
Tobago	0.36
Caroni	0.37
St George East	0.39
Total	**0.32**

Interpretation of Mean Difference (Cohen's d)	
0	There is no gender difference
Positive (+) D	Females have a higher average score
Negative (-) D	Males have a higher average score
Less than 0.2	Difference is insignificant
Between 0.2 and 0.5	Difference is small, but worth noting nonetheless
Between 0.5 and 0.8	Difference is medium in size
Greater than 0.8	Difference is large

Gender Differences in Language Arts Std 3 NT 2010

District	Mean Difference (Cohen's d)
Caroni	0.42
North Eastern	0.48
Port of Spain	0.47
Port of Spain*	0.59
St George East	0.49
St Patrick	0.49
South Eastern	0.46
Victoria	0.46
Tobago	0.61
Total	**0.47**

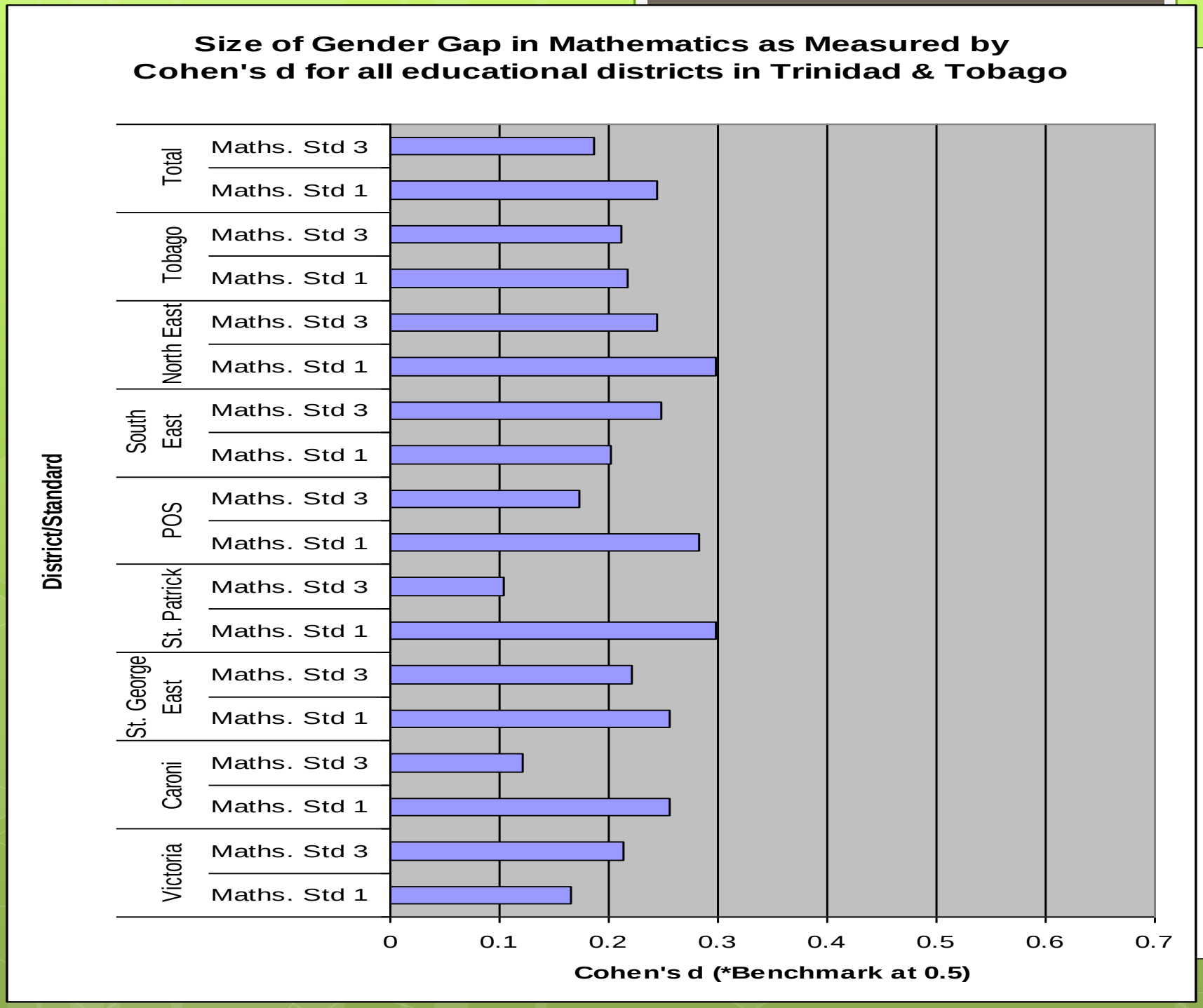
Interpretation of Mean Difference (Cohen's d)	
0	There is no gender difference
Positive (+) D	Females have a higher average score
Negative (-) D	Males have a higher average score
Less than 0.2	Difference is insignificant
Between 0.2 and 0.5	Difference is small, but worth noting nonetheless
Between 0.5 and 0.8	Difference is medium in size
Greater than 0.8	Difference is large

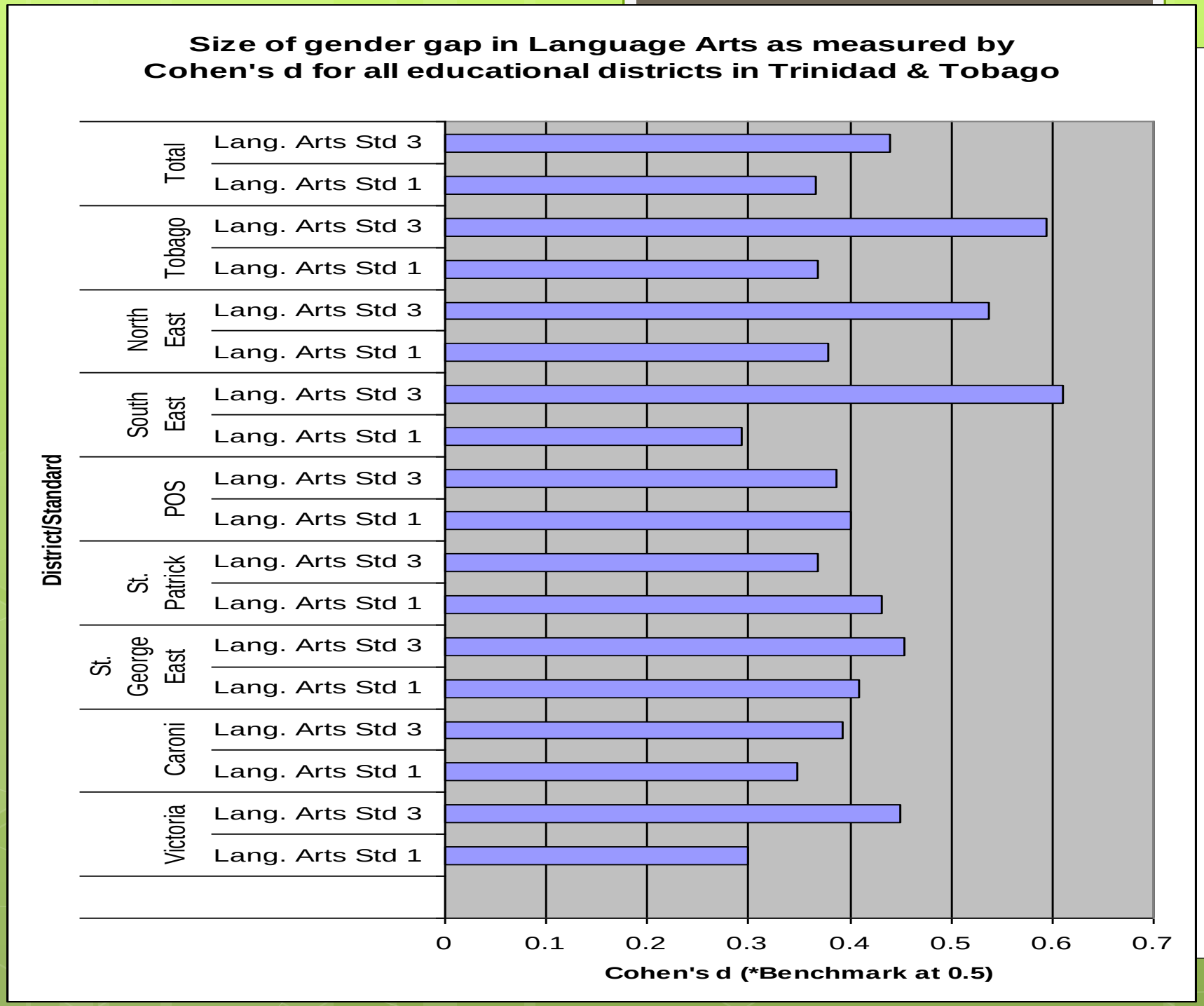
Gender Differences in Science Std 4 NT 2010

District	Mean Difference (Cohen's d)
Port of Spain	0.15
Port of Spain*	0.16
St Patrick	0.16
Tobago	0.19
Caroni	0.19
Victoria	0.20
South Eastern	0.20
St George East	0.21
North Eastern	0.29
Total	**0.19**

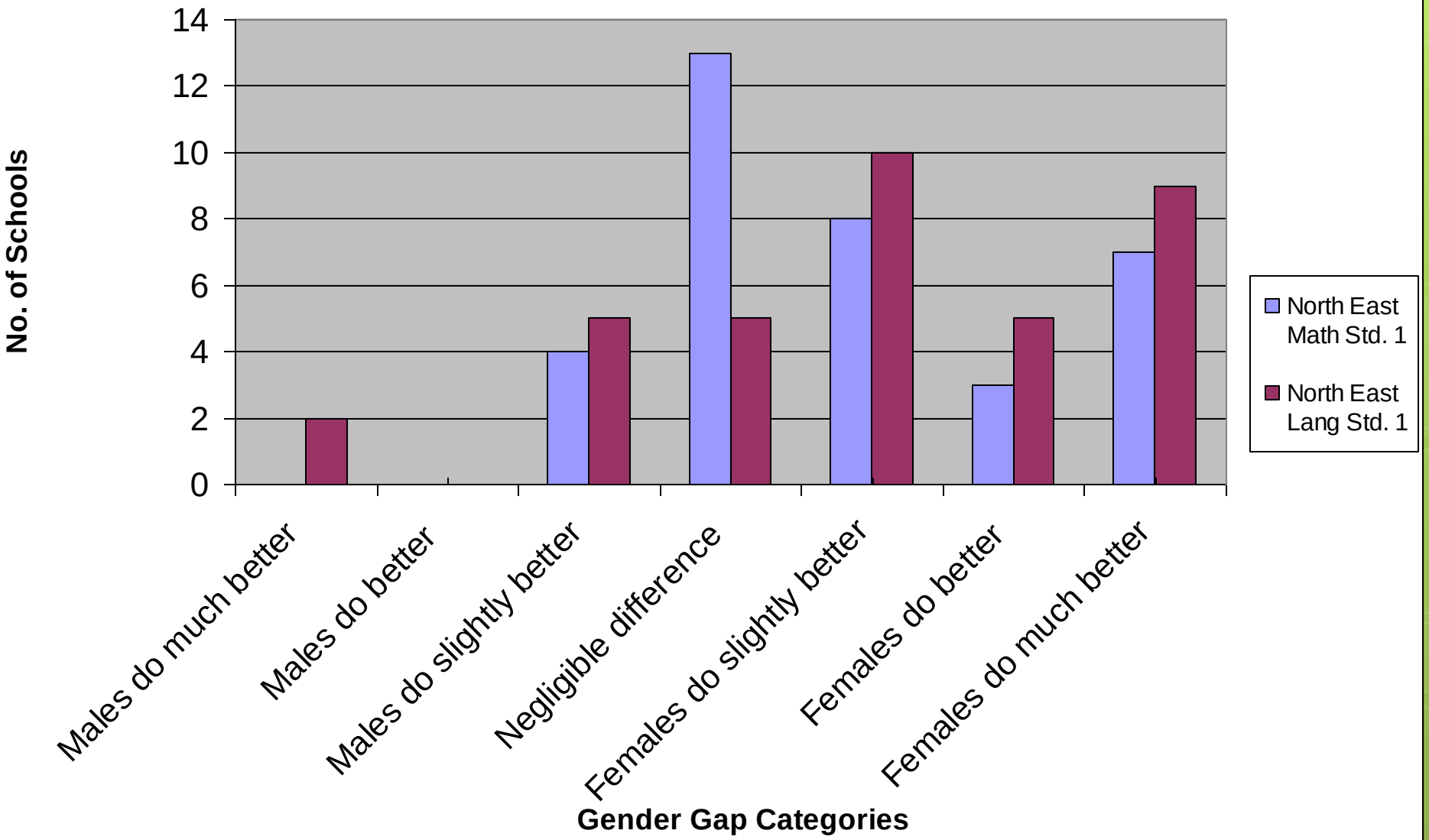
Interpretation of Mean Difference (Cohen's d)	
0	There is no gender difference
Positive (+) D	Females have a higher average score
Negative (-) D	Males have a higher average score
Less than 0.2	Difference is insignificant
Between 0.2 and 0.5	Difference is small, but worth noting nonetheless
Between 0.5 and 0.8	Difference is medium in size
Greater than 0.8	Difference is large

Peeling the Data

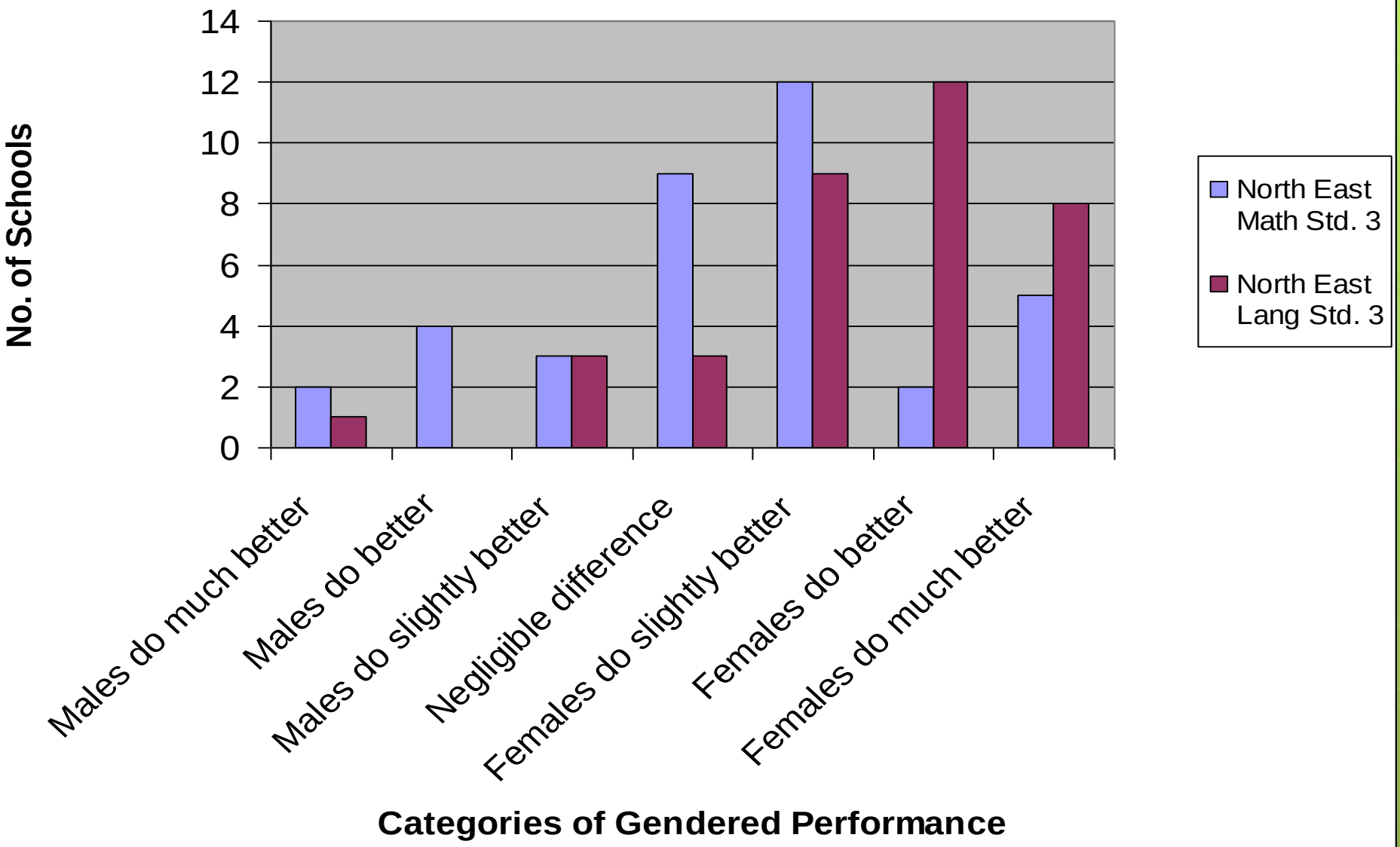

Size of Gender Gap in Mathematics as Measured by Cohen's d for all educational districts in Trinidad & Tobago
District/Standard
Total
Maths. Std 3
Maths. Std 1
Tobago
Maths. Std 3
Maths. Std 1
North East
Maths. Std 3
Maths. Std 1
South East
Maths. Std 3
Maths. Std 1
POS
Maths. Std 3
Maths. Std 1
St. Patrick
Maths. Std 3
Maths. Std 1
St. George East
Maths. Std 3
Maths. Std 1
Caroni
Maths. Std 3
Maths. Std 1
Victoria
Maths. Std 3
Maths. Std 1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Cohen's d (*Benchmark at 0.5)


Size of gender gap in Language Arts as measured by Cohen's d for all educational districts in Trinidad & Tobago
District/Standard
Total
Lang. Arts Std 3
Lang. Arts Std 1
Tobago
Lang. Arts Std 3
Lang. Arts Std 1
North East
Lang. Arts Std 3
Lang. Arts Std 1
South East
Lang. Arts Std 3
Lang. Arts Std 1
POS
Lang. Arts Std 3
Lang. Arts Std 1
St. Patrick
Lang. Arts Std 3
Lang. Arts Std 1
St. George East
Lang. Arts Std 3
Lang. Arts Std 1
Caroni
Lang. Arts Std 3
Lang. Arts Std 1
Victoria
Lang. Arts Std 3
Lang. Arts Std 1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
Cohen's d (*Benchmark at 0.5)

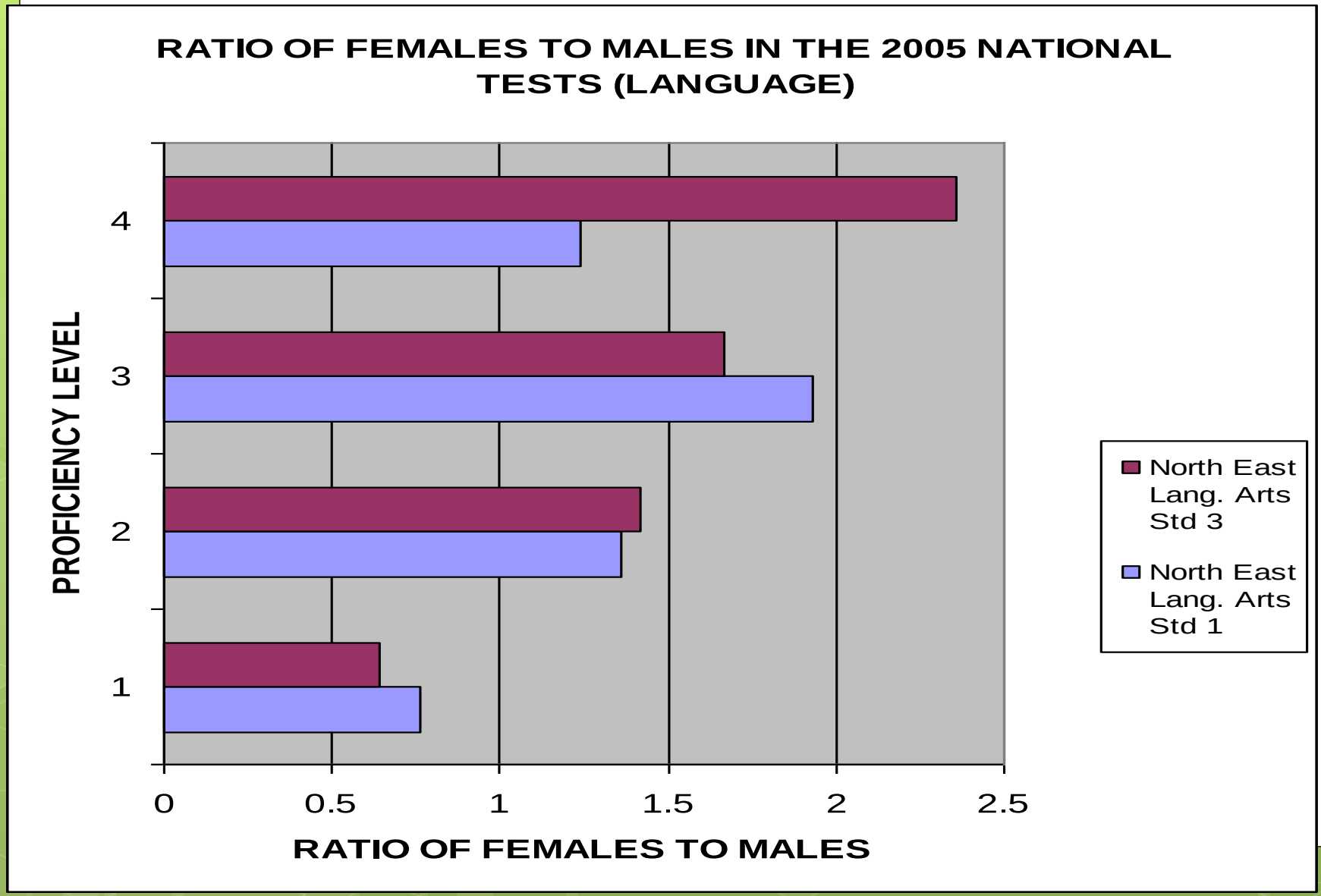
Number of Schools in the North Eastern District in Different Categories of Gendered Performance (Std 1)



No of Schools in the North Eastern District in Different Categories of Gendered Performance at Standard 3



Early Problems with Literacy for Males



Which males and females are at risk?

- Our research using large scale data in Trinidad and Tobago suggests that patterns of gendered achievement
  - are often complex and sometimes even contradictory.
  - Gender differences are sometimes related to the conditions that create overall lowered performance.
  - These differences might be related to specific institutional practices, beliefs, and metapatterns (culture)

Which males and females are at risk?

- **The correct questions are ----------**
  - Which males and females are at risk?
  - What can individuals schools do to minimize these differences?
  - What can systems do to make schools teachers aware and schools more accountable for differential performance?

What can individual schools do?

DAY 1 AFTERNOON

Using data to address the gender gap

- Using data effectively is one of the keys to addressing any condition in which achievement gaps occur.
- To use data effectively we must generate relevant data to answer the burning questions that confront us. We must analyse that data and with research and intuition gather insight into the issue.
- Knowledge and insight allows us to select action strategies to confront the issue.

Levels of Processing in DDDM

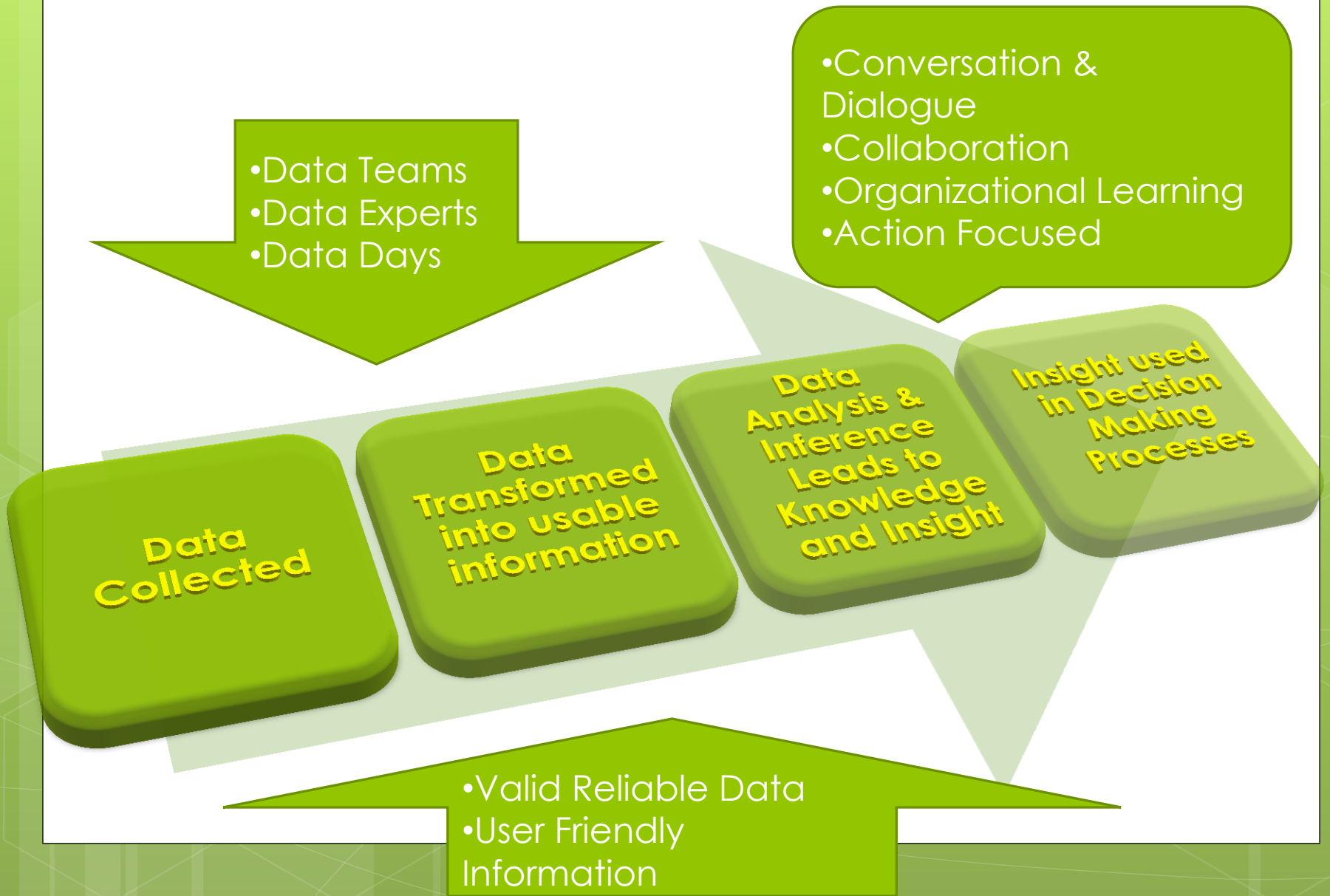
- **Data exist in a raw state. They do not have meaning in and of itself, and** therefore, can exist in any form, usable or not.
- **Information is data given meaning when connected to a context and** used to comprehend and organize our environment.
- **Knowledge is the collection of information deemed useful, and eventually used to** guide action. Knowledge is created through a sequential process in which connections are made between the data, real activities and plans for the future.

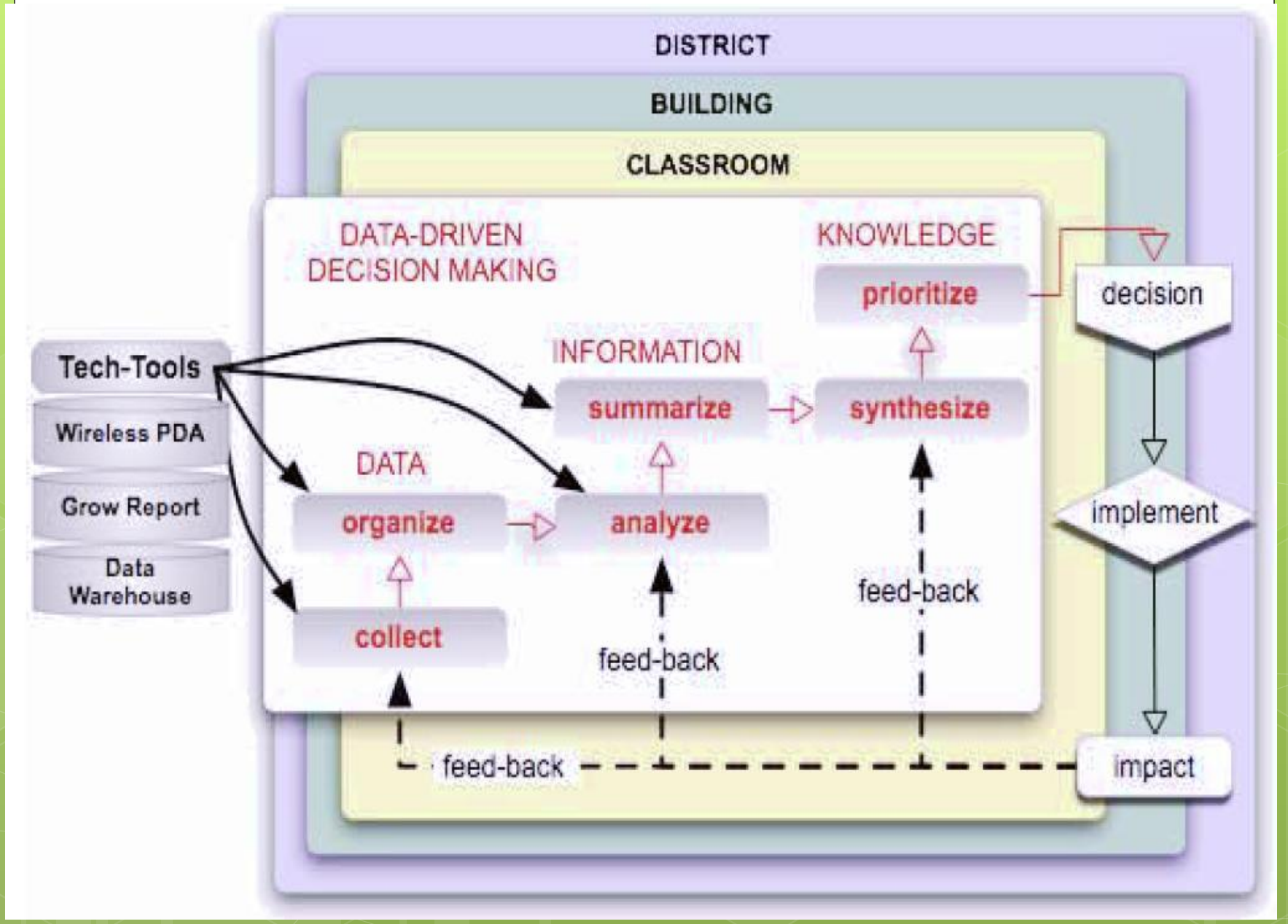
How is data, information, and knowledge different?

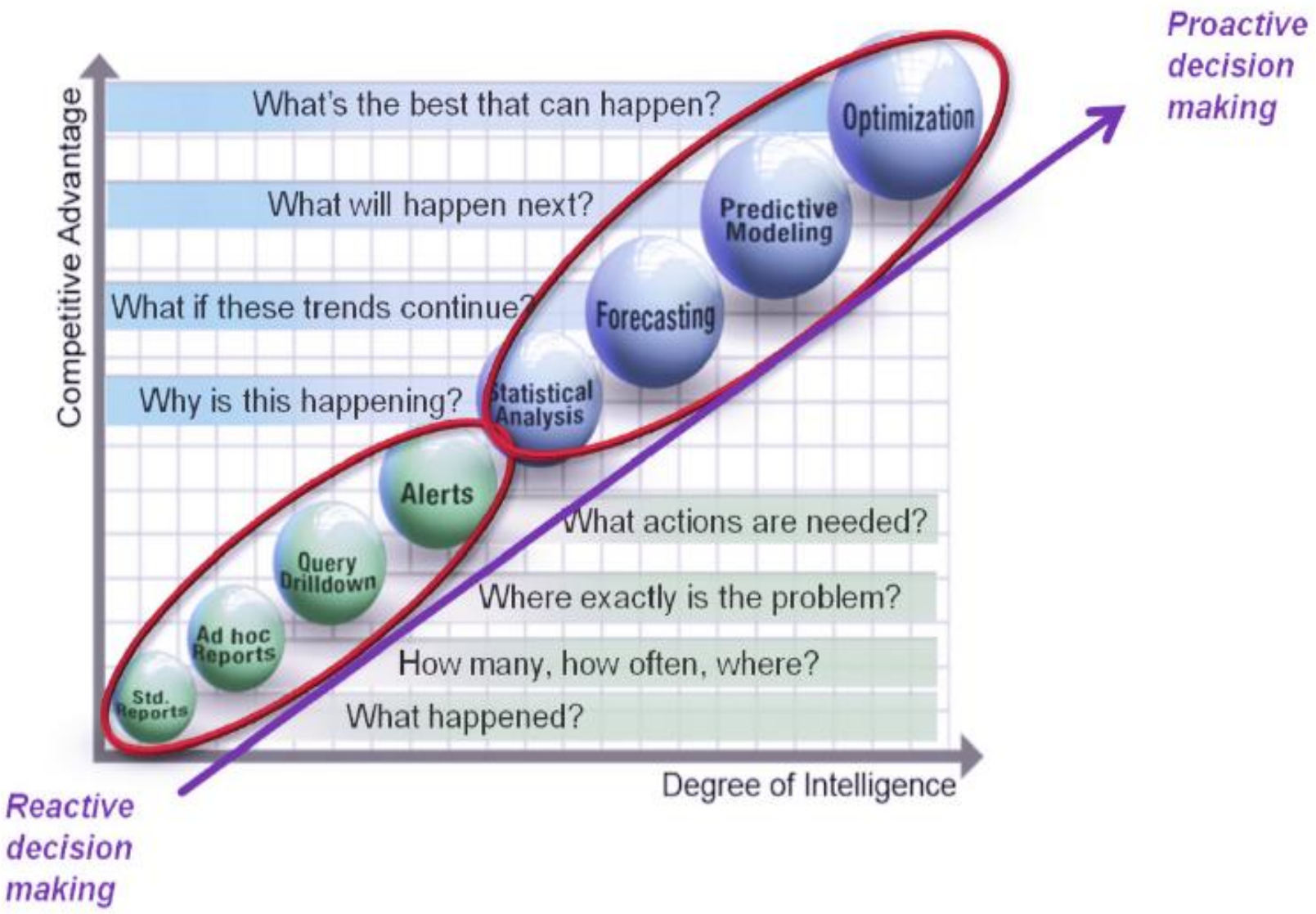
Those burning questions

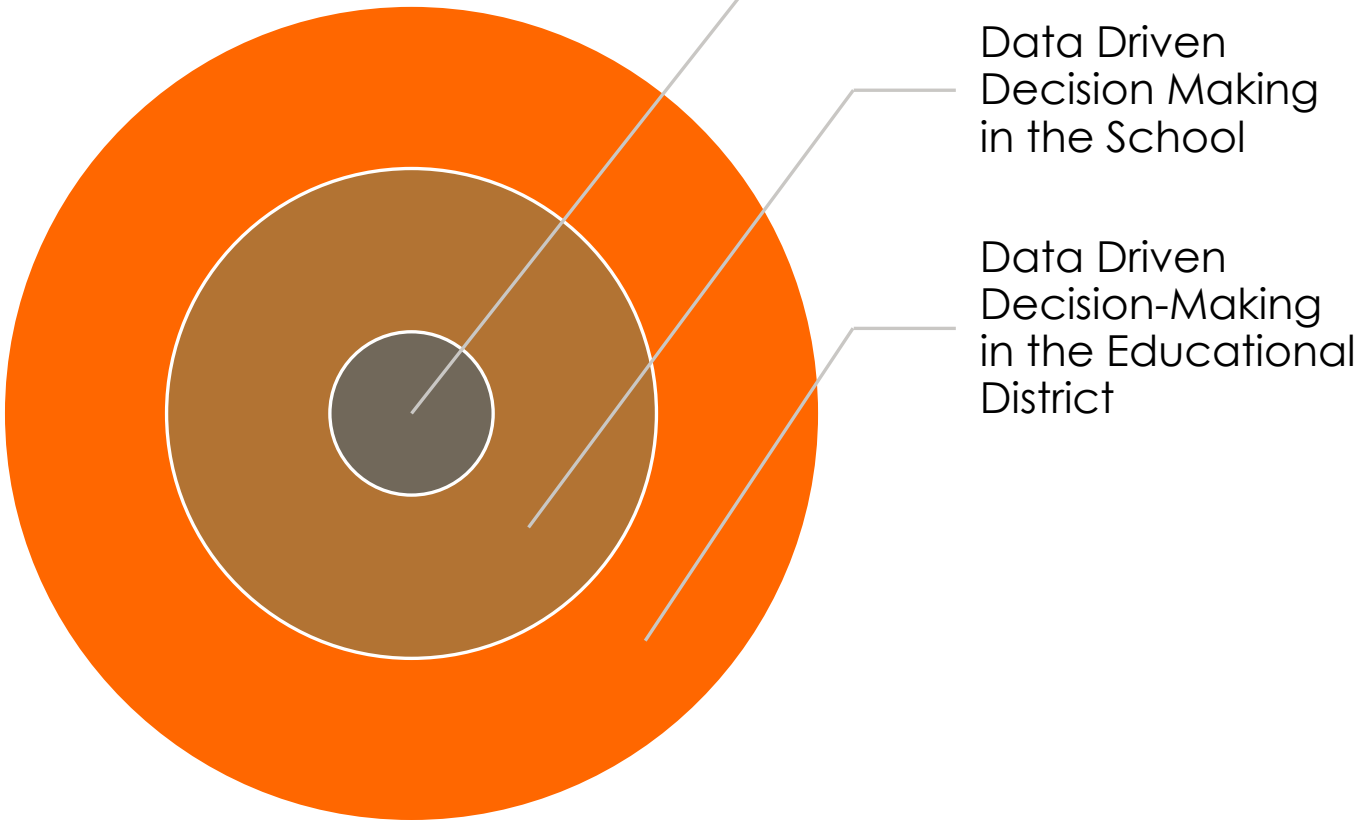
- Which particular boys underachieve?
- By how much?
- In what subjects?
- In what skill areas in the subjects?

Steps in DDDM




DISTRICT
BUILDING
CLASSROOM
DATA-DRIVEN
DECISION MAKING
KNOWLEDGE
prioritize
decision
Tech-Tools
Wireless PDA
Grow Report
Data
Warehouse
INFORMATION
summarize
synthesize
DATA
organize
analyze
implement
collect
feed-back
feed-back
feed-back
impact


Proactive decision making
Competitive Advantage
What's the best that can happen?
What will happen next?
What if these trends continue?
Why is this happening?
What actions are needed?
Where exactly is the problem?
How many, how often, where?
What happened?
Optimization
Predictive Modeling
Forecasting
Statistical Analysis
Alerts
Query Drilldown
Ad hoc Reports
Std. Reports
Degree of Intelligence
Reactive decision making


Data Driven Instruction
Data Driven Decision Making in the School
Data Driven Decision-Making in the Educational District

Protocol for Installing Data Driven at a School Site

1. Organize the school into data teams, with clear leadership and supports
    a. Organize for data experts in each team based on a skill bank approach
2. Provide time for the exercise-a data day or data week
3. Organize data and technology support
4. Ensure that data is readily available and that the expected tasks are clear-
    a. to transform the data into user friendly information
    b. to develop explanations and actions tor solve issues
5. Data teams may become school improvement teams or instructional improvement groups in the later stages of DDDM.
6. In parallel to the above, identify elements of a collaborative climate and a culture of inquiry to be installed by
    a. Modelling the desired behaviours
    b. Encouraging and rewarding teamwork
    c. Reducing defensive behaviours
    d. Ensuring a "no threat" environment in data use

Examine

- Examine the standards-referenced data
- Examine norm referenced data
- **Examine the disaggregated data**

Set Benchmarks

- Decide on targets or benchmarks that you school will like to meet

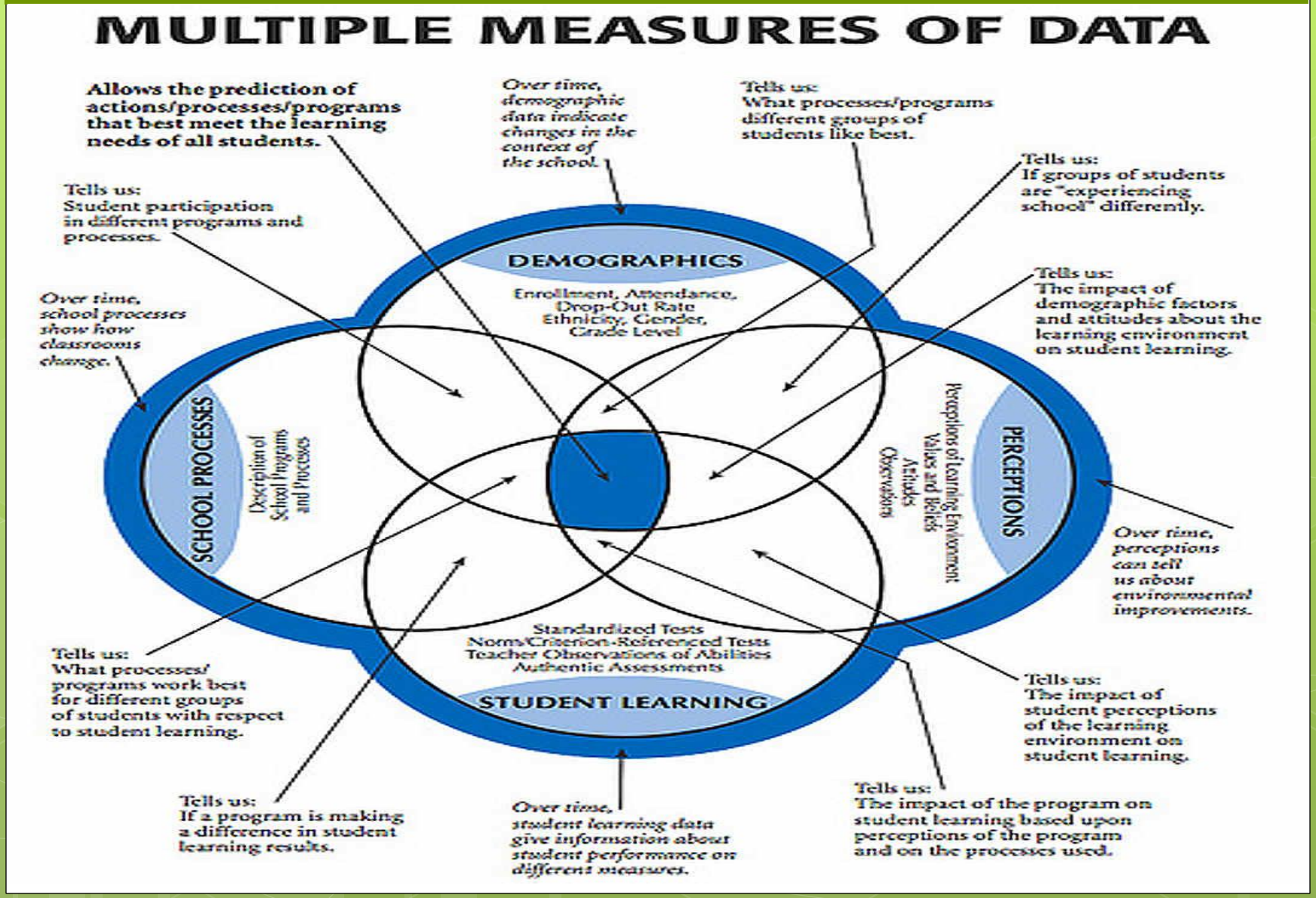
Choose Actions

- Develop or choose actions that carry you towards that benchmark

Collecting Data-Instruments

PURPOSE	SCREENING	FEEDBACK & PROGRESS MONITORING	DIAGNOSTIC TEST
INSTRUMENTS	NATIONAL TESTS/ BROAD BASED READING TESTS	CLASSROOM FORMATIVE ASSESSMENTS/ INVENTORIES	COMMERCIAL INSTRUMENTS such as WRMT III
SKILLS ASSESSED	BROAD IDENTIFICATION OF RISK	SPECIFIC SKILLS FOR REGROUPING	SPECIFIC DEFICITS
FREQUENCY	YEARLY/ TERMLY	WEEKLY/ DAILY	YEARLY
FOCUS	SCHOOL	CLASS/STUDENT	STUDENT
INTERVENTION	FIRST STEP	REVISION	STUDENT INTERVENTION

What types of data?



Demographic Data

- Race/Ethnicity
- Socioeconomic Status
- School Attendance Patterns
- Dropout Patterns
- Student Mobility Patterns
- Student Disruption/ Violence Patterns
- Transportation Needs and Patterns
- Size of School
- Type of School

- **Key Questions**
- **Who are the students**
- **What factors influence them**
- **What trends are noticeable?**

Achievement (Performance)Data

- Classroom test scores
- School term test scores
- National test scores
- SEA test scores
- Secondary School Placements
- Numbers under 30%
- Numbers obtaining first choice
- Numbers in top 100

- **Key Questions**
- **How are our students performing**
- **What factors influence these performances (connect to demographic data)**
- **What trends are noticeable?**

Perception Data

- School climate
- Student engagement
- Student opportunities to learn
- Staff commitment
- Parental involvement

- **Key Questions**
- **How do students and teachers perceive the context of learning**
- **What factors influence student achievement(connect to achievement data)**
- **What trends are noticeable?**

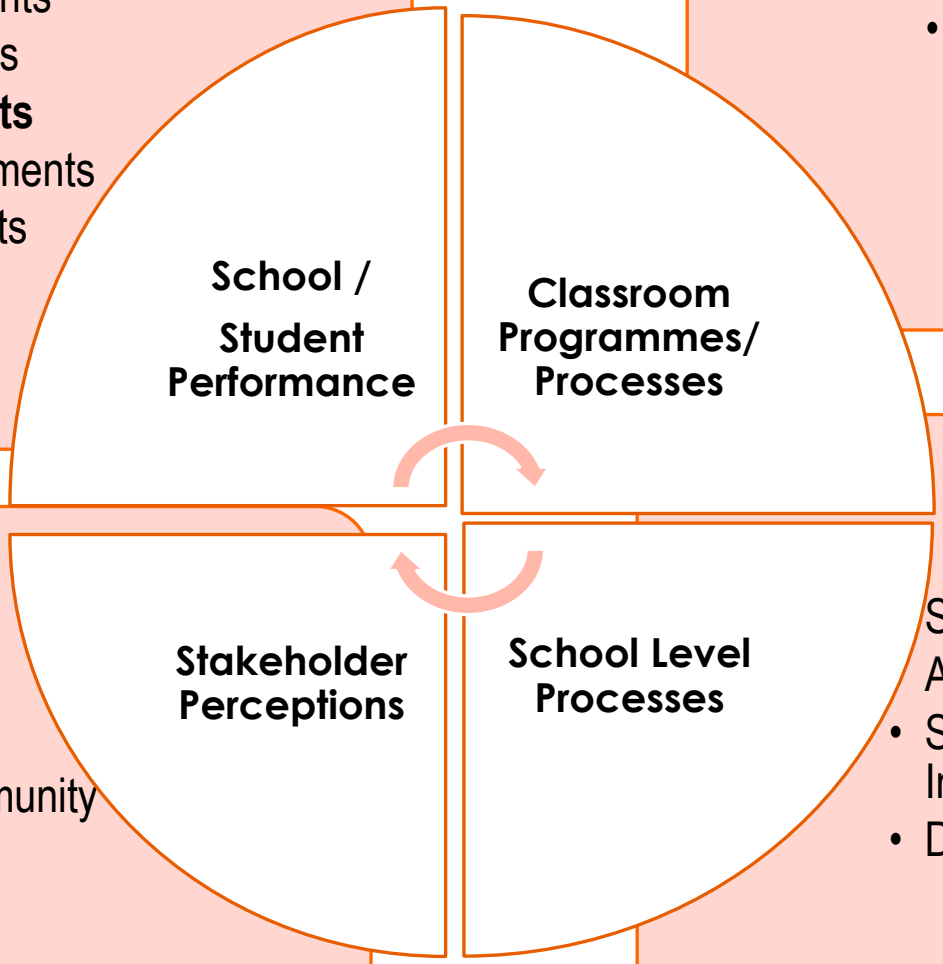
School Processes Data

- Extra-curricula Activities
- Curriculum Programmes (Intensity & Fidelity)
- Remedial programmes (Effectiveness)
- Staff development programmes
- Parental involvement Programmes

- **Key Questions**
- **How effective are programmes when implemented in the school?**
- **Are they related to increased student achievement(connect to achievement data)**
- **What trends are noticeable?**

Important Data Types in T&T

- **External Assessments**
  - National Assessments
  - Public Examinations
- **Internal Assessments**
  - Classroom Assessments
  - Interim Assessments
  - Demographic Data

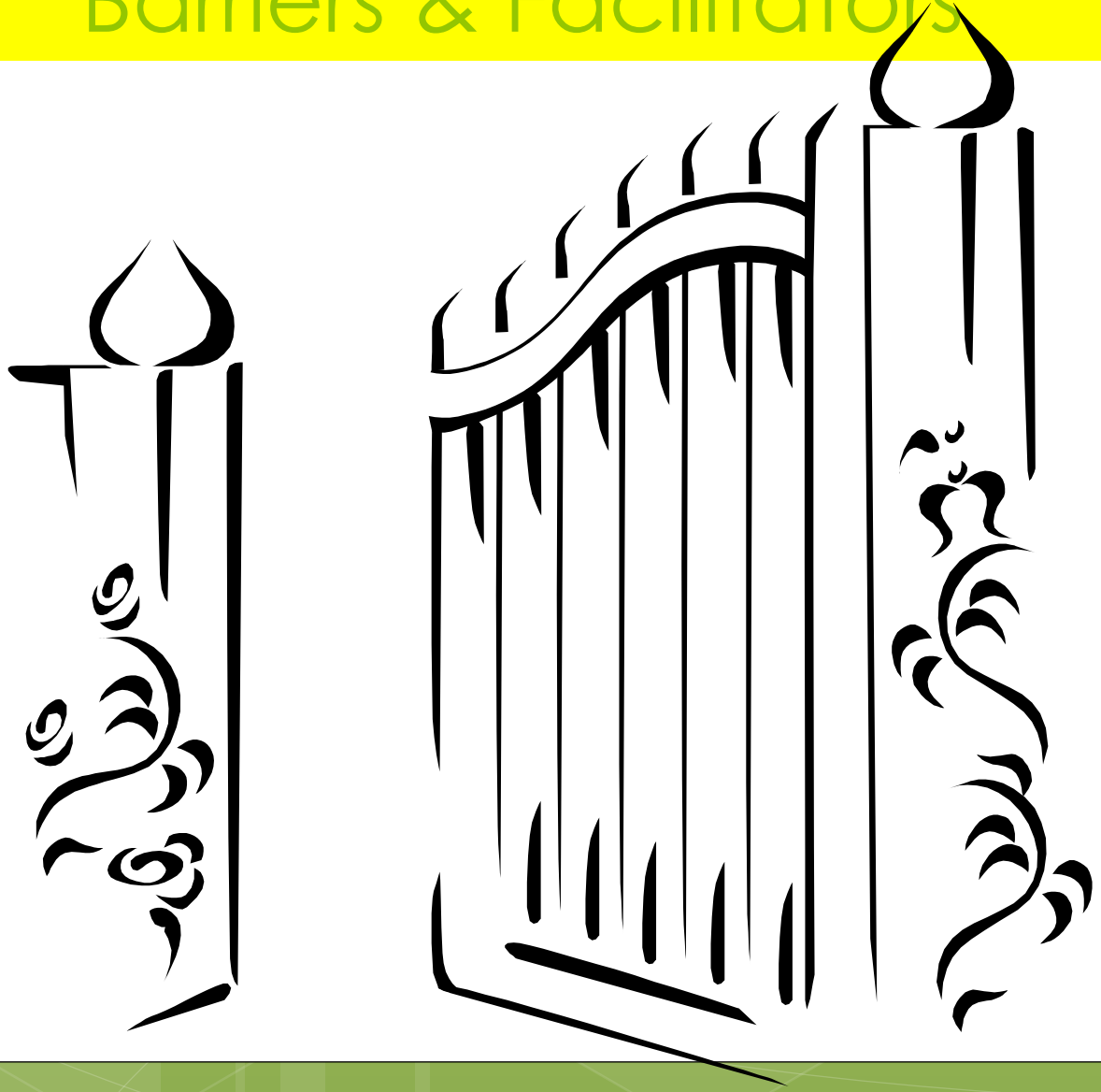


- Programme/ Intervention outcomes
- Teachers and Teaching Measures

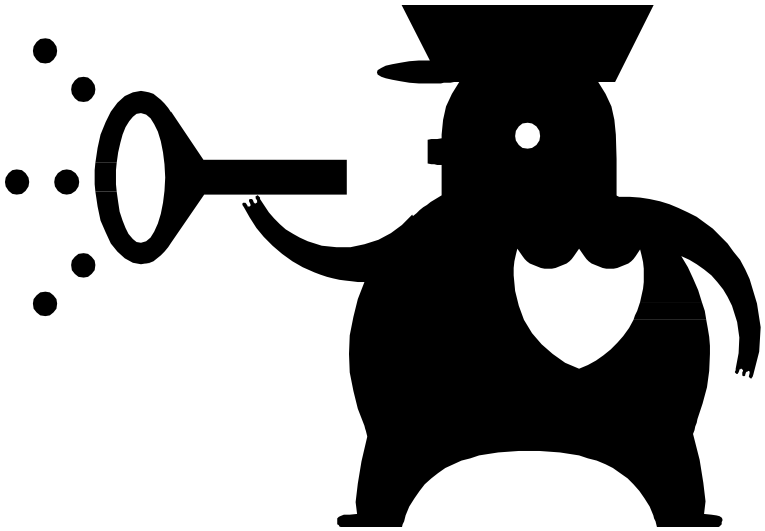
- Student Satisfaction
- Student Engagement
- School, Family, Community Partnerships
- School Ethos

- School wide Programmes Attendance & Tardiness
- School Violence Indicators
- Drop-Out Indicators

CHANGING THE CULTURE TO DDDM
Barriers & Facilitators



- How is data used in these two scenarios?
  - Hammer
  - Flashlight



Surmounting barriers to data use-Mistrust

- **in tu i tion** (nt-shn, -ty-)*n.*
  - **1. a.** The act or faculty of knowing or sensing without the use of rational processes; immediate cognition. **b.** Knowledge gained by the use of this faculty; a perceptive insight.
  - **2.** A sense of something not evident or deducible; an impression

Surmounting barriers to data use-Reliance on intuition

- **Neo:** No, thank you.
- **Merovingian:** Yes, of course, who has time? Who has time? But then if we do not ever take time, how can we ever have time?

Surmounting Barriers to Data Use
Time & Resources

- DDDM should be connected with a professional learning community (PLC) and professional development (PD) activity.
- Training should be available first provided to the district and then to schools.
  - A professional learning community is a team of educators who seek to continuously share learning and then act on what they learn. The goal of their actions is to enhance their effectiveness as professionals so that students benefit.

Surmounting Barriers to Data Use Knowledge and Capacity

Surmounting the Barriers to Data Use: Beliefs

- **"All children can learn."** How does this statement make you feel? Do you honestly believe all children can learn? **Share your thoughts**.

Facilitating Data Use- Work in teams

- Data teams should operate in schools and in the Districts to facilitate the process of DDDM
- Data teams can be multidisciplinary and draw on the strengths of different members or come from the same department
- **DISCUSSION: What might be the best composition for a data team within an educational district?**