

# TAKS-MATH: Are we moving forward?

Mathematics for English Language Learners  
Conference ; July 6-7, 2007



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# Background of the Study

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- ❑ Immigration is a phenomenon that school districts must address in order to be compliant with federal laws.
- ❑ The No Child Left Behind Act of 2001 creates increased accountability measures for public schools.
- ❑ The goal of the law is to have all children proficient in reading and math by 2014 and states must develop annual tests to measure student progress.
- ❑ The law calls for the use of scientifically proven teaching methods, highly qualified teachers in every classroom, and increased parental involvement.

# Objective of the Study

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- ❑ The number of ELL students is increasing at a very fast rate.
- ❑ It's important to analyze their performance and compare with it's peer groups.
- ❑ The goal of this study is to find out whether the ELL students and/or students monitored out of ELL are doing well as we expect. Another objective is to find whether reading and mathematics performance are correlated or not.

# Let Are Kids Walk !!!!!!!!!!!!!

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- ❑ Some parents were protesting the fact that their kids did not pass the TAKS test, and therefore were not allowed to walk the stage to receive their diplomas in the graduation ceremony, even though they had completed their class requirements with passing grades.
- ❑ In the picture below, you will find a fine example of the fruits of our education system, supporting her beloved scholar with a sign "**LET ARE KIDS WALK!**". Any bets on why she had free time in the middle to the day to stand around holding sign?



Kumer Das 2007

# Availability of TAKS Data

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- ❑ In Texas the number of students identified as LEP grew by 45.1 percent between 1994-95 and 2003-04.
- ❑ TEA (Texas Education Agency) carries the mammoth responsibility of helping more than 1100 school districts.
- ❑ TEA has a user-friendly webpage (<http://www.tea.state.tx.us/student.assessment/reporting/taksagg/dnload.html>) that allows researchers to download various TAKS data for grades 3-11.

# About the Data set

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- ❑ The TAKS mathematics tests assesses how well students understand mathematics, including algebra and geometry and how well they can apply this understanding into the real world. The knowledge and skills tested are grouped into ten objectives.
- ❑ A total of 5,641 variables has been studied for every single grade.
- ❑ There are more than 1,250 variables just for math. The other categories are: reading/ELA, writing, social studies and science.
- ❑ The data is provided separately for English and Spanish versions of the test for grades 3-6.

# Outline of the Talk

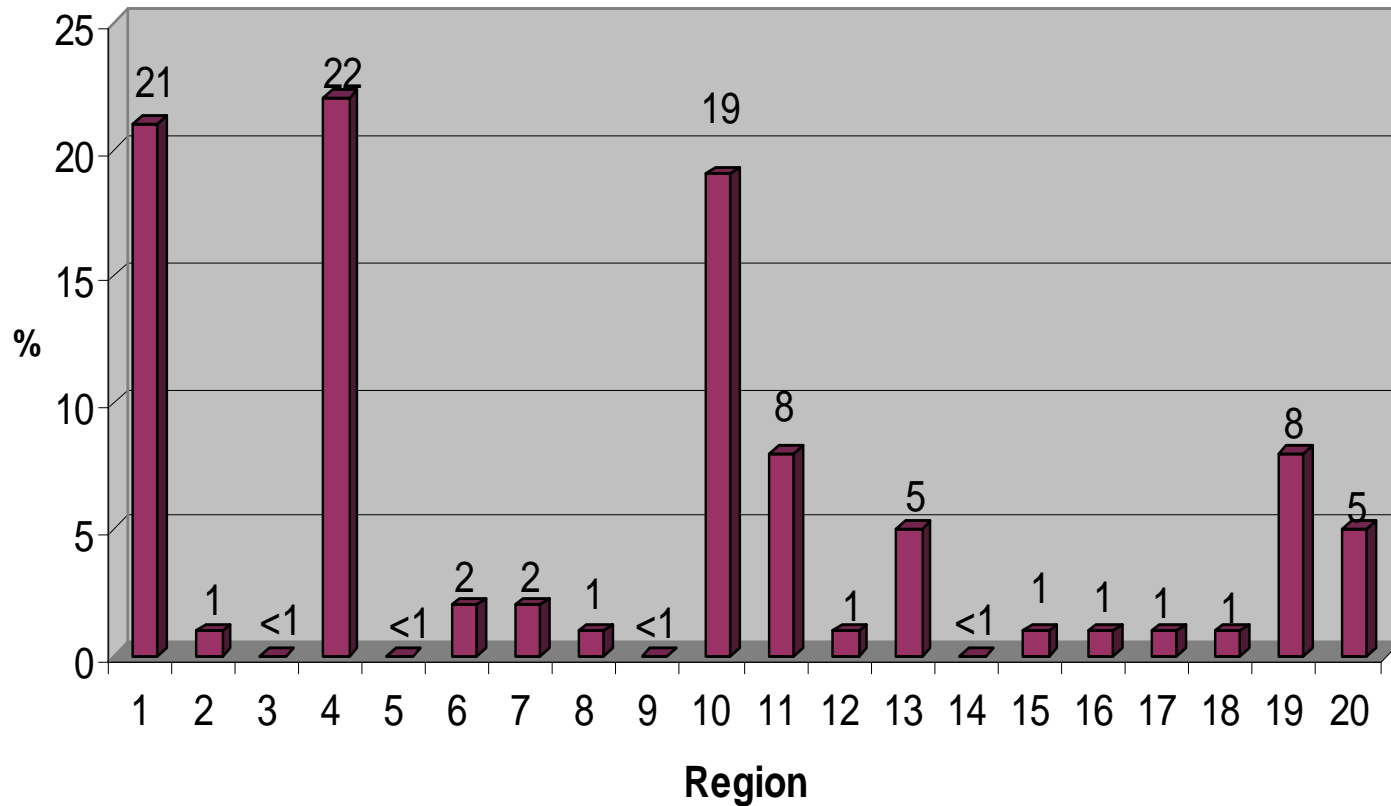
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- ❑ This study mainly focus on the performance of MELL ( Math for English Language Learner) data.
- ❑ In this talk, the regional and campus database has been used and several appropriate variables have been plotted by grade. Since our audience is mainly involved either in middle and/or high school emphasis has been given to those grades.
- ❑ Data has been obtained from both 2006 and 2007 TAKS.





# ELL Students Tested by Region (Grade 3-11)



1=Edinburg; 4=Houston; 10=Dallas; 11= Fort Worth; 19=El Paso; 20=San Antonio

# TAKS-2007 Performance

Grade-9

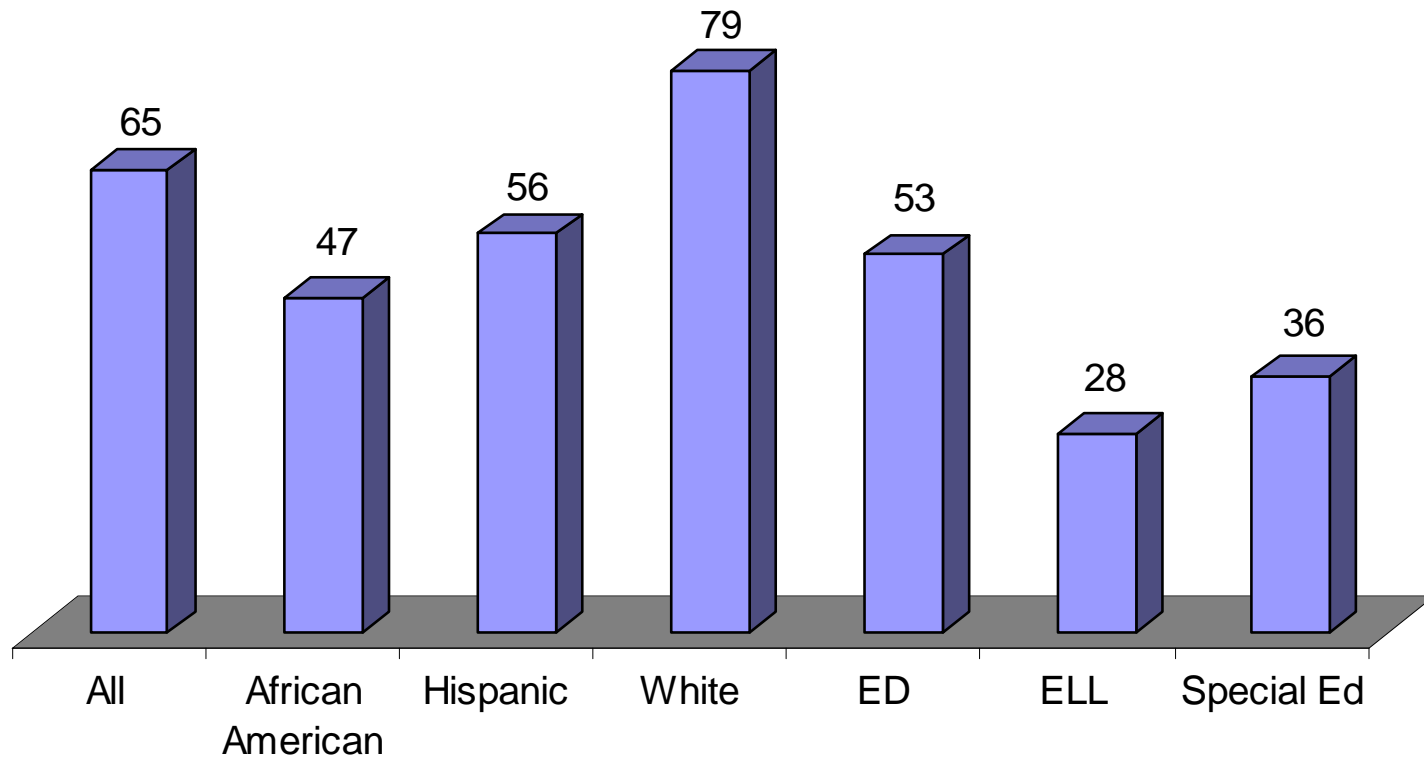
	% Met Standard	% Commended Performance
All Students	60	17
African American	44	7
Hispanic	49	9
White	76	27
Economically Disadvantaged	47	8
ELL	22	2
Special Ed.	28	3

# TAKS-2007 Performance

Grade-10

	% Met Standard	% Commended Performance
All Students	63	14
African American	45	4
Hispanic	54	8
White	78	22
Economically Disadvantaged	51	7
ELL	24	2
Special Ed.	29	2

### % Met Standard (Grade 7-11)



ED=Economically Disadvantaged

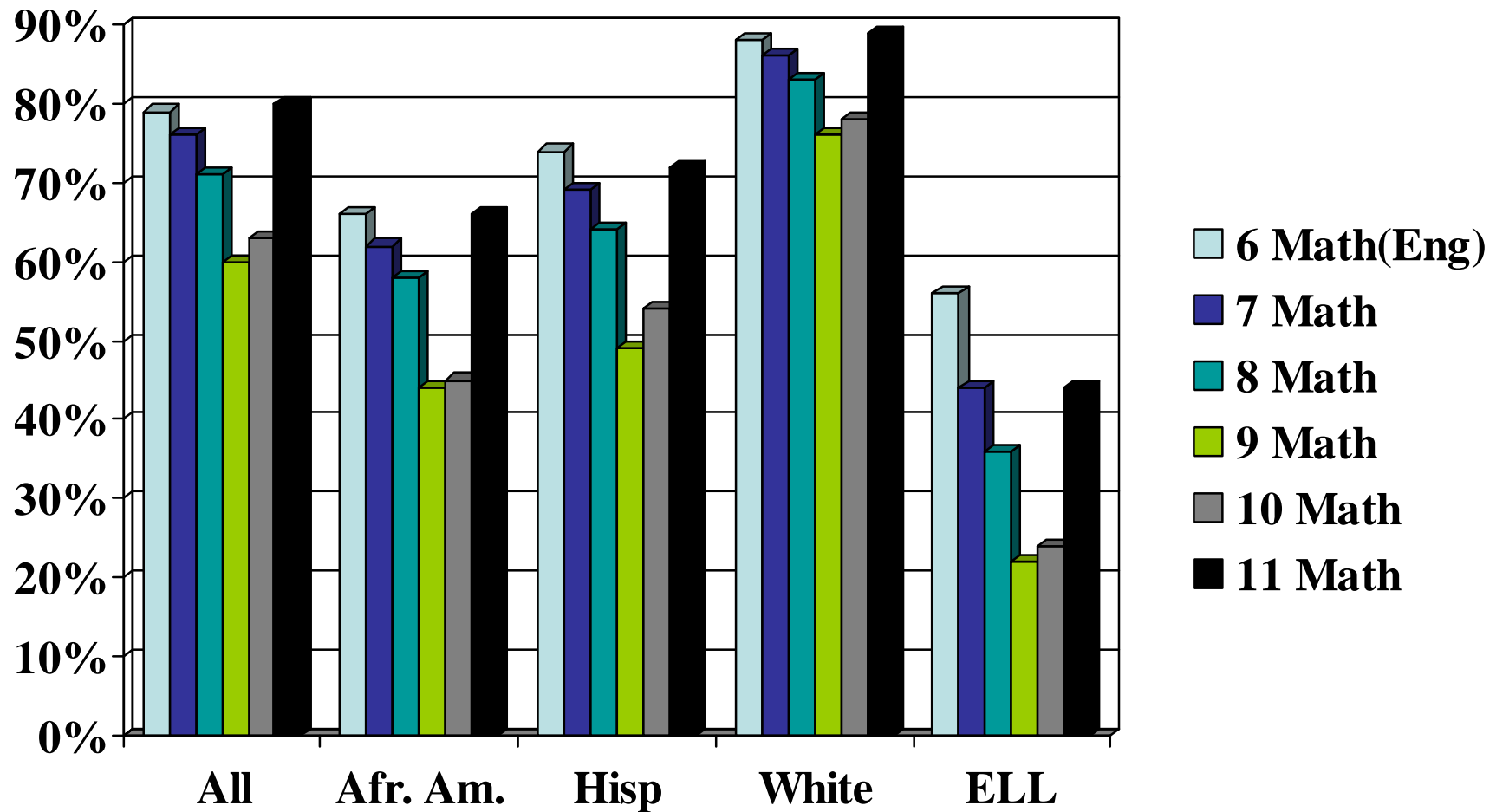
2006 Data

# Let's Take a Break!!!!!!!!!!!!

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- ❑ Numbers are tools, not rules.
- ❑ Numbers are symbols for things; the number and the thing are not the same.
- ❑ Skill in manipulating numbers is a talent, not evidence of divine guidance.
- ❑ The product of an arithmetical computation is the answer to an equation; it is not the solution to a problem.
- ❑ He uses statistics as a drunken man uses lampposts—for support rather than for illumination.

# 2007 Math TAKS Data



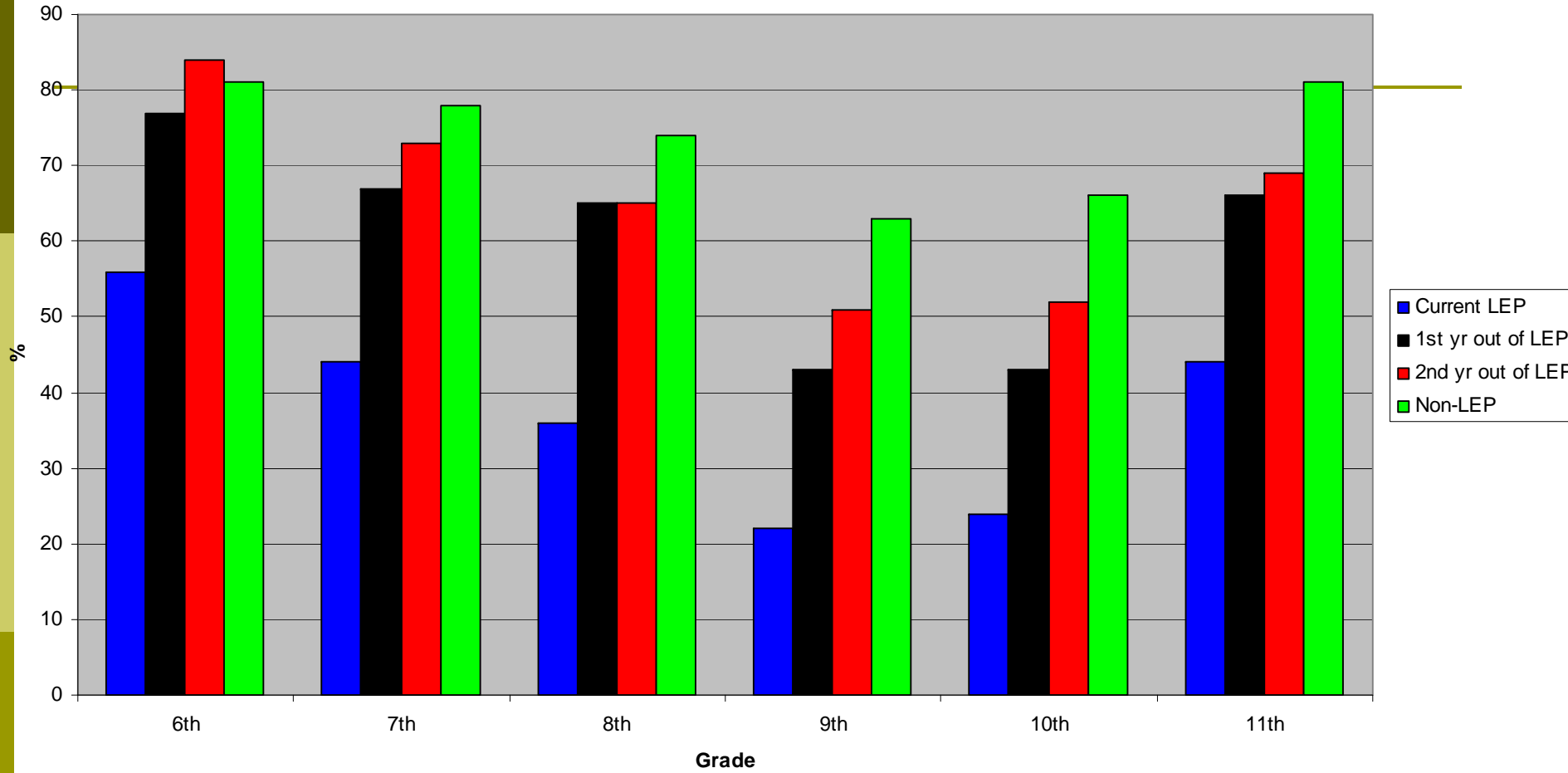
# Student Monitored out of ELL

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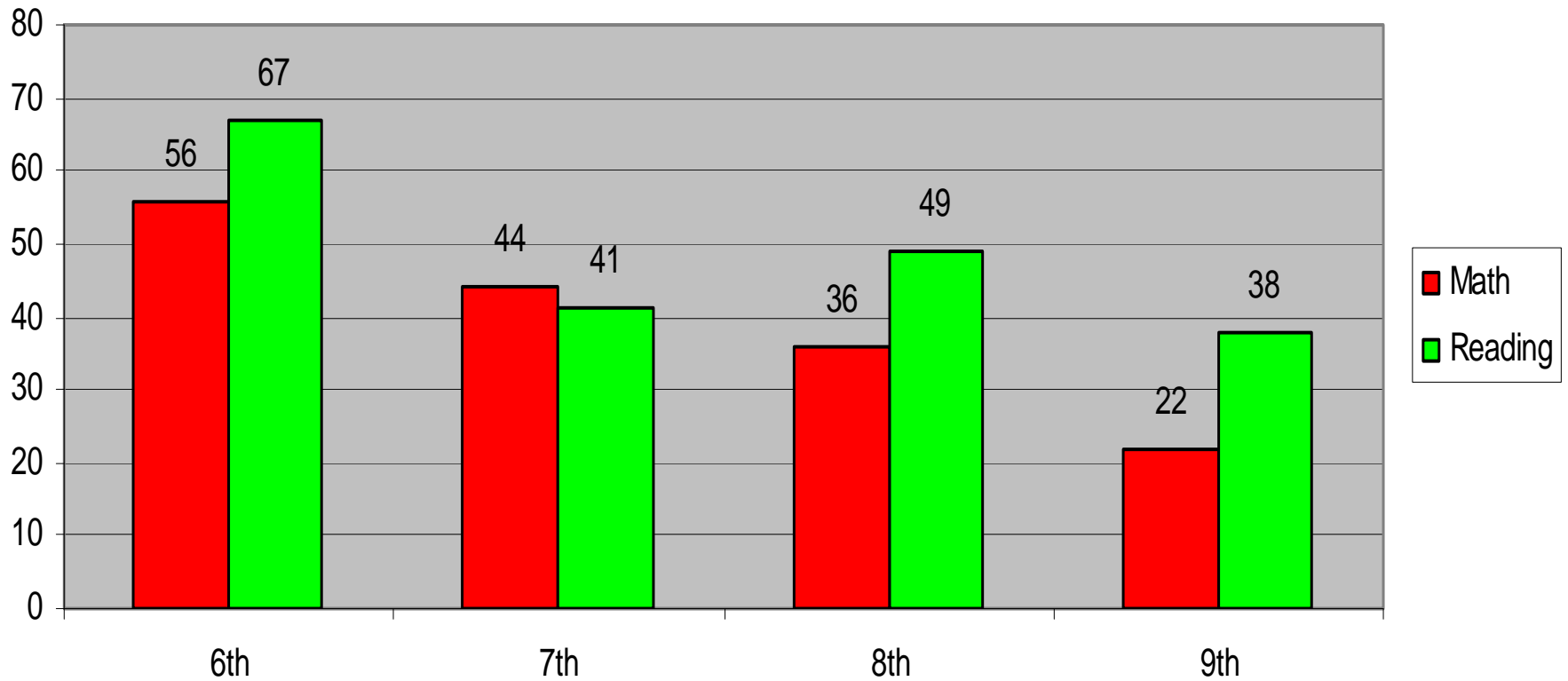
- ❑ For TAKS, student are classified as ELL student for a given number of years . Then they are transitioned to English-only (whether they are ready or not).
- ❑ Thus for the first time in 2005 the following variables have been studied:  
“% met standard among first year monitored out of ELL” and
- ❑ “% met standard among second year monitored out of ELL”.



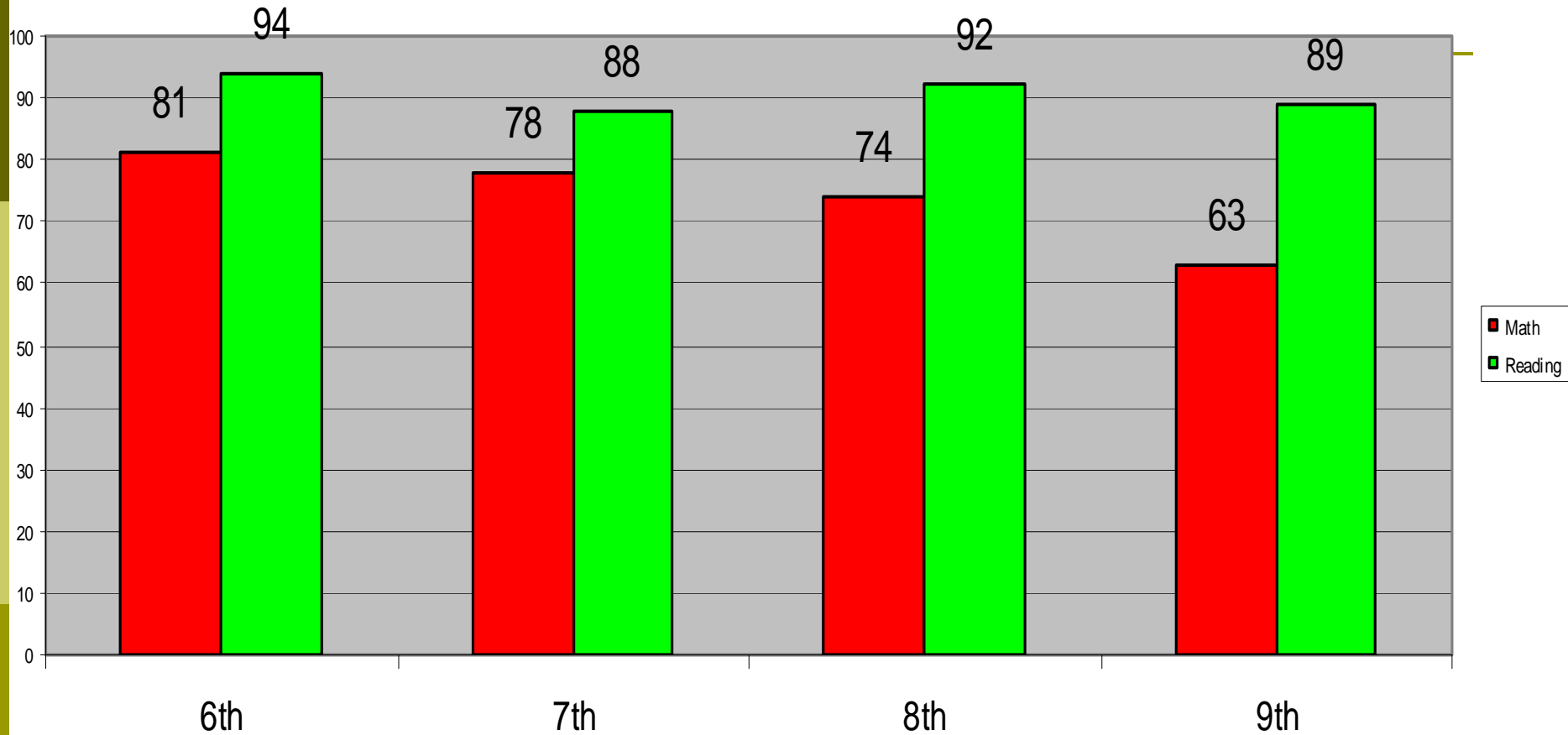
# 2007 Math TAKS Data



## Reading and Math performance by ELL student,2007

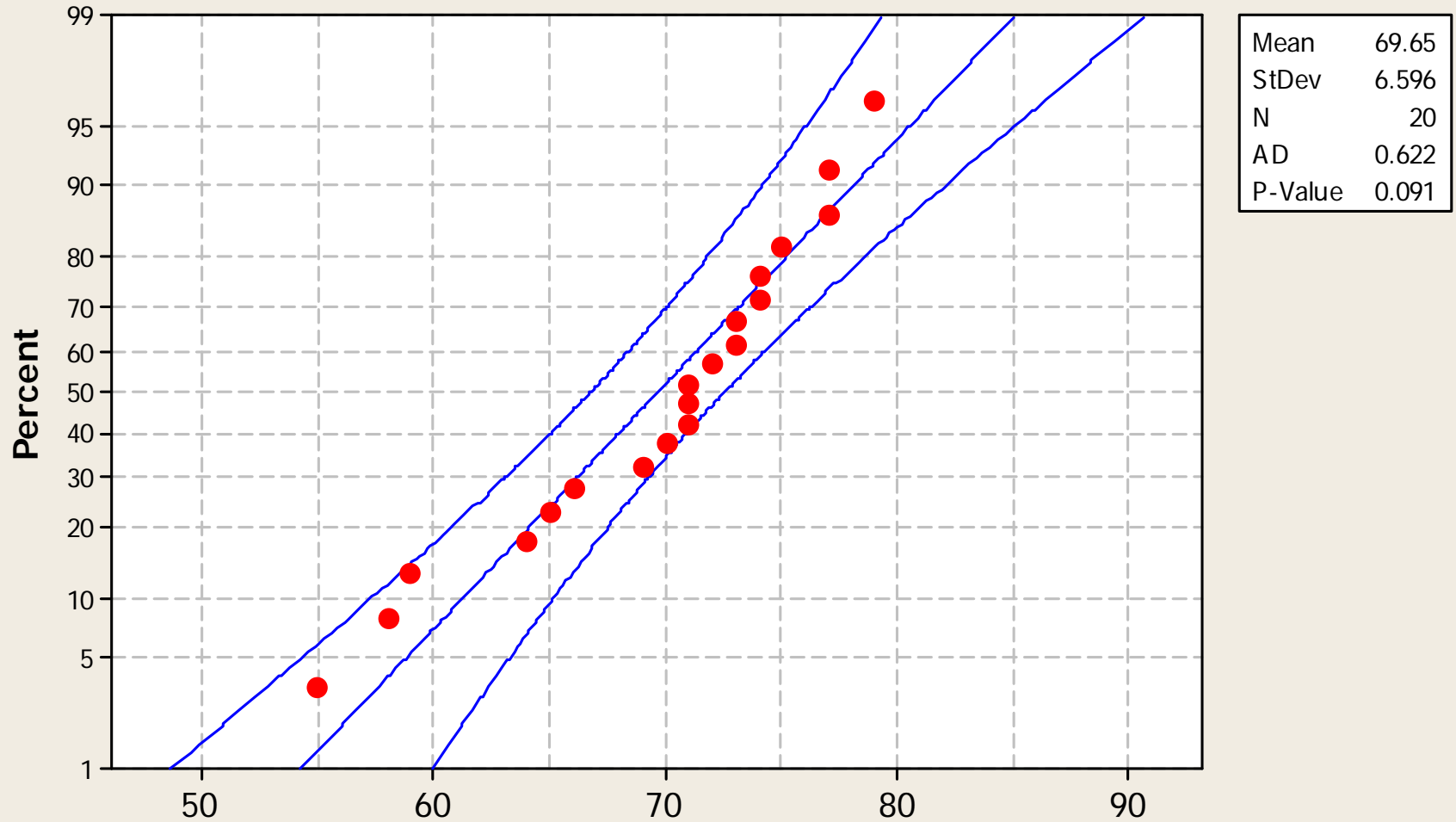


## Reading and Math Performance non-ELL student,2007



# Probability Plot of percentage of ELL student met the 2005 Math TAKS standard

Normal - 95% CI



□ **Pearson correlations between the percentage of students who met standard in reading and mathematics TAKS test**

Grade	All students	Hispanic students	White students	ELL students	Non-ELL students
2005 TAKS	0.909(**)	0.528(*)	0.824(**)	0.352	0.905(**)
Grade-6					
2006 TAKS	0.831(**)	0.635(**)	0.893(**)	0.829(**)	0.873(**)
Grade-7					
2005 TAKS	0.895(**)	0.622(**)	0.913(**)	0.668(**)	0.879(**)
Grade-7					
2006 TAKS	0.916(**)	0.608(**)	0.833(**)	0.732(**)	0.902(**)
Grade-8					
2005 TAKS	0.853(**)	0.180	0.834(**)	0.252	0.852(**)
Grade-8					
2006 TAKS	0.791(**)	0.440	0.790(**)	0.561(*)	0.782(**)
Grade-9					
2005 TAKS	0.836(**)	0.327	0.836(**)	0.724(**)	0.831(**)
Grade-9					
2006 TAKS	0.878(**)	0.441	0.716(**)	0.211	0.870(**)

□ \*\* Correlation is significant at the 0.01 level (2-tailed).

□ \* Correlation is significant at the 0.05 level (2-tailed).

# Reading and Math

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- Reading and mathematics performance are strongly correlated among the 'all students' , White students and non-ELL students group. Moreover, all these correlations are significant.
- However, reading and mathematics performance are either weak or moderately correlated among the Hispanic and ELL students. Not all correlation coefficients are significant.

# What's that mean?? Part-I

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- For example, if we phrase 2005 TAKS result obtained for 'white students' in grade-5, we could state the following results: 'a Pearson correlation coefficient was calculated for the relationship between the percentage of white students who met the standard in mathematics and the percentage of white students who met the standard in reading. A strong positive correlation was found ( $r=0.901$ ,  $p<0.01$ ), indicating a significant linear relationship between the two variables. That means White students who perform well in reading tend to perform well in mathematics as well'.

# What's that mean? Part-II

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- If we phrase 2006 TAKS result obtained for ELL students in grade-9, we could state that 'the correlation coefficient was calculated for the relationship between the percentage of ELL students who met the standard in mathematics and the percentage of ELL students who met the standard in reading. A weak positive correlation ( $r=0.211$ ) which is not significant was found. That is, reading and mathematics performance of ELL students is very weakly related to each other.



**BE CAREFUL**

**THIS MACHINE  
HAS NO BRAIN  
USE YOUR OWN**

- Do not interpret correlation coefficient as cause and effect relationship.
- But this misconception should not be taken to mean that correlation may never be used in drawing conclusions about causal relationships. A high correlation in many uncontrolled studies carried out in different settings can provide support for causality. However, the causes underlying the correlation may be indirect and unknown. Consequently, establishing a correlation between two variables is necessary *but not sufficient* to establishing a causal relationship (in either direction).

# BIG BANG

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- A surgeon, a Mathematician and a Politician were arguing about whose profession was the oldest. The surgeon stated that his profession was first, "After all", he asked, "who do you think helped God make Eve out of one of Adam's ribs?" The mathematician said "No, before Adam and Eve and even before the Big Bang, there was chaos and God needed a mathematician to show him how to use chaos theory." The politician spoke up, "Ha! I win, who do you think caused the chaos?"  
Thanks to Craig S.

