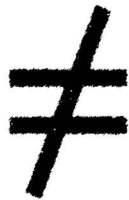


Racism in Mathematics: A Direct Factor in Underrepresentation



Richard Tapia

University Professor

Maxfield-Oshman Professor in Engineering

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Rice University



Rice University School Mathematics Project

June 10, 2014

Preface to Talk

Racism in Mathematics: A Direct Factor in Underrepresentation

Beliefs about Mathematics:

- Math is easy.
- Anyone with sufficiently hard work can be a successful mathematician.
- Mathematics concerns physical reality.

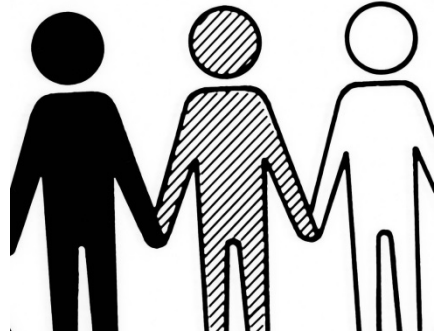
“It is remarkable that mathematics so totally removed from reality, can be used to model physical reality so effectively.” Albert Einstein

About Mathematicians:

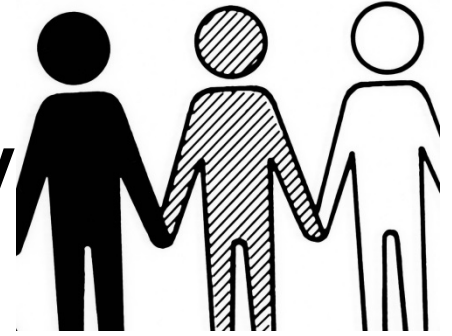
- Mathematicians are highly intelligent; perhaps the most intelligent (as a group) on campus.
- Mathematicians are elitist and do not suffer fools well. They believe that the world in general is full of stupid people.
 - “The difference between stupidity and genius is that genius has its limits.”
 - “Only two things are infinite, the universe and human stupidity, and I’m not sure about the former.” Albert Einstein
- Mathematicians do not like to do things that they do not do well.
- Mathematicians do not sell mathematics and their work well to both the general public and funding agencies.
- Mathematicians believe that their opinion is invariably the correct opinion.
- Mathematicians are socially awkward.
 - How can you identify a gregarious mathematician?
 - Jean’s observation.
 - Our SIAM dinner in Denver
 - Michelle Martin of NPR
- Mathematicians are objective and as such do not exhibit racist behavior.
 - Jim Douglas on Raymond Johnson in 1964.

OK, LETS FOLLOW THIS LEAD.

Introductory Statement



**Are we the
underrepresented minority
different?**



Growing up in America we are certainly made to feel different, and we are treated differently with lower expectations.

My Struggle for Identity

There is an identity crisis for underrepresented minorities growing up in the United States, and especially if you are good in science, engineering or mathematics.

My Struggle for Identity

In the United States I am called Mexican, and in Mexico I am called gringo. Where do I belong?

- **Los Angeles** – negative image with the term Mexican American.
“Your kind is not quality, and you do not belong in quality activity.”
- Coping with failure, maybe they were right.
- **My Mother:** Be proud of who you are.
- **Rat:** But mom, they won't let me be proud.

My Struggle for Identity

- But it gets worse, enter the “Foreign” Latino.
- How sad, you are neither Mexican nor American, you have no real culture. You do not know Latin American literature and you don’t speak Spanish correctly.
- **Rat Answer: I am Mexican American, and as such I am fortunate to be able to choose the best of both worlds.**
- I can contrast Jose Alfredo Jimenez with Hank Williams, Lola Beltran with Patsy Cline. You say that you do not know who Hank Williams and Patsy Cline are?
- It’s sad that you know so little about the country that you live in, that you teach in, and that you expect to mentor in.

I am American, I am cars and I am Rock ‘n’ Roll.

Issues Related to Race that Annoy Me

- Sportscasters (and others) mispronouncing the Spanish “z”, e.g. Diaz, Perez, Martinez.
- Voice speaking Spanish with a terrible accent in the elevators in Terminal C in Houston’s George Bush airport.
- We Mexicans are not good enough to play ourselves in the movies.

Pancho Villa – Wallace Berry (white)

Zorro – Guy Williams (white)

Chico and the Man – Freddie Prinze (New Yorican)

Richie Valens – Lou Diamond Phillips (Filipino) (Brother Puerto Rican)

Milagro Bean Field War – Sonia Braga (Brazilian)

Selena – Jennifer Lopez (New Yorican)

Cesar Chavez – Dolores Huerta played by Rosario Dawson (New Yorican)

Issues Related to Race that Hurt Me

- High school AMS Award
- High school counselor telling me that I did not belong in Math
- Rental house in Madison
- Madison neighbor's comment to our late daughter Circee
- CAAM Chair's comments on awards to faculty and graduate students in organizational meeting

WHO AM I?

Words That I Identify With That Make Me Happy:



- **Chicano**
- **Tejano**
- **Mathematician**

Society for Advancement of Chicanos and Native Americans in Science

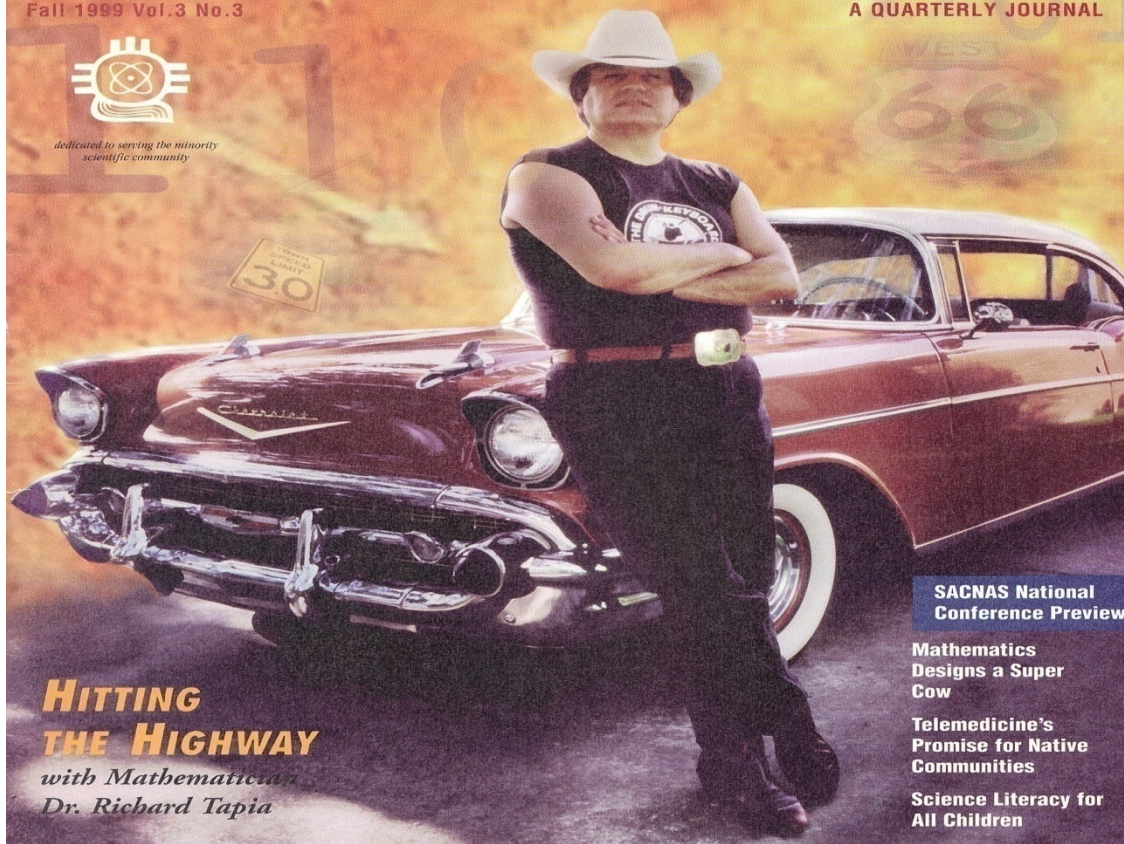
SACNAS NEWS

Fall 1999 Vol. 3 No. 3

A QUARTERLY JOURNAL



*dedicated to serving the minority
scientific community*



**HITTING
THE HIGHWAY**
*with Mathematician
Dr. Richard Tapia*

**SACNAS National
Conference Preview**

**Mathematics
Designs a Super
Cow**

**Telemedicine's
Promise for Native
Communities**

**Science Literacy for
All Children**

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The background of the slide is a close-up, high-resolution image of the United States flag. The flag is shown waving, with the blue field of stars on the left and the red and white stripes on the right. The stars are white and five-pointed. The stripes are a vibrant red and white. The lighting creates a sense of depth and movement in the fabric of the flag.

**Yes, my culture is American,
perhaps with a twist.**

American Culture

“The Legendary Back Seat of a ‘57 Chevy”



Worry About Underrepresentation?

- Our representation in the population is exploding.
- Our representation in STEM discipline is not improving.

“AN UNHEALTHY NATIONAL SITUATION”

A Profile of the Great State of Texas

Demography: Who are we today, and who will we be tomorrow?

Texas Population

Year	1980	1990	2000	2010	2020	2030	2040
White	66%	61%	53%	47%	43%	37%	32%
Hispanic	21%	25%	32%	37%	43%	47%	53%
Black	12%	12%	11%	12%	11%	10%	9%
Other	1%	2%	3%	4%	5%	5%	6%

The Browning of Texas

Population	Per Decade
White	↓ 5%
Hispanic	↑ 5%
Black	↓ 1%
Other (Asian)	↑ 1%

Consequence

In a little over 100 years

There will be no Whites in Texas

There will be no Blacks in Texas

Hispanics will be 85% of the population

Other (Asians) will be 15% of the population

A Profile of our Great Nation

Demography: Who are we today, and who will we be tomorrow?

U.S. Population

Year	1980	1990	2000	2010	2020	2030	2040
White	80%	76%	69%	64%	60%	56%	51%
Hispanic	6%	9%	13%	16%	19%	23%	27%
Black	12%	12%	12%	13%	12%	12%	12%
Asian	2%	3%	4%	5%	5%	6%	7%

The Browning of America

Population	Per Decade
White	↓ 4%
Hispanic	↑ 4%

Consequence

Linear extrapolation tells us that in 160 years

- There will be no Whites in America.
- Hispanics will be 80% of the population.

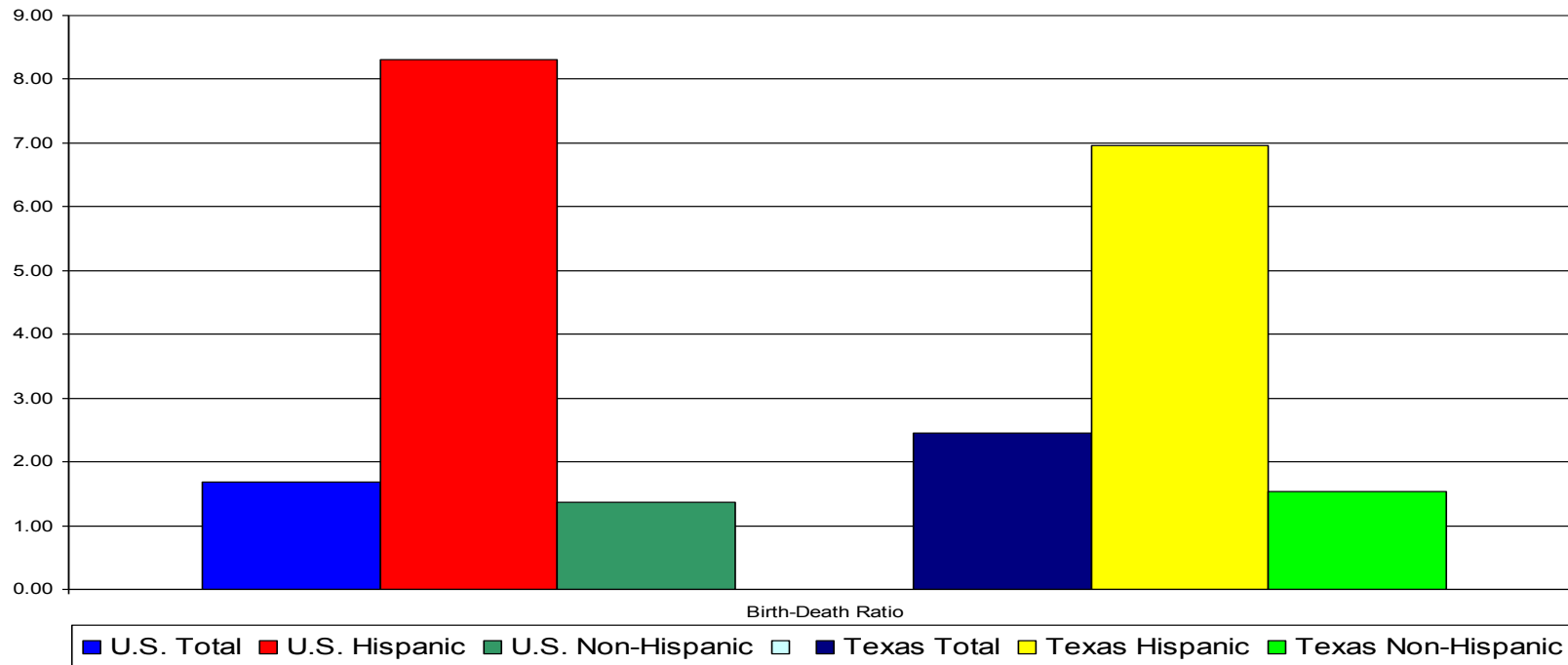
The Browning of America

Press Release: Pew Hispanic Center July 2011

The Mexican American Boom:

For the first time in history births overtake
immigration.

Birth-Death Ratios by Hispanic Origin, United States and Texas, 2000-2006



Source: U.S. data from U.S. Census Bureau. Texas data from Texas State Data Center

How Are We URM Doing In STEM Faculty Representation?



Science



Technology



Engineering



Mathematics

For good reason the nation uses
representation in the areas of:

**Mathematics, Computer Science, and Electrical
Engineering**

as indicators of health of STEM representation.

Blacks and Hispanics In the Academic Pipeline*

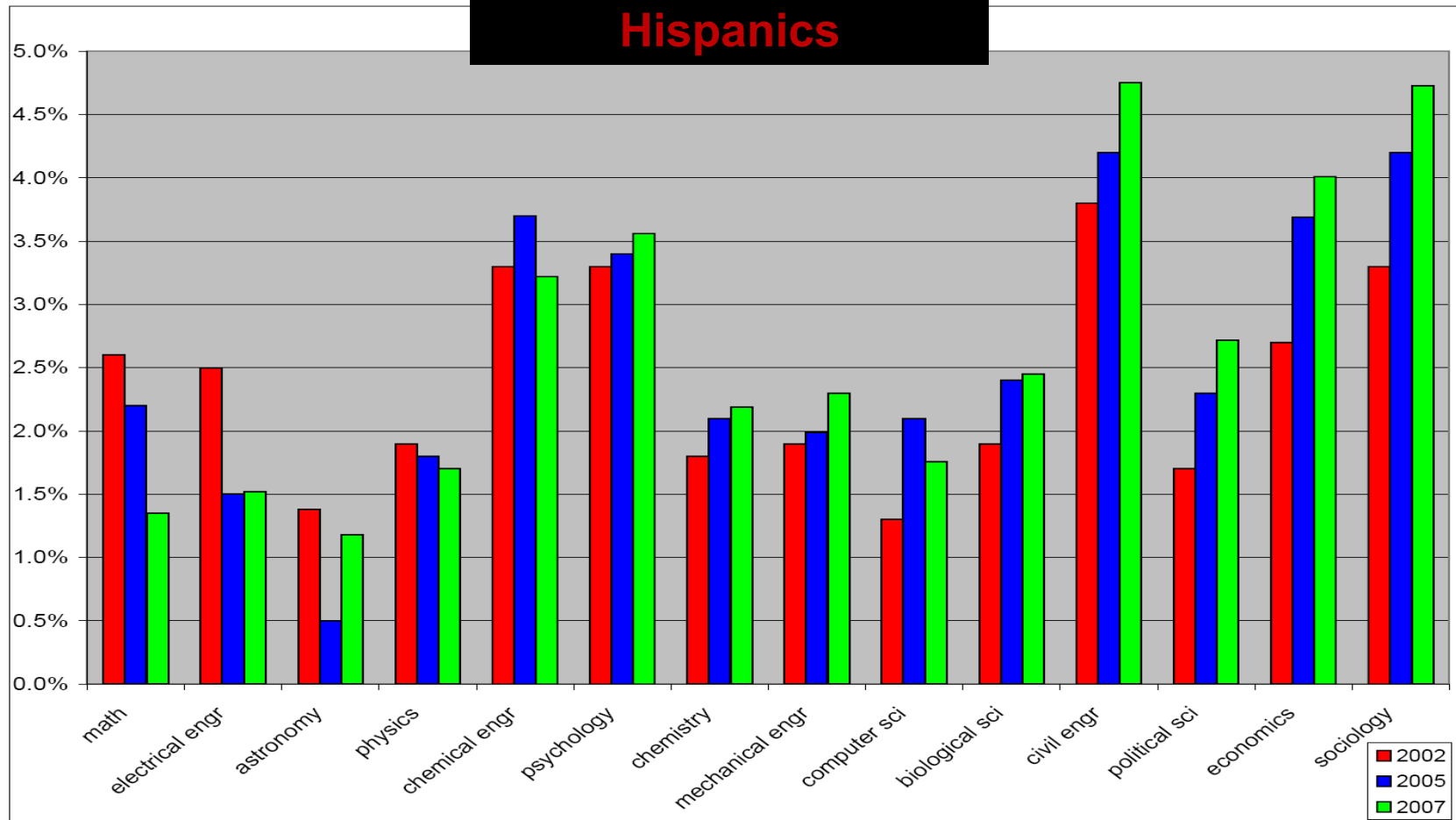
Discipline	Top 100 Departments 2007		
	Blacks	Hispanics	Asians (all)**
Chemistry	1.5%	2.1%	10.5%
Math	1.5%	1.7%	16.6%
Computer Science	0.9%	1.8%	27.1%
Physics	0.7%	1.8%	13.0%
Chemical Engr	2.1%	3.3%	17.8%
Civil Engr	1.8%	4.3%	17.3%
Electrical Engr	1.7%	1.7%	28.4%
Mechanical Engr	1.9%	2.0%	26.0%
Biological Sci	1.4%	2.5%	12.3%
Earth Sciences	0.9%	2.3%	6.6%

*Hispanics were 14.8% of the 2006 US population

**Asians were 4.4% of the 2006 US population

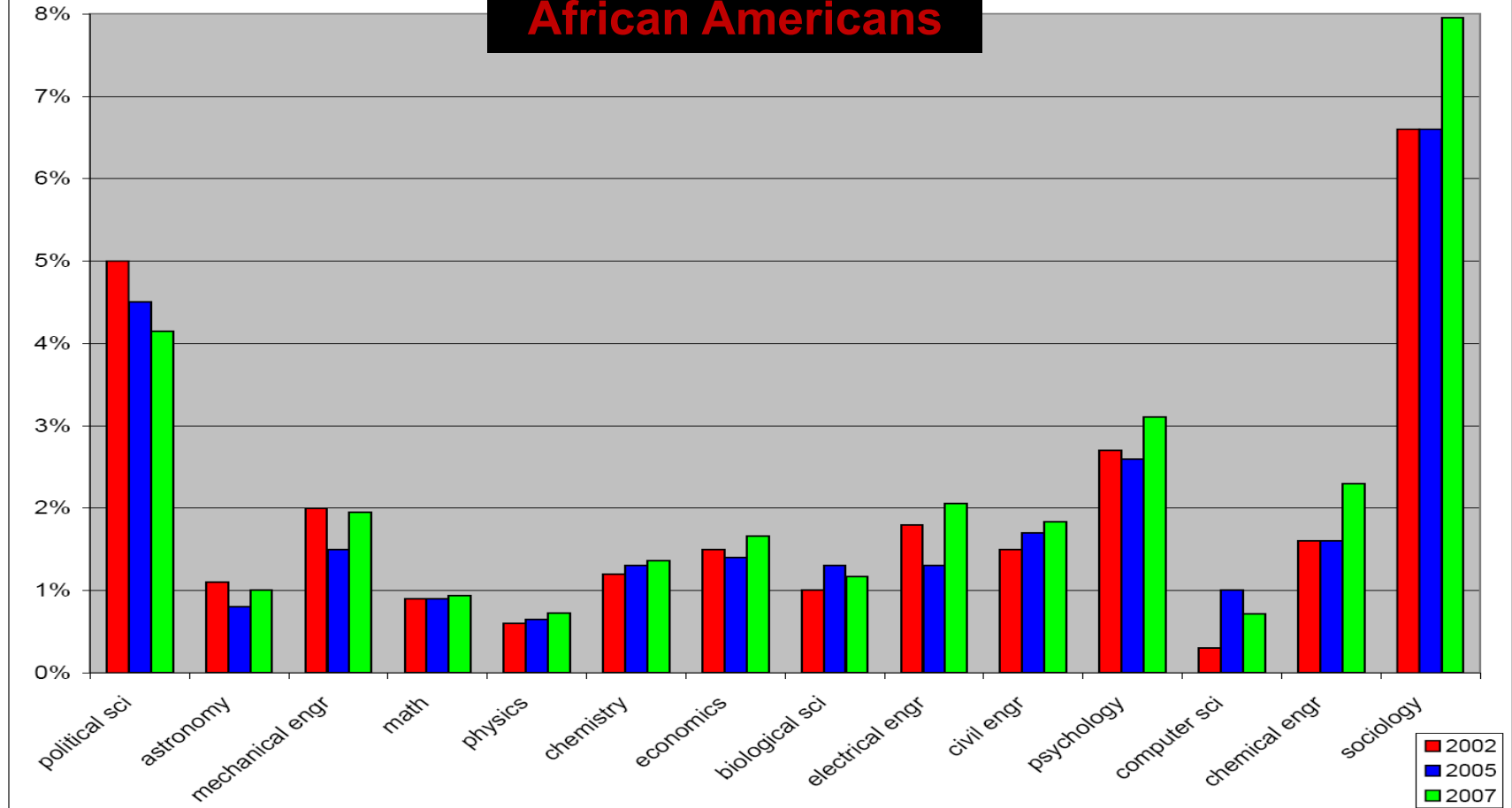
WE ARE HERE, BUT WE ARE NOT THERE

Hispanics



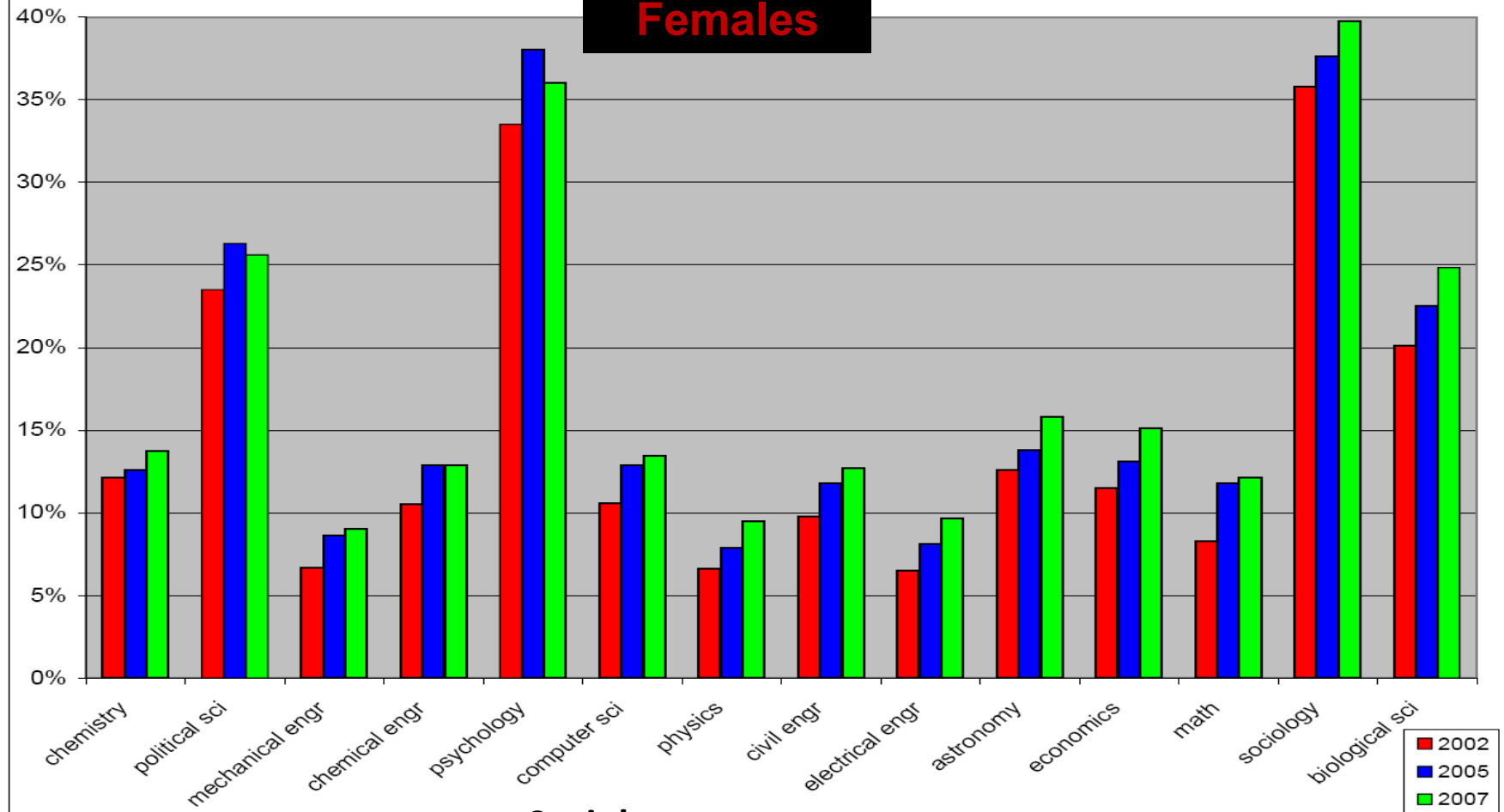
- Civil Engineering
- Sociology

African Americans



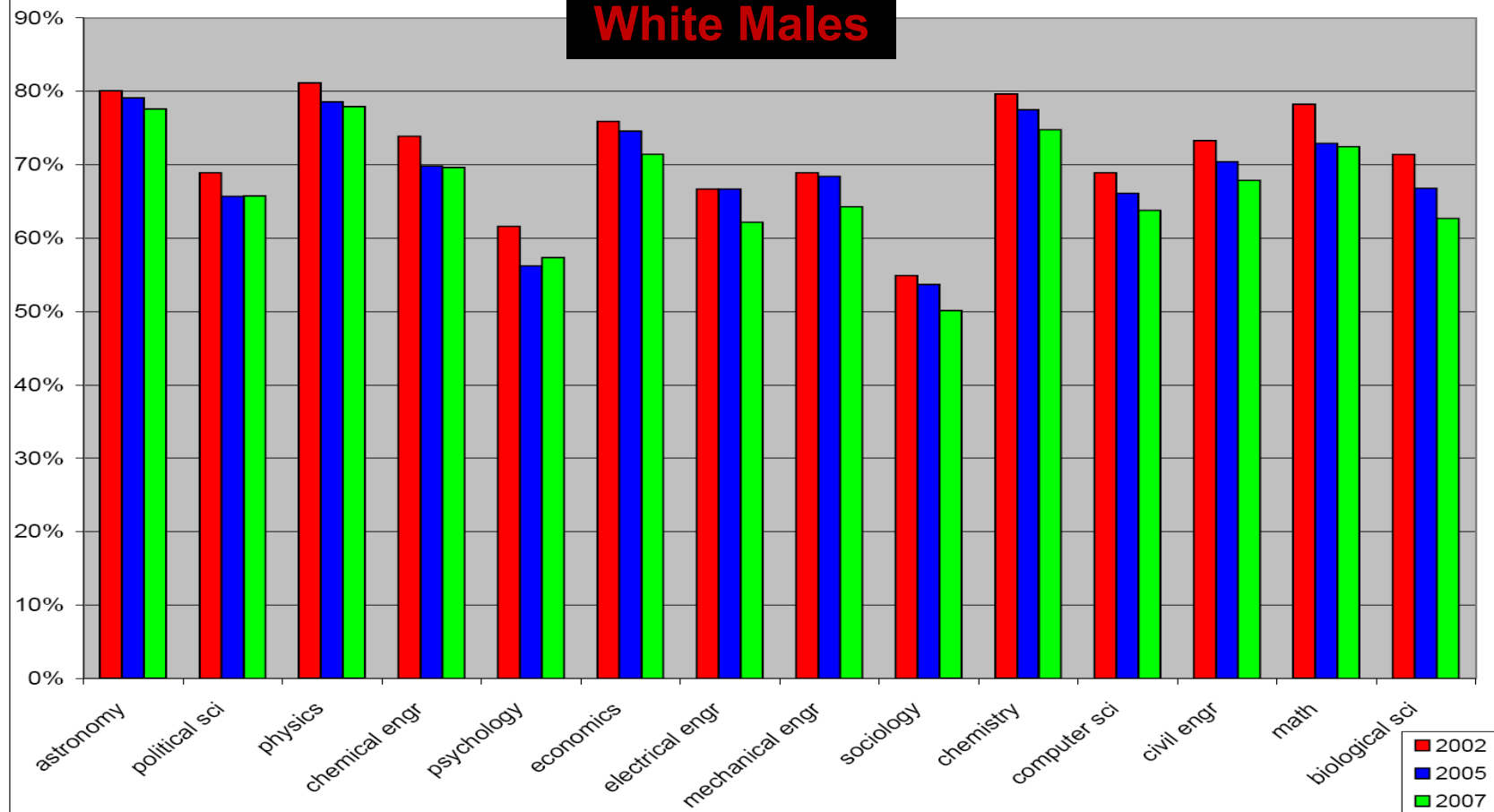
- **Sociology**
- **Political Science**

Females



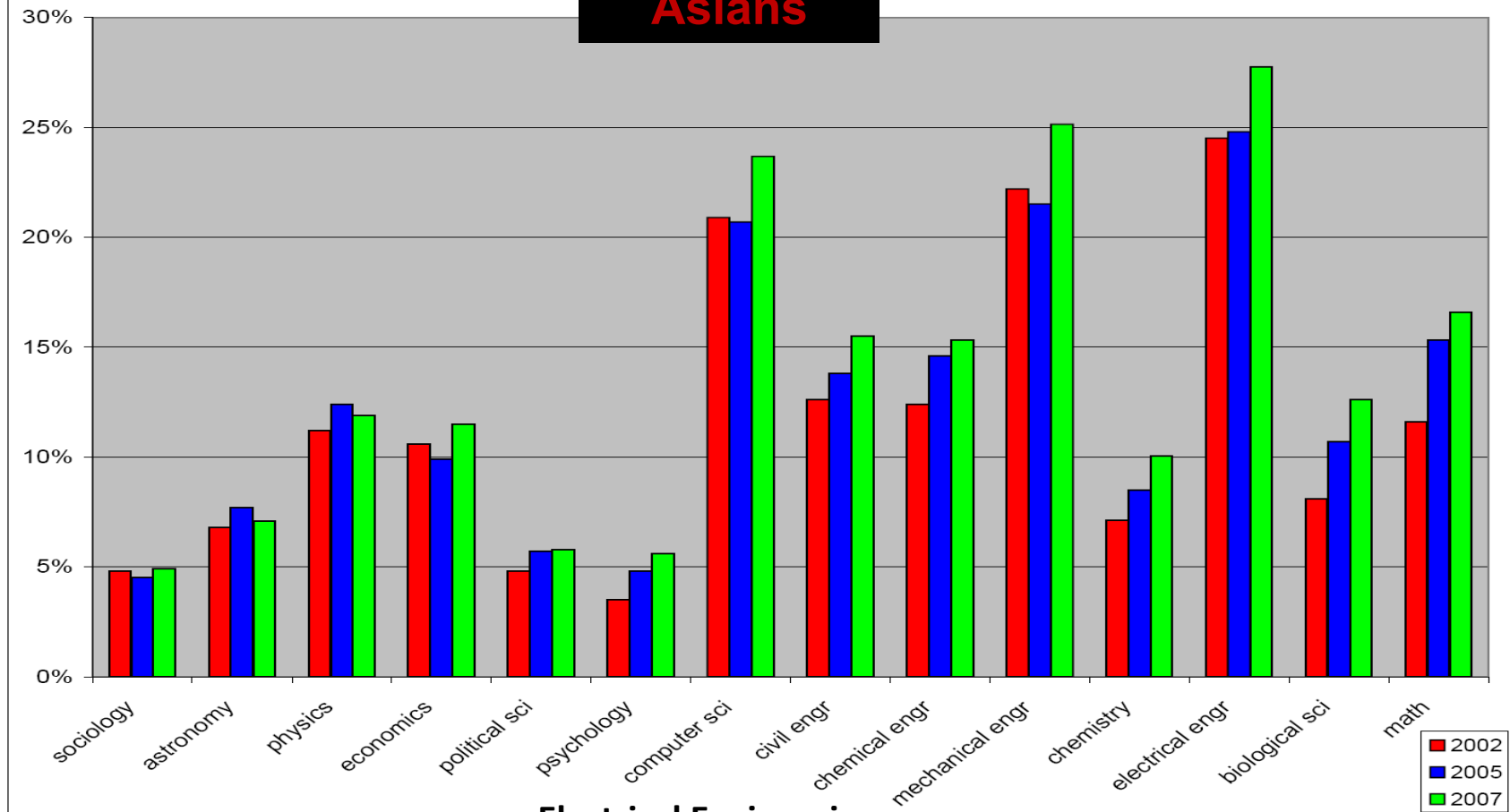
- **Sociology**
- **Psychology**

White Males



Everything but Sociology

Asians



- **Electrical Engineering**
- **Mechanical Engineering**
- **Computer Science**

Why Worry About Underrepresentation?

“Our concern with STEM underrepresentation today does not come from moral or ethical issues as it did in the 1960’s. Indeed, today it is a simple matter of the nation’s survival. As such it is an issue of numbers, not of which group suffered the most. Underrepresentation endangers the health of the nation, and not the health of the discipline.”

Overview of Racism: A Direct Factor in Underrepresentation

- **Stage 1 Racism: Yesterday**
 - Denied access
- **Stage 2 Racism: Yesterday**
 - Implementation of separate but equal programs
- **Stage 3 Racism: Today**
 - **Lower expectations for minorities**, deficient understanding and misguided corrections.

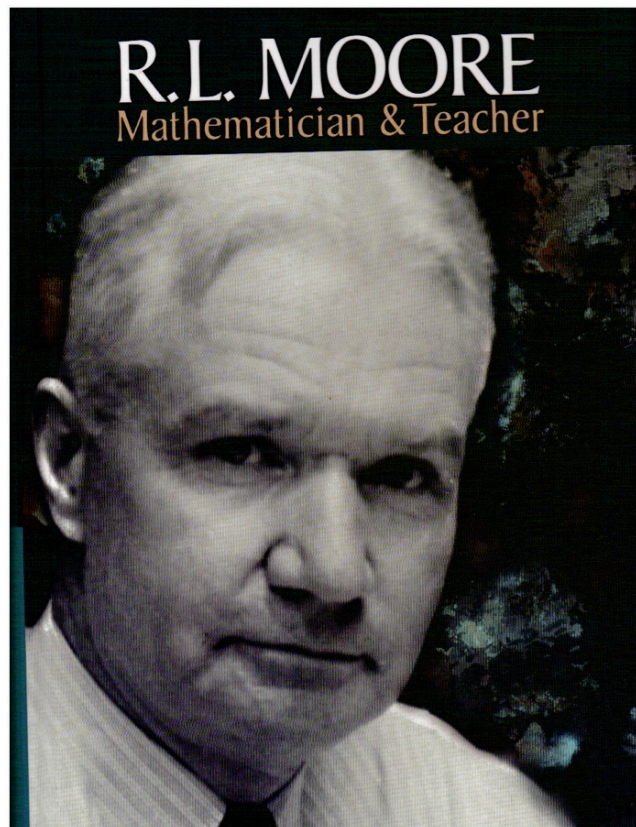
Stage 1 Racism: Denied Access



- Rice University (Prior to 1965)
- The canonical representor of denied access: 1891 Charter of Rice University: “...for cultivating means of instruction for the white inhabitants of the City of Houston and State of Texas”
- Interpretation of “White Only:” - No Blacks - No “Non-White” Mexicans - Asians ok
- Note: White women have always been included and were present in the first graduating class of 1912.

Stage 1 Racism: Denied Access Continued

- Berkeley mathematics and African American Mathematician David Blackwell:
 - 1954 Jerzey Neyman promotes recruitment of David Blackwell to Berkeley Math.
 - G.C. Evans: In math you don't (actually his wife -- Houston born and raised). Build him his own department – Statistics.
- University of Texas Mathematics and R.L. Moore (1960's)
 - Not in my classes- R.L. Moore
 - If I must, then a grade of C or worse.



**A Great Mathematician and A Great Racist
(Dallas Born and Raised)**

R.L. Moore (1882-1974)

Racist Mathematician Unveiled

- **Vivienne Mayes-Malone**, Math Ph.D. from the University of Texas-Austin: She could not enroll in professor R.L. Moore class., as he explicitly stated that he did not teach Blacks. Overlooking all this another of her professors, complaining against the civil rights demonstrations, said to her: “If all those out there were like you, hard-working and studious, we wouldn’t have any problems.” **Her reply:** “If it hadn’t been for these hell-raisers out there, you wouldn’t even know me.” (1966)
- **Walker E. Hunt**, Math Ph.D. From the University of Texas-Austin: “I also wanted to take R.L. Moore’s famous **Foundations of Point-Set Topology**. However, that was not to be. The reason, I was black! His words were, “you may take my course but you start with a C and can only go down from there.” (1979)
- **Raymond L. Johnson**, Ph.D. from Rice University (1969), ex-University of Texas-Austin undergraduate: “The image of R.L. Moore in my eyes is that of a mathematician who went to a topology lecture and when he saw that the speaker was black, he immediately walked out of the lecture.”

Stage 1 Racism: Denied Access Continued

Facts:

- R.L. Moore was the most prominent University of Texas mathematician (1960's)
- G.C. Evans was the most prominent Rice mathematician, and one of the most prominent University of California Berkeley Mathematicians

Irony:

- Moore Hall – University of Texas
- Evans Hall – Berkeley

Stage 2 Racism: Replace Denied Access with Separate but Equal

- America's solution technique to correct for denied education historically has been to propose separate but equal activities.
- Separate but equal is always separate but never equal.
- Separate but equal is destroying the country and will continue to do so if we not change this way of doing business.

Example 1: Separate, But NOT Equal

The Formation of Texas Southern University

In 1946 Heman Sweatt (African American male) denied admission to University of Texas Law School because of race. He filed suit. Texas had no law schools for African Americans. The Texas trial court continued the case for six months, enough time to allow the state to take over Houston colored junior college, under Senate bill 140 of the 50th Texas legislature March 1947, named it Texas State University for Negroes, and built a law school. It later became Texas Southern University. UT Austin remained white, and Heman got his own law school.

Example 2: Separate, But NOT Equal

University of Texas Pan American

1987 In *LULAC et al. v. Richards et al.*, MALDEF (Mexican American Legal Defense and Educational Fund) sued the State of Texas for discrimination against Mexican Americans in South Texas because of inadequate funding of colleges. Trial court held that there was discrimination. Texas Supreme Court unanimously reversed the trial courts decision. Border-area legislators continued the fight in Texas legislature. The small institutions in South Texas were admitted into the larger and powerful flagship University of Texas and Texas A&M University System.

Yet we still see separate but not equal.

More Proof of Separate, But NOT Equal

Example : University Funding

	Annual Budget Per Student	Endowment
Texas Southern University	\$9,000.00	23 Million
UT Pan American	\$13,000.00	29 Million
University Texas Austin	\$34,000.00	7.2 Billion
Rice University	\$84,000.00	3.6 Billion
For comparison purposes:		
Stanford University	\$185,000.00	12.6 Billion
Harvard University	\$181,000.00	26 Billion

Newsflash: Bittersweet-University of Texas



- **2009 Francisco Cigarroa becomes Chancellor of the University of Texas System.**
 - **Sweet:** the first Mexican American to become Chancellor of a major university system.
 - **Bitter:** Recently Cigarroa resigned. He had problems in dealing with regents and the President including issues concerning public education in South Texas

“Separate But Equal Lives On”

Stage 3 Racism: Deficient Understanding and Misguided Corrections

- Four significant factors in underrepresentation:
 - Faulty Evaluation by Mathematicians
 - The Mismatch Theory
 - The Role of Foreign Minorities
 - The Loss of the Precious Few

Stage 3: Lower Expectations for Minorities, Evaluation Criteria that Do Not Promote the Local and Global Mission, Deficient Understanding and Misguided Corrections

Math Evaluation: A major obstacle to improving representation for minorities.

- Mathematicians as self-proclaimed gate keepers of quality.

A Very Serious Obstacle

Fact: We URM have poorer preparation at all levels.

Fact: Mathematics faculty do not differentiate between poor preparation and poor talent.

Hence in entry level courses they interpret poor performance as poor talent and discourage the URM from continuing in STEM disciplines.

Stage 3 Racism (or Racism Today): Lower Expectations for Minorities, Deficient Understanding, and Misguided Corrections

An Example of Lower Expectations:

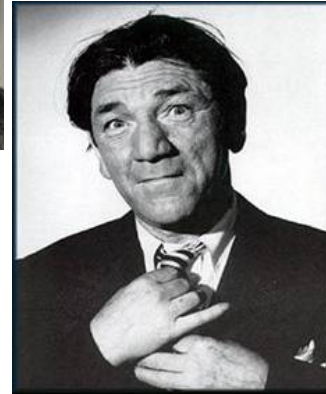
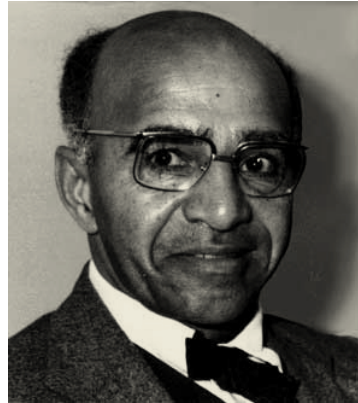
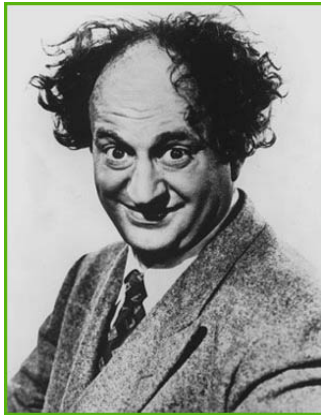
Rice CAAM: The Cassandra-Betty Story

Stage 3 Racism: Another Example of Lower Expectations

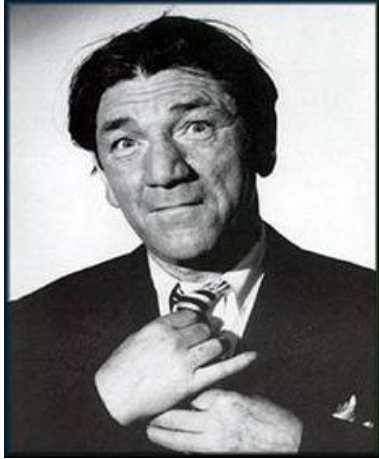
- **Rice Math: The Pedro Story**

“I try to discourage those that do not belong in Mathematics.”

According to at Least One Rice Mathematician One of the Following Does Not Belong in Mathematics, Which One?



According to at Least One Rice Mathematician One of the Following Does Not Belong in Mathematics, Which One?



An Example of Equal Expectations

“This instructor may be the most effective presenter I have ever met. With the beautiful words that he uses to appraise every single student, Professor Tapia fosters mutual respect among the members of the class. I was really impressed that at the end of the course, my opinion about EVERY SINGLE student was so high (the first time that I have ever experienced that feeling!) I would rate this point as much more than outstanding.”

→ ***A very good student from India.***

An Obstacle to Improving Student Representation

The Mismatch Theory

**A direct promotion of lower expectations
through separate, but equal.**

The Mismatch Theory

Sanders Elliot: Affirmative Action at research schools hurts the URM they are trying to help. They do not succeed in STEM and should therefore be directed to Minority Serving Institutions where they can succeed.

The correct conclusion: Must build support programs so that students that have preparation deficiencies but talent succeed.

Reality of Domestic STEM Education

- Pedigree is alive and well.
- Top research universities choose faculty from PhDs produced at top research universities.
- We must be represented as faculty in those places where national leaders are chosen, *e.g.*, Princeton, Harvard, Stanford, Berkeley, Rice, *etc.*, yet we are not there.
- Observation: I know of no minority STEM faculty at a Research 1 University who received their PhD from a minority serving institution.
- Number of degrees obtained by URMs alone is not a good measure of success. Degrees must be competitive with overall productivity.

An Obstacle to Improving Faculty Representation

The recent replacement of
“underrepresentation” with “diversity”

**True Diversity Doesn't
Come From Abroad**

Diversity vs. Underrepresentation

- Diversity: Inclusion of individuals with different backgrounds, characteristics, and attributes.
- Underrepresentation: Traditionally poor representation of minorities born and raised in this country.

i.e., Native Americans

African Americans

Hispanic Americans

Asian American as Faculty

Diversity on U.S. Campuses

Today's research universities are very “diverse” in terms of faculty and graduate students. They continue to do what they have always done well.

However, representation of members from underrepresented groups is non-existent.

National Diversity/Underrepresentation Concerns

- Promotion of diversity has replaced concerns for improving domestic representation.
- In what sense are Argentine or Colombian mathematicians underrepresented?
- Can we Chicanos compete with the very best these foreign countries have to offer?
- Universities play games in counting foreigners as underrepresented minorities, and to a large degree, this is actually promoted by NSF and other government agencies.

National Diversity/Underrepresentation Concerns

- Diversity is **good**.
- However, improving the participation of members from underrepresented groups is **critical** to the economy and health of this nation.

National Diversity/Underrepresentation Concerns

The two are not the same. Today we stay away from the politically incorrect term “underrepresentation” and use the politically correct term “diversity”. We do this with serious negative consequences for underrepresentation.

Qualifier

Many effective champions of representation were not born in the United States, but they were educated in the United States, for example Rodrigo Bañuelos, Carlos Castillo-Chavez, and Arlie Petters. Foreign minorities can help, and many do, but when dealing with improving representation we can not promote the foreign minority at the expense of the domestic minority.

An Obstacle to Improving Graduate Student and Therefore Faculty Representation

- **Critical concern:** Low representation of domestic underrepresented minority graduate students in STEM departments at Tier 1 research university

Restricting the Pool of the Precious Few

- **Two components:**
 - Minority Serving Institutions
 - Tier 1 Institutions

Restricting the Pool of the Precious Few: Part 1 Minority Serving Institutions

The good STEM students at a minority serving institution:

- Perform well, maintain confidence, and self-esteem.
- Are encouraged to go to graduate school at Tier 1 schools.
- Find their preparation for demanding graduate school deficient compared to other students.
- Leave with masters degree.

THEY ARE LOST TO RESEARCH SCIENCE.

Restricting the Pool of the Precious Few: Part 2 Research Universities

Minority STEM students who are accustomed to functioning with self-confidence encounter “sink or swim” culture and no support mechanisms at Tier 1 school.

Restricting the Pool of the Precious Few: Part 2

Feeling “beat up” and losing confidence they:

- Migrate to non-STEM majors, or
- Continue in STEM, but strongly avoid graduate school.

THEY ARE LOST TO RESEARCH SCIENCE.

This is very much what happens at Rice.

Bittersweet

Sweet:

- Rice graduates 91% of its athletes.
- Rice graduates 90% of its URM students.

Bitter:

- But not in an intended STEM major.

Stage 3 Racism: Deficient Understanding and Misguided Corrections

- 0 to 1 is infinite improvement.
- Therefore one is enough; we have ours, now you go get yours:
 - Raymond Johnson and Rice Math (Bittersweet)
 - Illya Hicks

A View From the Faculty

**A Recent Questionnaire of Rice
University Science and Engineering
Faculty on Their Perceptions
Concerning Underrepresented
Minorities (Confidential Data)**

Responses

- “Richard Tapia is very successful at attracting and retaining such students to our dept. This is **tolerated** to the degree that it does not **overwhelm** the dept.”
- “The department may very well have made a formal commitment to increasing and retaining underrepresented minorities, but I have seen no action to back up these words.”
- “The issue arises but, certainly not as a priority.”

Responses

- “We have always attempted to recruit women and American minorities instead of foreign graduate students. We have never been rewarded for this policy. The other S/E departments frequently have more foreign graduate students than American ones. In the aggregate, the Administration could do much more to encourage recruitment of American women and minorities **INSTEAD** of foreign students.”
- “We use only academic performance in making admissions decisions.”

How Faculty View Underrepresented Minority Graduate Students

Items related to underrepresented minority students	Percentage
Preparation depends on quality of the undergraduate institution	63
Requiring a lot of time and effort	34
Prepared for graduate work	27
Lacking in research experience	27
Under-prepared for graduate work	26
Hard workers	20
Possessing talent in the field of study	6

Stage 3 Racism: Deficient Understanding

Math Faculty Hiring at Research Universities: Evaluation that Does Not Promote University and National Needs.

Most problematic transition point for URM at research universities is faculty hiring.

- **Rice Embarrassment:**
 - Fact: There has never been an URM in a tenure track position in the Rice division of Natural Sciences in the history of Rice.
 - Fact: There has never been an URM woman in a tenure track position in the Rice Division of Engineering in the history of Rice.

URM Hiring at Research Math Departments

Our extra dimensions are not valued at hiring.
They are not even frosting on the cake, they are
the box that the cake came in and is thrown away.

Yet they are needed.

Faculty Hiring

- **The Narrow View:** Why I would not be hired by Berkeley Math Department?
- Insufficient Research Potential at an early age to be awarded a Fields Medal (The Math Nobel Prize).
- **Many successful hires:** can't teach, can't talk to students, can't mentor, do not serve as a role model, don't care about the national picture, don't care about students, and can barely find their way to their offices.

Faculty Hiring

The Full View:

- I would give in all standard components and beyond.
- My contributions would be valued.
- I would be promoted (tenured) but I would not be hired.

Never Berkeley, But Almost Stanford

1976

- Interest in RAT on the part of the Stanford Administration.
- Perfect teaching evaluations in 3 classes.
- Faculty advisor to all Hispanic student groups including medical and law.
- **Substandard offer:** I had to reject it (my extra dimensions were of negative value).

At Both Berkeley and Stanford

The Full view:

The pied piper effect



And Yet

1992

**Elected to National Academy of
Engineering
(First Latino)**

But There Is More,

Dr. Richard Tapia Receives National Medal of Science



First Latino to win this award

Do I Belong?

Norbert Wiener
Solomon Lefschetz
H. Marston Morse
Oscar Zariski
John Milnor
Paul Cohen
Jerzy Neyman
William Feller
John Tukey
Kurt Gödel
Joseph L. Doob
Peter Lax



The Full Spectrum of Participation

President Obama's Comments

But There Is More,

March 20, 2014: News Flash



**Richard Tapia wins NSF's
Prestigious Vannevar Bush
Award
(First Latino).**

**But I would not be hired by Berkeley
or Stanford Math.**

The Guiding Themes In My Life

“I am not the best, but I
am Good Enough.”



“If you sit on the porch with the big dogs, and occasionally bark like a big dog, the world will view you as a big dog.”

-Richard Tapia

A Message to Students

Your credentials precede you. They promote credibility and open doors.

“Tapia can’t be a total turkey.”

Be a professional who happens to be a minority, not a professional minority.

We serve as role models in two capacities: Minority youth and majority colleagues. Concerning the latter we want to show them that excellence comes in all flavors.

A Rice Success Story: The Tapia Center



ELA
Undergraduate

AGEP
Graduate

Originally funded by NSF, but grants have since sunsetted.

The Tapia Center

- One-on-One Faculty Mentoring.
- Trips to national conferences focused on minority representation and leadership: SACNAS, Blackwell-Tapia, Tapia Celebration of Diversity in Computing.
- Local Activities include:
 - Academic Survival Skills,
 - Annual STEM Research Symposium and Competition,
 - Host Minority Speakers,
 - Promote Leadership Skills,
 - Social Activities, and
 - Emotional Support.

We promote a feeling of belonging and build a community of support (extended family).

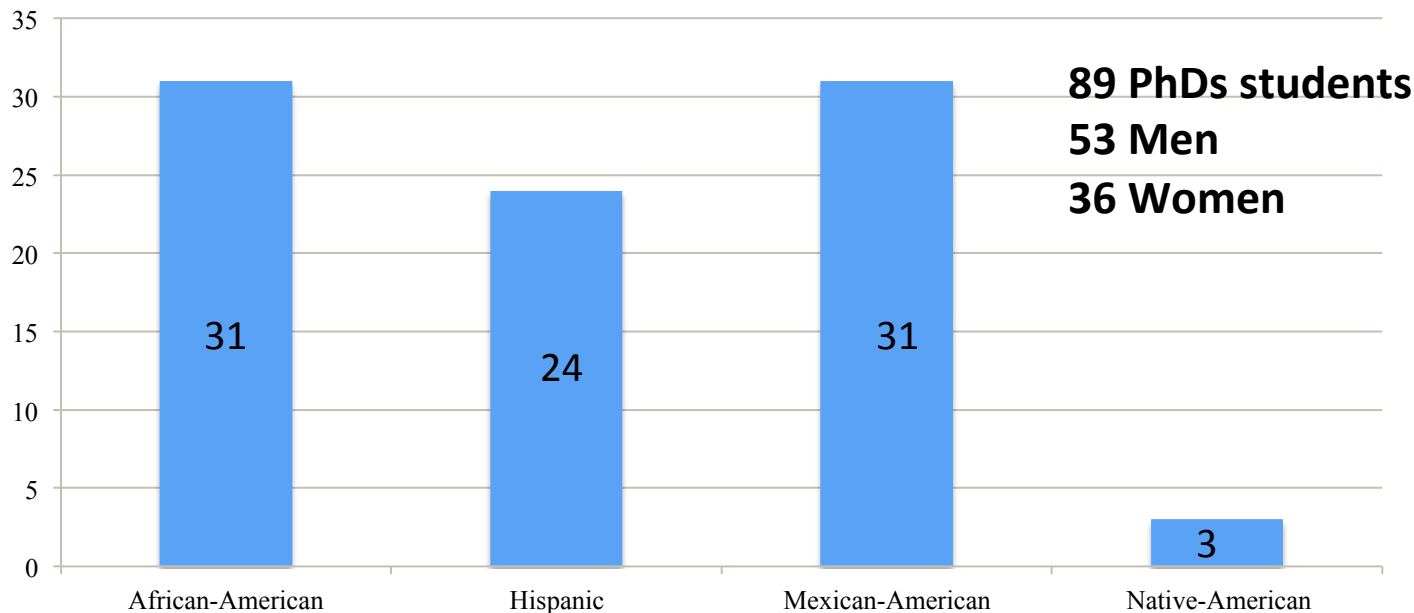
The Tapia Center

The Tapia Center has provided training and guidance to more than 6,000 students and 2,500 K-12 teachers and educated almost a quarter-million students and professionals about the importance of diversity and representation.

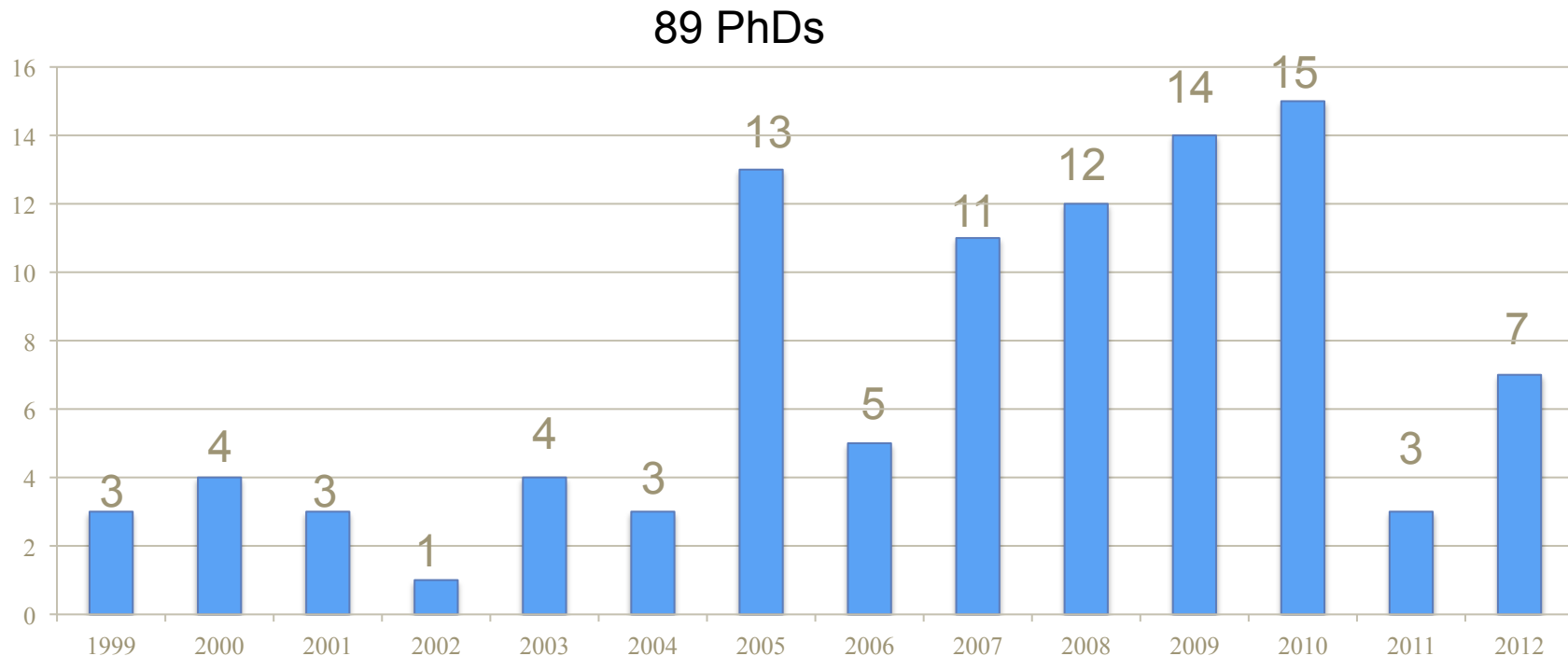


Tapia Center Efforts and Outcomes

PhDs (1999-2012)



Tapia Center Efforts and Outcomes



Tapia Center Recognitions

- CAAM Department recognized by the American Mathematical Society in 2010 as Programs That Make a Difference.
- Rice has 15 minority graduate students who received NSF Graduate Research Fellowships. This award is one of the nation's most prestigious awards for students in STEM. No other university can match that number.
- Rice has received national recognition for its educational outreach programs, and CAAM has become a national leader in producing women and underrepresented minority Ph.D. recipients in the mathematical sciences.

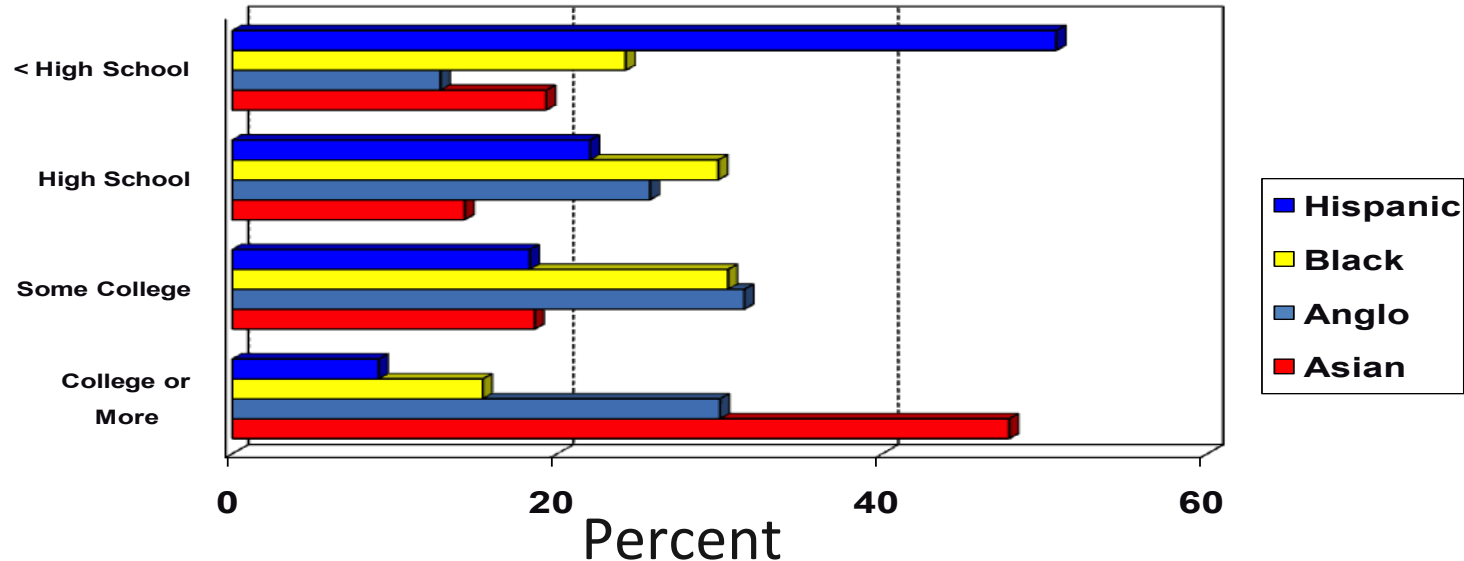
What must we do? Be aware that culture indeed plays a role

The Free Flowing 1960's

- I am ok, you are ok.
- Culture is ok, the system is to blame.
- We were wrong, culture does matter.

A Serious Concern For Our People

Educational Attainment in 2000 in Texas for Persons 25+ Years of Age By Race/Ethnicity



Source: US Census Bureau 2010

A Serious Concern For Our People

Cultural Values

- From New York Times 11/25/2011:

In New York, Mexicans Lag in Education

- In the past two decades, the Mexican population in New York City has grown more than fivefold, with **immigrants** settling across the five boroughs. Many adults have demonstrated remarkable success at finding work, filling restaurant kitchens and construction sites.
- But their children, in one crucial respect, have fared far differently.
- About 41 percent of all Mexicans between ages 16 and 19 in the city have dropped out of school, according to census data.
- No other major immigrant group has a dropout rate higher than 20 percent, and the overall rate for the city is less than 9 percent, the statistics show.
- The problem is specially unsettling because Mexicans are the fastest-growing major immigrant group in the city.

What Must We Do?

Be aware that culture plays a role and deal creatively in lowering the drop-out rate.

What You Can Do?

- **Secondary School Teachers**
 - Understand the differences between the various paths toward STEM undergraduate education.
 - Motivate, encourage, and direct wisely your minority STEM student.
 - Be aware that there are many paths to the same place.
 - Pay attention to the top, that is where our leaders should be coming from, but they are not!
- **University Professors, Students, and Staff**
 - Do not push for the acceptance of minority students who are underprepared unless you have active and effective support programs.
 - Promote a culture that supports.
 - Promote the understanding that underrepresentation endangers the economic health of the nation, and that all must play a role in improving representation.

What Must We Do?

Begin by combating THE LOSS OF THE PRECIOUS FEW at Tier 1 universities.

Recall:

- They migrate away from STEM majors.
- They choose not to go to graduate school.

A feasibility point: My Rice AGEP and ELA Programs.

What Must We Do?

Implement accountability
for activities counter to the
accepted mission.

Summarizing Points

- Without effective support programs, Rice (Caltech, MIT) may not be the best choice in STEM (math) areas for your minority student?
- My axiom of preparedness in STEM:
 - Rice
 - University of Texas
 - University of Houston
- Would I have a Ph.D. if I had gone to Rice in Mathematics as an undergraduate? (Recall my path.)
- Be aware that Nobel Laureates represent a broad spectrum of undergraduate schools, but a very narrow spectrum of graduate schools.

Summarizing Points

- Yes, K-12 is the critical component in improving representation, but we can't just wait until it is fixed. We in universities must produce the national STEM leadership that will play a lead role in the correction process. Moreover, this leadership can not just come from minority serving institutions.
- Representation at research universities can be improved, but it takes a leader and a supportive environment.
- The underrepresented minority's worst enemy is poorer preparation at all levels. As such we do not perform as we should on standardized tests and in advanced level STEM classes at research universities. Yet for the health of the nation we must be present at these universities.
- Today's mathematicians (and other scientists) are elitists, but they are not racists in the R.L. Moore sense. However, many believe that underrepresented minorities have less innate talent in STEM fields and have lower expectations for their success. They claim that these feelings were gained from experience in teaching underrepresented minority students. However, the inconsistency is that they are equating lack of talent with lack of preparation.

What Must We Do?

Concerning Universities (Tier 1)

Implement accountability
for activities counter to the
accepted mission.

State and National Shame

- UCLA and Berkeley in math have few minority undergraduate majors, essentially no graduate majors, and no minority faculty. Yet California has the largest minority population in the country.
- If a public flagship university is not responsive to the needs of the state, then both state and national funding should be cut.
- How about other public universities?
- How about private universities?

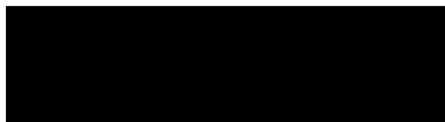
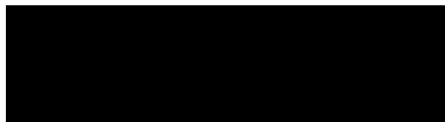
What Can we Do

- All university administrators make the politically correct statements with respect to the university's mission concerning diversity and the promotion of representation. However, what is said is rarely reflected at the level of the STEM departments.
- We must encourage the administration to practice departmental accountability.
- NSF can and should play a strong role here. Departments should be the unit of accountability.

What Can we Do

- Historically mathematics departments, among all academic departments, have been the largest obstacle in the improvement of representation in STEM areas.
- We must educate the faculty concerning the distinctions between poor preparation and poor talent. We must motivate them to accept the goal of improved representation and encourage them to provide programs and opportunities to compensate for poorer preparation.
- The University of Texas Austin has demonstrated that it can be done. You ask how can this be done? Well, I will now tell you how it can be done.

THANK YOU





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