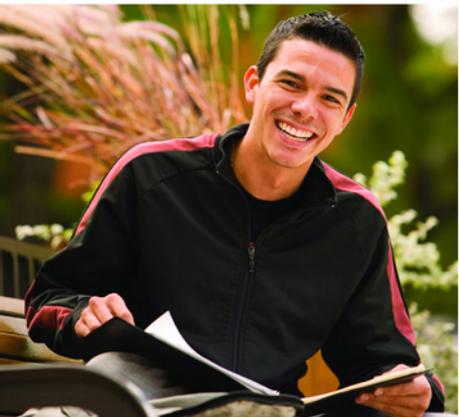




A NOTE ON MEASURING DIVERSITY



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Colleges Contemplate a 'Race Neutral' Future

- Race-conscious admissions policies are here to stay. Race-conscious admissions policies are in peril.
- The justices in Washington have affirmed the status quo. The justices in Washington have undermined it.
- Campus officials can rest easy. Campus officials should keep chewing their fingernails.

The Compelling Interest in a Diverse Learning Environment

The atmosphere of “speculation, experimentation and creation” – is widely believe to be promoted by a diverse student body
...the **“Nation’s future depends on leaders trained through wide exposure”**
to the ideas and mores of students as diverse as this Nation of many people...

.(Justice Powell in Bakke, 1978 in Admission and Diversity, ACT 2006)

The Issue of Critical Mass

The chief difficulty with looking to aggregate minority enrollment is that **it lumps together distinct minority groups** from different backgrounds, who may bring various unique contributions to the University environment.

African–American and Hispanic students, for example, are **not properly interchangeable** for purposes of determining **critical mass**,

(Fisher, *Petitioner*, v. Univ. of Texas-Austin, Sept.15, 2011, Supreme Court of the United States, PETITION FOR A WRIT OF CERTIORARI)

Key: Race-neutral Approaches

School boards may pursue the goal of bringing together students of diverse backgrounds and races through other means...

Race-neutral approaches can be used for decisions about individual students...

What are Race-neutral Criteria?

Examples

- *students' socioeconomic status;*
- *parental education (e.g., highest degree attained or years of education);*
- *students' household status (e.g., dual or single-parent household);*
- *neighborhood socioeconomic status;*
- *geography (e.g., existing neighborhood lines); and*
- *composition of area housing (e.g., subsidized housing, single-family home, high-density public housing, or rental housing).*

Purpose of Presentation

To identify limitations in the current measurement of Diversity

To demonstrate a composite index for study and reporting of HE diversity

To use the composite Diversity index to look at higher education in Illinois

Limitations of the Current Measurement of Diversity

PART 1

CAN'T DEAL WITH
Multiple categories
Multiple measures

Problems with Current Metrics

Current Limitations

Commonly Used Metrics

Counts

The numbers of individuals in various categories (e.g., “race” or ‘ethnicity’)

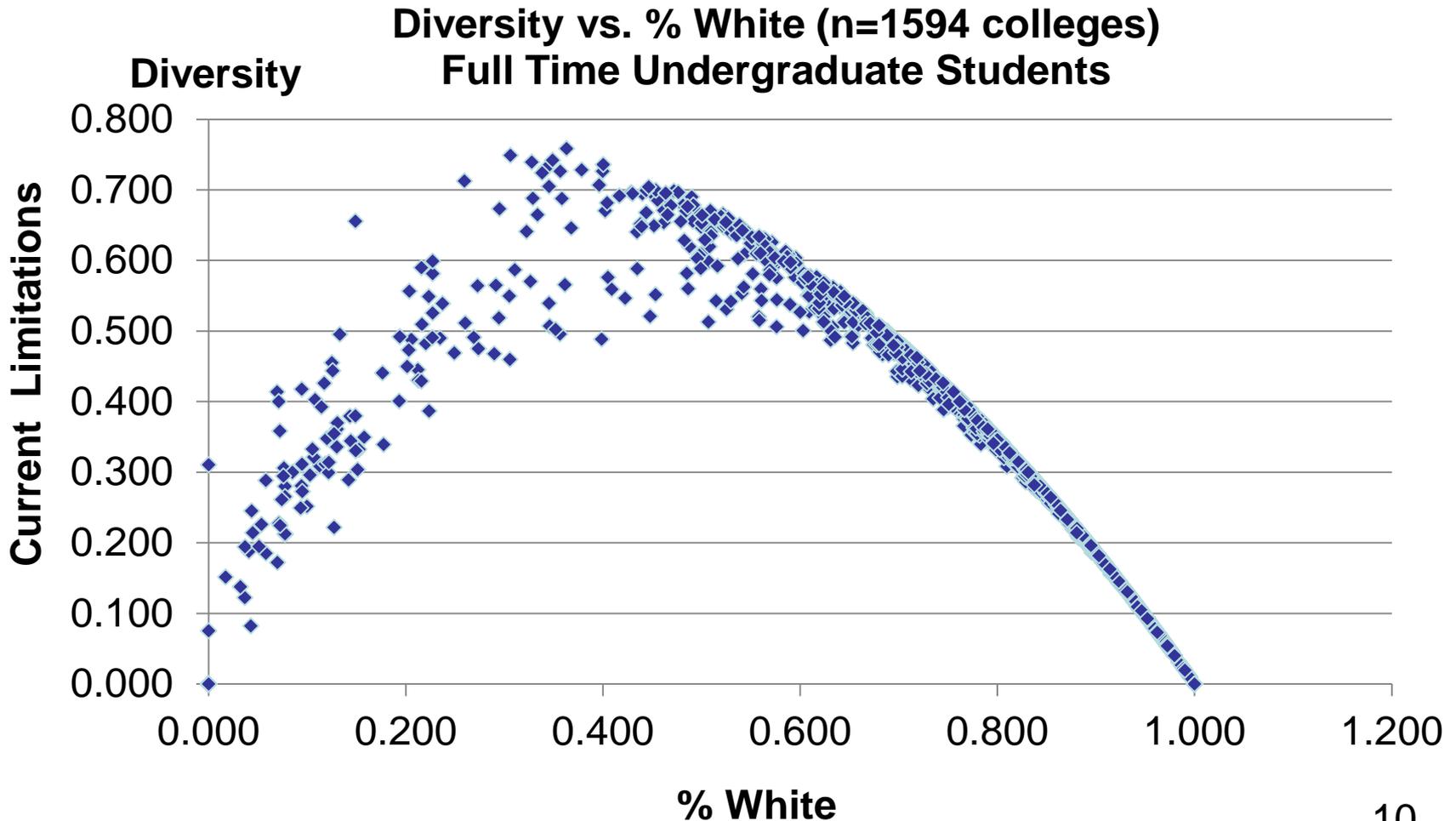
Magnitude

Calculate percentages in different categories

Three Problems

- 1) When use **1 category**, diversity decreases if greater than 50%
- 2) With **> 2 categories**, diversity is undefined
- 3) With **> 1 measure**, diversity is not an attribute

Problem 1: Using Proportions



Problem 2: Multiple Categories

Current Limitations

There is **no unique way to describe** the institution's diversity when it has more than two categories describing a single characteristic .

The category with **the largest proportion** may not represent a majority.

Trying to describe diversity by using the percent in the majority category **fails to describe** the proportion in multiple minority categories.

Examples: Multiple Categories

Current Limitations

Institution	Asian	Black	Hispanic	White
A	10%	30%	15%	45%
B	5%	60%	5%	30%

Which institution is more diverse?

Problem 3: Multiple Measures

Mission/Vision [UNC Charlotte]

Current Limitations

- *In the 21st century, an **increasingly diverse society** and a **global economy** are drivers for diversity in higher education.*
- *As North Carolina and the Charlotte region undergo rapid population growth and **demographic change**, UNC Charlotte must respond to the needs of a more diverse student population.*

Consistency with Mission/Vision (cont.)

Current Limitations

- *It is imperative that the University prepare its students to become leaders and thriving citizens in a **pluralistic and multicultural** society.*
- *At its fullest potential, higher education allows students to interact with **people from different backgrounds** and to intellectually engage a **range of ideas and perspectives**.*
- *This educational experience cultivates the skills that graduates will need to **function adeptly in a global society**.*

Multiple Measures

Current Limitations

How does UNC Charlotte describe its diversity?

- Pluralistic and multicultural
- People from different backgrounds
- Range of ideas and perspectives

Participant Question?

- How would you define diversity as an attribute?

Developing a Composite Index

PART 2

Deal with categories

Deal with multiple measures

Have a sustentative interpretation

Demonstrating an Alternative Metric Using Probability

Simpson's Diversity Index

- A measure of diversity which takes into account both richness and evenness.
- As species richness and evenness increase, so diversity increases.
- Introduced in linguistics (Greenberg) as the "monolingual nonweighted method".
- **Scores** countries **on the probability** that two citizens will share a mother tongue.

Simpson's Calculation (ecsi)

- If two students are selected at random, what is the probability they are in different categories on a characteristic?
- The probability of the difference is the **diversity**.
- Let p_i be the proportion of observations in category i . Then

$$\text{Diversity} = 1 - \sum (p_i)^2 \text{ for categories } i = 1 \text{ to } k$$

- Diversity ranges from 0 (all in one category) to $(1 - 1/k)$ where there is uniform distribution in k categories.

Methodology Statement: 2013/2018 Esri US Diversity Index

- “The Diversity Index from Esri represents the likelihood that two persons, chosen at random from the same area, belong to different race or ethnic groups.”
- “If an area's entire population belongs to one race group *and* one ethnic group, then an area has zero diversity. An area's diversity index increases to 100 when the population is evenly divided into two or more race/ethnic groups.”

Example: Diversity as a Probability

If there are two institutions that have the following multiple categories for race/ ethnicity:

Institution	Asian	Black	Hispanic	White
A	10%	<u>30%</u>	15%	45%
B	5%	<u>60%</u>	5%	30%

$$\text{Diversity for A} = 1 - (.10^2 + .30^2 + .15^2 + .45^2) = 1 - .325 = \mathbf{.675}$$

$$\text{Diversity for B} = 1 - (.05^2 + .60^2 + .05^2 + .30^2) = 1 - .455 = \mathbf{.545}$$

Institution A is more diverse.

Sullivan and Multiple Measures

Other Applications

- **Political Science.** Extended the measure of diversity to situations with multiple measures.
- **Approach.** Sum the squares over the multiple proportions and divide by the number of variables.
- **Interpretation.** “The proportion of characteristics upon which a randomly-selected pair of individuals will differ, assuming sampling with replacement.”

Sullivan, J.L. (1973), Political correlates of Social, economic, and religious diversity in the American states. *The Journal of Politics*, V. 35, No. 1, 70-84.

Sullivan's Measures

For describing political activity for various regions

- Sullivan's research used **six measures** of socio-economic status:

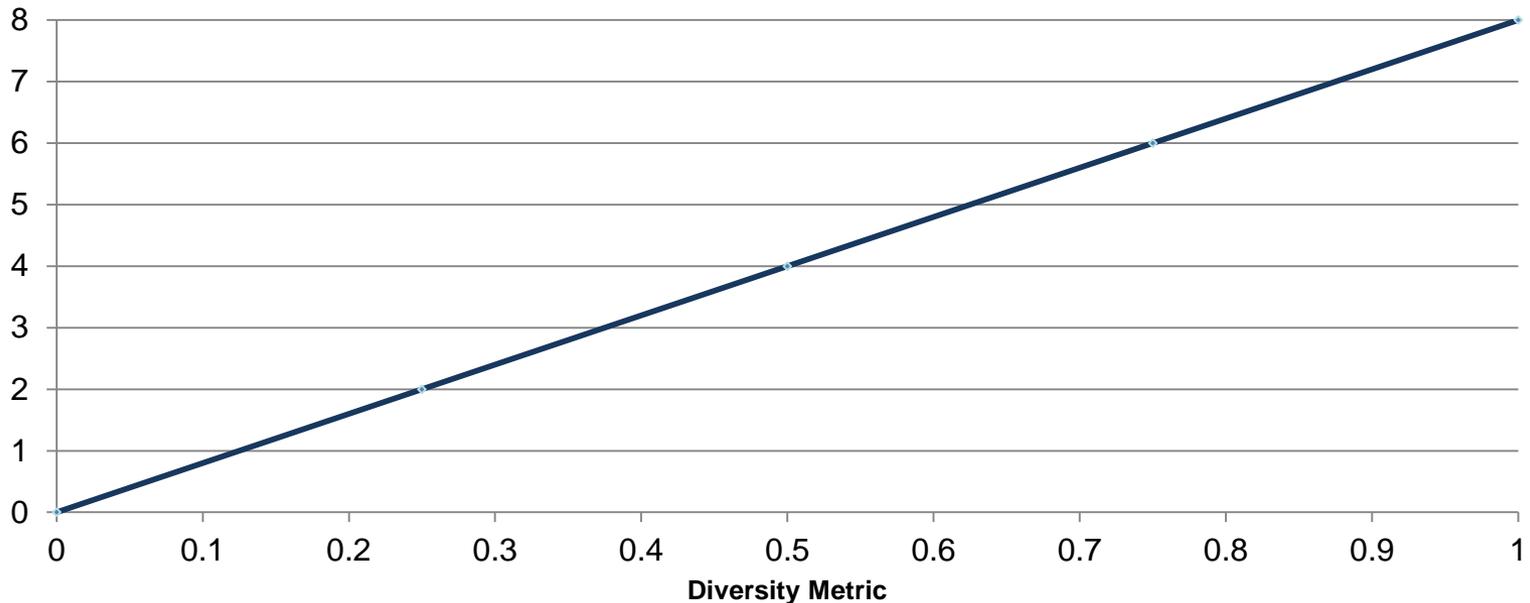
education	housing
income	ethnicity
occupation	religion
- The overall diversity metric was an **average** of the diversity indices for the included characteristics.

Interpreting the Composite Diversity Metric

Differences on Eight Characteristics Based on a Diversity Metric

Developing a Composite Index

Different Characteristics



As the Diversity Metric goes from 0 to 1, a random pair of students would be expected to differ on none of their characteristics to differ on all characteristics.

Demonstrate the use of a Composite Index PART 3

Compute the index
Look at basic properties
Compare institutions in Illinois
to see if can find interesting
facts

Analysis: An Example

- IPEDS Data Center
- Public and Private - Illinois
- Granted > 25 UG awards in 2010 -11
- Only Title IV institutions
- 2001, 2006 (2007), 2011 (2010)

- 137 with Metric
- 125 with Institutional Characteristics

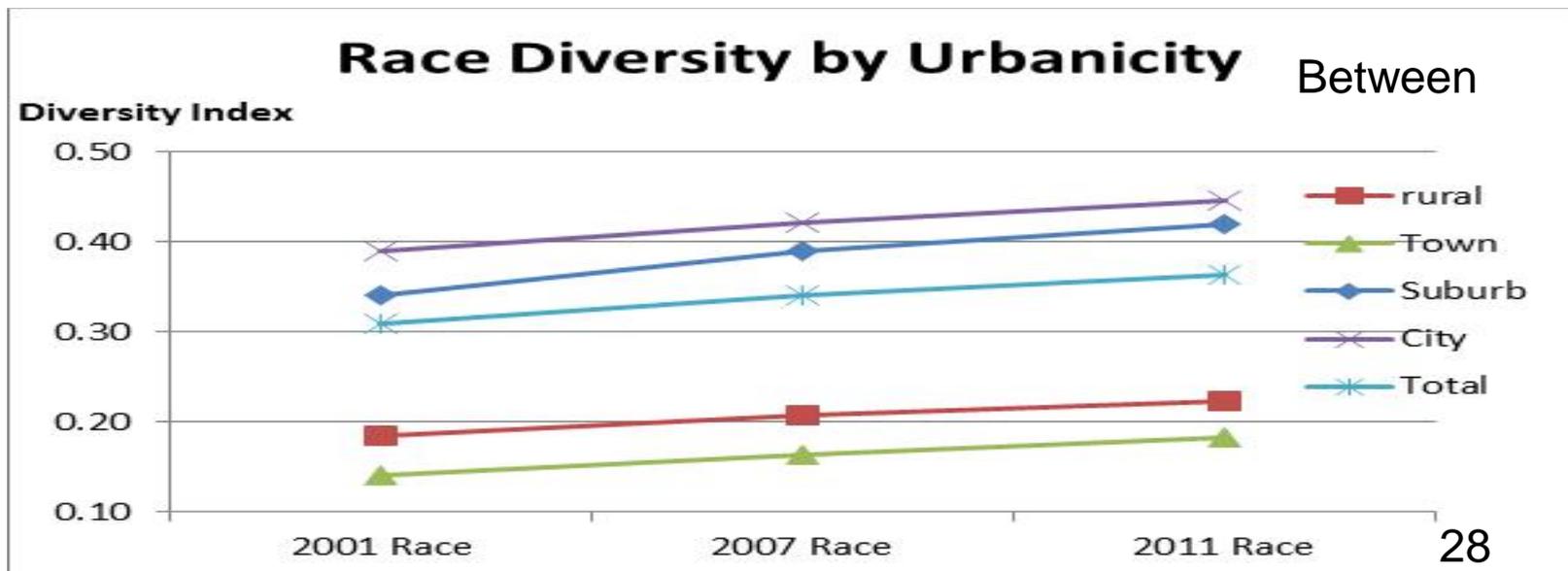
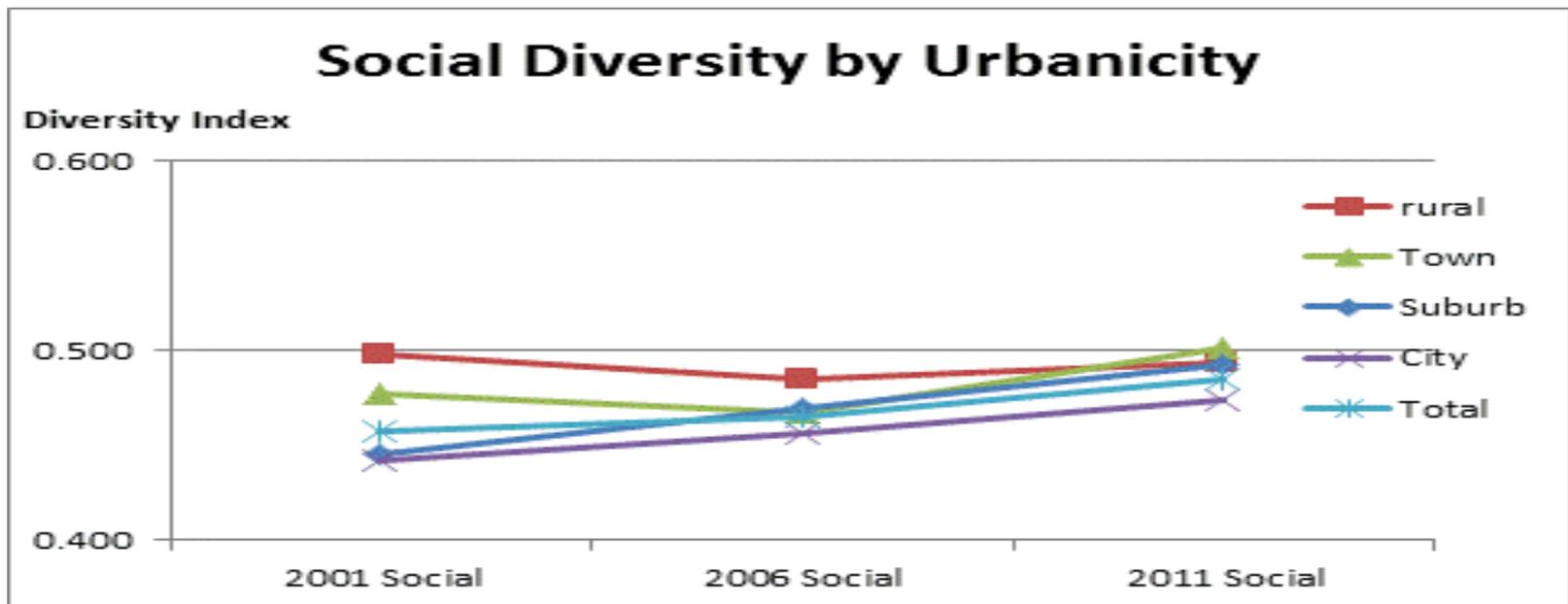
Means of Diversity Indices

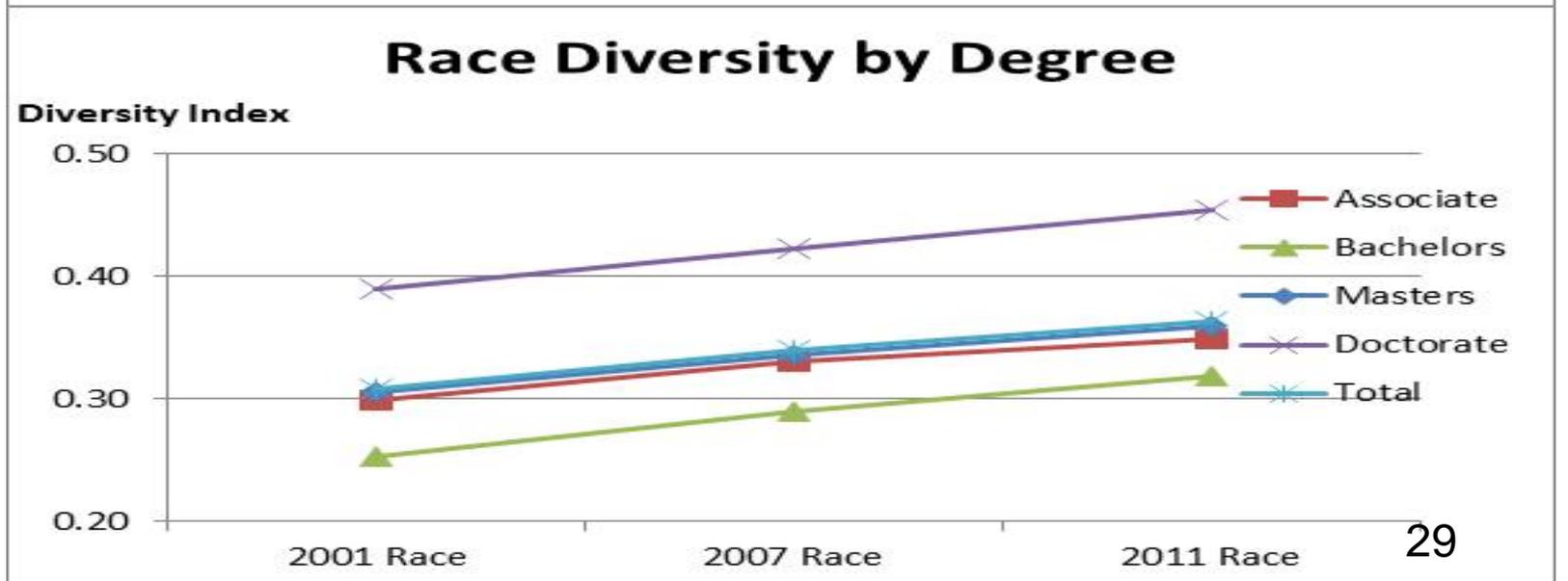
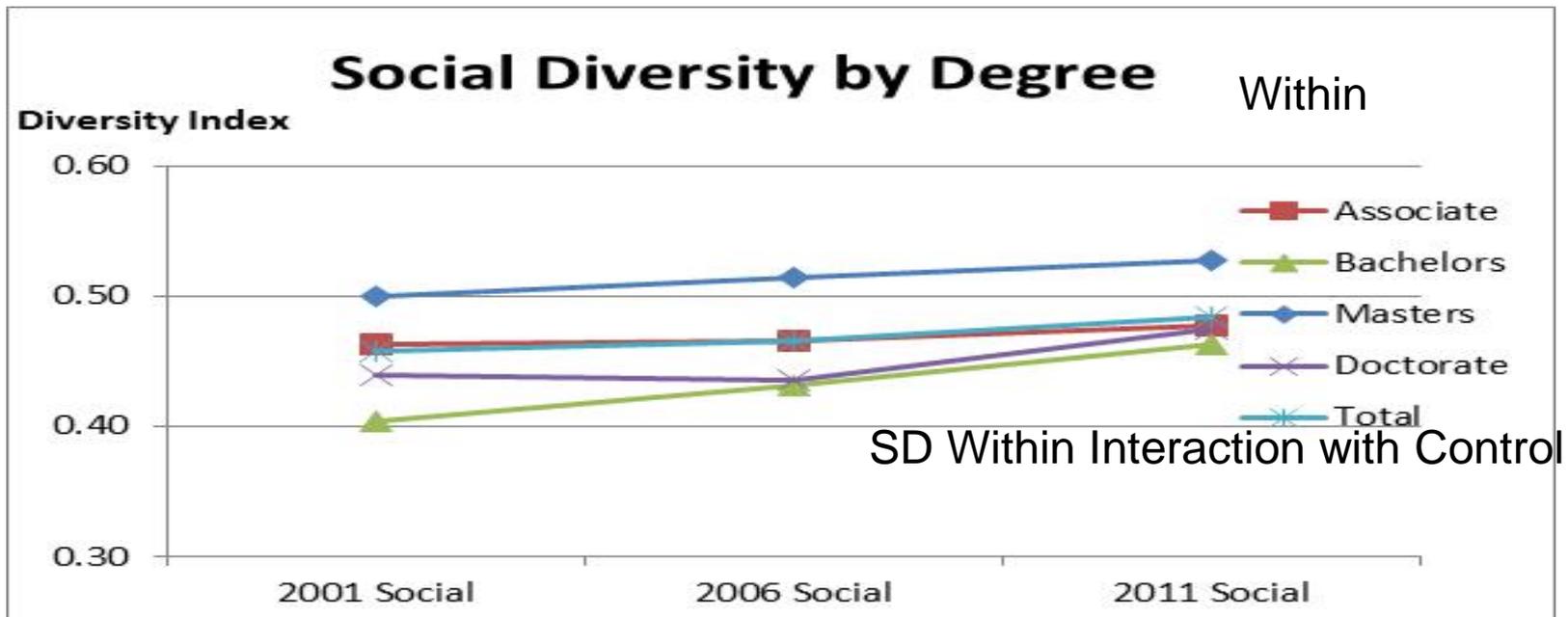
		Categories	2001	2006(7)	2011
Results	Staff Diversity	6	0.30	0.32	0.33
	Faculty Diversity	6	0.22	0.27	0.28
	FT UG Diversity	6	0.36	0.39	0.43
	PT UG Diversity	6	0.36	0.40	0.43
		Racial	0.31	0.34	0.37
	Federal Grant	2	0.37	0.38	0.42
	State Grant	2	0.33	0.34	0.34
	Cohort	2	0.32	0.34	0.38
	<u>Age</u>	<u>7</u>	<u>0.77</u>	<u>0.77</u>	<u>0.76</u>
		Social	0.45	0.46	0.48
	Institutional (Social+Racial)/2		0.38	0.40	0.42

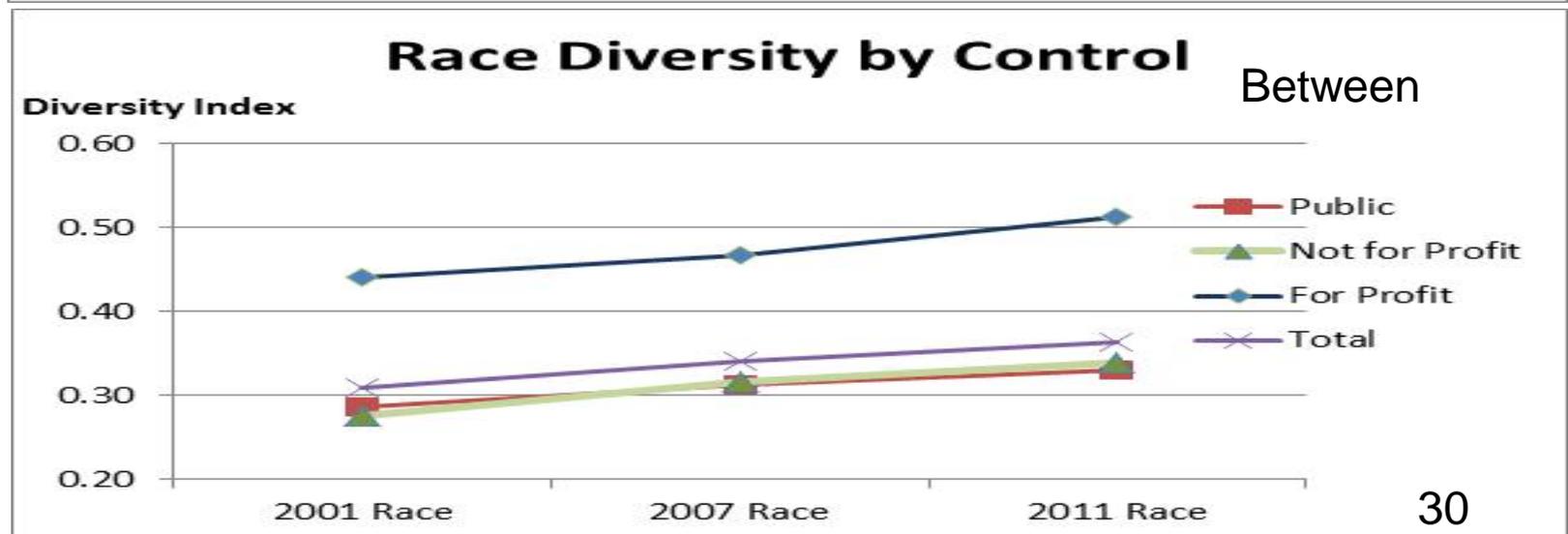
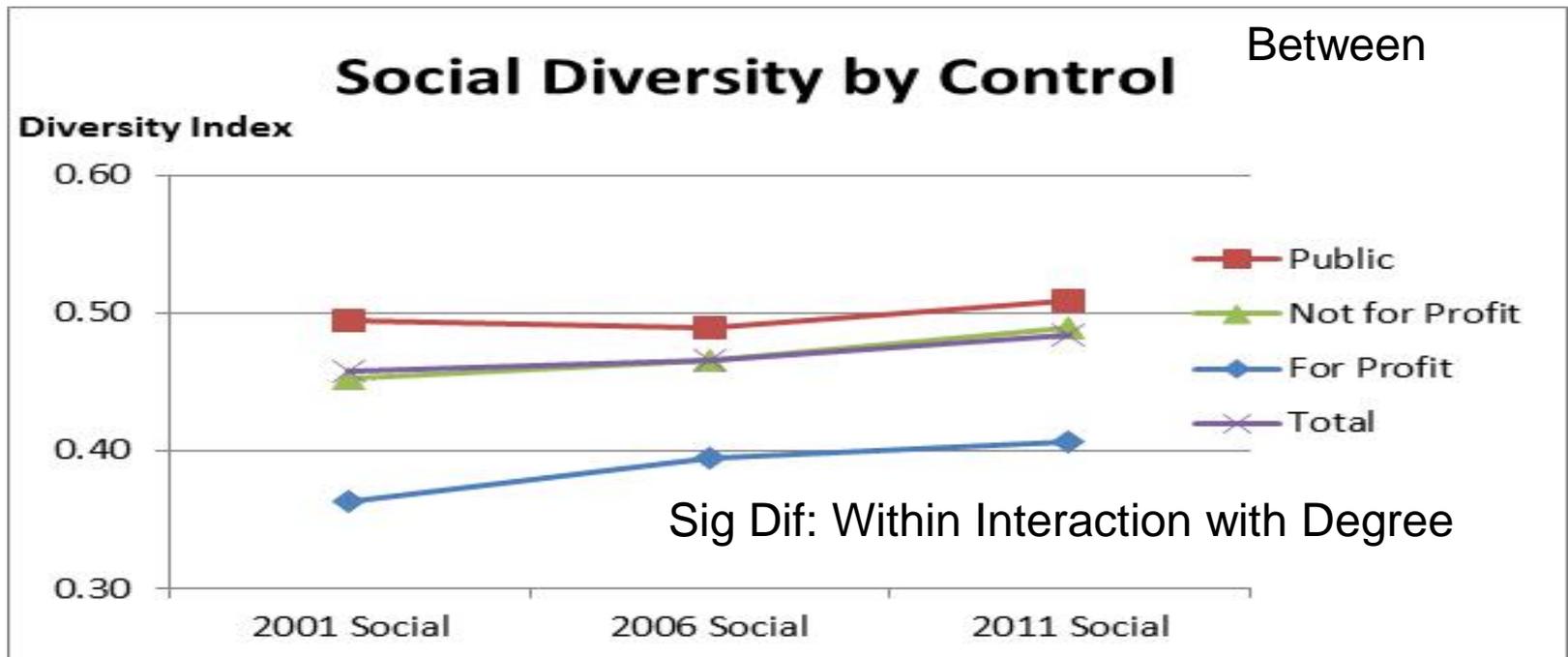
Correlations for 6 Measures Of Diversity

	2001 Race	2007 Race	2011 Race	2001 Social	2006 Social	2011 Social
2001 Race	<u>0.89</u>	0.95	0.93	-0.14	-0.12	-0.08
2007 Race	0.95	<u>0.92</u>	0.97	-0.20	-0.10	-0.05
2011 Race	0.93	0.97	<u>0.91</u>	-0.23	-0.13	-0.06
2001 Social	-0.14	-0.20	-0.23	<u>0.58</u>	0.74	0.61
2006 Social	-0.12	-0.10	-0.13	0.74	<u>0.59</u>	0.76
2011 Social	-0.08	-0.05	-0.06	0.61	0.76	<u>0.55</u>

Results







Principal Components - Varimax Rotation

Results

Diversity Indices	Ethnic Diversity	Social Diversity
2011 Staff Diversity	.864	-.221
2011 Faculty Diversity	.804	-.220
2011 Full-time student Diversity	.890	-.010
2011 Part-time student Diversity	.897	-.024
2010-11 Federal Grant Diversity	-.173	.723
2010-11 State Grant Diversity	-.160	.738
2011 Cohort Diversity	.219	.777
2011 Age Diversity	.487	.249

	Undergraduate	Ethnic Diversity	Social Diversity	Institutional Diversity
Size (FTE)		<u>.302</u>	.024	<u>.300</u>
Graduation Rate		-.078	<u>-.261</u>	-.193
Enrollment Growth 2005-10		.198	<u>-.212</u>	.093
ACT		.148	<u>-.350</u>	-.018
Faculty Sal		<u>.225</u>	.027	<u>.228</u>
\$ Research & Svc/TT Faculty		<u>.226</u>	-.132	.156
\$ Instruct/Acad Spt /FTE Stu		<u>.278</u>	<u>-.290</u>	.134
% FT Faculty Ranked		<u>-.367</u>	<u>.384</u>	-.177
% Faculty as FT		<u>-.226</u>	.116	-.164
Faculty as % Staff		-.154	<u>.250</u>	-.034
Net Income Ratio		-.196	-.028	<u>-.201</u>
Tuition/state Dependency		<u>.230</u>	-.163	.146
Endowment/ FTE Student		.066	<u>-.388</u>	-.113
\$ Instit/Stu Svcs/FTE Student		.148	<u>-.244</u>	32 .031

Comments and Conclusions

Comments

Comments and Conclusions

Conversations about diversity permeate discussions and influence policies about student access and achievement

Institutional policy on diversity has lead to mandatory and voluntary reporting to show accountability to the public

An institutions should use diversity indices that incorporate “race neutral” along with more traditional race and age-based measures

Conclusions

Diversity has multiple dimensions – and will differ for individuals institutions -
Mission

The two primary dimensions found here are **Ethnic Diversity** and **Social Diversity**

Diversity has been increasing in Illinois

Types of Diversity vary by institutional characteristics and urbanicity.

Questions?

Comments and Conclusions

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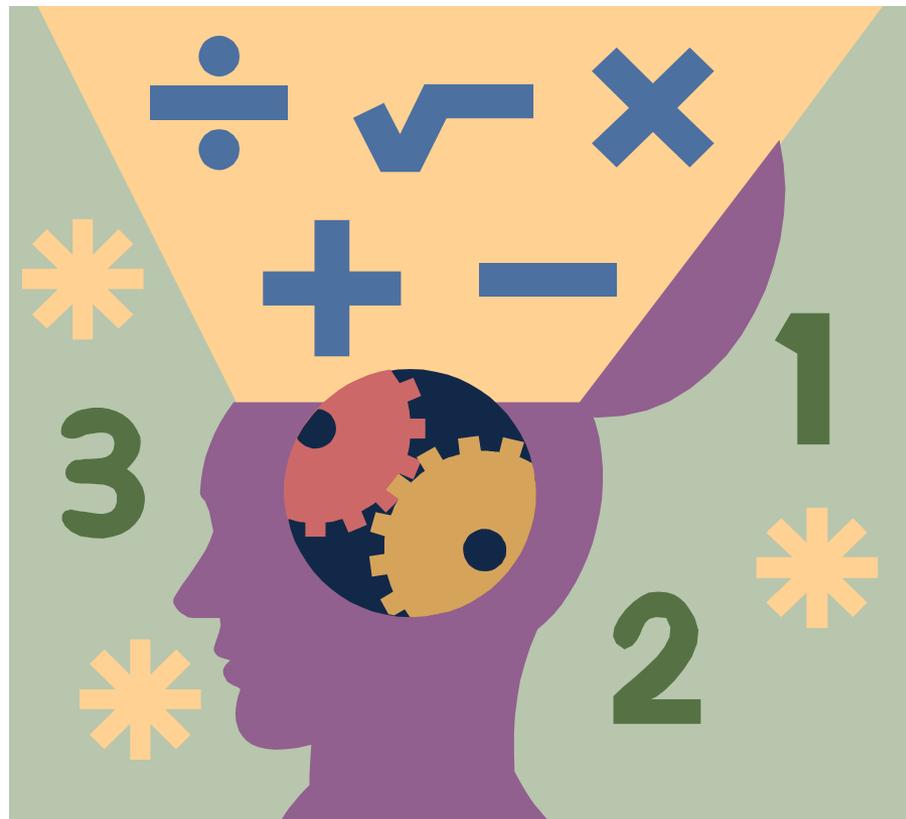
We have only started the journey to demonstrate our responsibility to validate Judge Powell's conclusion that the 'Nation's future depends on leaders trained through wide exposure.'

Thank You

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Appendix

- More results



Results - Correlations

	Undergraduate	Race Diversity	Social Diversity	Institutional Diversity
Size (FTE)		<u>0.302</u>	0.024	<u>0.300</u>
Graduation Rate		-0.078	<u>-0.261</u>	-0.193
Residential Capacity/FT UG		-0.166	0.015	-0.152
Acceptance Rate		-0.172	0.067	-0.135
Retention		-0.087	-0.068	-0.114
Enrollment Growth(2005-10)		0.198	<u>-0.212</u>	0.093
Tuition		0.141	-0.189	0.049
Apps/UG		0.039	-0.173	-0.041
ACT		0.148	<u>-0.350</u>	-0.018
%UG Part-time		-0.093	0.179	³⁹ -0.008

	Academic	Race Diversity	Social Diversity	Institutional Diversity
Faculty Sal		<u>.225</u>	.027	<u>.228</u>
\$ Research & Svc /TT Faculty		<u>.226</u>	-.132	.156
\$ Instruct Acad Spt /FTE Student		<u>.278</u>	<u>-.290</u>	.134
% FT Faculty Ranked		<u>-.367</u>	<u>.384</u>	-.177
% Faculty as FT		<u>-.226</u>	.116	-.164
Faculty as % Staff		-.154	<u>.250</u>	-.034
Student/Faculty Ratio		.067	-.146	-.002

Results - Correlations

	Financial	Race Diversity	Social Diversity	Institutional Diversity
Net Income		-.196	-.028	<u>-.201</u>
Tuition/state Dependency		<u>.230</u>	-.163	.146
Endowment/ FTE Student		.066	<u>-.388</u>	-.113
Financial Viability		-.016	-.162	-.089
\$ Inst / Stu Svcs /FTE Student		.148	<u>-.244</u>	.031
Administrator/ FTE Student		.086	-.188	-.003