

Measuring Racial Inequality: Indexes to calculate disparities and segregation

AFR 350(# 31275) / LAS 322 (# 39749)

Quantitative Reasoning
Math Core Curriculum

Provost Teaching Fellowship (PTF)

Spring 2025



Palmer Hayden (American, 1890 - 1973) – Midsummer in Harlem, 1938. Oil on Canvas. UT Art & Collection History Visual Resources Collection.

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Measuring Racial Inequality: indexes to calculate social disparities and segregation (Fall 2024)

A. Course Instructor and TA:

- ✓ Instructor: **Dr. Marcelo Paixão**

B. Objectives of the course

“Measuring Racial Inequality” is an undergraduate course introducing students to the main calculation methods and theoretical interpretation of indexes for studying socioracial inequality and segregation. It comprehends the statistical development of these indexes, their theoretical properties, and their practical application to social theory.

We understand an index as a synthetic number designed to capture some aspect of the social reality (for instance, income distribution, segregation, diversity, etc.) on a specific scale, usually ranging from zero to one (sometimes, for practical reasons, from zero to one hundred). These scales mirror levels of intensity of some social phenomena: from lesser (closer to zero) to higher (closer to one). Indexes are generated from one or more demographic indicators (prices, incomes, schooling, etc.) but express this dimension through easier visualization and interpretation.

Attending the course expect the students will develop the following skills:

- i) Understand the meaning of indexes to measure social/racial inequality, social distance, and attitudinal or behavioral patterns, including by the calculation and theoretical interpretation of those indicators;
- ii) Forms of application of Indexes of social inequality to understand and solve the current society's issues and deadlocks;
- iii) Employ the Index and scale of social inequality, distance, and patterns of ethnic-racial interactions to communicate aspects of social reality, normative judgments, and alternative proposals to improve the social fabric in oral and written forms.

“Measuring Racial Inequality...” enhances undergraduate students' skills in applying social statistics to problems in current societies worldwide, potentially increasing their competitiveness in upcoming Graduate school applications and in the job market as policymakers, private Foundations, Non-Governmental Organizations (NGOs), community organizations, journalists, social service professionals, and similar fields.

On January 9, 2020, The non-partisan Think Tank Pew Research Center launched a report in which 61% of adult Americans agreed that “there was too much economic inequality in the US,” and 42% understood that reducing

social disparities should be a top policy priority." <https://www.pewresearch.org/social-trends/2020/01/09/trends-in-income-and-wealth-inequality/>

Therefore, even if intuitively, most people know the meaning of social inequality. Indexes such as Gini, Theil, Atkinson, and Dissimilarity Indexes, among others, are often employed to measure this social phenomenon. Newspapers, websites, and official reports usually employ these Indexes in their analyses of social inequality, including its multidimensional aspect of race, ethnicity, and gender, among other categories. These Indexes are also tools for policy-makers and the empowerment of communities and social activists.

Do you know what these concepts mean? How are they calculated? Do you know their limits and potentiality to debate problems of social and racial disparities and injustices? We hope to be able to give you the essential tools to answer these questions during our course.

C. What are the classroom and university rules?

Classroom conduct. The Instructor is committed to creating a class environment framed on student participation, creativity, critical thinking, respect, and mutual understanding. As such, the students and the Instructor are expected to attend the classes with a high spirit of tolerance, knowledge, and openness to hear divergent opinions in the debate. Based on these principles, the Instructor encourages all students to participate in the classroom, honestly exposing their ideas and doubts, asking questions, and expressing their opinions regarding each subject under discussion. Participation and questioning will be very positively evaluated.

The Instructor will not tolerate any derogatory or inappropriate behavior toward classmates. Moreover, all forms of discrimination based on gender, sexual orientation, ethnicity, color, race, or nationality, as well as any other kind of intolerance and mistreatment, are strictly forbidden. The Instructor also asks the students to avoid napping or dozing off during class.

Use of computer devices. We recommend that the students bring their laptops, tablets, or scientific calculators to take notes in classes, make calculations, or access the Internet to visit some webpages related to the course content. By default, all devices must be placed offline unless we need to access some online resources. Using electronic devices to surf the web or other purposes unrelated to class learning and assignments is prohibited. It is strictly forbidden to use cell phones, apps, or electronic devices in the classroom that can produce noises, divert attention, or disturb the lecture in any way. In the case of unauthorized use of any device, the student will be invited to leave the classroom, and their attendance will be considered an unexcused absence.

Policy on scholastic dishonesty. Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such fraud harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Office of Student Conduct and Academic Integrity website at <http://deanofstudents.utexas.edu/conduct/>.

Artificial Intelligence (AI). The quizzes scheduled for this semester are customized, and the likelihood of finding the template online is limited. On the other hand, while the UT is still debating the best format for the acceptable use of AI in academic duties, the Instructor expects that the employment of this resource is made with extreme precautions, meaning the necessity of citing the source among quotation marks and posterior explanation of each quotation using your reasoning and words in all assignments. If not, the above rules about the *policy on scholastic dishonesty* will be applied.

Students with disabilities. The University of Texas at Austin provides, upon request, appropriate academic adjustments for qualified students with disabilities. For more information, contact the Services for Students with Disabilities website: <http://diversity.utexas.edu/disability/> and/or <http://diversity.utexas.edu/disability/how-to-register-with-SSD/>

Religious holy days. Students who miss a class or examination can complete the missed Assignment. They must inform the Instructor at least fourteen days before the class when they will be absent to observe their religious duties.

Texas Senate Bill 17. The law that outlaws diversity, equity, and inclusion programs at public colleges and universities in Texas does not affect the content, instruction, or discussion of a course at these institutions. Expectations and academic freedom for teaching and class discussion have not been altered post-SB 17, and students should not feel the need to censor their speech about topics such as race and racism, structural inequality, LGBTQ+ issues, or diversity, equity, and inclusion.

D. Grade Method

D.1. Assignment Weights

- ✓ Individual Exam (34%, average of three exams)
- ✓ In-Class Group Assignment (33% of the total, average of eight submissions)
- ✓ In-Class Group Presentation (33% of the total)

D.2. Numeric and Correspondent Letter Grading:

Approving:

A = 94-100 / A- = 90-93 / B+ = 87-89 / B = 84-86 / B- = 80-83 / C+ = 77-79 / C = 74-76 / C- = 70-73 /

Failing:

D+ = 67-69 / D = 64-66 / D- = 60-63 / F = 00-60

We will also use this numeric grade to score each Assignment and Exam.



Attendance and Assignment Rules



At the beginning of each class, the instructor will open a sign-in sheet for each student to sign. This list will be available for the next 15 minutes. If a student needs to leave class early, the Instructor must be informed at the beginning of class. If not, student attendance will be nullified.

Attendance is mandatory, and the absence must be justified. We consider an excusable absence the impossibility of attending the class for legal or health problems followed by medical or legal documentation signed by a lawyer or a physician within one week of the absence.

The maximum number of unexcused absences is ten (10) classes. After this, the student will have a penalty of one point per absence in the final grade (see the grading method in section D). A student will automatically be failed if he/she has more than eighteen (16) unexcused absences.

The exams and in-class assignments are mandatory. Deadlines and exam dates are non-negotiable. All quizzes and assignments must be turned in using Excel in case of calculations or written in Times New Roman 12, double-spaced with one-inch margins, and, when it is the case, adhere to Chicago or MLA citation format. Late assignments will result in a 5-point deduction per day for delay in the grade.

E. Class Method, Assignments, and Exams

Every class will last 1:15 minutes (4:05 – 5:20 p.m.).

The principal course material of this course is the book package (Measuring Racial Inequality: course packet) written by your instructor. It contains the Indexes' concept and steps for the calculation and interpretation, exercises, and responses. This material will be available for free on Canvas. Other readings or complementary pedagogical materials can be uploaded to Canvas during the semester.

On Mondays, the class will focus on the statistical dimensions of each concept introduced. This includes explaining how the Index is calculated, its general statistical properties, and its application to society's problems. The Instructor will teach in class using Excel, using examples from official statistics, surveys, or classroom situations. We recommend that each student bring a laptop or any other electronic device (but not a smartphone) to follow the explanation.

The class will have two sessions on Wednesdays, each lasting about 35 minutes. The first part will continue from the previous class, and the second will be hands-on. Three students will

work together, answering graded questions presented by the Instructor and submitting their responses to Canvas.

The class will take four in-class exams, each covering one part of the course Units. All the exams will have two to three questions that may be subdivided into others. One question will be based on a statistical calculation of some index, and the other will be based on the interpretation of statistical data on social/race inequality or social distance. The **First Exam** will be held on **February 19**, the **Second on March 12**, and the third on April 16.

The **In-Class Assignment** is a **weekly hands-on class** that happens on Fridays. It will consist of eight sessions, and students will work and learn together in groups of up to three. They will answer quizzes and clarify doubts with the Instructor and TA.

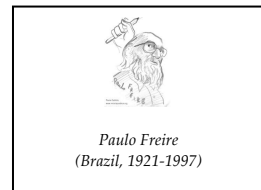
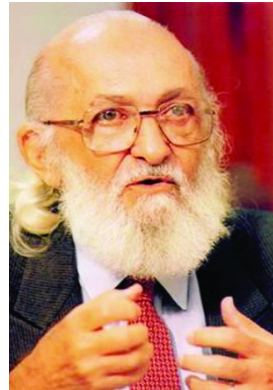
The **In-Class Group Presentation** will occur on the 14th week (April 21 and 23). In 15 minutes, three students will select an issue and research social and racial inequality in any place in the United States or other countries based on one topic discussed during the semester. This work will be presented through a PPW or similar app format obeying **one** of the formats: i) a research project for an Honor Thesis or a graduate program application; ii) a journalist's new story; iii) an NGO's report addressed to social activists; iv) a policy-makers preparing a policy for community development; v) publication on website or social media. Although the presentation is in a group, every member will be assessed individually. So it is highly recommended that the group divide the job evenly. The rubric for the presentation will be sent out timely.

Although the Instructor expects that every student already has some previous basic understanding of elementary knowledge of mathematics and statistics, we also know that "*Measuring Racial Inequality...*" is an introductory course. As such, we also expect that even students at a basic level can attend classes and do assignments and group work.

Students are encouraged) to make direct contact with the Instructor. You can e-mail Intranet on Canvas or e-mail him (marcelopaixao@utexas.edu). Allow 48 hours (business days) to respond to e-mail inquiries. Feel free to keep in touch to solve your questions and doubts, get information, and provide you with academic support during the semester.

Paulo Freire, QR and Social Justice

Paulo Freire is one of the most relevant Latin American educators of the last hundred years and one of the most influential educators worldwide. He achieved popularity following the publication of two of his books, in which he systematized the lessons learned during his work in Brazil and Chile in the 1960s: *Educação como prática da Liberdade* (Education as freedom practice, 1967) and *Pedagogia do oprimido* (Pedagogy of the Oppressed, 1970).



His critical pedagogy focuses on the most significant problems in the students' lives, using their vocabulary and examples elicited from the community to which they belong. This method allows the Instructor to challenge the students to overcome an uncritical vision of the world and inspire reflexive thinking.

We cannot mechanically transpose Freire's proposal into a classroom at UT. However, despite the differences between a poor rural village and an American prestigious university, we can envision a nexus between these distinct universes. The chronic difficulties encountered by students from historically underserved communities with Quantitative Reasoning courses can be interpreted – paraphrasing Freire – as a form of illiteracy or functional illiteracy on numbers. Also, the Brazilian educator stressed that the difficulties of the poor communities' literacy process resulted from the limitations of the traditional teaching methods, and he encouraged alternative and critical pedagogies.

Similarly, scholars have already proved that the causes of the challenges faced by historically underserved communities are not due only to the humble familiar backgrounds but are mainly driven by discriminatory practices and prejudices in the educational system since the first days of school.

F. Course Schedule (all the readings will be on Canvas)

Unit 1. Indexes Applied to Study Social Inequality:

Week 1 – January 13: Professor, course syllabus, and students' introduction

Readings:

- ✓ Syllabus of the course "Measuring Racial Inequality"

Week 1. January 15: Why is social and racial inequality a problem?

Week 2. January 22. Introduction to frequency and population distribution in percentiles

Week 3. January 27 & 29 - Measure of central tendency (the mean and variance, standard deviation) /

Week 4. February 3 & 5 - Palma Ratio (family of indexes). Lorenz Curve - definition and graphic representation; introduction to Gini Index

Week 5. February 10 & 12 - Gini Index - calculation, properties, applications, and limitations.



Week 6 - First Exam Week

Week 6. February 17 – Revision for the First Exam

Week 6. February 19 – First Exam

Week 7. February 24 & 26 - The Entropy Index, Theil T

Week 8. March 3 & 5 - The Social Welfare Index (Atkinson Index)

Week 9 – March 10 & 12 –



Week 9 - Second Exam Week

Week 9. March 10 – Revision for the Second Exam

Week 9. March 12 – Second Exam

Week 10. March 24 & 26 – Dissimilarity or Duncan Index

Week 11. March 31 & April 2 – Gini Index for Segregation

Week 12. April 7 & 9 – The Isolation and Interaction Indexes

Week 13. April 14 - Introduction to Poverty Indexes.



Week 13 - Third Exam Week

Week 13. April 14 – Revision for the Third Exam

Week 13. April 16 – Third Exam

Week 14. April 21 & 23. Group presentations

Week 15. April 28. Final dialogue on inequality and segregation