

Realistic Mathematics Education and Social Awareness: The Privilege Project

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Abstract

We rarely think about teaching inclusiveness and social consciousness in mathematics or statistics classes. However at the University of South Florida St. Petersburg, challenging and invigorating learning about intersectionality of privilege was incorporated into an general education statistics course in ways that changed students' hearts and minds.

During the summer 2017 semester, an Introductory Statistics class was enhanced with gritty, real, relevant, and important issues with the hope that if students became aware of the privilege they have, they might value their education more, be more motivated to learn and make an impact, and to care more about those with less privilege. This was a risky endeavor for many reasons. Colleagues might object. Some students might complain. Some administrators might hear and question the appropriateness of this choice.

Students learned about privilege through videos, readings, and conversation, used an online survey to generate privilege scores, examined their own pre-existing beliefs and attitudes, and viewed privilege through the eyes of those who have little. They used statistical concepts to examine the data gathered and developed rich, meaningful understandings of the mathematics content and of privilege. Ultimately, they found statistical evidence of real differences in privilege and reflected on the value and impact of this project on their views and values.

Introduction

David Lloyd George said “Don’t be afraid to take a big step when one is indicated. You can’t cross a chasm with two small jumps.” Math is the first discipline normally excused from “active learning” and “social engagement”. However, using everyday life contexts for teaching math can have a profound impact on student motivation and learning.

The Privilege Project spanned one entire semester and was used in teaching an Introductory Statistics course. The project consisted of six sequential tasks designed to introduce students to privilege and integrate the statistics content to analysis of the data generated by the class. Students learned about privilege, used a survey to assess their own privilege, reported scores anonymously and analyzed the data generated using statistics.

The topic of privilege engaged students' hearts and minds, as they constructively developed rich understandings of the math they were learning.

The Project

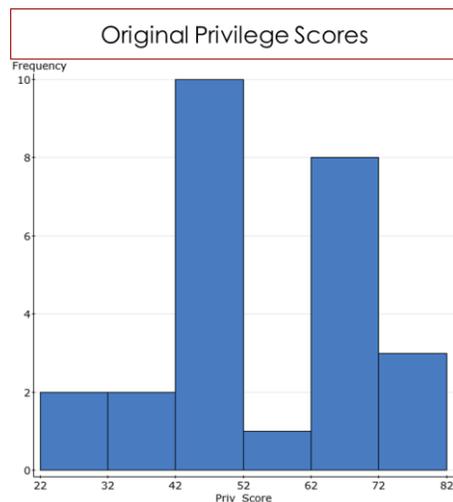
A framework for this learning was created to connect the development of an understanding of privilege with the statistics that students were expecting to learn. Best practices in transparency in teaching and learning were incorporated into each task: providing significant and supportive rationales for the goals of the tasks, detailing what was expected, and sharing detailed rubrics, scaffolding not only learning, but production of the assignments as students were to submit them. The compilation of the six tasks is provided in the Appendix.

For the first task, students needed to gain some understanding of what intersectionality of privilege entailed and write a brief essay explaining their understanding of privilege. This also provided a baseline for comparison at the end of the course. The class viewed and discussed one video about privilege, done by college students who had participated in a privilege walk. Students watched two other short videos on their own and read a few articles about privilege. Rather than grapple with the self-disclosure involved in doing the privilege walk, students completed an online survey and then reported their privilege scores anonymously using survey monkey.

The second task required a brief description of the data set of class privilege scores. Students used statistical tools to summarize these data, including a frequency distributions, histograms, summary statistics, and box plots. Students explained their thinking regarding which of the statistics they computed were meaningful for these data.

Class results for the privilege survey are provided in Table 1. High scores indicate high levels of privilege. At least 4 students had scores reflective of very low levels of privilege based on this informal survey.

Table 1: Privilege Scores for Actual Students

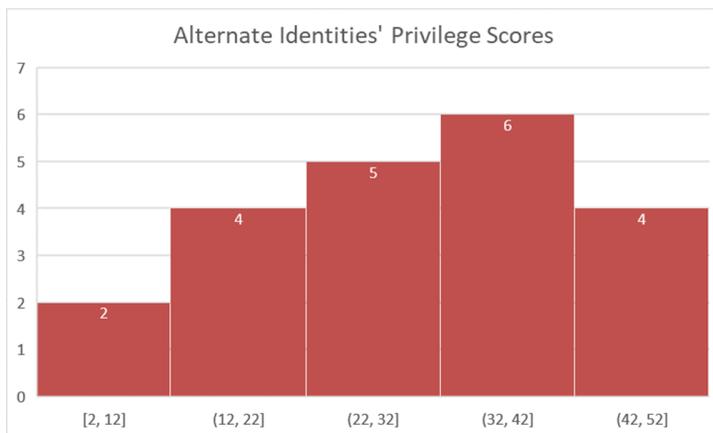


Verbatim students' comments regarding their scores included:

- “Very accurate and descriptive; spot on (score 27)
- “A lot of the questions were very thought provoking, and they are in reality in our today's society” (score 46)
- “I've always known that I've been privileged I guess”(score 79)
- “I feel like this survey was a complete waste of time” (score 60)
- “i thought i would be privileged but i guess im not” (score 49)
- “According to this survey, I'm under-privileged, but I've accomplished everything I've set out to accomplish so far in life. The idea of "privilege" keeping an individual from anything is ludicrous. We are in control of our lives and if we work hard enough for what we want, we get it.” (score 23)

Students were then given the opportunity to imagine life with less privilege, to “walk a mile” in someone else's shoes by being assigned an alternate identity. The instructor created alternate identity dossiers for each student. These dossiers each had a photo of the alternate identity and included sparse information about the alternate identity's gender, gender identity, orientation, socio-economic status, race, health, and/or language. Students could add details to the dossier if they chose to do so. However, they could not change any information already provided in the dossier. All dossiers were provided to the entire class, so that students could see every alternate identity. The alternate identities' stories were compelling and ensured that no one could blame them for their lack of privilege. For 3 or 4 days students were to carry this alternate identity in their hearts and minds. Then they re-took the privilege survey as their alternate identities and generated a new data set for study and comparison. The histogram for the alternate identities' privilege scores is provided in Table 2. The maximum score for the alternate identities was 50.

Table 2: Alternate Identities' Privilege Scores



The fifth task required students to prepare a concise and complete test of hypothesis to determine whether the alternate identity data were taken from a less privileged (hypothetical) population than the population from which the original class data were taken. As a result of their statistical analysis, students found that there was statistical evidence that the data were taken from different populations, indicating that there was evidence of privilege as a real social construct. In class, students discussed the implications of using made-up data and recognized that some class members had less privilege than did some of the alternate identities. They also

discussed the implication of modifying the specific questions in the survey, generating different scores.

Conclusion

The final task in The Privilege Project was for students to write reflections about the course. Some students wrote specifically about how the Project impacted them.

- “It’s an incredible thing when you start understanding something. Those moments really give one a glimpse into the kind of development human beings are capable of.”
- “My beliefs about privilege have changed after taking this class...I took being a white male and high school graduate for granted.”
- “Overall this class has opened my eyes to the amount of privilege I have and has made me want to give back more to those who are not as privileged, because privilege is not something someone can control and everyone deserves a little help.”
- “(I) want to inspire and encourage others...so that we can move toward a world with more love and positivity...eye opening and such a great thing to take part in.”
- “Taking part in this assignment really opened my eyes as to just how lucky I am...we need to change in understanding one another and ...change how the privilege system works in our world.”
- “(This project) taught me to appreciate everything that I have from food, water, clothes, a roof over my head, and my education.”
- “I am grateful that I was able to learn this.”

Engaging students with rich, meaningful, relevant themes creates eager, curious learners who can make meaning for themselves, related to both the content and the theme.

Appendix

Analysis of Intersectionality of Privilege Data Project

STA2023—Introductory Statistics I

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There are six tasks in this assignment, one due each week of the course. By completing all six tasks, you will gain a comprehensive understanding of the statistical methods we are learning in the context of an important social issue, privilege.

Purpose:

There are two main areas of statistics: summaries of data and inferences made about populations using samples of data. In both areas, understanding how this work is done will contribute to your ability to use statistics in your education and life, and will provide you with insights into how statistics are being used to influence your opinions, beliefs, and choices.

We will be using the lens of intersectionality of privilege as a way of connecting the statistics skills you are practicing to a very relevant social issue.

Skills:

The purpose of this assignment is to help you practice some of the statistical skills that are essential to your success in this course and in your adult life, in general.

1. You will understand how to summarize data using graphs, measures of central tendency, measures of variability, and measures of relative standing.
2. You will be able to analyze sample data to make inferences about a population.
3. You will become aware of the privilege as a social issue and be able to reflect in meaningful ways on this issue.

Knowledge:

This assignment will also help you to become familiar with the following important content knowledge in statistics:

1. Measures of central tendency including mean, median, mode, and midrange.
2. Graphical displays of data, including misleading graphs and graphs that are not misleading.
3. Measures of variability including standard deviation, variance, and range.
4. Tests of hypothesis about means and proportions.
5. Confidence intervals about means and proportions.

You will work on this project in phases throughout this course. You will have the opportunity to revise your work and resubmit it if necessary, because this is a learning process.

For each task, you will submit a word or pdf document through Canvas. Please use 12-point Times New Roman font, double spaced, 1 inch margins all around. Proof read carefully to

ensure you are using correct spelling and grammar. Spell check does not identify incorrect word choices (to, too, or two, for example) so please consider visiting the writing tutors in Davis 107 before submitting your work.

Task 1: Gain Understanding of Privilege and Collect Data

We will be using the theme of privilege as a relevant, real life context for applying statistics. Your first task is to develop your own understanding of privilege.

- Complete the survey at
- https://www.buzzfeed.com/regajha/how-privileged-are-you?utm_term=.hk9XRDY8J#.koE4e8Oj0
- Report your privilege score at <https://www.surveymonkey.com/r/9LLQVVS>. Your response is completely anonymous and will only be used for our class purposes.
- Watch the short videos below. You may also want to do your own research at the library or on the internet.
- https://www.youtube.com/watch?time_continue=720&v=N0acvkHliZs
- <https://www.youtube.com/watch?v=hD5f8GuNuGQ>
- <https://www.youtube.com/watch?v=0UmowwMivyU>
- After watching the videos and doing other research you need to do to develop your understanding of privilege, write at least one paragraph explaining privilege in your own words. You must use correct grammar and spelling.
- Submit your essay on CANVAS.

Task 2: Summarize Class Data Visually and with Sample Statistics

In this task you will apply what you have learned about summarizing sample data to our class privilege score data. You may use STATCRUNCH, EXCEL, other computer or statistical software, your calculator, graph paper, or other tools to complete this work. Your summary should be neat, organized, and well written.

Prepare a short, typed document with the following items:

- A one paragraph description of the participants.
- Describe in one paragraph the way the data were collected. (Note: “data” is a plural word, so “data were collected” is correct. “Datum” is the singular form.) Please be sure to refer to the material in chapter 1 as you describe the source of the data and the sampling method (see page 6 in your book).
- Create a frequency distribution of the data using 5 classes.
- Using your frequency distribution, create the histogram of the data. Be sure to include
 - Clear and complete title
 - Vertical axis label
 - Horizontal axis label
 - The bars touch (no gaps).
- Compute and present the summary statistics for the data including the mean, median, mode, midrange, range, and standard deviation.
- Create a box plot for these data.

- State whether these data are nominal, ordinal, interval, or rational and explain your informed decision.
- In a few sentences explain which of the statistics you computed are meaningful for these data? Defend your response with sound reasoning based on what we have learned.
- Submit your document on CANVAS.

Task 3: Create Secondary Data Set and Gain Richer Insight into Privilege

To enhance your understanding of privilege, you have been given an alternate identity. Your dossier may include information about your alternate identity's gender, gender identity, orientation, socio-economic status, race, and language. You may add to the dossier if you wish. However, you cannot change any information already provided in the dossier. Do you have mental health challenges? Have you lived in extreme poverty? Consider making your alternate identity a refugee, immigrant, migrant worker, or someone from another clearly underprivileged group in the United States. Were your parents literate? Is English your first language? Are you a non-Christian? You may want to review the privilege survey (link below) as you consider your alternate identity.

Please be sensitive to those less privileged and “walk a mile” in someone else’s shoes by looking at life in the US from significantly less privileged eyes than your own.

Prepare a brief reflection with the following items:

- Describe your alternate identity in detail (no more than two paragraphs or ½ page).
- Retake the survey at https://www.buzzfeed.com/regajha/how-privileged-are-you?utm_term=.hk9XRDY8J#.koE4e8Oj0 as the alternate identity individual.
- Report your alternate identity's score in your reflection.
- In no more than two paragraphs, describe the thoughts or feelings that arose as you looked at privilege through these different eyes.
- Explain the value of making up these new data as a class.
- Explain the importance of NEVER presenting made-up data as legitimate, real data.
- Submit your reflection on CANVAS.

Task 4: Use Inferential Statistics Methods to Compare the “Populations” from which our samples came

Inferential statistics procedures help us to make predictions about the populations from which samples are drawn.

In this task, you will use inferential methods to compare our original class data to our alternate identity data.

The scores on the privilege quiz range from a possible low of 0 to a high of 100.

Prepare a brief summary with the following items:

- Describe the alternate identity data from our class in one paragraph. Mention the demographics of this underprivileged group.
- Determine what mean of the original class data privilege scores. (You did this in Task 2)

- Create a 95% confidence interval using the mean of the original class privilege score.
- Interpret the confidence interval. What population are you making an inference about?
- Determine what mean of the alternate identity data privilege scores.
- Create a 95% confidence interval using the mean of the alternate identity privilege score.
- Interpret the confidence interval. What population are you making an inference about?
- Determine what proportion of the original class privilege data scores that were 50 or lower.
- Determine what proportion of the alternate identity privilege data scores that were 50 or lower.
- Create a 95% confidence interval for the difference in these proportions using original class privilege scores that were 50 or lower – alternate identity privilege scores that were 50 or lower.
- Interpret the confidence interval. What populations are you making inferences about?
- What assumptions are required for this confidence interval to be meaningful?
- Are these assumptions met?
- Submit your summary on CANVAS.

Task 5: Summarize Statistical Findings

In this task, you will finish your practice of statistical inference methods.

- Prepare a concise and complete test of hypothesis following our seven steps to test the hypothesis that our alternate identity data were taken from a less privileged (hypothetical) population than the population from which our original class data were taken. Assume independent samples and report the p-value for the test statistic. State your conclusion based on the hypothesis test results.
- Submit your report on CANVAS.

Task 6: Personal Reflection & Insights

It is time to reflect on what you have learned about statistics and also about privilege. Please select one of the topics below and respond with a thoughtful, well written, coherent essay of no more than one page. You may select additional topics if you wish, but this is not required.

Topics to choose from:

- The most significant thing you've learned in this course and what you will use this learning for.
- How your awareness and beliefs about privilege have changed and what you will do with this change in your world view.
- What other social or scientific topics or issues would you examine with statistics methods? Describe the method(s) you would use, including the reason for the selection(s).