

# Who Has the Advantages in My Intended Career? Engaging Students in the Identification of Gender and Racial Inequalities

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## Abstract

This article describes and assesses two learning modules designed to make students aware of gender and racial inequalities present in their own intended careers. Students identify their intended occupation in respect to the Standard Occupational Classification system and then use that code to determine the composition and earnings in that occupation with data provided. Analysis of student papers shows that this assignment contributes not only to the awareness of inequalities, but also to the development of quantitative literacy skills. Panel survey methods reveal substantial changes in students' beliefs about the extent of gender and racial inequality. Conclusions consider directions for the development of additional strategies to advance students' understandings of inequalities in adulthood and later life.

## Keywords

inequality, women, minorities, income, employment

A tremendous amount of information exists (e.g., in textbooks and films) that illustrates how women and racial minority groups experience disadvantages inside and outside the workplace. And yet all too often we experience frustration when students consider the information presented as difficult to understand or irrelevant to their own lives. And perhaps even more troubling are encounters that indicate that our lessons on inequality are not integrated in students' perspectives on life chances or social policy. It is clear that simple exposure to materials documenting the presence and scale of opportunity chasms is insufficient to catalyze the types of interest and critical thinking that we hope would occur.

The number of articles on the subject of teaching about gender and race inequalities published in *Teaching Sociology* (and elsewhere) reflects the struggles that instructors experience as they attempt to overcome students' resistance to

understand inequality as key to understanding social life (Davis 1992; Wagennar 2004). And even with the best efforts, studies have documented that students often leave college with many of the same preconceptions that they possessed at entry (Bransford, Brown, and Cocking 1999; Gardner 1991). In the field of sociology, researchers have noted that students enter sociology classes embracing "folk beliefs" that can impede advancing their understandings of both the scale and consequences of inequalities (Kleinmann and Copp 2009). And the lived experiences of students can also present hurdles. For

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example, students from privileged backgrounds, such as those attending selective private institutions like ours, can be especially resistant to learning about inequality (Haddad and Lieberman 2002). And for traditional-aged college students, reliance on lived experiences can prevent them from recognizing how discrimination may occur later in the life course. As a result, students can be dismissive of messages that contradict their beliefs that social equality can be achieved through merit (Harlow 2009) and discount information received as “just the teacher’s opinion” (Moore 1997).

Our impression (supported by data included in this article) is that even at the introductory level, most students enter sociology classes with a general sense that race and gender disadvantages are present in society. However, these pre-existing understandings lack precision and students have very limited capacities to identify the sources of inequalities. In turn, their policy prescriptions tend to center on the impact one can have on children (i.e., “provide the disadvantaged with better schools” or “parents should treat boys and girls equally”), but much less attention focuses on the contexts in which adult lives are lived—especially in respect to opportunity structures and workplace practices. The challenge of moving students’ attention to the complex arrangements that guide careers is compounded by the fact that many traditional-aged college students have not had firsthand experiences in respect to the numerous challenges that confront workers, such as hostile work environments, overt and covert discrimination, the competing demands of work and family, complexities in managing dual careers, and so on (Sweet, Casey, and Lewis 2009; Sweet et al. 2008). In reviewing articles on teaching gender and race inequality (many published in *Teaching Sociology*), we observed some useful pedagogical strategies. However, most of these articles were designed to teach students about inequalities in general, and most focus on only race or only gender but not both. By contrast, our assignment is designed to help students imagine how race and gender inequalities might sway the directions of their own careers *and* accompany that concern with data specific to the career aspirations of individual students.

In our review of articles on teaching gender and race inequalities, we identified three pedagogical strategies. One way of addressing gender and race is to focus attention on the ways these divisions are socially constructed. To illustrate the

construction and impact of gender norms, for example, Kleinmann, Copp, and Sandstrom (2006) use the strategy of “making the familiar strange” (e.g., by asking students to explain to a hypothetical group of Martians why men open doors for women). Other authors have developed exercises to help students see the social construction of gender inequality in how men and women refuse requests (Mallinson 2009); how students interchangeably use the terms of *sex*, *gender*, and *sexuality* (A. Miller and Lucal 2009); and how gender stereotypes are present in children’s literature (Taylor 2003). Similarly, instructors have used exercises to challenge the “naturalness” of dividing the social world into racial categories. For example, Obach (1999) described two activities in which he asked students to sort six different colored circles into patterns using whatever rules they could invent and in which he asked students to speculate about a person’s race based on phenotypic cues. And Townsley (2007) used changes in U.S. census categories of race to help students see how categories that have generally been taken for granted as “scientific” have actually shifted over time for reasons that are moral rather than scientific. Although these exercises vary in their specific strategy, all are designed to help students see race and gender as a set of categories created by society.

In addition, several articles outlined assignments and exercises that have been designed to help students better understand the contours of inequalities with the use of quantitative data. For example Atkinson, Czaja, and Brewster (2006) created a data analysis module using census data that allows students to see disparities in earnings between gender and racial groups. Other quantitative exercises focused on inequalities in more narrow domains of social life. Petrzalka (2005) provided students with data on faculty salaries to demonstrate gender inequalities in pay. Hattery (2003) asked students to count employees on a university campus to show race and gender disparities in employment patterns. Finally, Huhart (2007) asks students to keep track of gender differences in household work to reveal gender disparities within the household. While a strength of these pedagogies is facilitating student engagement in the use of data, it is not altogether clear that these approaches result in an impassioned response, or one that invites indignation or anger that might come from recognizing the extent to

which resources are inequitably distributed or how they might affect one's own life chances.

Finally, simulations have been used to help make students' understandings of inequality more tangible. Simulations can be particularly useful for teaching about inequality because these kinds of exercises help students think reflexively about their own lives, help them to think empathetically about others, and help overcome students' resistance (Touzard 2009). One of the more complex simulations was created by Corrado et al. (2001). In this exercise, students were broken into small groups and randomly assigned to race, class, and gender statuses. Then, in their small groups, they created division of labor and reward structures and completed a series of related activities. This simulation allows students to think about the larger dynamics of inequality within the world of work. This simulation builds on a similar simulation strategy for imagining life chances within the context of inequality as developed by Miller (1992). Alternately, Bordt (2004) developed a more narrow simulation in which students pretend to be members of a death penalty jury to reveal patterns of racial bias in jury decision making. While simulations and exercises help students to imagine what it is like to occupy the shoes of members of more disadvantaged groups, students also may be allowed to maintain their beliefs that inequalities do not affect them personally. When privileged students are asked to imagine how disadvantaged groups experience inequality, students are inclined to reinforce oppressive structures by focusing on gender as equally oppressive for both men and women (Kleinmann et al. 2006) and how race is used only to subordinate minority groups (Lucal 1996). As a result, students learn about oppressed groups without fully acknowledging the privilege of advantaged groups.

The exercise we discuss in this article is closely aligned with other pedagogies aimed at identifying the contours of the inequality by exposing students to empirical data that demonstrate the racial and gender composition of occupations as well as variation in the compensation received. It also shares in common, in a very loose way, some elements of simulation pedagogies, as we ask students to engage with the data in a very personal way by projecting their intended life course forward to identify if race and gender play a role in shaping the life chances of people

entering into and working in their intended career paths. As a result, this exercise invites students to think about and analyze the ways that gender and race might impact their own lives as professionals rather than the work lives of some socially distant group of others. Evidence suggests that this student-centered learning approach can overcome students' resistance to learning about inequality (Goldsmith 2006; Jakubowski 2001). In addition, by looking at commonalities across "the good jobs" that college students aspire to hold within the class, students learn to articulate reasons why some groups are underrepresented in a career path while others are overrepresented and why some groups are paid less and other groups are paid more. The dual focus of the assignment forces students to think about how structural arrangements provide advantages to different social groups.

The modules we describe and assess in this article were designed to demonstrate the magnitude of gender and racial inequalities to students while also connecting these patterns to students' own lives. In so doing, this learning activity is intended to position students to engage in serious inquiry into the causes of inequalities and consider policies and practices that may mitigate their occurrence. The overarching structure of the modules involves directing students to identify their intended careers, analyze data on employment and earnings in those careers, create a report that describes racial and gender differences, and consider why any disparities observed may exist. A Dewey-ian (1916) pedagogical philosophy underpins this approach, as students explore data that are relevant to their lives and discover realities that may not have existed prior to engaging in this work. By sharing observations with their peers, they generate informed and socially relevant knowledge that can be used for critical thinking in respect to policy initiatives and the allocation of resources. In addition, in accordance with the recommendations of the American Sociological Association's Task Force on the Undergraduate Major, these activities were intended to advance students' appreciation for and capacity to engage in empirically based research (McKinney et al. 2004). As discussed in a special issue of *Teaching Sociology* on this subject, it is important that students not only understand how to interpret data, but also to develop a capacity to present analyses of data through a variety of means, such as graphs, tables, and narrative exposition (Sweet and Strand 2006).

These modules are designed to advance the aforementioned skills by requiring students to provide presentations of analyses in the form of simple bar and pie charts with accompanying descriptive analysis.

Materials needed to implement the modules described in the following (including handouts and the associated data sets) are publically available through Social Science Data Analysis Network and the Pedagogic Service Project of the National Science Digital Library (<http://serc.carleton.edu/sp/ssdan/examples/38129.html> and <http://serc.carleton.edu/sp/ssdan/examples/38131.html>). Our interest in this article is to detail an assessment of outcomes fostered in an introductory level course (Introduction to Sociology) at Ithaca College, a medium-sized private undergraduate institution. The modules were introduced in two large lecture classes (98 and 236 students) taught by two different instructors. Most students take this course for one of three reasons: (a) It fulfills a required focused curricular choice in the area of "Self and Society"; (b) it sounds interesting; and/or (c) the course simply fits into their schedules. Few students enter the course expecting to become sociology majors, as only 13 (4 percent) of the 333 students who were eligible to participate in these assignments were sociology majors. One in five students (19 percent) were in the college's exploratory program and had yet to determine their majors. All students were of traditional college age, and the vast majority were in first semester of their freshman year (81 percent). Most of these students had graduated in the top quarter of their high school classes, and women (59 percent) and whites (86 percent) were overrepresented in comparison to the general population.

We note the following differences in the classes. The larger class was taught by a faculty member who had 20 years of experience teaching at the college level, had taught Introduction to Sociology at Ithaca College in numerous prior years, and had also developed and piloted the teaching module for use in other classes prior to its application in these classes. In addition to being evaluated on the basis of quizzes and attendance, students in the large class were expected to write any five of six reflection assignments, each worth 8 percent of the grade. These modules constituted two of the possible reflection assignments to be written. The students in this class were more likely to be beyond the freshman year (22 percent) as compared to the students in the smaller class (6 percent). And,

the students in the larger class met for an additional 1 hour per week in small discussion groups led by undergraduate student leaders.

The smaller class was taught by a newer faculty member who had five of years teaching experience at the college level, had taught Introduction to Sociology for three years at a different university, and had not worked with this teaching module before. In addition to being evaluated on the basis of participation and exams, students were expected to complete five of six assignments, each worth 10 percent of the grade. These modules constituted two of the assignments to be written. The smaller class held small group discussions in class rather than as an additional discussion section outside of class.

Because the classes were not identical in structure, there were some differences in the content examined in the course of the semester. And owing to the fact that the larger class had an additional discussion section while the smaller class did not, a more limited amount of discussion time was available in the smaller class. In the larger class, the assignment was discussed on two separate days (each on the date the assignment was turned in), while in the smaller class the two assignments were discussed together on the same day. While similar positive outcomes were observed in both classes, in the instances where magnitudes of effect varied, positive outcomes were more strongly observed in the large section class.

## MODULES: DESCRIPTION AND IMPLEMENTATION

For the sake of expedience, we describe here the application of the module on racial differences in employment and earnings. The module on gender follows an identical format.

### *Step 1: Orientation*

The first step in this project involved students identifying the career they intended to pursue after they leave college and locating its associated code in the Standard Occupation Classification (SOC) system. An overview of the SOC is available through the Bureau of Labor Statistics (BLS; [http://www.bls.gov/oes/2001/oes\\_stru.htm](http://www.bls.gov/oes/2001/oes_stru.htm)). The SOC organizes jobs into 23 major groups and 475 specific occupations. The links on the BLS make the identification of the specific SOC code

SOC	Employed	Mean	Std. Dev.
11-1011 Chief Executives	972,533	\$120,395	\$103,595
11-1021 General and Operations Managers	755,754	\$70,593	\$62,691
11-1031 Legislators	7,949	\$60,535	\$48,853
11-2011 Advertising and Promotions Managers	57,106	\$61,542	\$61,862
11-2020 Marketing and Sales Managers	835,042	\$74,373	\$65,007
11-2031 Public Relations Managers	54,159	\$59,170	\$44,996
11-3011 Administrative Services Managers	72,058	\$56,199	\$43,820
11-3021 Computer and Information Systems Managers	262,747	\$75,168	\$51,863
11-3031 Financial Managers	730,108	\$70,069	\$68,000
11-3040 Human Resources Managers	313,782	\$56,994	\$48,045
11-3051 Industrial Production Managers	260,722	\$63,511	\$44,692

**Figure 1.** Employment and earnings data made available to students

straightforward, but students need to be coached to first look for their occupation through the major group in advance of looking for the more specific classification. If they experienced difficulties in locating their SOC code, they were instructed to search the Bureau of Labor Statistics for their specific line of work (e.g., “zookeeper”) to see if that could help them locate the appropriate terminology/classification. In a few instances students had difficulties finding their specific occupation (i.e., sports manager) and needed some coaching on what might be the best code match. A substantial proportion of our students (estimated at roughly one in five) did not have solidifying career plans. These students were encouraged to identify a career for the sake of this project, even if it is one that they were only modestly considering pursuing. They were assured (with humor) that they were not being asked to lock themselves into a lifelong commitment, only to use this as an opportunity to begin reflecting on what they might do when they leave college and how gender and race may shape this experience.

### Step 2: Data Analysis

An Excel spreadsheet of employment and earnings was made available to students via Blackboard (see Figure 1). These data represent employment and earnings according to the 2000 census for all SOC groups, reported separately by race (white, black, Asian, Hispanic). A comparable file is also available on the basis of gender. By searching through this spreadsheet, students identified the number of employees present in

**SOC Race Worksheet**

Your SOC 6 Digit Code \_\_\_\_\_

Your SOC Occupation \_\_\_\_\_

- The total number of jobs in that occupation occupied by Whites \_\_\_\_\_
- The total number of jobs in that occ. occupied by African Americans \_\_\_\_\_
- The total number of jobs in that occupation occupied by Asians \_\_\_\_\_
- The total number of jobs in that occupation occupied by Hispanics \_\_\_\_\_
- Calculate the percent of jobs in that occupation occupied by Whites \_\_\_\_\_
- Calculate the percent of jobs occupied by African Americans \_\_\_\_\_
- Calculate the percent of jobs in that occupation occupied by Asians \_\_\_\_\_
- Calculate the percent of jobs in that occupation occupied by Hispanics \_\_\_\_\_
- The average wage in that occupation earned by Whites \_\_\_\_\_
- The average wage in that occupation earned by African Americans \_\_\_\_\_
- The average wage in that occupation earned by Asians \_\_\_\_\_
- The average wage in that occupation earned by Hispanics \_\_\_\_\_
- Calculate the ratio of African American's earnings to that of Whites \_\_\_\_\_
- Calculate the ratio of Asian American's earnings to that of Whites \_\_\_\_\_
- Calculate the ratio of Hispanic American's earnings to that of Whites \_\_\_\_\_

(These ratios should indicate that for every dollar a White person earns, the minority person earns X)

**Figure 2.** Worksheet

their own intended line of work as well as the mean earnings received. A worksheet (Figure 2) was incorporated with their analysis. Note that the completion of the worksheet required that students take the original data and create employment proportions and wage ratios. While these data could easily have been integrated into the spreadsheet in addition to the information already provided, our intent was to undermine any inclination students might have toward passively accepting the information encountered. The expectation of having students perform calculations forced them to understand that raw data can be combined or reworked into alternate structures.

### Step 3: Reporting of Findings

Students were then expected to write a report based on the information they collected on their own intended careers. Descriptions of findings were reported in narrative form and through the creation of pie charts that represented employment proportions and bar charts representing variation in average earnings. The charts were to serve both aesthetic and informative concerns and possess titles, be legible, have a palatable color scheme, and be created with Excel or PowerPoint. While expectations for completed charts were provided in detail, we offered only a cursory demonstration of the mechanics of construction.

Reports were to include detailed analyses, such that magnitudes of differences were considered and summarized, along with comparisons of all relevant groups (i.e., differences between racial minority groups were considered, in addition to their comparisons with whites). Finally, students were expected to explain why racial differences did or did not exist in employment in their intended line of work and to reflect on whether this may have an impact on their own career trajectory. Because this module was initiated in an Introduction to Sociology course, students were not required to integrate outside research beyond the information covered in lectures, class discussions, and readings. However, we would recommend including outside research as a component if this module were to be applied in a more advanced course.

#### *Step 4: Collective Synthesis*

After students submitted their papers, each professor presented an overview of the classes' results and in that same class session students collectively reported observations from their research. At the outset of this discussion we emphasized that the collective analysis was limited to considering the types of jobs college students aspire to hold. We illustrated selected lower tier occupation (e.g., maids and housecleaners) and helped students understand how the findings would vary if the class moved analysis away from "good jobs" and toward "bad jobs." In our large-format classes we structured a collective discussion to synthesize observations that involved having students indicate (by standing or using clickers, depending on the class) who aspired to be in an occupation in which, for example, racial groups were proportionately represented, in which African Americans out-earned whites, and so on. As these groups of students stood, we asked individuals to report on their intended line of work, the magnitude of the differences observed, and their explanations. While our approach was designed for large-format classes, instructors teaching smaller classes may consider having students share their findings sequentially, along with explanations.

Table 1 summarizes the findings generated from the student papers, and these findings were made evident as the class exercise was performed. There are a few things to note here. On the whole, the collective findings of student papers largely reflected the findings one might generate from

the analysis of all occupations, but especially the "good jobs" that might be found in the upper tier. They also make very clear the central observation that we had hoped our students would take away from this assignment—that women and ethnic minorities are underrepresented in most of the lines of work that college students aspire to hold, and that within those lines of work, women, African Americans, and Hispanics tend to earn less than their male and white counterparts. The collective reports also opened opportunities to discuss how and why the employment and earnings of Asians is remarkably different than that of other ethnic minorities.

Students raised complexities in social inequalities that are commonly not discussed at the introductory level. For example, in one in three occupations that our students aspired to enter, women outnumbered men (33.5 percent). As students discussed these occupations, they quickly came to recognize that these jobs tended to conform to traditional female roles (caring, nurturing, etc.) and that these types of jobs were also lower paying. Another interesting observation was that in roughly 1 in 10 occupations, blacks (7.5 percent), Hispanics (14.1 percent), and Asians (15.1 percent) outearned whites. The collective reports helped all students to understand the processes of considering such observations. For example, one student observed that African Americans earned more in his intended profession. In the class discussion he reported wrestling with this fact and concluded that what needed to be taken into account was that his intended career (music performance) had low wages for most workers. As a result, he suggested that even with this "advantage" African Americans were at a disadvantage in that they were clustering in an occupation where most workers earned low wages. This type of analytic sophistication—thinking critically about numbers and their meanings—is one of the things we hoped would happen in the course of the assignment in addition to an increase in knowledge of social inequalities.

Our expectations in respect to the depth and sophistication of analysis were modest, as our primary goal was to have introductory level students identify that gender and race matter as well as identify some of the mechanisms that create the disparities observed. These mechanisms can be the product of agency (variation in individual preferences and initiative), culture (largely reproduced by agents of socialization), and structure

**Table 1.** Comparative Analysis of Cumulative Findings from Student Papers on Intended Careers with All Occupations and Upper Tier Occupations

	Census data		
	Student papers	All occupations	Upper tier occupations
<b>Gender differences in employment</b>			
Genders proportionately employed ( $\pm 4.9$ percent)	10.5	9.9	11.8
Women are majority of workers (55 percent or more)	33.5	25.7	15.5
Men are majority of workers (55 percent or more)	56.0	64.4	72.7
<b>Gender differences in earnings</b>			
Equal earnings men and women (\$.91 to \$1.09:1)	5.5	8.4	7.1
Women outearn men (\$1.10:1 or more)	0.4	0.4	0.4
Women underearn men (\$.90:1 or less)	94.1	91.1	92.4
Women underearn men (\$.80:1 or less)	58.3	61.0	57.0
Women underearn men (\$.70:1 or less)	16.7	22.4	21.1
<b>Race differences in employment</b>			
Whites proportionately employed (65 percent to 74.9 percent)	6.2	20.3	10.2
Whites are overrepresented (75 percent or more)	92.6	56.4	81.4
Whites are underrepresented (<65 percent)	1.2	23.3	8.5
Blacks proportionately employed (7 percent to 14.9 percent)	24.5	45.9	44.1
Blacks are overrepresented (15 percent or more)	3.5	21.6	7.2
Blacks are underrepresented (<7 percent)	79.4	78.4	48.7
Hispanics are proportionately employed (7 percent to 14.9 percent)	19.0	42.2	32.6
Hispanics are overrepresented (15 percent or more)	1.6	17.8	0.8
Hispanics are underrepresented (<7 percent)	79.4	40.0	66.5
Asians proportionately employed (<7 percent)	83.7	78.4	76.7
Asians are overrepresented (7 percent or more)	16.3	21.6	23.3
<b>Race differences in earnings</b>			
Equal earnings blacks and whites (\$.91 to \$1.09:1)	36.5	42.0	32.1
Blacks outearn whites (\$1.10:1 or more)	7.5	8.0	3.8
Whites outearn blacks (\$1.10:1 or more)	56.0	50.0	64.1
Equal earnings Hispanics and whites (\$.91 to \$1.09:1)	22.9	31.2	25.3
Hispanics outearn whites (\$1.10:1 or more)	10.0	3.4	3.0
Whites outearn Hispanics (\$1.10:1 or more)	67.1	65.4	71.7
Equal earnings Asians and whites (\$.91-\$1.09:1)	55.2	40.0	44.9
Asians outearn whites (\$1.10:1 or more)	15.1	25.2	14.4
Whites outearn Asians (\$1.10:1 or more)	40.1	34.7	40.7

Note: Upper tier occupations are operationalized as those that pay greater than the median of the average incomes received by white employees in all occupations (\$34,515) in 2000.

(institutionalized practices that shape the allocation of resources)—all of which were discussed in various ways in course readings, lectures, and class discussions.

## ASSESSMENT

On the basis of observing these collective encounters and reading the submitted papers, our impression was that students took pride in writing about

their intended careers and interest in identifying the barriers (or advantages) that they may encounter. Many reported that they were not surprised at the existence of underrepresentation and pay disparities but they were surprised at the *magnitudes* of the inequalities. It was also evident that students performed considerable head scratching as they tried to come to terms with the disparities evident in their own intended careers. In the following analysis, we consider two general assessment questions. First, did the learning module

have a measureable impact in changing student beliefs on the nature and extent of social inequality? Second, did it have a positive impact on their development of skills necessary for quantitative literacy? Our analysis focuses on two sources of data—the content of student papers (race paper  $N = 268$ , gender paper  $N = 287$ ) and a pretest-posttest assessment of understandings of gender/racial inequalities and perceptions of quantitative skills. Because students had the option of completing alternate assignments, not all students completed both the race and the gender modules. In assessing changes in learning in respect to gender and race, analysis was restricted to students who performed the relevant module.

Papers were coded by a team of 15 upper level sociology majors who also served as our teaching assistants. Because the coding was performed as these assistants evaluated the papers, our coding strategy did not include a means of obtaining intercoder reliability scores. However, we did examine overall distributions between coders in respect to the papers they coded, and these distributions were highly consistent. Students' demonstration of quantitative abilities were coded according to the criteria developed by academic consultants employed in the Course, Curriculum and Laboratory Improvement project at the Social Science Data Analysis Network. Most of these consultants had previously participated in the Integrating Data Analysis program of the American Sociological Association (Howery and Rodriguez 2006). This rubric guides assessment on different dimensions of quantitative literacy—calculation (ability to perform mathematical operations), interpretation (ability to explain information presented in a mathematical form), representation (ability to convert relevant information from one mathematical form to tables, equations, graphs, or diagrams), and analysis (ability to make judgments based on quantitative analysis). Because this was an introductory level course, we did not expect mastery of any of these dimensions. Coders were trained to code these abilities on a 3-point scale of unacceptable, acceptable, or accomplished in respect to the rubric at the level that one might expect of college level freshmen. See the appendix for operationalization of these standards.

The pretest-posttest quasi-experimental design (Campbell and Stanley 1966) involved students completing an identical instrument on the first day of class and in the final week of the semester.

Additionally, because not all students were present on the days when the pretests and posttests were distributed, and owing to inconsistent reporting of student IDs (the means of linking records), it was not always possible to match pretest responses with posttest responses. Cases included in the panel analysis were restricted to those in which both survey waves were available and matched to each other as well as linked to the paper assignments ( $N = 203$  for race module assessment,  $N = 217$  for gender module assessment).

### *Changes in Awareness and Beliefs in Inequality*

On both of the modules, students could earn a maximum of 8 points. In one class students had the option to revise and resubmit their papers, an option that enabled most students to receive full credit on both assignments. Because some instructors will not be inclined to offer this option, the statistics reported are of the initial submissions, not the revised grades. Because most students received strong grades (race paper  $M = 6.76$ ,  $SD = 1.32$ ,  $N = 268$ ; gender paper  $M = 7.06$ ,  $SD = 1.08$ ,  $N = 291$ ), it is reasonable to conclude that they came away from the assignment with a solid understanding of racial and gender disparities in earnings and employment in their intended careers. While these papers showed that students were able to document inequalities in their intended careers, they do not demonstrate that students' understandings had changed.

To assess changing awareness and beliefs about racial and gender inequalities, we analyzed the pretest and posttest responses to the following questions:

- How common is it to find jobs that are strongly “gendered”—meaning that men are very unequally represented or that women are very unequally represented among the workers in that profession (Not common; This is occasionally true, but more often than not women and men are pretty equally represented in specific job categories; Very common—many professions employ very unequal numbers of men and women; I do not know)?



- How common is it to find jobs that are strongly “racialized”—meaning that whites, blacks, Asians, Hispanics, and other ethnic groups are not proportionately represented among the workers in that profession (Not common; This is occasionally true, but more often than not racial groups are proportionately represented in specific job categories; Very common—many professions employ very disproportionate numbers of whites, Hispanics, Asians, and other racial groups; I do not know)?
- On average, when women work in the same full-time job as men, for every dollar men in that job earn, women earn approximately (\$.50; \$.75; \$1.00 [the same as men]; \$1.25; \$1.50; I do not know)?
- It is common knowledge that in the United States women and most racial minorities, on average, earn less than white males. The questions that follow concern the extent to which race and gender hinders or favors the careers of women and minorities when they in are *in the same jobs* as white men.
- Which statement best describes your perspective concerning your intended line of work (what you will be doing after college) (Men and women, more or less, have the same opportunities in my intended line of work; Men have a significant advantage in my intended line of work; Women have a significant advantage in my intended line of work; I do not know if any groups have an advantage or disadvantage; I don’t know what I intend to do after college, so I cannot answer this question)?
- Which statement best describes your perspective concerning your intended line of work (what you will be doing after college) (Different racial groups, more or less, have the same opportunities in my intended line of work; White Americans have a significant advantage in my intended line of work; African Americans and Hispanics have a significant advantage in my intended line of work; I do not know if any groups have an advantage or disadvantage; I don’t know what I intend to do after college, so I cannot answer this question)?

As we expected, a sizable proportion of students entered our course already understanding that gender and race had an influence on opportunity and inequality (see Table 2). Nearly one in two (54.8 percent) students believed that it was “very common” for jobs to be gendered, and two in three (62.2 percent) correctly identified that on average women earn approximately \$.75 for every dollar men earn when performing the same type of job. Conversely, many did not know these facts or held errant understandings. And there was some incoherency in beliefs. For example, even though most students knew of gender inequalities in the general labor force, the modal response was that men and women have the same opportunities in the students’ intended line of work (43.3 percent). Similar patterns are evident for understandings of racial inequalities, with nearly two in three students (59.6 percent) entering the course believing that it was very common for jobs to be racialized, but only one in seven (14.8 percent) believing that whites had an advantage in their own intended line of work. We interpret this observation to indicate that students commonly perceive that their lives are distant from the forces that shape advantage and disadvantage—that these forces affect others (i.e., inner-city African Americans), but they are not especially relevant to their own lives and careers.

Table 2 reveals remarkable changes in understandings of gender and racial inequality. Nearly all students exited the course reporting that it was very common for jobs to be gendered (94.5 percent), and nearly all knew that on average women earn \$.75 for every dollar men earn (92.6 percent) and that it was very common for jobs to be racialized (95.6 percent). While not every student left the course convinced that men and whites had advantages in their intended careers, we observed a remarkable conversion, as nearly half of the class was shifted from a position of unknowing or errant beliefs to a conclusion of male advantage (+41.7 percent) and white advantage (+52.5 percent). The greatest change was among students who reported that they did not know on the pretest. Note also that a sizable movement occurred from many who had previously believed that men, women, whites, and minorities had the same opportunities in their intended lines of work. This level of change suggests that the modules are effective in swaying opinions of students who are most apt to hold

**Table 2.** Changes in Understanding of Gender and Racial Inequalities

	Pretest	Posttest	Change	Significance
Gendering of jobs				**
Not common	0.5	0.5	0.0	
Occasionally true	36.9	5.1	-31.8	
Very common	54.8	94.5	39.7	
I don't know	7.8	0.0	-7.8	
Women to men gender wage ratio				**
\$.50	3.2	6.0	2.8	
\$.75	62.2	92.6	30.4	
\$1.00 (same)	10.6	0.0	-10.6	
\$1.25	0.5	0.5	0.0	
I do not know	23.5	0.9	-22.6	
Gender advantages in intended line of work				**
Genders have same opportunities	43.3	23.1	-20.2	
Men have a significant advantage	17.1	58.8	41.7	
Women have a significant advantage	3.7	10.6	6.9	
I do not know	17.5	0.9	-16.6	
I do not know my future line of work	18.4	6.5	-11.9	
Racializing of jobs				**
Not common	2.5	0.5	-2.0	
Occasionally true	28.6	3.9	-24.7	
Very common	59.6	95.6	36.0	
I don't know	9.4	0.0	-9.4	
Racial advantages in intended line of work				**
Different races have same opportunities	36.5	14.4	-22.1	
Whites have a significant advantage	14.8	67.3	52.5	
Blacks and Hispanics a significant advantage	1.0	7.9	6.9	
I do not know	29.6	4.0	-25.6	
I do not know my future line of work	18.2	6.4	-11.8	

Note: Analysis of perceived racial advantages are restricted to participants in both surveys and studied their own career in respect to race ( $N = 203$ ). Likewise, analysis of perceived gender advantages is restricted to students who studied their own career in respect to gender ( $N = 217$ ).

\*\* $p < .01$  paired sample Wilcoxon signed rank test.

commonly intransigent beliefs. Clearly, most students were leaving the course with more sophisticated perspectives on race and gender than they held on entry. Of course, it is possible that these changes could be attributed to factors beyond the learning modules, such as outcomes of maturation or history (i.e., aging, or exposure to the content of lectures, or by reading other assigned materials).

### Assessment: Advancement of Quantitative Literacy

As part of the assignments, students could earn a maximum of 3 points by submitting a well-constructed pie chart showing the racial/gender

proportions and bar chart showing average earnings by race/gender. In one class students were offered the opportunity to revise and resubmit their work. Most students took advantage of those opportunities and subsequently submitted graphs that could have been assessed as acceptable or accomplished. On the race paper, 66.8 percent of the students earned full credit on their first submission. Points were commonly deducted for simple errors (poorly executed scaling, improper format, etc.). The paper on gender showed some improvement (this was assigned after the race paper in both classes) as 75.4 percent received full credit on the first submission.

Table 3 shows the assessment of the quantitative literacy abilities as evidenced in student

**Table 3.** Assessment of Quantitative Literacy

	Race papers	Gender papers
Calculation		
Unacceptable	3.0	1.4
Acceptable	12.9	7.1
Accomplished	84.1	91.4
Interpretation of information		
Unacceptable	7.5	3.1
Acceptable	35.4	35.5
Accomplished	57.1	61.3
Graphic representation of data		
Unacceptable	7.9	2.8
Acceptable	38.2	32.1
Accomplished	53.9	65.2
Critical analysis of data		
Unacceptable	14.2	4.9
Acceptable	46.4	45.5
Accomplished	39.3	49.7
N	268	287

papers. Not surprisingly, because the expectations for calculations involved elementary skills, the vast majority of students performed that work to an accomplished level. Far lower levels of accomplishment were evident in the interpretation, representation, or analysis assessments. In the interpretation abilities, the most common shortcoming was failing to summarize commonalities or differences between all groups. For example, African Americans might have been recognized as earning less than whites, but Asians were left unmentioned. Another source of error was that magnitudes of differences were not sufficiently captured in the presentation. For example, a gender wage ratio of 80:100 was described as “small.” Limited representation abilities were revealed in construction of graphs that were difficult to read. Some students protested point deductions, arguing that the color graphs visible on their computer screens did not transfer well to their submitted black and white printed copies. Thus, they understood the mechanics of graph construction but did not embrace the imperative of creating reader-friendly presentations. Critical analysis abilities were most commonly considered unacceptable if students ignored their analysis and wrote unsubstantiated opinions about the origin or existence of inequalities or presented conclusions that were contrary to what the data might suggest

(e.g., reports from men entering into lines of work where men are mightily advantaged that “gender won’t really matter to me and my career”).

Finally, we considered changes in perceptions of personal competence in respect to locating and working with data. On the panel surveys, we asked four questions:

- How would you describe your ability to make a pie chart or bar graph using a program such as Excel or PowerPoint (I know I can do this well; I think I can do this; I do not know if I can do this; I do not think I am capable of this right now)?
- How would you describe your ability to take statistical information (e.g., percentages or averages) and write a report that describes what these numbers mean (I know I can do this well; I think I can do this; I do not know if I can do this; I do not think I am capable of this right now)?
- Suppose you are asked to find the number of people employed in some line of work, such as “bartenders” or “zookeepers,” and you are not allowed to simply “Google it.” How confident are you that you know how to find this information (Yes, I am certain that I know where to find this information; I probably could find this information; I am not sure that I would know where to look; I would be totally lost and have no idea where to look)?
- What is the best source of reliable information about the composition of American society concerning issues such as income, racial composition, birth rates, death rates, populations of cities, and so on (Public opinion polls [like the Gallup poll]; The U.S. census; The U.S. census, but this information is not made available to the general public; Mainstream media such as ABC News, Fox News, CNN, ESPN, etc.; There is no reliable information available; I do not know)?

Table 4 shows that only about 1 in 2 students entered our courses believing that they could make graphs using a spreadsheet program like

**Table 4.** Changes in Perceived Abilities to Analyze and Present Quantitative Analyses

	Pretest	Posttest	Change	Significance
Confidence in making graphs				**
I know I can	23.9	84.0	60.1	
I think I can	55.1	15.2	-39.9	
I do not know if I can	17.7	0.4	-17.3	
I do not think I am capable	3.3	0.4	-2.9	
Perceived ability to write a statistical report				**
I know I can	22.6	82.7	60.1	
I think I can	64.2	16.5	-47.7	
I do not know if I can	11.5	0.8	-10.7	
I do not think I am capable	1.6	0.0	-1.6	
Confidence in locating employment data				**
I know where to find this	8.2	66.7	58.5	
I probably could find this	53.1	30.0	-23.1	
I am not sure where to look	35.4	2.9	-32.5	
I would be totally lost	3.3	0.4	-2.9	
Best source of information on composition of American society				**
U.S. census	58.0	92.6	34.6	
U.S. census but not publically available	6.6	1.2	-5.4	
Public opinion polls	0.8	0.8	0.0	
Mainstream media	4.5	1.2	-3.3	
There is no reliable information	6.2	1.7	-4.5	
I do not know	23.9	2.5	-21.4	

Note: Sample restricted to students who participated in both surveys ( $N = 243$ ).

\*\* $p < .01$  paired sample Wilcoxon signed rank test.

Excel (55.1 percent), could write a report based on statistics (64.2 percent), were fairly confident or very confident that they could find employment data (61.3 percent), or knew that the U.S. census was the best source of information on the composition of American society (58.0 percent). On exiting the course, these perceptions of self-competence had improved substantially with 8 in 10 students being confident in their ability to create graphs (84 percent) and write reports (82.7 percent). Most of the class moved to a state of feeling very confident in making graphs, as well as being fully confident that they could write a report based on statistics (+60.1 percent) and being fully confident that they could locate employment data (+58.5 percent).

## CONCLUSIONS

In this article we outlined the application of two learning modules designed to increase students' understandings of gender and racial inequalities.

Relying on an approach common to many other exercises, we attempted to make this assignment relevant to student lives, but with an eye to the careers they have yet to chart and in respect to experiences they have yet to encounter. Our assessments demonstrate considerable improvement in students' understandings of social inequalities. In addition, these modules made it possible to engage students in quantitative research and document their quantitative abilities. Self-report assessments of students support a conclusion that the application of these modules facilitated improvement in competence for future quantitatively oriented work.

In our concluding comments, we offer an observation about focusing student attention forward in the life course. Commonly instructors are stymied when trying to demonstrate to students what the future might hold as their lives unfold. Because the demographic composition of society is increasingly varied, and because the life course is increasingly less scripted (MacMillan 2005), it is less advisable for

instructors to provide simplistic descriptions, such as “this is what happens to women” and “this is what happens to Hispanics” as a means of convincing students that “this will happen to you.” However, what instructors can do is raise questions for students to consider in respect to the lives that they intend to chart, and why it might be of interest to map the impact of race and gender (as we did in these modules), but also family status, sexual orientation, disability, social class, education, geographic location, and other social markers as they intersect with those objectives. To show how these statuses influence life chances, students can then be charged with finding out

what happens to people similar (and dissimilar) positions to themselves who made the choices that they want to make. Providing students with data, as we did in these modules, is only one pedagogical strategy among others that could be applied in this teaching paradigm. The Deweyian approach we offered here suggests that the assignment not stop there. Once students have performed their individual work on their intended life paths, the next step involves sharing these observations. At that point, understanding becomes a collective project and the analysis starts to shift from “my intended to career” to “our generation’s project” and the barriers to be dismantled.

## APPENDIX

### *Quantitative Literacy Rubric*

Dimension	1 (Unacceptable)	2 (Acceptable)	3 (Accomplished)
Calculation: Ability to perform mathematical operations	Fundamental errors result in numerous errors in generation of calculations.	Successfully performs many calculations but patterns of errors are evident.	Consistently performs all calculations successfully.
Interpretation: Ability to explain information presented in a mathematical form (e.g., tables, equations, graphs, or diagrams)	Incorrectly explains information in key forms of presentation or with many errors across types of data.	Correctly explains information in some forms correctly (but not others) or makes several errors across various data forms.	Correctly explains information presented in a variety of forms consistently and reveals nuanced understandings.
Representation: Ability to convert relevant information from one mathematical form to another (e.g., tables, equations, graphs, or diagrams)	Unable to convert data from one mathematical form into any other form or makes significant errors when doing so.	Able to convert data from some mathematical forms into some, but not all, other forms or converts among all forms with several errors. Graphics are rudimentary, but not of a quality ready for presentation.	Able to convert data from any mathematical form to any other form with no errors. Graphs are accurate, fully labeled, reasonably scaled, and intelligible.
Analysis: Ability to make judgments based on quantitative analysis	Rarely or never makes correct judgments based on data presented.	Generally makes correct judgments based on data presented.	Reliably makes correct judgments based on data presented and considers the limitations of the data.

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