In this paper, we report on a research study that investigated the impact of participation in an undergraduate research program on students’ pursuit of graduate and professional education. We surveyed two groups of alumni of the University of Michigan: those who had participated in the program between 1989 and 1994 and those who had applied to participate but were not admitted to the program during those years.

The sample consisted of 1 UROP student matched to 1 to 3 non-UROP students. UROP and non-UROP students were matched on major field of study (e.g., English, biology), race or ethnicity (African American, White, Asian American, Latino/a American, Native American), graduation date, and cumulative university GPA. Each UROP student was matched to 1 to 3 non-UROP students to insure that each UROP student would have at least one non-UROP student return a completed survey. This match allowed comparison between two groups of students who should have the same incoming motivations to participate in undergraduate research and allowed for analysis of the impact of undergraduate research above and beyond differences on incoming background characteristics.

Pursuit of graduate education and involvement in postundergraduate research. The chi-square for graduate education (whether students pursued some form of graduate or professional education) was significant, \(X^2(2, N = 288) = 9.77, p < .01\).

1. What are the individuals and variables in this study? For categorical variables, name the levels. For quantitative variables, name the units.

2. Do the data result from a random sample from some population and/or a randomized comparative experiment? Or are they from an observational study? If a random sample, is it a simple random sample or is it some more complicated design such as a stratified random sample? If a randomized comparative experiment, describe the design. If from an observational study, is the analysis treating the data as if it came from a random sample or from a comparative experiment?

3. What is the parameter about which we are making inferences? (Which Greek letters are customarily used for these parameters and what do they correspond to in terms of the population?)

4. Are the inferences confidence intervals, hypothesis tests, or some other kind of inference?

5. What is the standard statistical inference technique for an inference in this situation? Is there any evidence as to which technique was used in this paper? What statistics are reported and computed in the report (and what are the customary symbolic names for these statistics)?

6. The statistical technique used makes assumptions about the population distribution. What are these assumptions? Are we justified in using this technique in this case?

7. Explain clearly the meaning of the \(p\)-value or confidence interval in the context of the particular research question.