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Education & Employment

Research Question

Do people tend to enter careers related to their field of study after graduation?

Our Source of Data

We explore this question by analyzing survey results collected by the National Center for Educational Statistics, in their "2008/12 Baccalaureate and Beyond Longitudinal Study". Specifically, we will look at a sample of college graduates who achieved a Bachelor's degree in 2008, and compare their field of study (their undergraduate major) against the reported relatedness of their primary job to the major of their Bachelor's degree.

Our sample consists of approximately 14,600 graduates of the 2007/2008 academic year, who responded to the initial survey in 2007/2008, and who also responded to a follow-up survey in 2012.

To collect this data, we made use of the QuickStats utility from the National Center for Educational Statistics to gather tabular information for our sample from the longitudinal study that we've chosen.

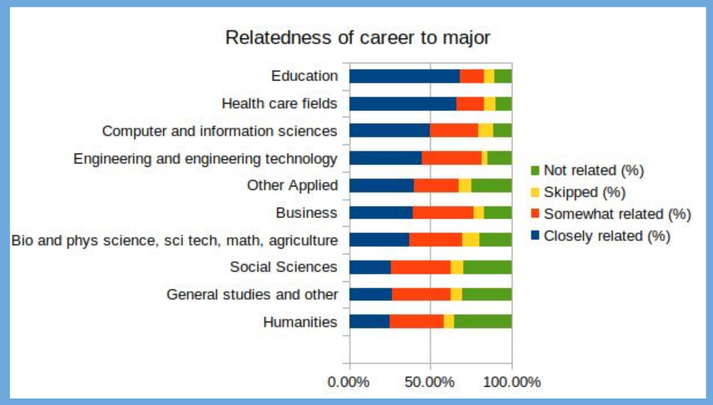
Assumptions in the Data

The utilities and information that we used to create our data table impose several assumptions. The sample size was never concretely defined, only getting as precise as "approximately 14,600". The percentages in the original data tables were also subject to rounding, and the magnitude of that rounding is unclear.

The Data Itself

Our initial data consisted of a table of percentages, where each row was independent of the other rows, and a separate table of percentages representing the relative proportions of each major in the sample. We combined these, along with our known sample size, to generate the table below. Each cell represents the approximate number of college graduates who rated their career with a particular level of relatedness, when compared to their major.

	Closely related	Somewhat related	Skipped	Not related	Total
Computer and information sciences (CSIS)	208	127	36	49	**420**
Engineering and engineering technology (Eng)	392	322	28	130	**872**
Bio and phys science, sci tech, math, agriculture (SMTA)	398	348	116	213	**1075**
General studies and other (GenEd)	116	162	32	135	**445**
Social sciences (SocSci)	570	812	171	668	**2221**
Humanities (Hum)	428	568	111	599	**1706**
Health care fields (HC)	735	185	82	107	**1109**
Business (Biz)	1320	1286	225	572	**3403**
Education (Ed)	817	180	70	132	**1199**
Other applied (Other)	865	604	163	543	**2175**
Total	**5849**	**4594**	**1034**	**3148**	**14625**



Analyzing the Data

In order to analyze our data, we start with the following hypotheses:

Null: A graduate's choice of major has no relation to the relatedness of that graduate's career.

Alternative: There exists at least one choice of major that is notably different in its degree of relatedness to the graduate's career.

With our hypotheses defined, we note that our explanatory (choice of major) and response (career relatedness to major) variables are categorical in nature, and that each cell in our table contains at least 10 observations. With these requirements satisfied, we employ a chi-square test to explore whether or not we have evidence sufficient to reject the null hypothesis. We find a chi-square statistic of 1448.082, and a corresponding p-value less than 0.0001. With such a p-value, we see that assuming no relationship between a graduate's choice of major, and the relatedness of that graduate's career choice to their major, we would expect to see data capable of producing a chi-squared statistic at least as extreme as 1448.082 by random chance alone less than 0.01% of the time.

We then find 95% confidence intervals, finding 38 statistically significant intervals. The 10 largest intervals are presented below:

CSIS - GenEd:	(0.1717, 0.2974)	CSIS - SMTA:	(0.0692, 0.1809)
CSIS - HC:	(-0.2228, -0.1122)	CSIS - Ed:	(-0.2408, -0.1316)
Eng - GenEd:	(0.1364, 0.2413)	CSIS - Other:	(0.0455, 0.1496)
CSIS - Hum:	(0.1923, 0.2964)	CSIS - SocSci:	(0.1874, 0.2897)
CSIS - Biz:	(0.0568, 0.1579)	Gened - SMTA:	(-0.1595, -0.0596)

These intervals show pairs of majors that have notable differences between their career relatedness. The bar chart to the left shows this more clearly. Those with a major in education or health care are dramatically more likely to enter a career relevant to their major, while those in the humanities or social sciences are much less likely to do so, as an example.

We conclude that graduates with a Bachelor's degree are more likely to enter careers related to their profession if they majored in education or health care fields, and are least likely to enter careers related to their profession if they majored in the social sciences, general studies, or humanities.

The original sample data from which our analysis draws from was selected by a multi-step process involving, among other things, a stratified systematic sampling with predetermined sampling rates that varied between strata. Picking apart the particular details of exactly how that selection occurred were beyond the scope of this course's material, so we conservatively claim that our conclusion could be generalized to baccalaureate graduates from the 2007/2008 academic year.

We cannot determine causal relationships given only this data alone, since there was no random assignment of chosen major to the members of the sample.