

## DISCUSSION

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For purposes of this discussion, I would like to distinguish between the two topics which are the subject of Dr. Spaeth's paper. The first topic is change in choice of career fields between the freshman and senior year in college. The second deals with change in choice of career field between the senior year and the third year following graduation. To summarize my conclusions: the ingenious technique developed by the author seems to be much more productive in connection with the latter time period than with the earlier one. For the former, it strikes me as a statistical exercise which adds relatively little to the existing body of knowledge in this area; for the latter, I think it is a useful tool which --with some further refinements or adaptations-- can make a valuable contribution in an area where new and better data are sorely needed.

First of all, there is a slight technical bottleneck in connection with the use of the method for change patterns between the freshman and senior years in college. As Dr. Spaeth indicated in his presentation, data for both years were actually collected during the senior year, in 1961. Furthermore the wording of the retrospective question differs slightly from the question dealing with current choice. The recall item reads as follows:

Career preference when you started college.  
Give your single strongest preference even  
if it was vague or if there were several  
alternatives.

Therefore, one may question the use of a method using independence values and a time 1 versus time 2 comparison when the 2 items were asked at time 2 and in different ways.

But more important than the technical question is the substantive one. In terms of new findings, the approach yields little that was not previously known, and has less explanatory power than earlier analyses using traditional statistical techniques. There has been a great deal of research in the past 10-15 years in the area of motivations, behavior and values of college students, including occupational choice. It has been well established that clear, early occupational choices occur most often at the two extremes--among students oriented toward the traditional professions, medicine and to a lesser extent law (and in these fields a family tradition is often present) and among lower-class students whose sights are fixed on education or business, the upper limits of their aspiration spectrum. Except at these two extremes, freshmen occupational goals are vague for a great many students, perhaps the majority. It is precisely one of the basic functions of the 4-year college stay to provide for students a clarification of their own interests, abilities, and suitable career commitments. Depending on family background and the type of high-school attended, freshmen often have

little knowledge of occupational alternatives (for example, underexposure to the social sciences is common) or come to college with an inappropriate evaluation of their competitive standing (for example engineering is often initially selected by students who do not have the necessary background and ability in mathematics and science). On this topic--of what happens during the college years--we are fortunate in having a voluminous and carefully researched literature which has been building up over the past two decades, partly through small-scale psychological and sociological studies done on many campuses with captive student populations, and more recently, through foundation or government-supported large-scale research efforts, such as those of the Cornell group, conducted by Rosenberg and his associates, the work of Ann Roe and her colleagues, at Harvard, the recent studies conducted by NORC and analyzed by Jim Davies, which Dr. Spaeth has mentioned, and many others. While there is of course always room for more and better data, and innovation in methodology, I do not see any "pay-off" in terms of new insights or a better model through the use of the methods presented by Dr. Spaeth.

Let me now turn to the second topic, change in career fields between the senior year and 3 years after graduation. Here we are indeed gaining much new and useful information from the data presented by Dr. Spaeth. Not only do these data consist of genuine time 2 versus time 1 responses, but the time 2 responses were given after reality-testing of academic preferences and tentative choices in the present opportunity structure of the occupational world. Concerning the dynamics of early career choices and changes in the period following college graduation we do not have the wealth of data available for "captive" college populations. We have neither the small insight-providing studies which would give us hypotheses to test with larger samples, nor the relevant basic statistical data which would provide the needed parameters. To the best of my knowledge, the only recent information about the transition from educational institutions to the labor market stems from the work done by Dr. Spaeth and his colleagues at NORC, and from the studies we are involved with at the Bureau of Social Science Research, where under sponsorship of the National Science Foundation we have so far conducted two elaborate nation wide follow-up surveys of the class of 1958. These types of studies are beginning to provide the parameters, although I feel that much of the depth needs to be filled in through more intensive studies in the future.

What Dr. Spaeth's findings point to most overwhelmingly is of course stability in choice of career fields, rather than change. He is the first to say so, since he has developed the particular technique he presented here to overcome the handicap to the analysis of change patterns caused by the stubbornness of the data. Obviously, he has a right to concentrate his attention on the small minority of cases which were indeed subject

to change, but I can't help being more intrigued by the very fact that the great majority of his respondents displayed consistency and stability over the 3-year period with respect to career fields. This is all the more impressive because the wording of the question--which in effect uses academic fields and careers fields interchangeably--might at times be conducive to inconsistency (for example, men seeking administrative and managerial careers might easily have selected two different answer categories in 1961 and 1964 without having made an actual career change). This stability is shown not only by the large number of identical choices in the 2 years, but also by the clustering of practically all change patterns around the diagonale, which means that observed changes involved closely related fields. Whatever dispersion there is seems to be largely caused by very small numbers of actual cases, and in one particular case, seems to be hard to understand on the face of it, so that one suspects a possible error: twenty men who in their senior year planned a business career had switched to medicine 3 years later (a switch which would normally require substantial additional undergraduate preparation). Furthermore, as pointed out by Dr. Spaeth, the ordering of fields leaves some groups off the diagonale, although the "drastic" change which is thereby shown is artificial. And last but not least, the unavoidable necessity of making some arbitrary classification decisions may also produce some shifts which are more apparent than real. Thus, 88 respondents who chose an "education" career in their senior year and are shown as having switched to "physical science" careers may have merely shifted from high-school teaching to teaching at the jr. college or 4-year college level--a shift which under the NORC classification system removed them from education and into physical science. So, all in all and despite some deliberate--and justified--rigging to emphasize change, we see very little movement and very few drastic switches--and this is an extremely important finding which Dr. Spaeth's method illustrates elegantly. If I may speculate for a moment, I think this represents an important and basic social trend which has been greatly accelerated since World War II. As you may notice, I do not happen to agree with Harold Goldstein and some of the members of this audience that our labor force even at the professional level is characterized by great occupational flexibility and that shifts from one field to another will continue to be common. I feel that we have moved much more decisively to early specialization, usually determined at the time the bachelor's degree is received and that subsequent field shifts will be the exception rather than the rule.

In order to gain a fuller understanding of the mechanisms involved here, two efforts are needed, both rather cumbersome but I think indispensable for a meaningful analysis of the current occupational shifts. In the first place, broad categories, like the ones used in the paper under discussion--while much more manageable for tabular presentation--are conceptually inadequate. Nowadays, a shift from one physical science to another--even from one subspecialty to another--is a significant departure, and probably the

preferred mechanism on the one hand for adjusting the allocation of available professional manpower to the needs of the economy, and on the other for enabling college graduates to correct early career decisions. Data from our own studies dealing with switches from undergraduate to graduate fields of study show considerable shifts from one social science to another, or from one engineering specialty to another, but relatively little switching across fields. If Dr. Spaeth had shown us the more complex matrices based on detailed, rather than broad fields, we would have had more evidence of change. Furthermore, such matrices would be extremely useful because they might provide some clues as to what linkages between fields are common and how much elasticity there is between related fields. Switches from electrical to nuclear engineering, from clinical to experimental psychology, from French to Swahili have meaningful manpower implications and could be assessed very efficiently through the method developed by Dr. Spaeth.

The second, related point which we need to keep in mind is the birth of new occupational fields, many of which do not fit neatly within the established standard categories into which we customarily organize our data. Here again, we may both understate or overstate occupational shifts, depending on rather arbitrary classification decisions. A political science student who becomes a systems analyst may or may not continue to work in the discipline in which he was trained. An engineer who becomes a contract negotiator for complex research programs may be classified as a business executive although his engineering training continues to be of paramount importance in his work. This is a cumbersome and tedious problem which all researchers handling educational and occupational data have struggled with in the past and will continue to struggle with in the future. However, classification decisions turn out to influence very significantly the judgments we make about trends in the relation between education and occupation, and about the extent to which the present generation of college graduates engage in highly specialized or broadly convertible careers.