

On-line computerized career guidance

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The background, rationale, and development of an on-line computerized career guidance system are presented. Special emphasis is placed on the relationship between the conceptual theory and the working design for the system.

The problem of advising people about educational and career choices largely has been overlooked by measurement and assessment experts. Normally, people receive this kind of information in one of two ways. The first is through guidance counselors in high schools and colleges. These people are expected to handle a variety of problems, ranging from treating depression and test anxiety, to dealing with disciplinary problems, to family therapy. They are normally well informed about college admissions procedures, but they often lack up-to-date expertise in test development and psychometrics. As a result, they tend to derive most of their assessment information from a few selected tests, such as the Kuder and the SAT. These tests provide only a limited array of data on which to base a set of career recommendations. The alternative, and less frequently used, source of career guidance information is through psychotherapy, emotional counseling, or more in-depth forms of treatment. Here, a person may learn a good deal about his or her motives, fears, and defenses, all of which are important in the course of making career choices but are, in fact, a relatively narrow base for making these kinds of decisions.

The purpose of this paper is to describe the impetus, rationale, and development of an automated career guidance system that may be of use to counselors concerned with this problem. Because a good deal of the approach draws on my own research in personality psychology, I will discuss this aspect of the system in detail.

IMPETUS

My work in this area began during the course of a 5-year project, funded by the Spencer Foundation, to study verbally gifted adolescents. One major component of this study was a counseling package in which project members tried to make very concrete suggestions to the gifted sample regarding their possible career options. We had a large set of test data available from which to draw in making recommendations (a much larger set than would be practically feasible for any single counselor to develop). This project was the source of immense practical experience in learning how to do this kind of counseling. In addition, it became apparent that the counseling package we had assembled was substantially

superior to those available through school systems or private sources; in a sense it had to be, because it was based on a much larger volume of test data.

RATIONALE

This experience with counseling verbally gifted youth led to the following question: What is the minimum number of tests required to obtain the maximum amount of information per case, which information would then be used as a basis for career planning? That is, what are the areas of competence, interest, and ability that one would need to assess in order to provide a person with a comprehensive statement regarding his or her unique constellation of talents and predilections, which could be used for career planning?

After some experimentation, I concluded that there are six broad areas of talent and temperament that need to be assessed in order to provide a truly comprehensive guidance report. These areas can be assessed using paper-and-pencil measures in about 4 h. The appropriateness of this conclusion has been verified by using the career assessment package with over 300 persons. To date results have been unusually positive, as defined by client feedback regarding satisfaction.

Intellectual Functioning

Intellectual functioning, defined in terms of verbal and numerical ability, can be assessed by a number of intelligence tests. The overall level of performance reflects the kind of academic performance that can be expected from the client, as well as whether the person should reasonably consider going to college and/or graduate school and the level of college (local community college vs. Ivy League college) the person should apply to. (A final recommendation in this area is qualified by a consideration mentioned below.) In addition to an estimate of overall level of intellectual performance, it is important to look at the relative elevation of the verbal vs. numerical scores. When these scores are high and about the same, the person is generally considered well balanced and can be expected to do well in virtually any field or academic specialty. When the verbal score is higher than the numerical score, the interpretation is that the person will do well in the humanities, social sciences, art, literature, and philosophy. It is also assumed

that the person will be somewhat impulsive, disorderly, impatient with routine, and rather sociable. When the numerical score is higher than the verbal score, the person is assumed to do best in technical subjects, mathematics, and the physical sciences. The prediction is that the person will have difficulty expressing himself or herself well orally or in writing and will be somewhat unimaginative, tough-minded, and socially insensitive.

Originality

The second area that must be assessed is originality, which can be evaluated in a variety of ways. (The process normally requires about 30 min.) Persons who score high on measures of creativity are assumed to be imaginative and original. More important, they prefer to work on tasks and problems that are open-ended, on which they can define what counts as a good job and they can work relatively free of supervision. Persons who receive low scores on measures of creativity prefer jobs and tasks with criteria for successful performance clearly spelled out, systematic procedures, and specified supervision.

Interpersonal Competence

The third area to be assessed concerns interpersonal competence. Persons who are socially skilled are assumed to have leadership ability and should consider managerial positions or jobs in which they can work with people. Persons with low scores for interpersonal effectiveness will be most successful working in conjunction with someone who can meet the public for them. The low scorers work better by themselves at research jobs, computer programming, and various crafts. They generally will not do well in sales, social work, teaching, or other tasks that require providing social services.

Conscientiousness

Persons who score high in conscientiousness and dependability will generally be good students, will often be overachievers, and will work hard at everything they undertake. Beyond that, they are assessed as having the capacity to inspire trust in others; as a result, they do well in jobs that depend on the trust of others (e.g., banking, law, the clergy). Persons with low scores are more creative and more spontaneous and imaginative, but they are also more disorderly and unruly. Low scores in this area are associated with work in advertising, interior design and architecture, public relations, and the arts. Such persons often make good research scientists, airline pilots, movie stunt persons, and race car drivers.

Academic Motivation

High scores in academic motivation are mandatory if a person is considering postgraduate training. They are, in fact, more important than high scores for intellectual functioning in recommending further schooling. High scores are associated with careers in law, science,

and medicine; low scores are associated with careers in the crafts, in sales, and in business.

Vocational Interests

Vocational interest and preference data provides information regarding how well or realistically the client can make decisions and evaluate his or her talents and competencies vis-à-vis the world of work. When these vocational preference data are combined with the foregoing information regarding intellectual talent, originality, social skills, conscientiousness, and ambition, the counselor is able to write a very detailed set of recommendations for the client regarding career choices and academic programs.

DEVELOPMENT

The task of assembling, administering, scoring, and interpreting such a comprehensive battery is beyond the capability of most school-based guidance counselors, and, in fact, beyond the expertise of many counselors in private practice. There is, however, a means for making this comprehensive career guidance package accessible to large numbers of persons who want to use the service. Specifically, the entire package can be presented, scored, and interpreted by means of an on-line computer, in a fashion precisely analogous to computer-assisted psychodiagnosis. In addition to making these services available to a much wider client population, there are at least two other advantages to be derived from a computer-assisted guidance package. First, it is much faster to administer; in fact, up to 40% savings in test-taking time can be expected. Second, statistical interpretation of test results is widely known to be more accurate than idiosyncratic and extemporaneous interpretations. That is, through this method, the counselor can take advantage of the knowledge and skills of an experienced service provider who will furnish the interpretive algorithm.

My design for the computerized career guidance system was based upon these facts. I began with the theoretical rationale described above and my knowledge and experience derived from putting this theory into practice. Through introspection, I became aware that there were many decision rules and associated output statements that I used in a rather structured manner when analyzing test data. These were specified to a computer programmer who incorporated them into a program for interpretation.

The final package consists of an intelligence test, personality inventory, and vocational interest measure. All tests are administered on-line in less than 2 h. This reduction in test administration time from the 4 h required for manual administration results from the use of selective scales rather than whole tests and the use of briefer intelligence and vocational tests, as well as from the fact the on-line testing is significantly faster than paper-and-pencil testing.

The vocational assessment report averages several pages in length. It includes both narrative information and a graph of scale scores. Specific recommendation for career choices are made. Usually, the report is

available 2 or 3 min following the completion of testing.

Programming is in PASCAL for use on DEC 11-series microcomputers. A CRT, printer, and a direct-access storage device are required.