The Science Behind YouScience®

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For more than 100 years, psychologists have been studying what makes people happy and successful at work. Two fundamental ideas have persisted: (1) people tend to choose and remain in careers that interest them, and (2) people succeed in careers where they can use their natural aptitudes. YouScience is premised on these ideas. We help you uncover your interests and natural aptitudes, and then help you find careers that match up with them. Sounds simple, right?

Actually, doing this right is harder than you might think. For example, consider the following:

- How do we know which interests to ask you about?
- How do we know which aptitudes to ask you about?
- How do we measure your interests and aptitudes? (We can't see them!)
- How do we match you to careers based on your interests and aptitudes?

Answers to all of these questions could simply be made up by a few people sitting in a room, but the results wouldn't be pretty. The answers YouScience provides are grounded in nearly a century of research and scientific data stemming from the fields of vocational counseling and industrial-organizational psychology.

Your Interests

Early in the 20th century, psychologists began to study people's work-related interests.[1,2,3] Of course, individuals hold a variety of interests. But what psychologists have found over the years is that when you ask people about the types of activities they like and then analyze the responses, you find they can be grouped into six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC).[4] As it turns out, the types of activities people perform at work can also be described in terms of these six types. Together, these types constitute what psychologists call the RIASEC model of vocational interests,[4] which has become the dominant model of interests used by vocational counselors and researchers alike. Numerous research studies conducted over the past several decades indicate that the degree to which a person's interests match up with the type of activities performed on a job can predict a number of important outcomes: (a) which careers people choose,[5, 6] (b) whether people are satisfied with their jobs,[7,8] (c) whether they stay in or leave a job,[9] and (d) how well they perform on the job.[9,10] The approach YouScience uses to measure your interests is based on the RIASEC model.

Your Aptitudes

Since the late 1800s, scientists have worked to understand the nature of human aptitudes.[11] You can think of aptitudes as natural abilities that make it easier (or harder) for you to learn (and be good at) various types of work. As with interests, one might imagine that people can have a really wide range of aptitudes. Again, scientists have conducted studies that have allowed them to boil aptitudes down to some major types. Indeed, back in 1940, a psychologist named Louis Thurstone conducted a study that involved administering a large number of ability tests (56 of them!) to a large group of students.[12] Upon analyzing the students' scores on these tests, Thurstone found that subsets of those tests produced similar results and reflected what Thurstone called primary mental abilities. Since Thurstone's work, many psychologists have conducted

similar types of research and have come to similar conclusions: Human mental abilities can be boiled down to a limited number of key types, and those types keep showing up across studies.[13] The types of aptitudes assessed within YouScience are consistent with those found by Thurstone, yet offer finer-grained perspectives on your abilities which, in turn, can help us better pinpoint the careers in which you may perform well.[14,15]

Measuring Your Interests and Aptitudes

Measuring psychological attributes such as interests or abilities is not like measuring physical attributes like your height or weight. You can't see interests or abilities. So how do we do it?

Because of the complexity involved in measuring what you can't see, there's actually a science behind measuring psychological attributes called psychometrics. There are standards for determining the quality of psychological measures. These standards, grounded in the principles of psychometrics, reflect the views of psychologists and experts in educational and psychological measurement.[16]

Two critical indicators of quality measurement are that the scores resulting from psychological measures show evidence of reliability and validity given their intended use.[17] Think of reliability as the consistency of the scores produced by a test. For example, if we ask you similar questions, will you give us similar answers? If we ask you the same question on different occasions, will you give us similar answers? If not, your scores wouldn't be very reliable because we wouldn't know which answers really reflect you!

As for validity, think of it as evidence that your test scores will allow us to draw accurate conclusions regarding how you will behave or feel. For example, if your scores indicate you'd potentially be good at or interested in a career involving science, would you actually be? Validity basically refers to evidence that supports making connections between test scores and the claims someone wants to make based on them. In this case, our focus is on using your interest and aptitude scores to make claims ("inferences") that you would perform well or be happy with different types of careers.

OK - there's your quick lesson in Psychometrics 101. So how do the measures used within YouScience stack up in terms of reliability and validity evidence?

The interest measure underlying the YouScience system – the Interest Profiler Short Form (IPSF) – was developed by psychologists working for the National Center for O*NET Development.[18] The Occupational Information Network (O*NET) is the primary source of occupation information in the U.S. and was developed (and continues to be maintained) by the U.S. Department of Labor's Employment and Training Administration.[19,20] Research conducted during the development of the IPSF provides solid evidence that (a) it produces reliable scores for each of the RIASEC interest dimensions, and (b) the scores it produces for those dimensions show good correspondence with another well-established, independently developed measure of the RIASEC interest dimensions (a key form of validity evidence).[18]

The aptitude measure underlying the YouScience system is a computerized variation of the Ball Aptitude Battery.[15] The BAB is one of the better known and well-researched multi-aptitude tests available today. Previous research established evidence of (a) the reliability of aptitude scores it produces, (b) the correspondence of its aptitude scores with other well-established and independently developed measures of aptitudes (a key form of validity evidence), and (c) its ability to predict actual performance on various jobs.[14,15,21,22,23]

Matching You to Careers

This is where the magic happens! We have scores that tell us about your interests and aptitudes, and good evidence that those scores are reliable and valid. The final piece of the puzzle involves matching you to careers. For this, we return to O*NET. As noted earlier, the Department of Labor's O*NET system provides a comprehensive source of information on careers. Among the types of data maintained within O*NET are how important different natural abilities are to successful performance on more than 900 careers, and the degree to which each RIASEC dimension describes and characterizes each career.

Once we measure your aptitudes and interests, we compare your collection of scores (your "profile") to the profiles of more than 500 O*NET careers. This subset of careers was strategically selected for inclusion in YouScience based on their current and future promise. Next, we generate "fit" scores for you for each of those careers in terms of aptitudes, interests, and overall fit, and present to you a list of those careers that fit you best. The "algorithms" we use to compare your score profile to the career profiles are informed by decades of psychological research on factors to consider when matching people to careers.

Continual Improvement of the Matching Process

One very powerful feature of the YouScience system is that the algorithms used to compare your aptitudes and interests to career profiles are being continuously evaluated. We are obsessed with providing you the best career recommendations possible. As YouScience "learns" more about you and other users, the large amounts of data we amass will help us refine the quality of these predictions. This is part of the reason we will occasionally ask you to answer questions as you navigate the system. All of this data is part of a comprehensive plan to improve the person-to-career matching process and provide the best recommendations possible to you and future generations of users. In essence, we actively further what is known and possible in terms of current science with regard to career counseling through continuous data collection and sophisticated analytics.

References

We've noted many pieces of scientific literature in the sections above. Here are the full references for those citations where you can learn more.

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