

Challenge Program, which offers enrichment opportunities to elementary students, to the Talent Identification Program (TIP), which offers challenging classes on the university campus, students are given opportunities to study topics and in ways that they would not ordinarily do in the regular classroom. In spring 2009, the Torrance Center started offering Saturday programs, called Academic Adventures, for students who have participated in the Duke fourth- and fifth-grade Talent Search. The Torrance Center now has a coordinator of educational programs, Elizabeth Connell, and additional programs are in development.

In addition to serving children and their families, the educational programs serve as a training ground for potential teachers and researchers who aspire to work with such students. University students and faculty from throughout the university participate in teaching the children and adolescents and investigating better ways to identify and nurture their talents.

The center also conducts regular training to prepare and update educators on skills such as administering and scoring the Torrance Tests of Creative Thinking, or the various components of coaching students in the Future Problem Solving Program, both creations of Torrance. Longer-term training sessions, each lasting for several weeks, have educated teachers from Korea about identifying and teaching gifted and creative students.

The Torrance Center sponsors a yearly Torrance Lecture, which has brought outstanding national and international speakers to the University of Georgia campus to discuss current creativity research and practices. Recent lecturers have included Dean Keith Simonton, Joseph Renzulli, June Maker, Mark Runco, and Terry Kay.

In the interest of sharing existing knowledge and creating new knowledge, the center maintains a small library with tests, articles, and books related to creativity. It also supports a visiting scholar program for individuals from around the world to work with faculty and resources in the center as well as the much larger collection of resources established by Torrance and housed in the Hargrett Rare Books Library of the University of Georgia main library. Scholars have come from Russia, Korea, Portugal, Egypt, and Turkey in recent years.

In 2008, the center hosted its first international creativity conference at the University of Georgia's

Costa Rica campus. For 5 days, individuals from around the world and the United States shared insights, research, and programs related to creativity at an ecological campus on the edge of the cloud forest. This conference is planned to be a biennial event held during universities' winter break in January.

Also in 2008, the Torrance Center was able to hire the first endowed E. Paul Torrance Professor of Creative Studies and Gifted Education, Mark Runco. Runco, who is also the Torrance Center Director, has bolstered the research power of the Torrance Center with his role, which is strongly dedicated to research and development. As founder and editor, he has moved the *Creativity Research Journal* to the Torrance Center.

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See also Creativity, Definition; Torrance Tests of Creative Thinking

Further Readings

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- Torrance, E. P., & Safter, H. T. (1990). *The incubation model of teaching: Getting beyond the aha!* Buffalo, NY: Bearly.
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TORRANCE TESTS OF CREATIVE THINKING

The Torrance Tests of Creative Thinking (TTCT), described in this entry, are a battery of tests that are designed to assess creative thinking abilities in individuals from kindergarten to adulthood.

Published since 1962 by Scholastic Testing Service (STS), the figural and verbal tests are more than tests of divergent thinking. They also assess creative strengths and dispositions that may be expressed through the activities. These strengths and dispositions include humor, resistance to premature closure, and emotional expressiveness, among others. The tests do not measure motivation, skill, temperament, or any number of other factors that play a part in creative productivity. However, the same could be said of other aptitude and achievement measures. IQ tests certainly do not measure motivation to use the intelligence.

What *is* important is how well the tests measure what they purport to measure and how useful they are to educators and researchers. Several studies affirm the TTCT's predictive validity, most recently the results of the 40-year follow-up of elementary children given the tests in 1958 who were contacted in 1998 to assess their creative achievements in adulthood. So, evidence indicates that they are useful as predictors of creativity. Also, the reliability of the tests indicates strong internal consistency. Interrater reliability studies that are routinely performed in the STS Scoring Center and by the Torrance Center illustrate that trained scorers routinely obtain reliability coefficients showing agreement of greater than 90 percent. Finally, in the 50 years since they were created, the TTCT have been translated into more than 35 languages and have been used around the world. Their lasting and widespread use is further evidence of their efficacy.

To further make the case for the usefulness of the tests, we can look at E. Paul Torrance's reasons for developing them. In 1943, Torrance was a counselor and high school teacher, he read *Square Pegs in Square Holes* by Margaret Broadley, and he was struck by her description of children who don't fit into the school environment as "wild colts" who must have their energy directed toward positive pursuits. She wrote that unless this energy is used and directed into the right channels, it is a problem, but well-directed and developed, the aptitude can lead individuals in outstanding creative work. Torrance's career was interrupted by military service in the U.S. Army. He was appointed to head a task force to study factors in fighter interceptor effectiveness in Korea with particular emphasis on the jet aces, and he found that the outstanding aces were also like wild colts but had

learned discipline to adapt successfully in the Air Force and learn how to survive. Seven years of experience in Air Force survival research gave Torrance many insights about creativity and training to behave creatively in response to emergencies and extreme conditions.

Moreover, Torrance believed that everyone has creativity, and it can be nurtured. When U.S. education was making its first response to *Sputnik*, he was designing tests to measure this special ability, creativity. Torrance was concerned that creative individuals are being overlooked and even undermined psychologically for lack of widespread use of creativity detection instruments. Thus, he designed the tests to measure creative thinking abilities so that they could be enhanced in everyone. The TTCT, especially the figural, are culture-fair tests that can be administered to individuals of all ages, cultures, and socioeconomic statuses to highlight their abilities. The tests were seen as a means of assessing the effectiveness of creativity training, understanding the human mind, and assisting with curriculum design and psychotherapy.

The verbal tests consist of six activities that take approximately one hour to administer. The respondents are requested to ask questions, guess causes, predict consequences, improve a product, think of new uses for a common object, and reason in a hypothetical situation. The figural tests consist of three activities and take approximately 45 minutes to administer. The respondents are given 10 minutes each to add details to black-and-white shapes and abstract line drawings to make something out of them. The instructions for the activities are designed to motivate the respondents to give creative responses by instructing them to give many, unusual, detailed ideas. Torrance found that performance on the verbal and figural tests show almost no relationship, which indicates that the verbal and figural tests measure different areas. In addition, Torrance has developed other creativity tests to measure creativity in other areas such as *Thinking Creatively With Sounds and Words* (TCSW) and *Thinking Creatively in Action and Movement* (TCAM).

Among Torrance's creativity tests, the TTCT, the TCSW, and the TCAM are in widespread and worldwide use because they have good reliability, have proven validity, are easy to use, and are neutral regarding a wide variety of factors such as