

for the body, awareness of the body and a reverence of the body—these are clearly good paths to peak experiences" (Maslow, 1971, p. 176). However, he also saw the possibility of mathematics education as peak producing, adding wryly, "... of course there are mathematics teachers who have devoted themselves to preventing this" (Maslow, 1971, p. 178).

Support for some of these propositions was not slow in coming in the form of empirical studies. "Experience" had long before been rejected by objectivistic psychology. Yet when it returned in the form of peak and positive experience, there was no rush to eliminate it, even though objectivists remain skeptical—but respectful. Responding to Maslow's challenge to education, Nancy Wilgenbusch (1980) saw the possibility of developing Maslow's call for a human potential in teacher education.

Researchers in music also answered the Maslovian call. J. A. Pennington (1973) developed a quantitative measurement of the peak experience in music. M. K. Pafford (1970) asked 400 students to read an autobiographical description of a peak experience and then asked them if they had had a similar one. Pafford reports a significant correlation between such an admission and an active interest in creative writing, painting, music, and poetry.

For Privette's study of the transcendent, positive, and peak experiences, a musician describes being carried away by his own performance on the trumpet as each of the performers in a band took turns improvising. The trumpeter reported that he was conscious only of his own music and his self; it was not until the experience was almost all over that he realized the dancing had stopped and all had gathered around to listen to his improvisations. The empirical data and the case studies reported lend credibility to the relationship between art and peak experience.

THE DRUG EXPERIENCE

Early in his descriptions of the peak experience, Maslow permitted himself to consider drug experiences as possibly having some similarity to the peak experience. However, he clearly rejected this as reported in a later paper by Mildred Hardeman (1979). Maslow is quoted as saying, "I would certainly be very wary about the possibilities of drug induced peak experiences. Peak experiences that really change the person come about where they are earned . . . as the result of a year of sweating on a psychoanalytic couch" (Hardeman, 1979, p. 24).

Nevertheless, a sizable literature has grown up around the use of dipropyltryptamine (DPT) with terminal cancer patients. For example, W. A. Richards (1975) reported that in 15 of 34 subjects the drug resulted in a peak experience, and that testing and interviewing by therapists supported the probability of reduced stress in those patients. However, two social workers who rated "blind" before and after the drug therapy did not judge the patients to be any different after the therapy. On the other hand, R. E. Klavetter and R. E. Mogar (1967) reported a study, in which subjects given LSD for a 14-month period indicated positive changes. It appears that at best the issue of the presumed similarity of drug and peak experiences must remain in doubt.

A FURTHER EMPIRICAL STUDY

The issue of the researchability of Maslow's contributions became of more and more consequence as both behaviorism and humanistic psychology grew in popularity. Studies cited previously demonstrate that empirical studies have not been neglected in the exploration of the validity of the peak experience. Wuthnow (1978) has reported on perhaps the most ambitious effort so far. His team used a stratified sample of 1000 persons representative of all those aged 16 or over living in the five counties that constitute the San Francisco-Oakland area. Forty professional interviewers conducted the one-hour interviews. Reports of having had certain peak experiences were made by 88% of the subjects. "High peakers" were most likely to feel that their lives were meaningful. Nonpeakers were more likely to hold materialistic values. High peakers also were more likely to be concerned about social problems.

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COGNITIVE THEORIES OF EMOTIONS

EMOTIONS

PHENOMENOLOGY

TRANSPERSONAL PSYCHOLOGY I AND II

T. LANDSMAN

PEARSON, KARL (1857-1936)

Called the founder of the science of statistics, Pearson made contributions of major importance to the development of the biological, behavioral, and social sciences. His application of mathematical and statistical methods to the study of biological problems, particularly evolution and genetics, ranks among the great achievements of science.

An exceptionally brilliant student, Pearson was graduated with honors in mathematics from Cambridge University, where he also studied physics, philosophy, religion, and law (he was admitted to the bar). His motto was the basic theme of his life: "We are ignorant; so let us work." While a professor of applied mathematics at the University of London, he published works on elasticity and on the philosophy of science, before coming under the influence of Sir Francis Galton, who helped to shape Pearson's subsequent career. Mainly as a result of reading Galton's *Natural inheritance* (1889), he became a devoted disciple and personal friend of the great man, and his career was set on the course that led to the development of statistical theory and methods suited to dealing with the problems posed by Galton's work on human variation, heredity, and eugenics. Inspired by Galton's ideas, Pearson stated that "real knowledge must take the place of energetic but untrained philanthropy in dictating the lines of feasible social reform." Galton's great influence on Pearson is attested to by the latter's devoting almost 20 years to writing a four-volume biography, *The life, letters, and labours of Francis Galton* (1914-1930). In 1904, Pearson was appointed the first director of the Galton Laboratory at the University of London, and was the first professor to occupy the Chair of Eugenics, which Galton had endowed with a gift of £45,000.

Pearson's many statistical contributions are now a standard part of the research methodology of the behavioral and social sciences. They include mathematical formulations of types of frequency distributions, measures of skewness and kurtosis, curve fitting, the standard deviation σ , the "chi-square" test, the contingency coefficient, the product-moment correlation coefficient r ; biserial, multiple, tetrachoric, and nonlinear correlation, and derivation of the probable errors and sampling distributions of a variety of statistics, published in Pearson's *Tables for statisticians and biometricians* (1914). He also invented principal components analysis, a forerunner of factor analysis later developed by Charles Spearman. Few scientists have contributed a more useful and enduring legacy than did Pearson.

A. R. JENSEN

PECJAK, VID (1929-)

Born and raised in Ljubljana, Yugoslavia, Pecjak received the Ph.D. degree from the University of Ljubljana in 1966, pursued postdoctoral studies at the University of Edinburgh and University of Illinois (Urbana), and attended a summer workshop at Lehigh University in Bethlehem, Pa. Since 1966, he has been a professor of psychology at the University of Ljubljana, and as a visiting professor has taught at the University of Hawaii, the