Behavior

Tracking global happiness

As if anyone needed reminding, life isn't fair. Or as an old blues song intones, "It's a mean old world." Yet most adults report at least a moderate sense of happiness and satisfaction in major areas of their lives, such as marriage, work, and leisure, a new analysis of international survey data finds.

Researchers need to examine how so many folks manage to cut a generous slice of happiness from life's sometimes humble pie, assert Ed Diener and Carol Diener, psychologists at the University of Illinois at Urbana-Champaign.

In 37 of 43 countries for which nationally representative samples are available, average ratings of well-being and happiness fall into the moderately positive range, the researchers report in the May PSYCHOLOGICAL SCIENCE. These nations include Brazil, Egypt, Japan, South Korea, Mexico, Thailand, and the United States. The only countries in the negative range were India and the Dominican Republic.

Moderate happiness also emerges in U.S. surveys of poor, physically disabled, unemployed, and elderly individuals.

"Most people are not elated most of the time," the scientists hold. "They are just mildly happy."

Surveys elicited self-reports of the degree of satisfaction in various life domains and the extent to which daily events evoked pleasant or unpleasant emotions. Several surveys also found that participants' responses matched the assessments of family members and friends.

A positive temperament may conspire with good fortune to render some individuals happier than others, according to another study in the same journal.

Identical twins, but not fraternal twins, show marked similarity to one another in self-ratings of happiness and contentedness, regardless of their education, income, marital status, or religious commitment, argue psychologists David Lykken and Auke Tellegen of the University of Minnesota in Minneapolis. Genetically derived traits may thus play a large role in how happy people feel over time, the scientists suggest.

Periodic ups and downs in life, such as a job promotion or a bad financial investment, have largely temporary effects on an individual's well-being, in Lykken and Tellegen's view.

Their study consisted of 1,380 adult pairs of identical and fraternal twins raised together and 111 adult pairs of identical and fraternal twins raised apart. Identical twins in both groups reported similar levels of happiness, unlike their fraternal counterparts, the Minnesota investigators note.

Reading by the letter

North American children learn the names of letters of the alphabet long before they grasp the sounds that those letters make. In fact, preschoolers may take their first steps toward literacy by using their knowledge of letter names to identify sounds in printed words, according to a report in the May DEVELOPMENTAL PSYCHOLOGY.

In experiments directed by Rebecca Treiman, a psychologist at Wayne State University in Detroit, 42 children ranging in age from 4 to 6 were asked to identify the first or last letters for a series of spoken words. Youngsters did well when the letter's name was part of the word's pronunciation, such as the "b" in "beech" and the "f" in "deaf." Their performance fell sharply for letters without matching sounds, such as the "b" in "bonus" and the "f" in "loaf." The importance of letter names also appeared in a substantial minority of children who stated that "wife" begins with a "y" and "seem" begins with a "c."

Teachers might take advantage of this tendency by exposing beginning readers first to words in which letter names match sounds, such as "bead," Treiman and her coworkers propose. Instruction could then proceed to the more subtle skill of connecting letters in printed words to speech sounds.

Biology

John Travis reports from Madison, Wis., at the first meeting of the RNA Society

RNA challenges cancer . . .

In laboratories around the world, researchers are taking a fresh look at RNA, a nucleic acid made from a single strand of chemical components called nucleotides. Cells normally use the nucleotide sequences of RNA strands to transfer the protein-building instructions from double-stranded DNA to ribosomes, sites inside cells where proteins are made.

Some investigators contend that RNA can do much more than simply carry DNA's message. For example, one research group has devised a form of gene therapy using ribozymes, enzymes made of RNA, to correct faulty protein-making blueprints (SN: 6/8/96, p. 357).

Another group suggests that ribozymes can eliminate harmful proteins after they're made. Joachim W. Engels of the University of Johann Wolfgang Goethe in Frankfurt, Germany, and his colleagues report that they have designed ribozymes that bind to and break apart a mutant protein that turns cells cancerous.

The protein, part of the signaling machinery that governs cell growth, is encoded by a gene called *N-ras*. A cell has two copies of the gene, but a mutation in just one copy causes the cell to proliferate out of control.

Engels' group has synthesized RNA strands that, in test-tube studies, destroy the proteins produced by a mutant *N-ras* gene but spare proteins encoded by the normal version of the gene. To allow the ribozymes to do the same inside cells, the researchers have modified the RNA strands slightly, making them more resistant to degradation by cellular enzymes. They plan to test these ribozymes on tumor cells from a person with an *N-ras* mutation. "The real proof will be if the proliferation disappears," says Engels.

. . . and viruses

RNA can also combat viruses, suggest investigators from the Pennsylvania State University College of Medicine in Hershey. Jin-Feng Wang and his coworkers mixed nucleotides together at random, creating a large pool of RNA strands with unknown sequences. They then isolated any strands that bound to Rous sarcoma virus, an avian virus of the same family as HIV, the AIDS virus.

Those strands were mutated slightly and put through the selection process once again. By repeating this cycle many times, Wang's group evolved a small pool of RNA strands that bind efficiently to the virus. From that pool, the researchers identified five strands that significantly inhibit infection of quail eggs by the Rous sarcoma virus. Wang and his colleagues suggest that a similar strategy could be employed to evolve RNA that inhibits HIV, bacteria, or even tumor cells.

. . . and autoimmune diseases

RNA-based therapy may also have the potential to tackle autoimmune diseases. In some of these illnesses, the immune system generates disloyal antibodies. Instead of binding viruses or bacteria, these so-called autoantibodies fasten onto the body's own proteins. In some people, for example, insulin cannot control concentrations of sugar in the blood because autoantibodies bind to the cell surface protein that recognizes insulin. This prevents the insulin from working and signals the cell to make less of the insulin receptor.

Researchers have now sifted through a pool of random RNA nucleotide sequences to find ones that bind to such autoantibodies. In test tubes, these RNA strands prevent the union between autoantibody and insulin receptor, report Seong-Wook Lee and Bruce A. Sullenger of Duke University Medical Center in Durham, N.C. The researchers plan to test this strategy on rats that have autoantibodies to a receptor protein for the neurotransmitter acetylcholine. In humans, this autoimmune reaction causes myasthenia gravis, a neuromuscular disease.