Gender Paths Wind Toward Self-Esteem

A study tracking self-esteem and psychological adjustment in youngsters from the early teens to young adulthood finds that a healthy regard for oneself develops differently in boys and girls.

What's more, reported feelings of self-worth do not necessarily reflect psychological health, according to the new data, which will appear in the June CHILD DEVELOPMENT. For example, 14-year-old boys who expressed abundant self-esteem displayed considerable trouble in expressing their emotions and dealing effectively with others.

However, healthy self-esteem tended to increase for boys and decrease for girls during the nine-year study period.

"We're now looking closely at the possibility that there may be different types of self-esteem in our sample," says Jack Block, a psychologist at the University of California, Berkeley. Block conducted the analysis with Berkeley colleague Richard W. Robins.

A recent one-time survey of U.S. youngsters age 9 to 16 noted drops in self-esteem for girls entering adolescence that far outpace those reported by boys (SN: 3/23/91, p.184). Other researchers who have studied children as they proceed through early adolescence cite less pronounced and often temporary self-esteem differences between boys and girls.

"It's rare for self-esteem researchers to look beyond the early adolescent years," asserts Barton J. Hirsch, a psychologist at Northwestern University in Evanston, Ill. "That's what makes this new study interesting."

Block and Robins studied 47 women and 44 men, all of whom live in the San Francisco Bay Area. Each participant entered the study in 1968, at age 3. About two-thirds are white; the rest are black or Asian. Ongoing analyses have yielded clues to the development of drug use and delinquency (SN: 5/1/93, p.282).

At ages 14, 18, and 23, volunteers completed a two-part self-esteem test. First, they described themselves by grouping 43 adjectives and short phrases — including "competitive," "creative," and "gets upset easily" — into seven categories ranging from "most undescriptive" to "most descriptive." About one week later, they performed the same task to describe the person they would ideally like to be. The extent of agreement between the two sets of descriptions determined that person's self-esteem.

Most self-esteem studies rely on short questionnaires that make general inquiries into whether people like themselves, but fail to establish why they like themselves, Block contends. On these tests, a report of high self-esteem may reflect an attempt to deceive or please the researcher, self-absorption, or healthy feelings of self-worth, he holds.

Unlike most previous studies, the Berkeley project used clinicians to develop a personality profile of each youngster at the time of each self-esteem test.

From age 14 to 23, one-fifth of the boys displayed substantial losses and one-third reported marked gains in self-esteem. Over the same period, nearly one-half of the girls cited a significant decline and one-fifth reported a considerable increase in self-esteem.

Boys exhibited much individual volatility in self-esteem, particularly between ages 14 and 18, the researchers note.

The personality profile of girls reporting high self-esteem remained consistent at all three ages. Clinicians rated them as cheerful, assertive, emotionally open and warm, relatively spontaneous, able to work well with others, and unwilling to give up when frustrated.

In contrast, the profile of boys citing high self-esteem changed radically. Although rated as stern, humorless, unemotional, and lacking in social skills at age 14, at later ages these boys developed more of the openness and expressiveness shown by high self-esteem girls.

Relating to others well fosters self-esteem for females, whereas managing one's anxiety in social situations importantly aids male self-esteem, the psychologists suggest. For instance, 23-year-old women with high self-esteem emphasized the closeness of their social relations, while high self-esteem males at that age stressed keeping emotional distance and control when dealing with others.

The "cultural press" of adolescence may help shape gender differences in the nature of self-esteem, Block notes. "In crasser terms, females are socialized to get along in society, and males are socialized to get ahead," he says.

The researchers plan to look at how adolescent self-esteem relates to adult functioning and how universal, gender, and individual experiences lead some people to feel good about themselves and others to feel worthless. *— B. Bower*

Researchers bid for big-science biodiversity

Now that politicians rank biodiversity high on the world's list of environmental priorities, scientists intimately involved with identifying Earth's plants and animals are calling for a sixfold increase in funding for their work.

This week, three groups representing these scientists, known as systematists, released a draft of "Systematics Agenda 2000: Charting the Biosphere." This policy paper urges systematists to discover, inventory, describe, and classify all existing organisms within the next 25 years. To do that, international support for systematics must increase to $3 billion per year, according to the report.

With current manpower and funding — about $500 million worldwide annually — that task would take 150 years, says Joel L. Cracraft, an ornithologist at the American Museum of Natural History in New York City. Systematists estimate that as many as 90 percent of the world's species have not been discovered. Yet according to a report by the National Research Council, more than half of those organisms are likely to disappear by the year 2010 — taking with them their potential economic value — if the current rate of habitat destruction continues.

For example, scientists have discovered that several endangered woody mints found in Florida give off potent insect-repelling aromas, says John Fitzpatrick of the Archbold Biological Station in Lake Placid, Fla. Only recently did plant taxonomists realize these mints represent five species (one of which has not yet been described in the scientific literature). That information helped guide their analyses of compounds in these plants, Fitzpatrick reported last week at the 16th Annual Spring Systematics Symposium of the Field Museum of Natural History in Chicago.

"These things are really, really closely related, and yet they are really different in their biochemistry," notes Cracraft. One mint grows only in a lot behind a bowling alley; the others are no better off.

Thus, proponents of this agenda are urging their colleagues to work harder to gain the attention of the public and of governments and other funding agencies before it is too late. "We've been thinking too small for too long; we must make ourselves relevant," says George Rabb, who heads the Brookfield (Ill.) Zoo. "We need more boldness: We need to unite and be more effective politically."

With support from the National Science Foundation, representatives of the Society of Systematic Biologists, the Willi Hennig Society, and the American Society of Plant Taxonomists worked for two years to develop the agenda, which seeks to put their discipline on a par with large science initiatives such as the Superconducting Super Collider, space telescopes, or the Human Genome Project.

"There's no reason that biodiversity can't be a big-ticket item," Cracraft told SCIENCE NEWS. "We need to shed physics envy and promote systematics envy and biodiversity envy."

Although the effort began as a strategy for U.S. science, it quickly took on an international focus, Cracraft says. It calls for the building of museums and training of systematists in Mexico, Brazil, Indonesia, Colombia, and other "species-rich" countries. According to the agenda, about 80 percent of the land plants and animals live in countries with barely 6 percent of the scientists who know how to determine what these organisms are and how they are related.

"What we're trying to do is to get other countries to realize they must understand biodiversity in a sophisticated way," Cracraft says.

Such knowledge is worth the investment, he and others argue. They cite the value of biodiversity in providing disease-resistant plant and animal varieties, new genes for improving domesticated animals and crops, and new compounds for the pharmaceutical industry. In addition, colorful coral reef fishes, giant saguaro cacti, magnificent elephant herds, and many other plants and animals lure millions of tourist dollars to otherwise destitute regions.

Furthermore, for countries involved in the Biological Diversity Convention (SN: 6/20/92, p.407), the more species they document, the more aid they may warrant for those resources, says Brian Groombridge of the World Conservation Monitoring Center in Cambridge, England.

Thomas Eisner/Cornell Univ.

Systematists have learned that Lake Placid Scrub Mint differs from closely related mints, each a potential source of insect repellent.

As part of this push, researchers recognize the need to get information out of museums and into the hands of policymakers and others. Thus, like the global climate change programs and the Human Genome Project, the plan calls for compiling databases on computer. Ideally, anyone could gain access to pictures and sounds as well as verbal descriptions electronically, says Cracraft, who coordinated development of the agenda.

That access would help countries make better conservation decisions, says Groombridge. His not-for-profit organization supplies diversity information to governments and engineering companies planning development projects or assessing natural resources. At the systematics symposium, he cited the need for more extensive cataloging of more kinds of organisms. His organization's review of newly reported species indicates that about the same number of new ones is described in each plant and animal group each year. "The way I interpret this is we have a bottleneck in taxonomists," Groombridge says. "This serves to highlight the need for more and continuing [growth in] systematics, not less."

"We're the only ones trained to inventory and analyze species diversity and to understand the phylogenetic relationships," adds Cracraft.

Often, however, young U.S.-trained systematists leave the discipline for lack of faculty or museum positions, complains Hugh Iltis, a plant taxonomist at the University of Wisconsin-Madison. "There are no jobs; yet there are huge genera that are not described." *—E. Pennisi*

Gene finding gives clues to DNA repair

In the mid-1960s, as a postdoctoral student, James E. Cleaver thought a lot about the genetics of radiation sensitivity in cells. One day, he read a newspaper report about xeroderma pigmentosum (XP), a rare disease that renders people ultrasensitive to sunlight. Are people with XP, Cleaver wondered, somehow unable to repair the genetic damage caused by exposure to the sun's ultraviolet rays?

"It was the kind of [hypothesis] that if I was right, I had a living out of it, and if I was wrong, nobody would have noticed," recalls Cleaver, now a geneticist at the University of California, San Francisco. He proposed the connection between XP and faulty DNA repair and proved it. Now, 25 years after Cleaver's initial report, two teams of scientists have independently flushed out the defective gene that causes a particularly severe form of the disease, XP-G. The researchers report their work in the May 13 NATURE.

Defects in this gene, and in seven others linked to different forms of XP, interfere with normal DNA repair. Usually, these genes serve as a blueprint for enzymes that recognize and cut out sections of cells' damaged DNA. Other cell mechanisms clear away the wreckage and replace the damaged sections of genetic code.

People with XP suffer various symptoms, depending on which defective gene they carry. In people with XP-A, for example, DNA repair is almost completely knocked out, causing brain deterioration and many skin tumors. In contrast, people with less severe forms of the disease can avoid many of its serious symptoms by simply avoiding exposure to sunlight. About one person in 100,000 has the disease, says Richard D. Wood, a biochemist at Clare Hall Laboratories in South Mimms, England.

DNA repair, the researchers emphasize, has proved one of the most fundamental aspects of cell life. It counteracts the constant assault on cells by chemicals, radiation, and other environmental causes of genetic damage. Unfortunately for people with XP, "mutations in these [repair] genes can cause important developmental defects, such as mental retardation, immune-system diseases, and sensitivity to cancer-producing compounds," explains Stanford University molecular biologist Philip C. Hanawalt.

In one of the new studies, Wood and graduate student Anne O'Donovan found that extracts from normal cells, containing functioning repair enzymes, turned DNA repair back on in XP-G cell extracts. The scientists then isolated the particular enzyme that reversed the defect and mapped its gene to chromosome 13.

A team of researchers at the University Medical Center in Geneva, Switzerland, came upon the XP-G gene while studying an entirely different disease, systemic lupus erythematosus (SLE). Searching for a protein linked to SLE, these researchers by chance discovered a gene capable of restoring normal DNA repair function to XP-G cells, report Daniel Scherly and colleagues.

These two reports herald the final stage of a 25-year effort to identify and copy, or clone, the defective DNA-repair genes that cause XP, Wood explains. To date, five genes have been isolated. By next year, Wood predicts, investigators will find the remaining three. At that point, research will shift toward puzzling out the function of each repair gene.

Cancer treatment could benefit from increased intimacy with DNA-repair biology, says Wood. Typically, cancer drugs kill tumor cells by attacking their DNA. If researchers could find a way to selectively shut down tumor cells' repair machinery, cancer drugs could kill tumor cells much faster than they kill normal cells, he says. *—D. Pendick*