Behavior

Living longer: Conscientious kids . . .

Dependable, truthful children who ponder the consequences of their behavior before acting do more than delight their mothers. A research team contends that these conscientious kids also tend to survive a few years longer as adults than their more impulsive, unreliable age-mates.

Growing up with parents who did not get divorced and having a stable marriage of one's own also help keep death at bay, according to a follow-up of people first studied when they attended California public schools more than 70 years ago.

At that time, Stanford University psychologist Lewis Terman recruited 856 boys and 672 girls who performed particularly well in school and had an IQ score of at least 135. Every 5 to 10 years afterward, experimenters administered a variety of questionnaires to the volunteers (who dubbed themselves Termites). In 1991, half of the men and one-third of the women were known to have died.

Conscientious children — especially boys — lived from 2 to 4 years longer than "nonconscientious" peers, report Howard S. Friedman, a psychologist at the University of California, Riverside, and his colleagues. A similar survival edge emerged for those with no personal or family history of divorce. So, for example, conscientious men from stable families lived an average of 81 years, compared to 74 years for nonconscientious men whose parents had divorced.

The influence of these factors on death rates is less than the known effects of sex (men die at younger ages than women), cigarette smoking, and alcohol abuse. Yet conscientiousness and marital history affect mortality about as much as better-known risk factors such as systolic blood pressure, cholesterol concentrations, exercise, and diet, Friedman and his coworkers assert in the February AMERICAN PSYCHOLOGIST.

Surprisingly, people who were optimistic and cheerful as children tended to die several years younger than their less buoyant counterparts. Although the optimists more often smoked cigarettes, drank alcohol, and took other risks, these factors do not account fully for their accelerated death rate.

Emotional instability, depression, and hostility in childhood had no clear effect on adult mortality rates, the scientists add.

Although the Termites do not constitute a random population sample, Friedman's group argues that the roles of conscientiousness and marital stability in mortality deserve a closer look.

. . . and religious, social perks

People whose religious beliefs give them feelings of strength and comfort and who regularly participate in a social activity markedly improve their chance of surviving at least 6 months after undergoing heart surgery, according to a new study.

Physicians may need to rally group and religious resources of heart disease patients as routinely as they render advice on cigarette smoking and high blood pressure, assert Thomas E. Oxman, a psychiatrist at Dartmouth Medical School in Lebanon, N.H., and his coworkers.

The researchers interviewed 232 people, age 55 or over, within 2 weeks of heart surgery (in most cases, coronary artery bypass procedures); 21 of them died in the 6 months after their operation.

About one in five patients citing neither feelings of strength and comfort from religion nor social activities died in that period. Around 1 in 13 who noted either religious strength or social participation, but not both, died during that time. But only 1 in 50 patients reporting both religious strength and social activities perished during the follow-up, the researchers report in the January-February PSYCHOSOMATIC MEDICINE.

These findings held regardless of age, number of prior heart operations, cigarette smoking, depression, or anxiety.

Computers

Pigeonholing text

The enormous task of categorizing and retrieving information from the vast quantities of text stored in digital form has spurred the development of a variety of strategies for finding the textual needle in the database haystack. Most of these automated techniques rely on the identification of specific words and phrases after sentences and paragraphs are stripped of extraneous material (SN: 9/7/91, p.155). However, such methods often require some degree of expert human participation in their development and setup. They have trouble with misspellings and garbled text, and they are usually suitable only for specific topics or languages.

Now, Marc Damashek of the Department of Defense's National Computer Security Center at Fort George G. Meade, Md., has developed a text categorization and retrieval technique that works equally well in any language and requires practically no human preparation. His method, known as Acquaintance, is purely statistical. "No prior information about document content or language is required," Damashek says.

His software divides text samples into sequences made up of a given number of consecutive characters, then computes how often each distinct sequence appears in the document. To gauge similarity, Damashek assumes that two documents showing comparable patterns are likely to deal with related subjects.

Tests of the technique show that it performs well for grouping documents by language, topic, and subtopic, Damashek says. He describes the method in the Feb. 10 SCIENCE.

Taking a faster path

Modern long-range weather forecasting requires the use of complicated mathematical models simulating the atmosphere to make predictions. As new weather data are collected, these models are continually updated to reflect actual weather conditions more accurately. But it isn't at all obvious how to make the necessary adjustments to improve the match between the models and the observations. Meteorologists rely on mathematical techniques to optimize the fit.

Forecasters are now testing a novel optimization method that reduces considerably the amount of computer time needed to establish the initial conditions that go into weather models for making a particular forecast. Developed and refined by Jorge Nocedal of Northwestern University in Evanston, Ill., and his collaborators, this technique shows considerable promise.

Searching for the best fit resembles the problem faced by a hiker caught in the mountains when fog and darkness shroud the way. Bound for a village at the bottom of the deepest valley, the hiker can do little more than take one step at a time and see what happens.

One strategy is to check around for the steepest descent, then take a step in that direction and repeat the procedure. But that's a very slow process, and it's easy to get caught in a hollow still distant from the home valley.

Keeping track of the terrain while walking is an improvement on this strategy. The hiker can build up a simplified "map" of the entire mountain and from this map compute the likely position of the lowest point. Instead of heading in the direction of the steepest descent with each step, the hiker moves toward what the map shows as the lowest point. With each step, the map improves and the hiker gets a better sense of which way to go. This idea underlies the technique developed by Nocedal and his coworkers.

There's one further complication. A hiker needs only two coordinates — longitude and latitude — to specify a position. Weather models involve steps corresponding to a million or more variables. Hence, to keep their model manageable, researchers use information from only the last 5 to 15 steps.