Sports Science

Joel Greenberg reports from the University of Oregon in Eugene at the Olympic Scientific Congress

Traumatic tennis: A state of shock

Wide World Photos

McEnroe

John McEnroe does not have a reputation as a person who makes friends easily. However, one gets the feeling that McEnroe, the scowling scourge of tennis line judges and referees around the globe, would take an immediate shine to Richard H. Cox. A sports psychologist at Kansas State University in Manhattan, Cox tests the performance of volunteer "tennis judges" by employing an unusual method: He shocks them with a mild electric current.

"Players such as McEnroe and Ilie Nastase have called public attention to...the problem of irate tennis players verbally abusing line judges for questionable decisions," says Cox. One of the purposes of the experiment, he says, was "to determine the effect of stress upon a human observer's visual discrimination sensitivity and response bias."

Cox tested 33 female and 33 male university physical education students by presenting them with a series of 128 slides of tennis balls landing either just in or out of the court. The slides (actually 32 of them were shown four times) were flashed on the screen at eight-second intervals. The subjects were then told to call the balls in or out under one of three conditions: control, where no feedback was given; verbal feedback where the tester said "error" when one was made; and shock, where a mild shock was administered to the wrist after an incorrect call.

Cox reports that although "male subjects are consistently better than female subjects at discriminating between a ball being in or out" in the control situation, that difference begins to narrow as the males' scores worsen in the verbal feedback group and disappears in the shock group. He also found that for both sexes, "humans are not consistent — they gave different responses to the same pictures on different occasions.

"[Other] research indicates that in most perceptual situations, females are better than males," Cox says. "I found the opposite, and I don't have any idea why."

However, he adds, since the sex-related difference "seems only to be warranted in situations of low to moderate stress...in a highly competitive professional tennis situation, the women may perform at the same level as the men.

"Ultimately," Cox says, "it is the goal of this line of research to provide a measurement tool whereby prospective line judges can be evaluated and perhaps trained." Even if such a test did not yield any more competent tennis judges, McEnroe might at least approve of the method.

The Russians aren't coming...again

Oleg Milshtein of the USSR was scheduled to appear on a panel entitled "The Olympic Games as an Instrument of National and Foreign Policy." He never showed up. But Milshtein was not alone. Only "two or three" of the 27 Soviet scientists who had said they were participating in the Congress actually did so, according to John R. Crosiar, a spokesman for the University of Oregon. The Soviets did not, however, officially boycott the meeting, as they have the Olympic Games themselves — giving fear for the safety of their athletes as a reason.

"The Russians have a point," sociologist Harry Edwards of the University of California at Berkeley told SCIENCE NEWS. "I'd be reluctant to go [to the Games] too. There's a damn good chance of something [violent] happening there."

In his presentation on sports aggression and violence, Edwards said that violence surrounding sporting events in many countries has "increased in seriousness, frequency and maliciousness — both on and off the field." For example, he says, violence during college football games in the United States is up 18 percent since 1978. "These are the kinds of things that are imitated by young kids," he adds.

Edwards says the escalation of violence "reflects deeply rooted interrelationships within society. Violent sports are not a 'safety valve' of a violent society, but rather an institutionalization of that violence." In addition, he says, athletes have been elevated in society to such high positions of stature and wealth that there is more pressure on them — particularly blacks — to fill those few top athletic roles that are available. Therefore, they are becoming more competitive and aggressive, says Edwards, who has served as an advisor to a number of black Olympians in the past decade.

Finally, Edwards says, because ticket prices have soared to pay for the higher-priced athlete, families can no longer afford to attend games. Consequently, he says, crowds are comprised of more "young male fans," who are more prone to violence during a sporting event.

When is a drug a drug?

Along with security at the Olympics, drug use to enhance athletic performance is perhaps the most controversial issue at the 1984 Games. Recently, a U.S. bicyclist was suspended from competition because he consumed a "Chinese herb" prior to a race. The time since the 1972 Olympics has been characterized by "an increasingly long list of banned drugs" for Olympic athletes, says W. M. Brown of Trinity College in Hartford, Conn.

Brown notes several features of currently banned drugs:

- The maximum caffeine level for athletes is defined as 15 micrograms per millileter — simply overingesting combinations of coffee, soft drinks and over-the-counter pain medications could lead to excessive accumulations.
- The hormone testosterone has been difficult to detect in excess because it occurs naturally in the body. Now, however, a new test measures the ratio of testosterone to a metabolite, epitestosterone, which normally occurs in a one-to-one ratio. "Since exogenous testosterone isn't converted as readily (as naturally produced testosterone) to epitestosterone," he says, "it changes the ratio." The International Olympic Committee requires the testosterone/epitestosterone ratio in the urine to be less than six to one, according to Brown.
- Among the side effects of anabolic steroids, he says, are acne and liver tumors and, for children and adolescents who are still growing, premature bone fusing and precocious puberty.

Los Angeles: Playing it by air

How will the Olympic athletes perform in the infamous air of Los Angeles? Researchers from the University of Southern California in Los Angeles performed a series of tests with a dozen male volunteers who rode stationary bicycles in quintessential L.A. conditions: temperatures hovering around 100° F, humidity around 50 percent. They measured physical variables in instances where the air was either unfiltered or filtered and monitored pollutants including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and various suspended particulates.

The scientists observed that under nonfiltered conditions, the average exercise heart rate was higher, 158 beats per minute, than when the air was filtered, 149 beats per minute. However, in most of their other measurements, the researchers found no significant changes in body responses triggered by the L.A. air.

"In spite of the subjective discomfort identified for (nonfiltered) conditions by some subjects," they conclude, "it was apparent that metabolic and hematological variables were not affected by breathing moderately polluted air during long-duration, submaximal exercise."