

BEHAVIOR

Deborah Franklin reports from Los Angeles at the annual meeting of the American Psychological Association

Identifying men who might rape

Painting the personality profile of a potential rapist is tricky, though questions of who rapes and why have attracted growing research interest in the last several years (SN: 9/13/80, p. 166). Characteristics of convicted rapists, whose unusually brutal acts or low socioeconomic status may have singled them out for capture, can't be counted on to represent the traits of the majority of rapists whose crimes remain unreported, says Niel Malamuth of the University of Manitoba.

In an effort to test the theory that many men possess a proclivity to rape, Malamuth and colleagues asked normal men (mostly undergraduates) in several studies to indicate, on a scale of one to five, the likelihood that they would commit rape if they could be assured of not being caught or punished. Although the results of each study varied somewhat, "a sizeable percentage of the respondents indicated some likelihood of raping," Malamuth reports. "Across these varied studies, an average of about 35 percent of males indicated any likelihood at all of raping . . . and an average of about 20 percent indicated higher likelihoods."

The finding has little value as an isolated statistic, Malamuth told SCIENCE NEWS, but men who indicated some likelihood of raping distinguished themselves in other ways. They were consistently more likely than men who reported no likelihood of raping to believe in rape myths (e.g. "women ask for it"), to show higher levels of sexual arousal in response to rape depictions, and to exhibit aggressive behavior against women in a laboratory setting. Malamuth emphasizes that the findings do not mean that the identified men will actually commit rape, but do suggest that sexual aggression against women is "a major societal problem rather than the problem of a few individuals," and provide a population in which the sources of the problem might be studied.

Video games may aid brain-injured

Already crowding corners of coffee shops, theater lobbies and arcades with their mind-teasing allure, electronic video games have moved to the hospital ward where they may speed rehabilitation in brain-injured patients. The same challenges to memory, hand-eye coordination, and logical skills that fascinate the video game aficionado can provide important stimulation for victims of strokes or traumatic brain damage, reports William J. Lynch, of the Veterans Administration Medical Center in Palo Alto, Calif.

Paraplegics who initially may have trouble steering an electric wheelchair's joystick can gain valuable practice in navigation with games that simulate driving, Lynch says, while gadgets that involve sighting and hitting a target can aid patients with visual problems. Best of all, the games are fun, an important factor in occupational therapy where pencil-pushing tasks can produce tedium and frustration. "The fact that the games use a TV screen to project video displays makes them less threatening to the average patient," contends Lynch.

Fear of failure plagues procrastinators

Many student procrastinators are neither lazy nor undisciplined, but may be perfectionists suffering from low self-esteem, report two psychologists from the University of California at Berkeley. "Procrastination creates a buffer between performance and ability," says Jane B. Burka. "By waiting until the last minute to work, performance does not reflect true ability but rather, skill at brinksmanship." Burka and Lenora M. Yuen lead students in eight weekly group therapy sessions that identify the fears of failure and needs to challenge authority that can promote procrastination.

TECHNOLOGY

Measuring the quick of time

Studies of phenomena like laser fusion demand the ability to make rapid measurements that require signal resolution in the subnanosecond range. (Light itself travels only 30 centimeters in 1 nanosecond.) This requires high-speed integrated circuits for signal processing and sensing. The fastest commercially available silicon circuits have switching times of about 0.5 nanosecond. However, in fusion experiments, this can be a long time.

As a possible substitute for silicon, Stefan P. Swierkowski, Lawrence F. Jelsma and Asher S. Blum at the Lawrence Livermore National Laboratory are studying gallium arsenide, through which charge carriers move 5.5 times as fast as through silicon at low electric fields. They are producing gallium arsenide integrated circuits based on the metal-semiconductor-field-effect transistor (MESFET). A MESFET consists of a small area on a semiconductor crystal surface selectively doped with impurity atoms and provided with three parallel conductors.

An important part of the research effort is a computer model designed to guide development efforts by simulating the MESFET's behavior. The model indicates that MESFET's will have very short switching times.

The researchers believe gallium arsenide-MESFET technology is a leading contender for producing the high-frequency analog and digital circuits needed for new measuring instruments.

A solar glass for all seasons

A sheet of glass that bends easily and transmits more light than ordinary window glass is under development at Corning Glass Works to meet the special needs of the solar industry. The glass also has to be resistant to weathering and chemical attack and have a good surface.

Corning produces the unique glass using a patented "fusion-draw" process, originally developed for making a bendable rear window for the now-extinct convertible automobile. Molten glass flows into a V-shaped trough, spills over the edges and runs down either side of the trough, sticking like honey. At the point of the V, the two flows of molten glass fuse to create a single sheet. This processing method alters the optical properties of the small amount of iron found in the glass, making the glass more transparent. This process also makes thinner, lighter glass than the more conventional float process produces.

In the last two years, the Solar Energy Research Institute has financed two production runs of the solar fusion glass and distributed samples to a wide variety of potential users. Now it is up to the solar industry to decide whether the glass should go into commercial production.

One crystal per part

Single-crystal turbine blades developed by the Pratt & Whitney Aircraft Group will get their first commercial application next year in engines for the Boeing 767 and Airbus A310. In a patented process, a single crystal grows from molten metal in a mold into the form of a turbine blade, about 4 centimeters wide and 10 centimeters long.

Conventionally cast blades develop a random grain structure, in which each grain is a tiny crystal of metal, while single-crystal blades have no grain boundaries. The nickel-based alloy used contains high levels of tantalum, chromium and aluminum, but elements, such as carbon or zirconium, which tend to reduce an alloy's strength, ductility and melting point, are no longer needed to strengthen grain boundaries.

The new blades can withstand higher temperatures so jet engines can run hotter and be more fuel-efficient.