Study takes measure of college athletes

The first nationwide survey of college athletes, including those in big-time football and basketball programs, provides both encouraging and disturbing news about these young men and women. The $1.75 million study was commissioned by the National Collegiate Athletic Association (NCAA) Presidents Commission.

"There are no great surprises in the results," Martin A. Massengale, chair of the NCAA group and chancellor of the University of Nebraska in Lincoln, told a press conference this week in Washington, D.C. "But this is truly a landmark study for college athletics and provides the first national data on student athletes."

Investigators, directed by psychologist Robert J. Rossi of the American Institutes for Research (AIR) in Palo Alto, Calif., administered questionnaires earlier this year to 4,083 students at 42 NCAA Division I colleges and universities, which include the highest-level athletic programs. Students and institutions were chosen randomly.

College athletes included football players, men's and women's basketball players, men and women with athletic grants in other sports, and men and women playing in other sports without athletic grants. The researchers also surveyed students involved in time-consuming extracurricular activities other than intercollegiate athletics, such as band, drama, student newspaper or campus work-study programs.

Data are not yet available for students uninvolved in demanding extracurricular activities or for a separate sample of black students participating in no such activities.

The study finds some encouraging similarities between athletes and "other extracurricular" students. Both groups report spending about the same number of hours per week in class, preparing for class and in social activities. The two groups are, in general, equally satisfied with their academic performance.

Football and basketball players, however, spend 30 hours per week in their sports when they are in season and 18 hours per week in their sports during the off-season, more time than they spend preparing for and attending class combined. Athletes in all sports had slightly lower grades than other extracurricular students.

About three-quarters of college athletes, including football and basketball players, do not expect to become professional athletes. The athletes are nearly twice as likely as other extracurricular students to say they intend to get a college degree in business; students with other extracurricular interests are more likely to work toward degrees in engineering, arts and humanities, education and biological sciences.

While more than a third of football and basketball players and nearly half of the other athletes report being an athlete made it easier to avoid drugs, 12 percent of the football and basketball players say being an athlete made it harder to avoid drugs. The survey did not ask about the use of specific drugs, such as cocaine or steroids.

Among football and basketball players, 12 percent reported problems in at least two of five areas: psychological distress, physical distress, difficulty in avoiding drugs or alcohol, mental and physical abuse, and poor academic performance. About 4 percent of college athletes in other sports reported problems in two or more of these areas, as did 7 percent of other extracurricular students.

Students were not asked about sources of abuse or psychological distress.

College athletes with multiple problems are found more often at institutions with successful, highly competitive football and basketball programs. The researchers plan to question these students more closely.

These and other study findings will be considered by the NCAA in upcoming discussions of college athletics policy.

– B. Bower

Supernova images and luminous arcs

Giant luminous arcs, now envisioned as the highly magnified images of distant, extremely faint galaxies, constitute a kind of cosmic mirage. Clusters of galaxies in the foreground act as gravitational lenses, distorting the curvature of space to produce multiple images of any background feature. Such a lens provides a view of galaxies that would otherwise be too distant and faint to observe in detail directly from Earth. A recent theoretical analysis suggests that it may prove worthwhile to look for images of supernova explosions within luminous arcs. Moreover, a single supernova going off within a distant galaxy is likely to show up at three different positions in the corresponding luminous arc.

"We wanted to address the question: What would be a typical factor by which the brightness of a supernova would be increased [by a gravitational lens] to see whether this is something that would be reasonably easy to observe?" says astrophysicist Bohdan Paczynski of Princeton (N.J.) University.

"Our analysis shows that such a supernova would be quite easy to see." Paczynski and Israel Kovner of the Weizmann Institute in Rehovot, Israel, report their results in the Dec. 1 ASTROPHYSICAL JOURNAL LETTERS.

Typical luminous arcs, often as much as 300,000 light-years in extent, are blue, reflecting the color of the background galaxy (SN: 1/17/87, p.36). Although researchers aren't sure why these distant galaxies appear so blue, one possibility is that the galaxies may be in a stage of active star formation. With so many young stars, supernovas would likely occur more frequently than in normal galaxies, perhaps as often as once every few years instead of every hundred years or so.

If this scenario is correct, then it would be worthwhile taking a look at all known luminous arcs, say, once a week or once a month for signs of a supernova, Paczynski says. About half a dozen luminous arcs are known, and systematic searches now in progress will probably unveil a few dozen more examples, further increasing the chances of observing a supernova.

Triple images occur because typical galactic clusters aren't quite spherically symmetric. They act as gravitational lenses with a somewhat distorted focus, creating a diamond-shaped region wherein objects produce three distinct but distorted images. The observed luminous arcs are so spectacular because they generally consist of three overlapping, extended images of the background galaxy, located near the focus of the gravitational lens.

The recent discovery of a luminous arc in which the three images are not completely merged supports this picture. "You see not a single arc but three sections of an arc, which are clearly separated," Paczynski says.

Finding multiple supernova images would provide useful information about both the geometry of the galactic clusters responsible for producing the lens effect and the geometry of the universe. "Seeing a triple image of a single event like a supernova with reasonably good positions, intensities and time delays could produce all kinds of information, which is extremely difficult to get otherwise," Paczynski says.

In particular, because light passing through a gravitational lens follows different paths to the three image locations, the flash of a supernova would arrive at different times. "Those time delays would depend on the properties of the lens and the geometry of the universe," Paczynski says. "If the lens were perfect, you would get just one image, and you would not get this time delay."

The discovery of supernova images in a luminous arc would strengthen the argument that clusters of galaxies can act as lenses and that luminous arcs truly are multiple images of distant, background galaxies. Says Paczynski, "If you found a supernova that flashes in succession in three different parts of an arc, this would be as good a proof as you could possibly imagine."

– I. Peterson