

- COUNTERPOINT -

The Quest for Clean Competition in Sports: Deterrence and the Role of Detection

Larry D. Bowers*

Can we catch every person violating anti-doping rules through just a random drug test given the current resources? No. The police cannot catch every impaired driver, so should they stop trying? Regulators cannot catch every incidence of insider trading on Wall Street, so should we cease regulation of the finance industry? And should we stop performing Internal Revenue Service audits because some people successfully cheat on their taxes?

The fundamental problem with the question posed based on a Bayesian analysis of testing numbers is that it assumes that catching every cheater through random drug testing is the sole purpose of an antidoping program. It is not. But before focusing on the role of drug testing in an antidoping program, why are antidoping rules important?

To live together and achieve societal goals, we agree to a set of rules to govern our work and play. We accept rules against impaired driving, for example, because of the potential harm to others. We accept rules that the basketball rim is 3.05 m high and the court is 28 by 15 m to have a level playing field. Violating the rules that the athlete agrees to abide by to have equitable competition has its own name: cheating. When an individual cheats, whether in sport, at work, or on their taxes, it defrauds or takes something away from others. It is ethically and morally wrong, no matter how the individual tries to rationalize it.

Cheating by violating antidoping rules is not a victimless crime. Cyclist Scott Mercier was forced to make the choice to quit the sport he loved because he was unwilling to become a fraud and risk his health. Shot-putter Adam Nelson recently received his gold medal 9 years after the 2004 Olympic contest because reanalysis of the samples with new technology revealed anabolic steroids in the winner's urine. Nelson's response: "It's not just a victory for me, but a victory for the system" (1). And these lost opportunities do not address the

millions of dollars in prize and endorsement money of which the cheater defrauds his competitors.

The essence of sport is competition, a word derived from the Latin *competere*, meaning "strive together." A contest between skilled opponents is what most people love about Olympic competition—the challenge of bringing forth an outstanding human effort when the pressure to perform is most intense. Sport at its best teaches ideals such as mastery of skills, hard work, concentration, effort, teamwork, and respect for others (2). In the absence of "striving together," we change from a sports contest to an exhibition of physical and mental skills. The Harlem Globetrotters have incredible skills, but their matches with the Washington Generals are entertainment, not a sports contest. At the other extreme, we have contests that are characterized by winning at all costs, including cheating with drugs. Competition, in its true sense, deserves a level playing field devoid of drugs (3).

The alternative to antidoping rules—pharmacological anarchy—has no merit. The playing field is not leveled by letting everyone do what they want. For example, not everyone starts with the same red blood cell mass or responds in the same way to a drug at a safe dosage. So allowing the use of drugs does not level the playing field, it just changes it. Thereafter, the combination of athlete and drug advisors willing to take the greatest risk will win the contest, and that athlete may be unknowingly participating in unregulated human experimentation. One might contemplate dividing a sport into 2 parts, 1 with unlimited drug use and 1 drug-free. That has been tried in powerlifting with poor results (4). Some individuals would cheat to win in the drug-free competition rather than finish in the middle of the pack in the unlimited competition. There is a more profound question about human character in individuals who want to win so badly that they will cheat their competitors and fans. But that question is beyond the scope of this article.

What is the objective of an antidoping program if not only positive drug tests? The primary goal is to deter the athlete from making the decision to use a performance-enhancing drug or method. The decision to not cheat is driven in part by an individual's moral inhibitions, and the athletes themselves have a role in

US Anti-Doping Agency, Colorado Springs, CO.

* Address correspondence to this author at: US Anti-Doping Agency, 5555 Tech Center Dr, Suite 200, Colorado Springs, CO 80919. E-mail lbowers@usada.org. Received June 11, 2014; accepted June 17, 2014.

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deterrence by developing a community that actively values clean competition rather than winning at all costs. In the 1980s, when anabolic steroid use was reportedly rampant, track and field athletes and football athletes strongly supported drug testing programs to curtail steroid use out of concern for their health. An effective antidoping program must include education on the value of sport and the health risks of doping to support the development of the athlete moral community.

For those individuals whose moral inhibitions are weak at the time of the decision to dope, drug testing provides an additional motivation to resist. Perceptual deterrence (5–7) is based on the assumption that individuals make rational decisions about doping, and that they weigh the benefits and costs of doping before they make that decision. There is evidence that athletes behave rationally in choosing to dope and that drug testing affects their decision. Deterrence is based on three perceptions: the certainty that the individual could be caught; the severity of the formal and informal sanctions; and the celerity of the imposition of those sanctions. Informal sanctions are the negative feedback received from significant others. A recent US Anti-Doping Agency (USADA)¹ survey of Olympic athletes confirmed research in other fields that informal sanctions have a higher perceived cost to the individual than formal sanctions.

The perception that the individual can be caught is the most important of the three factors. What can we do to increase the athlete's perception that they are likely to get caught? Catching an individual requires collecting a sample at the right time and having the analytical ability to detect the prohibited substance in that sample. Unlike the situation in the clinical setting, athletes and their unethical advisors actively attempt to avoid detection by changing routes of administration and timing of doses. The uncertainty (for the athlete) of collection timing is an underappreciated component of effective testing. For this reason, the USADA Protocol for Olympic Movement Testing from October 7, 2002, included a requirement for athlete whereabouts information to facilitate no-advance-notice out-of-competition testing. The global antidoping movement would benefit greatly from focusing on the effectiveness of collection rather than numbers of samples collected.

The incidence of doping among elite athletes has been estimated through several different kinds of studies (8–11). It is somewhat reassuring that all of the

studies have arrived at an incidence between 10% and 30%. The incidence of doping appears to vary by sex, by sport, and by country. This rate is significantly higher than the rate of reported laboratory adverse analytical findings, which are generally in the 1%–2% range. The argument that prohibited substances are detected in a small percentage of samples and therefore it is not worthwhile to test ignores the role of testing in the overall program.

As an example, antidoping programs have used longitudinal testing of hematological biomarkers and physiological steroids to evaluate an athlete's test results against their own previous results (12, 13). Some samples are collected to establish the intraindividual (normal) reference range. Not only have the results of longitudinal testing been used as evidence in antidoping rule violation hearings, but they have also been frequently used to schedule targeted testing. In addition, some number of negative tests has the effect of increasing certainty that the individual could be caught, thus deterring them from making the decision to dope. Not every negative test should be considered a "failure," but unfortunately it is easier to count positive tests than it is to measure deterrence.

Individuals change their risk perceptions according to their experiences with any system, including antidoping. Funding research into new detection methods and collection approaches, as is done by the Partnership for Clean Competition and the World Anti-Doping Agency (WADA), is also critical to maintaining a state-of-the-art testing regimen and increasing athlete perceptions that they could be caught. In addition to method development, current research contemplates use of oral fluid and dried blood or plasma spots to enhance cost-effective collection of samples. Research done primarily to support antidoping testing, such as on insulin-like growth factor 1 (14), human chorionic gonadotropin (15), and adaptive modeling (16), also has value to the broader clinical, pharmacological, and endocrinological community, a societal benefit derived from antidoping efforts. Storage of samples and retesting with state-of-the-art methods at a later date, as mentioned above, also increases the perceived uncertainty about being able to "beat" the tests.

Collection of nonanalytical evidence has become more important. Tips and substantial assistance from athletes have resulted in a number of antidoping sanctions. Cooperation with law enforcement has provided antidoping authorities with not only the Bay Area Laboratory Cooperative investigation but also materials that athletes have tried to bring across borders and evidence of illegal Internet purchases. These, along with "suspicious" (negative) test results, have been used as evidence in cases to prove use under the WADA Code

¹ Nonstandard abbreviations: USADA, US Anti-Doping Agency; WADA, World Anti-Doping Agency.

as opposed to direct detection of the prohibited substance. In the 2015 version of the WADA Code, there is increased enforcement potential to support sanctioning of doping enablers. Deterrence benefits from any method of increasing the certainty of being caught.

Should sports that are willing to pay players tens of millions of dollars a year contribute more to enforcing antidoping rules? Absolutely. Does every player, coach, and fan need to ensure that they do not adopt “decompetition” attitudes? (17) Yes. Should fans be more discerning in accepting the excuses for doping, especially when it affects their home club hero? Definitely. Should athletes be held accountable to the same standards as the rest of society? Without doubt. But these changes will take more than a testing program; they will take a steady hand on the societal rudder for the long term.

Given the challenges, why even try? Frank Deford of National Public Radio (August 29, 2012) may have said it best:

So eventually, we might doubt all the bodies. And if you doubt the voices, there is no opera; if you doubt the bodies,

there is no sport. It becomes just another entertainment with special effects.

We would truly be dopes to fail clean athletes and lose the true value of sport.

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