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Justifying anti-doping: The fair opportunity principle and the biology of performance enhancement

Summary

Doping is a complex moral and scientific dilemma and its prevention has led to a costly but less than perfect control system implemented worldwide by the World Anti-doping Agency (WADA). For a substance or method to be considered for the WADA Prohibited List three criteria are considered: (1) the substance or method has the potential to enhance, or enhances, sport performance (2) use of the substance or method represents an actual or potential health risk to the athlete, and (3) use of the substance or method violates the 'spirit of sport'. The 'spirit of sport' is defined as '…the celebration of the human spirit, body and mind' and explained with reference to a series of ideal values: ethics, fair play and honesty; health; excellence in performance; character and education; fun and joy; teamwork; dedication and commitment; respect for rules and laws; respect for self and other participants; courage; community and solidarity. These values do not lend themselves to clear-cut interpretation and are of little help in drawing unambiguous lines in concrete cases. A proposal is made of how to interpret 'the spirit of sport' in more precise ways in terms of a combination of the fair opportunity principle and a biological and evolutionary understanding of athletic performance as a result of the systematic utilization of the phenotypic plasticity of the human organism. The argument is that such understanding improves significantly the possibilities for line drawing when it comes to doping issues.

Keywords: doping, ethics, biology, performance

Background

Can the campaign in sport against the use of performance-enhancing substances and methods referred to as doping be justified? Is anti-doping a reasonable and well-informed position in the modern world of sport?

These questions may seem rhetorical. Today more resources than ever are put into anti-doping work. The 1999 establishment of the World Anti-doping Agency (WADA) is an expression of strong will to meet what is considered one of the most momentous challenges to sport ever.

Public and political consensus on anti-doping however is no guarantee for a good justification. Line drawing between acceptable and non-acceptable performance-enhancing means and methods is complex and challenging from both an ethical and scientific point of view. Some hold that the ban on doping is problematic and even unjustifiable (Brown, 1990; Black & Pape, 1997; Tamburrini, 2000; Savulescu et al., 2004). Extensive doping cases in international elite sports such as athletics and professional cycling indicate that some athletes and coaches seem to accept and indeed practice doping (Waddington & Smith, 2009).

In this paper we take a critical look at the rationale for anti-doping. More specifically, we examine the moral and scientific status of the use of banned performance-enhancing substances and methods in organized, competitive sport. Firstly, we sketch how intuitively appealing arguments in support of anti-doping cannot withstand critical scrutiny. Secondly, informed by the ideal of fair opportunity and by broadly accepted biological concepts, we propose a detailed interpretation of WADA's normative argument of doping as a violation against 'the spirit of sport'. We argue that our interpretation represents a reasonable and fertile operationalization and that it provides a sound rationale for anti-doping.

Before proceeding we ought to make clear that we do not address current anti-doping policies and whether or not their organization and implementation are rational and cost-efficient. Our concern is the normative and scientific background of the position of anti-doping; the very idea that doping is against 'the spirit of sport'.

Arguments in support of anti-doping[1]

A predominant argument in support of anti-doping is that doping is unfair. The implicit understanding of fairness seems to be one of a moral obligation on rule-adherence that arises when we are voluntarily engaged in rule-governed practices (Rawls, 1971). If as today there is a ban on certain performance-enhancing substances and methods, those who use such means break the rules. For doping to give an advantage athletes who use doping depend upon the rule-adherence of others. In this way rule violators enjoy the benefits of cooperation without doing their fair share. They cheat.

The problem with the fairness argument is that it does not really help in the justification of anti-doping as such. Justifying a rule by reference to the wrongness of breaking it implies logical circularity and is invalid. What is at stake here is the very rationale for anti-doping. In fact, the fairness argument is sometimes used to reject anti-doping policies (Tamburrini, 2000). If a significant number of athletes break the rules without being caught, a minority of rule-adhering athletes has a disadvantage. Morality does not pay. The situation is unjust and the fairness obligation becomes problematic. Actually, to restore justice an alternative could be to lift the ban and leave the choice of performance-enhancing means and methods to the athletes and their supporting systems themselves.

Stronger arguments in support of anti-doping can be found in the risk of harm. Although solid scientific evidence might be lacking in some cases, there are strong indications that extensive use of performance-enhancing substances on the doping list implies serious health risks (Hartgens & Kuipers, 2004; Tentori & Graziani, 2007). We take as a premise the significant health hazards and even the risk of death linked to the extensive use of, for instance, anabolic androgenic steroids (AAS) and erythropoietin (EPO).

This view also follows official justification from WADA. For a substance or method to be considered for the WADA Prohibited List, the two first criteria that have to be met are (1) medical or other scientific evidence, pharmacological effect or experience that the substance or method has the potential to enhance, or enhances, sport

[1] The discussion is based on Loland (2011).

performance; (2) medical or other scientific evidence that the use of the substance or method represents an actual or potential health risk to the athlete.[2]

At elite levels, however, performance enhancement strategies often involve significant risks of harm. Long term and hard training pushes the limits towards overtraining and possibly injuries. Similarly, competition itself can lead to acute injury. In some sports the risk of harm can even have a constitutive and valuable function. In parachute jumping and downhill skiing there is an inherent possibility for serious harm and death. In boxing, avoiding pain and harm oneself and imposing pain and harm on opponents are important technical and tactical challenges. An argument on anti-doping due to health risks could be developed into a more general argument against the practice of elite sport as a whole.

Such a conclusion is unreasonable as no distinctions are made between kinds and relevance of risks as related to the nature of sport. Different social institutions and practices are defined by different goals and values. In medicine, the overriding goal is to prevent and treat illness and thereby to maintain and restore health. In other settings health is given lower value. The Olympic motto *Citius, altius, fortius!* expresses the strong drive in elite sport of improvement, of realizing athletic potential, of testing the limits and possibilities of individual and team performance. The challenge is to put in the necessary effort to succeed and at the same time to avoid injuries. One of the important challenges in both downhill skiing and boxing is the proper calculation and taking of risk. Health risks linked to doping seem to be of a different kind. Why?

'The Spirit of Sport'

An idea often expressed by sport leaders and athletes is that drug-enhanced performance comes about without training and individual effort or contribution. Performances based on pharmaceutical means are considered 'un-natural' and 'artificial' and the risk involved is therefore considered unnecessary and non-relevant (Hoberman 1992; Houlihan 2003).

[2] See article 4.3.1 in the WADA Code, http://www.wada-ama.org/rtecontent/document/code_v3.pdf. Accessed July 26, 2009.

Interpretations of what is 'natural' and 'artificial' however are to a large extent social and cultural constructions that change over time. During most of the 20th century there was a strong and enduring resistance against women's sports as they were considered against female nature and ideals of femininity (Guttmann, 1991). In many sports requirements on amateurism and a controlled 'manly' style of performance have been replaced by an ethos of efficiency and performing at the limits of exhaustion.

In the current situation however the idea of drug-enhanced performance as somehow undeserved and contradictory to sport values seems to have grown strong. Questions of anti-doping seem to go straight to the heart of discourses on the meaning and value of sport. A well-justified standpoint necessarily needs to build on an interpretation of what sport is all about.

WADA has recognized this and refers to a third criterion for the prohibited list: the substance or method under consideration violates 'the spirit of sport'. In the so-called 'fundamental rationale' for the WADA Code, 'the spirit of sport' is defined as '…the celebration of the human spirit, body and mind', and it is characterized by the following values:

- Ethics, fair play and honesty
- Health
- Excellence in performance
- Character and education
- Fun and joy
- Teamwork
- Dedication and commitment
- Respect for rules and laws
- Respect for self and other participants
- Courage
- Community and solidarity [3]

[3] http://www.wada-ama.org/rtecontent/document/code_v3.pdf, p. 3. Accessed July 27, 2009

From a philosophical and practical point of view these are general references and hard to apply when it comes to concrete cases and line drawing. What does 'the spirit of sport' mean in practice? How can the idea be interpreted?

Athletic Performance and the Fair Opportunity Principle

Independent of individual motivation among participants and the variety of social and cultural contexts in which sport takes place, the demarcation criterion distinguishing sport competitions from other social practices, or what is sometimes referred to as their structural goal, isto measure, compare and rank participants according to athletic performance (Loland, 2002). The core of sporting rule systems, or what is often called the constitutive rules of a sport, includes definitions and regulations of such performances. In football, the point is to score more goals than the opposing team without touching the ball with the hands and without being in an offside position. In the javelin throw, participants strive to throw the javelin the furthest given only a fixed number of attempts.

Rules of anti-doping differ to a certain extent from constitutive rules as they regulate performance-enhancing substances and methods outside of the competitive setting. They can hardly be labeled constitutive as the realization of soccer games and javelin competitions are possible without them. In the discussion of anti-doping it is necessary to proceed from the structural goal of competitions and their constitutive rules to a more general normative and scientifically informed understanding of athletic performance.

An athletic performance is a complex human phenotype and the outcome of a high number of genetic and environmental influences from the moment of conception to the moment of performance. For the purpose of analysis a distinction between genetic and environmental factors makes sense.

Genetic factors are the predispositions for developing the relevant phenotypes for good performances in a sport (Bray et al., 2009). A person with good predisposition is usually characterized as a 'talent'. Talent in this sense is distributed in the so-called 'natural lottery' and based on inheritance.

Athletes develop their talent through gene-environment interactions. The extent to which talent given performance capacity can be enhanced by training is itself a genetic trait (Bouchard et al., 2001). Both genes and environment exert impact from the very first nurture via development of general abilities and skills to specific training and the learning of the particular techniques and tactics of a sport. Environmental influences are based in part on chance and luck (a person with a talent for running is born next to atrack and field facility with a good coach) and in part on own effort (the person realizes his or her talent through hard training over many years).

A critical question is whether all kinds of inequalities linked to performance, also including those caused by performance-enhancing drugs, are of relevance in sports, or whether some inequalities ought to be eliminated or compensated for.

Typically, questions of equality and inequality raise discussions of fairness and justice. A general fairness idea found in many moral theories (Beauchamp, 2001, 372-74), goes as follows:

> Persons should not be treated unequally based on inequalities that they cannot influence or control in any significant way and for which they therefore cannot be claimed responsible.

This can be called the fair opportunity principle. In democratic societies, distribution of basic goods and burdens are built upon this principle to a large extent. For example, physical and mental handicaps or other unfortunate conditions in life are compensated for by financial support and integrative efforts in work and leisure.

The fair opportunity principle seems to have implications in sport as well (Loland 2002, 2009). One example comes from classification. Athletes are classified according to sex, age, and sometimes body size. A lightweight boxer is not matched with a heavyweight as the outcome usually is given. Female sprint runners do not compete with male runners.

One possible reason is a quest for uncertainty of outcome. In general, one-sided contests are enjoyable neither to participants nor spectators. This however cannot be

the only rationale. If this were the case we could imagine all kinds of competitive setups such as between humans and animals or between humans with very different performance capabilities who are given handicaps.

This however seems to contradict general conceptions of what sport is all about. Classification in sport is better understood as an expression of the principle of fair opportunity. Looking across a series of sports, the idea seems to be to evaluate inequalities in performances that are primarily linked to and influenced by choices and efforts of the athlete and as such to a large extent under athlete responsibility. For this reason athletes are somehow identified with their performances and admired or criticized based on the extent to which they are able to realize their potential. Lack of classification disturbs such responsibility and leaves inequalities in genetically based 'constants' such as body size and biological sex with significant and systematic impact on the outcome. Therefore boxing fights between unequal parties and mixed races among elite sprinters are considered unfair.[4]

Philosophers concerned with potential moral qualities in sport support the fair opportunity principle for several reasons. One common justification is the Kantian one. Fair opportunity builds on the idea of persons as to be treated as ends and never as means only. Competition is considered an advanced form of cooperation in which individuals and teams do their utmost to out-perform each other while at the same time treating each other with mutual respect and as equals (Loland, 2002). In neo-Aristotelian terms, the fair opportunity principle is linked to the development of moral character or virtue (Morgan, 2006; McNamee, 2010). Training to realize one's talent takes will power, dedication, and hard work. Competing well takes courage, concentration, the ability of doing one's best and never giving in, and honesty and dignity both in victory and defeat. These human qualities are seen to have meaning over and above the sport setting. Philosophers define them as moral virtues. Murray (2007) sums up by referring to the normative ideal of sport as 'the virtuous development of natural talent towards human excellence'.

[4] There is of course much room for improvement of fair opportunities in sport. In some sports, there is a need for more classification, other sports classify too much. For instance, basketball and volleyball in which body height is crucially important to succeed there seems to be a rationale for classification according to height. In other sports such as in rifle shooting or archery, biological sex seems to be irrelevant to performance and sex classification ought to be abandoned.

How much further can the fair opportunity principle take us in the discussion of anti-doping?

Anti-doping Revisited

The fair opportunity principle and ideas of human excellence are normative premises and thereby matters not primarily of empirical investigation but of reason and argument. To check out their relevance they need to be applied and if necessary adjusted in practical situations and in relation to basic, scientific facts. Such reasoning is a key characteristic of practical ethics and can be performed in various ways. Based on Rawls' theory of justification by a 'reflective equilibrium' our aim is to search for positions towards anti-doping in which basic normative premises and scientifically informed and considered judgments in practical situations are mutually supportive and cohere.[5]

Let us start with a thought experiment. Let us assume that doping has not been a contributor to the general improvement of athletic performance in recent history. Then three major areas, technology, biomechanics, and training sciences, can be identified as contributing to improved performance. In most sports, technology (including use of novel materials) is controlled by tight regulations and standardization through the federations. Although at times there are intense discussions of technological innovation and fairness, equality of opportunity is secured in general. Biomechanics has helped to improve performance by providing a better understanding of how human movement techniques can be optimized to achieve better results. Advances in biomechanics and movement techniques do not result in improvement without trial and error-processes and the efforts of athletes and coaches themselves. As long as new techniques do not give rise to health hazards, they do not lead to ethical inquiry. With regard to anti-doping, it is thus improvement by training that requires our scrutiny.

Training sciences include both social sciences such as psychology and pedagogy and natural sciences such as physiology, biochemistry and molecular biology. The

[5] For an explanation of the idea of 'reflective equilibrium' in ethics, see Rawls 1971: 19-22, 48-53.

substances and methods discussed in doping issues are primarily of a bio-medical kind. In a comparison with training therefore biology will be the main perspective.

In training, appropriate modulations of the internal working of an athlete's body (physiology) are responsible for a desired gain in athletic ability. The same holds true for performance gains obtained by using doping agents. Let us look first at the biological basis of training induced improvements in human exercise capacity. In exercise training most if not all tissues of the body are subjected to stress. For muscle tissue this may be an extraordinary high load (mechanical stress) to which the fibers of the trained muscles are subjected. On the cellular level this mechanical stress is transmitted via a mechanical link (integrins) from the outside of the muscle cell (i.e. the connective tissue attached to the tendons) to the inside of the muscle cell. In the inside of the muscle cell the transmitted mechanical stress is setting off a number of biochemical reactions (signaling cascades) that end up regulating in a complex manner the rate at which genetic information is transcribed and/or translated into functional proteins (Hoppeler et al., 2007). This is done in an attempt to repair eventual damage that occurred during exercise (compensation) but also in order to better prepare the cell for a similar stress in the future (super compensation).

In a similar way exercise training related disturbances of metabolism, of hormonal status and of neuronal activation all set off independent but massively interlinked signaling cascades not only in muscle cells but in essentially all organs. These mechanisms serve the goal to compensate for exercise related stress and damage and to make organs performing better in future use. Biologically speaking, exercise training consists in using repeated stress situations of the organism in order to improve its performance under the specific stress conditions. On the molecular level this means using signaling cascades to modify the transcription and translation of specific genetic information useful under particular stress conditions (Coffey & Hawley, 2007). Training can thus be seen as a multi-organ and multi-gene response of our organism to a specific stress. The capacity to adapt to training appears as a consequence of evolutionary selection of organisms with a "built in" capacity to adapt to external stress by modifying (in the case of interest, performance related) aspects of the phenotype (Nussey et al., 2007; Wittkopp, 2007; Callahan et al., 2008).

Let us now look at what happens inside the body when we take a performance-enhancing substance as those listed on WADA's doping list. Doping agents are intermediates, end products, or modulators of biological processes in our body that have a desired ergogenic (performance enhancing) effect. They can be identical to the body's own products (EPO, testosterone, red blood cells) or they can be chemically constructed to act in a desired way (anabolic steroids, beta blockers). In essence, they produce a beneficial physiological effect in an athlete without invoking the complex organismal reaction described for the training stress response. Doping agents are thus specifically targeted to improve body functions (i.e. muscle strength or aerobic capacity) of relevance to performance with minimal disturbance of cellular and organismal homeostasis.

The particular case of EPO can serve as an example. If we inject the body with EPO, the main response is that the number of red cells produced in our bone marrow is increased (as EPO stimulates red cell precursor cells to replicate more rapidly). An increase in red blood cells in the periphery helps in transporting oxygen from the lungs to the muscles, increasing aerobic performance capacity relevant for all endurance type sports. In experimental situations performance gains of up to 7 % have been realized with small increases in red cell blood mass, such as those easily realized with EPO applications or blood transfusions (Ferretti et al., 1992; Ekblom, 2000).

Now, let us look at a situation in which EPO is increased as a consequence of exposing the organism to hypoxia (lack of oxygen), a particular condition found at altitude and simulated in oxygen deprived environments (hypoxic tents etc.). Under these conditions most cells of the body respond to the decreased levels of oxygen by intracellular signaling leading to the production of HIF-1 (hypoxia inducible factor 1). HIF-1 is a transcription factor which is capable of turning on the EPO gene which then in turn produces the EPO hormone responsible for increasing red blood cell mass with all associated effects described above (Stray-Gundersen & Levine, 2008). This response can be seen as a reasonable body reaction to being at altitude. However, HIF-1 is a master gene and has many more actions than just increasing EPO levels in the circulating blood (Maxwell, 2005). HIF-1 has been shown to be a key regulator of a hypoxia response in most organs of the body comprising a switch

of the body metabolism towards using carbohydrates as a substrate, to increase substances that influence growth of blood vessels and dozens of other organismal reactions. Some of these reactions may be beneficial; some may be detrimental to performance. The outcome of exposing athletes' bodies to hypoxia is both wanted and unwanted reactions in regards to enhancing performance. By injecting EPO you essentially only get the increase in red cell mass that is favorable to endurance performance.

Similar cases could be made for other substances that are used as doping agents as they are biochemical agents that are intended to have performance enhancing effects such as EPO. Other substances exert anabolic effects such as steroids that stimulate muscle growth. Some substances are agonists. They mimic the action of substances that occur naturally in the body (steroids). Others have antagonistic effects. They are not produced by the body and prevent biochemical agents produced in the body to interact with their receptors (beta-blockers). In general, it can be said that doping substances and methods interact with biological targets and have desirable performance enhancing characteristics in addition to the training activities of an athlete.

We turn now to the normative premises and our reinterpretation of 'the spirit of sport' in terms of the fair opportunity principle and ideals of human excellence. To a certain extent it makes sense to say that substances and methods on WADA's prohibited list enhance performance independent of talent. Training on the other hand invokes the phenotypic plasticity of the human organism, a consequence of the specifics of the evolution of the human species. Accepting bodily reaction patterns and using the innate adaptability of humans to physical challenges cohere with the idea of developing natural talent. Most substances and methods on the doping list are qualitatively different because they bypass the body's natural and evolutionary based complex stress and compensation reactions. The use of prohibited substances and methods overruns natural talent, reduces athlete's possibilities of developing sporting excellence as human excellence in virtuous ways, and contradicts the spirit of sport as interpreted here. Based on these premises, the position of anti-doping can be justified.

On this basis the traditional arguments on health and fairness can be revitalized as well. The health risks involved in the use of substances and methods on the banned list do not seem to add value to the practice of sport. Such use does not cultivate athlete abilities and skills but tends to transfer responsibility for performance towards bio-chemical and medical expertise. From the fair opportunity perspective, this implies unnecessary and non-relevant health risks that should be avoided. Moreover when a ban on doping is justified without references to the wrongness of breaking it, anti-doping has a solid fundament and the fairness argument becomes valid as well.

Concluding Comments

Questions of the justification of anti-doping cannot be separated from questions of the value and meaning of sport. Anti-doping cannot be based on fairness and health arguments alone but rests ultimately on a normative view of sport and more specifically of athletic performance. We have argued that WADA's rather vague references to 'the spirit of sport' need to be and indeed can be operationalized.

We have combined a close understanding of fair opportunity with a biologically based understanding of training. The latter is seen as the systematic utilization of the phenotypic plasticity of the human organism that on a more general level is a consequence of the specifics of the evolution of the human species. The use of most substances and methods on the banned list is akin to 'short cuts' in performance development as it trespasses, often in harmful ways, human phenotypic plasticity. This seems to move the responsibility of performance from the athlete towards external expert systems, and it goes against the fair opportunity principle and the idea of the virtuous development of talent towards human excellence.

Our argument warrants at least two immediate comments. Firstly, we do not claim that our approach will solve all line-drawing problems between acceptable and non-acceptable means and methods. Neither is this surprising. Line drawing when it comes to the use of performance-enhancing substances and methods is a complex ethical and scientific field that requires continuous critical scrutiny. Our argument is simply that our interpretation of 'the spirit of sport' provides a more precise and better justified guideline for line drawing than what is currently the case.

Secondly, we acknowledge that there are alternative normative interpretations of sport leading to other positions in the debate over anti-doping. For instance, as argued by Savulescu *et al* (2004), a restrictive attitude towards performance-enhancing substances in sport seems anachronistic and irrational. In competition, fair opportunity is crucial. Athletes outside of competitive settings ought to follow the laws and regulations of their societies and be able to choose whatever performance-enhancing strategy they prefer. From this perspective, new bio-technology is considered to have significant liberating and empowering potential and needs to be met in liberal and non-prejudiced ways.

We welcome an open debate on the scientific and ethical aspects of anti-doping but believe that in the current situation the liberal approach is sociologically naïve and put athletes at the risk of exploitation. We have argued for a position towards anti-doping based on the fair opportunity interpretation of 'the spirit of sport' combined with an understanding of performance enhancement as the utilization of the phenotypic plasticity of the human organism. In our view this provides a solid underpinning for a position opposing doping practices, empowering athletes, and advancing sport as a sphere of human excellence.

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