

Gene-Doping: Sport, Values & Bioethics

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Abstract

This paper problematises the ethics of genetic modification (GM) in sport by outlining the perspectives of four organisations which have recently spent time considering the subject: the International Olympic Committee, the World Anti-Doping Agency, the United States President's Council on Bioethics, and the Australian Law Reforms Commission. The paper outlines scientific developments in genetic research, which might make realisable the genetic engineering of athletes. Subsequently, an overview of the varied perspectives of the four organisations is given, by articulating the moral discourses which is present through each. Various arguments are recognised as having importance in reaching a conclusion about whether GM in sport should be legal or not. In particular, these arguments comprise concerns about safety, fairness, and moral character. It is suggested that reflective bioethical investigations can assist the development of a coherent ethical policy about genetics in sport, by informing sports ethics with a rich basis of literature dealing with such central concepts as personhood, autonomy, and humanness. In conclusion, it is argued that sport ought not approach GM in a comparable manner to how it has approached doping, as GM entails a much wider breadth of ethical implications, often unrelated to sport.

Keywords: *sport, bioethics, genetics, fair play, doping*

Introduction

The prospect of genetic manipulation to assist athletes in competition has been the subject of debate for some important institutions in the last 2 years and a recurring theme at many recent scientific conferences. In June 2001, the International Olympic Committee (IOC) Medical Commission held a working group on gene therapy, concluding that "Gene therapy holds great promise for all people including athletes competing in Olympic sports. We endorse the develop-

ment and application of gene therapy for the prevention and treatment of human disease. However, we are aware that there is the potential for abuse of gene therapy medicines and we shall begin to establish procedures and state-of-the-art testing methods for identifying athletes who might misuse such technology” (4).

Later in the year, the World Anti-Doping Agency (WADA) scheduled a meeting titled the ‘Genetic Enhancement of Athletic Performance’ (10), due to take place at the Cold Spring Harbour Laboratories, New York in September. However, subsequent to the terrorist attacks in New York on September 11, the meeting was postponed until the following March (2002). At this meeting, WADA officials, geneticists, and ethicists gathered, making similar conclusions to the IOC working group. However, delegates at the meeting emphasised that scientific progress in this area is such that any attempts at enhancement would be unethically largely because they are currently *unsafe*. Importantly, in the concluding statement of the conference was a note stressing the need to include a reference to so-called ‘gene-doping’ in the anti-doping code, the core document of anti-doping policy and the basis of determining what is considered a legitimate performance modification in sport. This recommendation was later written into WADA’s new revised draft of the code in 2002 (due for implementation in 2003), along with a distinction between modifications (in general) that enhanced performance (illegal) and those that did not (of which there is now no prohibition).

These sporting institutions have not been alone in taking an interest in GM for sport. On 11 July 2002, the United States President’s Council on Bioethics (9) met to discuss the prospect of genetic manipulation for sport. The Council received a paper from Dr. Theodore Friedmann, who also serves on the WADA Health & Medical Research Committee, and who has been involved with this topic for some time. Dr. Friedmann outlined the scientific possibilities and together with the Council, discussed the ethical implications of the technology.

Additionally, the Australian Law Reforms Commission (ALRC) published a paper late in 2001 concerning the use of genetic information (1). One section of this paper was dedicated to ‘other uses,’ which included the potential legal issues arising from using genetic information and genetic testing in sport.

These broad interests give a rationale for considering the varying ethical issues arising from GM in sport. This paper will begin by outlining some areas of genetic research, which might have implications for the GM of athletes. Next, I will give an overview of ethical issues concerning GM in sport by outlining the various discourses of key organisations interested in the topic. Finally, I will consider how perspectives in bioethics can inform the approach to this problem.

The Science

It is widely recognised that the present level of sophistication in genetic research is such that the applications to sport are highly unlikely. With relatively

few successes in gene therapy, the prospects for genetic transfer technology seem uncertain, though pessimistic. However, this is no basis upon which to conclude, therefore, that the possible applications to sport are of no serious ethical concern. It is possible to identify a number of emerging studies in genetic science, which could lead into sporting applications. For example, IGF-1 or insulin-like growth factor might be used by athletes for boosting muscle mass, even though its medical purpose is for treating muscle wasting disease. Dr. H. Lee Sweeney at University of Pennsylvania (USA) and separately, Geoffrey Goldspink at the Royal Free and University College Medical School in London, who have made similar findings, are undertaking research in this area. Using a form of IGF-1 called mechano growth factor (MGF) with mice, which is used to treat muscle-wasting diseases such as muscular dystrophy, Goldspink's team were able to isolate muscle tissue and insert the MGF gene. The results showed an increase in muscle mass by approximately 20 percent after two weeks. At Harvard University, Dr. Nadia Rosenthal used IGF-1 in gene therapy in mice to halt depletion of muscle strength that comes with old age. As Rosenthal notes, "Older mice increased their muscle strength by as much as 27 percent in the experiment, which suggested possibilities for athletes as well as for preserving muscle strength in elderly people and increasing muscle power in those who suffer from muscular dystrophy" (6).

Additionally, genetically engineered erythropoietin (EPO) might also be used to boost an athlete's performance on the genetic level. EPO has the potential to increase endurance capabilities, though its medical application is to increase the hematocrit level in patients with chronic renal disease. Research identifies the effects of inserting genes into a virus to produce a specific bodily effect. For example, at the University of Chicago, Jeffrey Leiden used an adenovirus to deliver EPO to mice and monkeys, to observe whether it would render a difference in biological capabilities. By inserting the gene into a virus strand, it was transported throughout the body and did, indeed, have the effect of increasing the level of red blood cells that were being pumped around the body. In performance, this produces a similar effect to that of blood-doping, which operates on a similar principle by re-introducing blood into the body to boost the amount of oxygen being transported around the body, to offset fatigue. Thus, genetically inserting EPO into an athlete could increase the capabilities for endurance when active, which would be useful for any long distance event. Similar work has been conducted by Dr. Steven Rudich, of University of Michigan, where inserting EPO into the leg muscles of monkeys produced a significantly elevated red blood cell level for 20 to 30 weeks (6).

Other emerging research from Lin et al. (5) includes the gene 'PGC-1', which is known to tell other genes in muscle whether they should be turned on or off. The implications of manipulating this gene entail the possibility of being able to switch on those muscle fibres (fast or slow twitch) which are most con-

ductive to an athlete's chosen sport. Alternatively, the ACE gene (angiotension-converting enzyme) has been received by Montgomery et al. (7, 8) and is claimed to be associated with endurance capabilities. Collectively, these findings are providing a scientific basis for arguing why there are serious concerns about the ethical status of sport in the era of GM and this seems reflected by the breadth of institutions, which are taking this matter seriously.

The Good and Bad of Genetically Modified Sport

There are two bodies of literature that can claim some informed opinion on the ethics of GM in sport. These comprise the sub-disciplines of 'philosophy of sport' and 'philosophy of medicine', more specifically, 'sport ethics' and 'bioethics'. Though it is only really the former of these that has spend considerable time problematising the ethics of performance modification in sport. Since the publication of W.M. Brown's, 1980 article 'Ethics, Drugs & Sport' (2) the *Journal of the Philosophy of Sport*, has maintained a discourse about doping and sport for the last two decades. Interestingly, despite the considerable overlapping of medical ethics with sporting issues relating to human enhancement, there has been only a limited amount of interaction between scholars of the different disciplines. This can be explained in at least two ways.

First, it can be argued that sport ethics is already subservient to medical ethics. Thus, what is ethically acceptable in sport relating to drug enhancement and doping, is already contingent upon what is ethically acceptable in medicine. For example, a sports physician cannot and ought not prescribe potentially performance-enhancing drugs, unless the athlete requires such drugs to alleviate any illness. However, this matter is not straightforward and it is no easy task for a physician to decide how best to treat their athlete-patient – more as an athlete or more as a patient. It is quite evident how this is an ethical quandary for a physician. From the long-term health of the individual, it might be wiser to treat the person as a patient and give little value to their sporting career. However, if the individual gives a great deal of value to their sporting career and is prepared to make long-term health sacrifices in order to be excellent in sport, then it might be in the patient's best interests to receive treatment that makes them well for sport, rather than well for life.

The other reason is remarkably similar in form, which is to argue that sport is separate from broader social norms and rules and operates within its own system of logic. As such, it need not be beholden to, say, general guidelines in medical ethics. On this basis, the aspiration of sport ethicists is to problematise sport as a moral practice, rather than as a context within medical ethics. Consequently, the application of medical ethical arguments in the case of GM in sport are not as relevant as sports ethical arguments about what, for example, constitutes the 'good game.' Thus, even though sporting practices are highly constituted by

what is medically acceptable, the critical question for sports ethicists would be whether or not they should be. If sport ought not to be restricted by what is medically ethical, then conclusions about GM in sport might be quite different. This casuistic approach to ethics need not depart from the literature in medical ethics, though relies considerably more on the context of sport rather than the context of medicine.

Varied Interests, Varied Arguments

An important aspect of the GM in sport discussion is to recognise the highly political context to the discussion. At the beginning of the paper, I outlined a number of different organisations, which have recognised the concerns arising from GM in sport. Each of these organisations approaches the subject from a different perspective with different interests and this is reflected in the discourse emerging from their varied meetings. Collectively, they provide a useful overview of the varying arguments in favour or against the use of GM in sport. It is useful to discern the varied interests of these organisations so as to understand why a particular discourse is emerging from each of them.

The International Olympic Committee and the World Anti-Doping Agency

The IOC and WADA comprise two of the most important institutions in the world to have created an anti-doping legacy. The modern debate about doping emerged in the mid-1960s, as a result of some fatal incidents in competitive sport. Of particular importance was the death of English cyclist Tommy Simpson, whose enduring drug-induced image is remembered during his final race in the Tour de France in 1967, during which he collapsed and later died (3). Since then, the IOC Medical Commission has worked to rid drugs from sport, though the consistency and logical basis of their policy has often been questioned.

WADA emerged in 1999 as an adjunct to the IOC, taking over its anti-doping programmes largely to ensure impartiality and rigour in the formulation of anti-doping priorities. The WADA meeting in March 2002 was the first occasion that genetic-doping has been discussed in any formal manner within the organisation and the meeting was praised for having invited the perspectives of a broad range of experts, including geneticists, sports ethicists, bioethicists, as well as coaches and athletes. Nevertheless, the 'agenda' of WADA (and the IOC) was set before the meeting took place. For WADA, the interest has always been to prevent the existence of GM in sport, before it takes place. As noted in the introduction, WADA has now included a reference to gene-doping in their anti-doping code, condemning its use for anything other than therapeutic purposes. Both the IOC and WADA make two major concerns explicit, which are for the promotion of *fair play* in sport and for the health and *well-being* of athletes. However, rarely

are these terms problematised through investment in philosophical research, despite them being highly contested concepts. On one view, it could be argued that GM in sport can promote fair play, by allowing all individuals the opportunity to engineer a genetic disposition that is optimal, though undoubtedly such a view is not reflective of the IOC or WADA intended meaning of fair play. Neither of these organisations is concerned about potential athletes whose body type does not fit the parameters of elite sport, nor are they concerned with providing opportunities in elite sport, whereby persons of varying body types can become elite. For example, there is no motivation for creating a form of volleyball with a lower net for individuals who are too short to excel in the sport at an elite level. This kind of inequality or inaccessibility is not given much importance in the discussions about fair play in sport.

The United States President's Council on Bioethics

The President's Council meeting presents a quite different kind of discourse to the IOC and WADA meetings. Consulting the minutes of the meeting, it is immediately apparent that the perspective of the Council is less concerned about sporting values and has less sympathy with protecting an alleged integrity of sport. Nevertheless, the perspectives emerging from the meeting are varied and might be summarised thus:

- The Romantic View
- The Entertainment View
- The Techno-Centred View

The 'Romantic View' is most comparable to that asserted by the IOC and WADA and is concerned for an alleged integrity of sport, which is seen as being threatened by the technology of GM and other forms of doping, such as drugs. The 'Entertainment View' recognises sport as an entertaining enterprise, where it is valued primarily for providing extraordinary performances. In this case, GM could enhance the entertainment value of sport and would thus be desirable. Alternatively, GM might reduce the entertainment value of sport, since spectators might lose faith in the 'human' characterisation of sport. Finally, the 'Techno-Centred View' of sport recognises technology as an integral aspect of sport, not separate or negative aspect of it. In this case, GM in sport can be seen as simply a sophistication of sport's inherently technological character and can be legitimate for this reason.

The Council also raises some general points of argumentation, contrasting 'individual autonomy' perspectives with concerns about the value of 'social practices.' Here, the Council engages with the ethical limits of paternalism, recognising that if athletes are fully informed of the risks, then there seems no reason to prevent them from using such technology. However, it was also recog-

nised that, since genetic technology is at such an early stage, it is not currently possible for athletes to claim that they are 'informed' since we simply do not know enough about the risks. It was also recognised that the genetic issue in sport is comparable to the performance modification questions in sports generally, which did not seem recognised in the WADA discussion, which, I suggest, are overly focused upon the 'doping-like' comparisons.

The Council also questioned the role of medicine in the process towards GM in sport. Of interest have been the problematisation of the therapy/enhancement distinction and the epistemological difficulties of asserting what constitutes a 'normal' disposition, from which one can reject being 'abnormal'.

In sum, the President's Council arguments fall broadly under concerns about: safety, fairness, and character, where character is the primary ethical concern. However, both safety and fairness are argued as secondary issues, since each could be overcome while maintaining the moral integrity of sport. Certainly, Council members were not convinced that GM might level the playing field, though this is not only because we cannot know the outcome of GM and whether it might affect different people in different ways. Rather, and more persuasively, their contention is that it cannot be concluded in the first place that one individual is genetically superior to another. For example, let us suppose that the phenotype of two endurance athletes could be compared and it were possible to identify the capability of their respective 'endurance genes'. In making its claim, the Council is arguing that any such difference between the athletes does not warrant the conclusion that one athlete is more superior than the other, since that would be to prioritise the value of only one gene rather than to give a balanced appraisal of the genetic capabilities of each individual. For this reason, genetic superiority cannot be used as a basis for concluding that GM is legitimate.

In conclusion, the Council argue that what matters most in sport are the 'means' by which achievements are gained and that this is largely related to appraising the character of the athlete. On this basis, GM has little value because it does not have any bearing upon the athlete's character and to allow its use would make it more difficult to appraise the capabilities of the athlete.

The Australian Law Reforms Council

The ALRC has an approach comparable to the President's Council. It has neither preconceived interests in sporting values, nor any strong appreciation for sport ethics. Rather, its concern is for the legal implications of using genetic information. Their perspective is interesting largely because it is quite distinct from the other two discussions, which focus upon emerging technology. In contrast, the ALRC concerns rely upon comparably rudimentary technology, though which still give rise to considerable ethical and legal concerns. Their discussion paper about the use of genetic information identifies that sporting authorities

might misuse such information to the detriment of individual athletes' rights. For example, the ALRC state that,

genetic testing may lead to discrimination against certain athletes. For example, an athlete with a susceptibility to a particular injury may never in fact develop the injury, but may be dropped from the team by management in an effort to avoid potential liability if the injury manifests. Alternatively, a sports co-ordination body may seek to impose certain conditions on players to minimise its own liability for any injuries they may suffer. For example, the Professional Boxing and Martial Arts Board (Vic) has proposed the genetic testing of all professional boxers in Victoria as a condition of their license to fight (1).

The ALRC approach is also noticeably more reflective than either the IOC, WADA, or the President's Council. Importantly, the ALRC paper is proposed as a discussion paper, and their focus is not strictly ethical. Nevertheless, their concern is significantly more for the genetically modified athlete rather than the sporting practice and they recognise that the existence of genetically modified persons – athletes or otherwise – cannot simply entail the disqualification of such persons from social practices.

Conclusion: How 'Reflective Bioethics' Can Help

Presently, the emerging perspective in sport is to rid sport of GM before it even enters into competition. This method of prevention rather than cure is certainly desirable from the perspective of principle-based medical ethics, and is certainly a departure from much of what has become the legacy of anti-doping policy. For many years, such policymaking has been largely 'reactive' rather than 'proactive,' due largely to the difficulty of foreseeing what kinds of doping methods will emerge. However, the approach to the sport problem ought not to be informed only by traditional medical ethical principles. Indeed, it seems reasonable to argue that there exists a tension within the medical community about the benefit and value of genetic technology and that this tension has given rise to a crisis of medical ethics. Increasingly, it seems that medical ethical principles are confounded by new technologies, which encompass a number of circumstances that complicate the ability to apply ethical principles. Moreover, it is not even clear that the old principles of autonomy, justice, beneficence and non-maleficence are still applicable. In the emerging bioethical discourse, each of these principles can be contested, particularly in respect of genetic technologies.

The term 'reflective bioethics' has been used elsewhere as a means to challenging the principled approach to medical ethics and even to sever medical ethics from its stanch, strictly moral philosophical roots.

My reasons for introducing bioethical studies into the discussion about anti-doping in sport are threefold. First, it is my contention that the study of sport ethics and the development of anti-doping policy require further integration

with medical ethics literature. This is not to advocate sport as being subservient to medical principles in ethics. Rather, it is to acknowledge that the process of argumentation within these distinct subjects borrows from similar methodologies and uses similar concepts. For example, the concepts of naturalness, personhood, humanness, normalcy, autonomy, and integrity are all discussed in great depth both in sport ethics and bioethics, though very rarely have the two disciplines sought to inform each other's respective analysis.

Second, it is necessary to recognise that the GM issue in sport is not only a sporting problem. It is not only the case that athletes might seek to use GM as a means to performance enhancement. Instead, it is also realistic to expect genetically modified humans to seek sport as a means by which they might prosper. Consequently, sporting authorities are not only dealing with athletes who are trying to cheat. They are also dealing with individuals who have been modified for non-sporting reasons, but who might be particularly gifted for sport for this reason. As well, decisions made about the use of GM in sport cannot be divorced from the social context within which they are situated. If specific forms of GM are considered socially acceptable, then it might not be sufficient to maintain their prohibition from use in sport.

Finally, a reflective bioethics discourse can enrich the discussion about GM in sport as it can assist in revealing how this discussion provides greater insights into the ethical concerns about genetic technology generally. In sum, if it were possible to combine the varied interests and arguments of the different institutions outlined here, then, I would suggest, a more satisfactory approach to the GM problem in sport could be ensured.

It is not satisfactory for sporting authorities to simply reject GM from sport. Nor is it satisfactory to simply employ the flimsy 'therapy/enhancement' distinction as a basis of legitimacy. Moreover, sporting authorities cannot approach the problem expecting only to deal with so-called 'cheats' who are deemed to be flouting sporting rules and values, rather than merely rejecting the philosophically weak foundation of anti-doping rulings. This is not an argument for accepting GM in sport at any cost. Rather, it recognises that the kind of discourse this problem requires, cannot be one that places neat and tidy policy making ahead of the messy philosophising and ethical reasoning that must inform policy.

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