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SPORT, ATHLETES AND PERFORMANCE ENHANCEMENT.

Emily Ryall is Senior Lecturer in Philosophy at the University of Gloucestershire and the vice-chair of the British Philosophy of Sport Association.

The issue of performance enhancement in sport is a perennial one and it is unlikely to be a surprise to many when controversies will undoubtedly once again appear with the forthcoming Olympic Games. Most of the most prominent cases are associated with doping infringements but there are other contentious aspects of performance enhancement, such as the use of particular pieces of equipment, clothing, or training aids. When (elite) sport is ultimately about improving performance, it begs the question as to what determines acceptable ways to enhance this performance (such as, the use of hypoxic (oxygen reduced) chambers, running spikes, and nutritional supplements) and what makes particular methods unacceptable (for example, artificially enhancing oxygen uptake, polyurethane swimsuits and anabolic androgenic steroids). One of the main bodies that determines this, the World Anti-Doping Agency (WADA), stipulate three criteria, of which the substance or method is required to satisfy two before it is included on the banned substance or method list; that the method/substance is performance enhancing, that it is harmful to health, and / or, that it is contrary to the 'spirit of sport'. Although these criteria provide some guide as to whether a particular technology ought to be accepted or outlawed (and there are good criticisms against all three of these measures from both conceptual and ethical standpoints), precise judgements as to whether a technology falls into a particular category is nevertheless an extremely difficult task. Arguably, this task is only going to become greater with likely technological developments in the near future, and this is particularly the case for technology that blurs the boundaries between natural and unnatural, therapy and enhancement.

The paradox inherent in sport centres on the setting of an arbitrary goal and inherently inefficient means to reach it. This is encapsulated by Bernard Suits' definition of game-playing as the "voluntary attempt to overcome unnecessary obstacles". So for an event such as the 100m sprint, the most efficient way to reach the finish line first would be, for example, to use a motorbike, to start before the gun, or to kill off one's competitors. However, the rules dictate that the means allowed to get to the finish line first eliminate all of these possibilities. Yet, the drive to ever improving quantifiable progress goes against this notion of inefficiency. When the sports record is of ultimate importance (and can earn athletes in excess of \$100,000 simply for breaking it regardless of any subsequent sponsorship deals), anything that gives the athlete an

edge over either other athletes or their previous performances, will be attractive. This highlights the paradox at the highest level: sport is designed to be a challenge to overcome unnecessary obstacles in an inefficient way and yet it also involves a desire to overcome these obstacles faster and more successfully than before. This problem is further exacerbated by the fact that performances are only valuable (and therefore quantifiably meaningful) if they are tests of human athletic capability rather than the performance of a particular piece of technology. This is often given as one of the main arguments against allowing drugs in sport since (so the argument goes) results should be based on the natural capabilities of the athlete (and all the virtues required to achieve them) and not the result of scientific endeavours in a laboratory; thus contravening the 'spirit of sport'.

However, the flawed logic of ever-increasing quantifiable performance means that the sporting authorities are going to find themselves having to make increasingly complicated judgements as to what determines unacceptable technological aid, and who is eligible to compete in particular competitions. There have been two recent controversies in the area of technology and enhancement that effectively illustrate this point. The first is the controversy over the 'Fastskin' swimming costumes that led to the 2009 World Championships being designated the 'asterisk' or 'plastic' games due to the influence that these swimming costumes had on the results. The second is concerned with the South African sprinter, Oscar Pistorius, and his prosthetic limbs.

Although polyurethane swimming costumes were developed in the late 1990s, it wasn't until a decade later that technological innovation in one particular swimsuit, Speedo's LZR, resulted in significant rule changes that prohibited the use of these costumes. This was a consequence of 43 world records being broken at a single championship event, five times as many records as is usual in these competitions; and in all of which the winner wore LZR inspired swimsuit technology. Although advancements in swimsuit technology had occurred over the previous couple of decades, the apparent performance enhancement was marginal and it wasn't conclusively clear that the suit technology had a significant effect on the result. Results were still believed to be dictated by the athletes themselves. The difference in the 2009 world championships was that the results of the technology could no longer be ignored. It effectively became an embarrassment for the sport as both media and public felt disillusioned with the performances as it seemed counter to one of the intrinsic values of sport; testing the natural capacities of the athlete.

The problem however is in determining exactly what constitutes 'natural' performance. As technology is so pervasive in elite sport and athletes undergo rigorous training regimes in a variety of highly controlled environments and fuelled by a variety of nutritional and

technological supplements, it is difficult to identify what 'natural' actually means. Indeed, there are claims (and have been for a while, e.g. Donna Haraway's 1985 *Cyborg Manifesto*) that the idea of the 'natural human' is an unrealisable notion that makes no sense in the modern world.

This is becoming more apparent and more problematic in the world of disability sports, where the concepts of fairness, natural, enhancement and therapy are increasingly slippery. It was noticeably the case for South African sprinter, Oscar Pistorius, aka. 'the Blade-runner', and his wrangling with the IAAF over the use of his prosthetic legs in 'abled bodied' events. The issue began in 2007, when Pistorius competed in an International able bodied event (he didn't do particularly well, finishing 7th after the 8th runner had stumbled and fell at the start). The discomfort that the IAAF felt with a disabled athlete running alongside abled bodied athletes was enough for them to 'invite' Pistorius in for testing to assess whether his prosthetic limbs were giving him an unfair advantage and enabled him to go beyond his natural capacities (though one might indeed wonder how the 'natural' capacities for a man with no legs might be judged). These laboratory tests measured a range of movements that were deemed inherent to running, including forces, energy consumption and wind resistance, and it was concluded that the 'blades' did indeed provide the user with an unfair advantage. The reasons given were that his prosthetic limbs were biomechanically different to an abled bodied athlete's legs and produced more recoil spring and less drag. Since there were no rules in the IAAF's regulations about the use of prosthetic limbs, the rules were subsequently amended to prohibit, "any technical device that incorporates springs, wheels or any other element that provides a user with an advantage over another athlete not using such a device". This isn't the end of the story though. Pistorius successfully appealed against the IAAF and the ban on him competing was overturned on the grounds that insufficient variables had been tested. The appeal centred on the fact that although the recoil spring from his prosthetics gave him an advantage over latter stages of the race Pistorius was required to work that much harder getting up to speed in the first place, thus eliminating the advantages gained.

The problem that sporting authorities are currently facing is that technological advancement in prosthetic limbs has reached a level whereby they are surpassing what is considered within the normal range of human ability. Scientists at Georgia Institute of Technology and North-Western University have recently and successfully developed prosthetic limbs that are directly connected to the nervous system and can be manipulated and controlled by thought alone. The picture of cyborgs as seen in science fiction films such as *Blade Runner*, *Robocop* and *I-Robot* no longer seems far-fetched. As our understanding of neurological and nervous systems develops alongside advancements in electronics, synthetics and artificial intelligence, the notion of

replacing not only relatively simple body parts, such as cartilage and tendons, but whole limbs and organs will become ever more common. And whereas sporting bodies can change rules on technology that isn't an integral part of the human body (such as polyurethane swimsuits), it is more difficult to amend rules when the athlete herself has this technology embedded within themselves, as in the case of prosthetic limbs or surgical implants such as synthetic cartilage and tendons. For the baseball pitcher who has had his damaged elbow tendons replaced with a stronger material that enables him to throw faster and harder, or the archer who has undergone laser-eye surgery, it is not so easy to distinguish between therapy and enhancement; between natural and unnatural. If the archer was born partially sighted but an operation gave her perfect sight, judgements would need to be made as to whether this is an artificial and consequently unfair enhancement or whether it was still within the range of natural and normal human capabilities, and the 'spirit of sport'. Difficult issues will continue to arise when, through technological innovation, the performances of those previously considered 'disabled' surpass the achievements of their 'abled bodied' competitors. The sporting authorities will then have to make decisions as to who is eligible for competition in particular sporting events.

This problem is further compounded by the fact that sport is a small sphere within wider human life. Many technologies seen in sport were first applied in other aspects of society, particularly medicine. Much recent advancement in prosthetic limb technology was brought about by US investment in the rehabilitation of veteran soldiers from Iraq and Afghanistan that were victims of explosive devices. If technology reaches a level whereby it becomes more attractive to have technological implants or modifications in order to have a better quality of life (and this is often the case today for those opting for laser eye surgery whereby it is considered easy, more effective and even cheaper to opt for surgery than to use glasses or contact lenses) then being a 'bionic' human might become the norm.

It is not unfeasible for this also to be the case in the area of genetic technology (which is currently classed as form of doping by the sporting authorities) whereby genetic modification or genetic screening may become an acceptable social norm. Yet this poses further problems for the sport. If an athlete has undergone germ-line genetic modification before they were born and necessarily without their consent, and if genetic modification continues to be prohibited by the World Anti-Doping Agency, then it arguably raises human rights issues if someone is prevented from participating in a sport for a reason that they had no control over. Furthermore, since logic would dictate that without the initial genetic modification, *that particular* human would not have been born, it is not clear how the result could be considered one of unfair performance enhancement.

What is clear then is that the sporting authorities will have to manage developments in technology and ensure that those aspects that are intrinsically valuable in sport are preserved. Arguably, continuing to value and measure quantifiable performance – how fast can a human run 100m? – will become meaningless as technology becomes increasingly embedded into our very being. It may not be too far in the future whereby an athlete with prosthetic limbs that are integrated with his neurological and other physiological systems, outperforms all ‘abled bodied’ athletes. If such technology becomes ‘better than new’ other athletes may be encouraged to undergo enhancement simply to compete. This possibility has prompted some (such as philosopher of sport, Sigmund Loland) to advocate a ‘thick theory’ of sport and argue a move away from a linear performance-based assessment of sport, whereby we measure times run or distances thrown, towards a more aesthetic and experiential appreciation of sport. When advances in technology result in linear sporting performances becoming meaningless (because they remove any notion of ‘natural human capacities’), then we are left with the gap being filled by other values that are less affected or threatened by technology, such as creativity, innovation and beauty.

What recent developments and controversies in sports technology illustrate is that the attempt to shield sport from further technological effects will be unattainable as it becomes increasingly embedded into, and a normal part of, our wider lives. Meaningful sporting performance will have to be adjudicated on the ability to create new techniques, manoeuvres and accomplishments that demonstrate those phenomenological aspects of being human rather than on those linear, quantifiable units of distance, time and speed that are today considered the zenith of the Olympic Games.