

Monsters, Mutants and Mistaken Metaphors: Why our fears about genetic technology in sport are unfounded

What I am going to do today is revisit some work that I started as part of my PhD and later published as a journal article in 2008. I believe it is an area that hasn't been given sufficient attention but one that holds important implications for policy makers, particularly in sport.

My research in this area focuses upon the way in which the pictures presented by the media about genetic technology create misleading perceptions and fears. My original analysis was conducted on a search of newspaper articles about genetic technology in sport and suggested that three themes emerged: threats to individual identity, the creation of gods and monsters, and the emergence of fearful scenarios.

What I intend to do today is to outline the conclusions drawn from my earlier research but to also highlight how the way in which misleading pictures presented by the media regarding genetic technology aids the traditionally conservative governing bodies and sporting authorities in their policy decisions.

Although my initial research was conducted over a decade ago when, due to the prominence of the human genome project, genetic technology was commonly discussed in the media, the issue of genetically modified athletes is still pertinent today. In the last ten years, both the World Anti-Doping Agency and BASES, the British Association of Sport and Exercise Scientists, have produced policy relating to the use of genetic technology in sport.

Whilst discussion in the wider media on this issue is not as prominent as it was in the early 2000s, it does still come up on occasions; usually, prior to or during important large scale athletic competitions such as the Olympic Games.

To illustrate the kinds of imagery that is used by the media in its portrayal of genetic technology, I wish to draw to your attention an article from the Sunday Express published three years ago during the London Olympics in 2012. It exemplifies my earlier findings about how genetic technology in sport is depicted in the mass media, and arguably informs wider public perception on the issue.

The headline is: RISE OF THE MUTANTS; How genetic engineering will create a race of super sport stars. The details are, to quote:

IT IS one of the most fiercely contested races in history and expert opinion is divided as to who will get to the line first. As scientists take huge strides in genetics to treat lethal

diseases, they are being tracked in secret laboratories by technicians using that knowledge to supercharge athletic performance.

Long the preserve of science fiction writers, with weakling Steve Rogers turned into a super soldier in Captain America, it is now becoming close to reality.

Medicine is concentrating on curing muscular dystrophy, cystic fibrosis and cancers while rogue sports researchers are engineering athletes of the future, powered by increased muscle, greater oxygen capacity and higher pain thresholds.

When the difference between gold and also-ran is measured in milliseconds the quest for that extra edge is pushing sport into a Frankenstein world where individual athletes can have their bodies genetically modified...

...The spectre of a master race of Olympic competitors is a looming danger and some experts refuse to rule out the possibility that a genetically modified athlete is competing in London...

...The mutant athlete is now ready to train harder, recover faster and perform at a higher level.

Whilst we can accept that the Sunday Express isn't renowned for its sober reporting of the facts, the type of language used here can also be found in articles by more respected news outlets. My original analysis included articles from the Guardian, The Times, the BBC and even New Scientist magazine.

My argument can be summarised in the form of the following:

1. The metaphors we use to describe the world affect the way in which the world is subsequently conceived.
2. Common metaphors used to describe genetic technology create a particular conception about its use, application and moral acceptability.
3. This particular conception leads to the rejection of genetic technology in sport on moral grounds.
4. The use of different metaphors would create different conceptions.
5. A different conception may lead to a different moral judgment about the acceptability of genetic technology in sport.

The basis of my argument stems from a phrase by Wittgenstein (1968, §109) who said: 'Philosophy is a battle against the bewitchment of our intelligence by means of language.' Philosophers have a role to play on issues such as this as they are able to show how the world can be otherwise.

Let me be clear at the outset that I am not saying that genetic technology is safe or that we should wish to see a world of genetically modified athletes. Although speculation has existed for the last 15 years that various 'unscrupulous' or 'rogue' countries and their scientists are experimenting in order to create genetically modified athletes, there is no evidence that this is the case. But whilst I have concerns about issues of coercion, I am ambivalent about genetic technology. I think that it has the potential to be of benefit to health and wellbeing in many areas but it is currently a developing technology that will take time to become safe and reliable. What I wish to highlight though is that fears arise, for the most part, because it is a technology that the average Joe doesn't really understand.

I will argue that the pictures depicted in the media of 'Frankenstein athletes' and 'sporting Armageddon' arise as a consequence of being misled by the metaphors that are used to describe and explain genetic processes and phenomena. In doing so, I will draw upon the work of Lakoff and Johnson (1980) who claimed that metaphor is a necessary part in our understanding of the world but I will argue that a literalization of these metaphors, illustrated through examples in the media, elicit (limiting) pictures of the world. I will suggest that we need to be careful that the pictures we hold about genetic technology in sport do not arise as a consequence of being bewitched through our language.

Lakoff and Johnson's influential work on metaphor proposes the convincing argument that metaphor isn't simply a rhetorical aid, as traditionally viewed, but rather a fundamental part of language that provides us with our conception of the world. They maintain that we do not view the world first and then ascribe words to depict that world; rather, 'reality' or 'what is out there' (in terms of social reality) is understood and constructed through our language, and much of the language we use involves metaphorical allusion. Metaphor, they argue, provides us with the means to make connections and links between abstract and concrete concepts and reflect upon these concepts; so an understanding of these abstract concepts is based on an association with tangible perceptions and experiences. For instance, metaphors provide us with a partial understanding of complicated ideas such as time, communication, and argument. In addition to this, metaphorical concepts have an element of flexibility within them that can be stretched beyond the information given by raw sensation, hence the traditional view that metaphor is a rhetorical and aesthetic device. This may provide an indication as to why a reliance on a metaphor can provide us with a misconception as to how things 'really' are. This is not to say that one is able to dig beneath the metaphor to reveal an objective, external world, for a non-metaphorical language would not be language as we understand it.

Our language is awash with 'dead' metaphors which we fail to acknowledge as metaphorical utterances because they are hackneyed and stale through their overuse in everyday communication. An example of this can be given in the way we conceive of time as a linear entity with defined boundaries in phrases such as, "I'm running out of time" or "I've been going through a difficult period (of time) recently." This is a metaphorical conception; time isn't something that can be stepped out of or travelled through despite what such expressions as these may indicate. The problem we have as humans is that it is very difficult (if not impossible) to understand time in any other way than by conceiving it as something else, for instance, by understanding it in terms of a journey that we may make physically in the world by travelling from A to B. Another example of an ingrained metaphor common in our language is one where we say, "I've been feeling depressed recently" that relates to other statements such as, "He's got a big weight on his shoulders." Depression is so embedded in our language that it is an accepted medical condition even though there is no physical indentation or pressure upon the body. To be depressed is a metaphor for an emotional state or feeling that may or may not be chemically or hormonally caused. However, it is because these types of metaphors are so deeply rooted in our language and thought processes that they are exactly the types of metaphors that illustrate Lakoff's and Johnson's point and give rise to the title of their book. These metaphors are not 'dead' in any sense; they are the 'metaphors we live by'. They are the tools which have aided and shaped our understanding of the world.

An acceptance of Lakoff's and Johnson's view is not to say that the traditional view of metaphor is obsolete, as metaphors can be linguistic in their nature, but simply that they proceed from the respective concept from which they originate.

There are many examples that illustrate that our understanding of the world is dependent on metaphor. These include: the belief that an atom is a tiny solar system with the nucleus at the centre and electrons spinning around it; and the apparent contradicting views that light consists of particles and that it also consists of waves. On the former; since the early part of the twentieth century, physicists have relinquished the view of the atom as a solar system, yet it is still provided as an effective and educative picture of atomic structure. Similarly, the apparent conflicting notions of light being both a wave and a particle remains useful depending on which aspect of light is being considered; our depiction of what is true about the world is dependent on how we understand the situations in which we find ourselves. The use of metaphors in the supposedly 'objective' 'hard' sciences not only aids with our comprehension but is also an illustration of how scientific practice is tied in with other cultural practices and narratives.

Essentially, although metaphor can provide an alternative picture of the world, it is still necessary to be wary of the view that one believes it presents. Metaphor is a double-edged sword in that whilst it can provide an alternative, illuminating and novel conception of the world, this new perspective can be just as bewitching (in believing that it provides a more accurate representation of reality) than previous conceptions.

This may be seen in areas where there is a general lack of understanding or comprehension on a simple level, or an area that requires a specialized vocabulary, such as genetics. A false picture arises when metaphor used in these areas begins to be literalized. This is a problem that has been recognized by some researchers in this field; for instance, Carl Cranor (1994) highlighted the concern that some authors have about the prevalent use of metaphor in genetics. This is despite the fact that it is difficult to conceive of any discussion on genetics without the use of metaphor. Nevertheless, Cranor argues that terms that label 'genes as master molecules', and talk of 'genetic error', 'genetic normality' and 'genetic causation', may distort expectations and understanding about how genes work. He concludes that beliefs resulting from using this language can determine political decisions. If Cranor is correct then it highlights how this can also apply to the world of sport and anti-doping legislation.

Metaphor can be literalized as a result of a comprehension gap between technology and language where language is always inevitably a step behind new scientific discovery, process and analysis. Taking words out of their usual 'language-game' and placing them into novel ones (producing metaphor) is a way of overcoming this comprehension gap. Even when scientists coin new words in an attempt to explain or describe particular phenomena, they necessarily revert to metaphor when they are explaining what this new term means. If a biologist wished to describe a particular process to a layperson, she may well revert to metaphor and say, 'Think of it like X because it shares the similar features of a, b, and c.' Yet in their attempt to understand this process the layperson may also ascribe irrelevant or inappropriate features of the metaphor being used which may lead to believing additional aspects about X that the biologist would not adhere to.

Hubbard and Wald (1997) argue that the metaphorical language that is used in genetics is bound to carry some residual baggage from usages in everyday language. They maintain that when biologists, in an attempt to explain their research, clearly use verbs like 'control', 'programme' or 'determine' they connotatively assign a role to genes and DNA that is far more active than it actually is. In contrast to the implications derived from such verbs DNA is remarkably inactive and only becomes active when interacting with other molecules.

When we speak of genes 'fighting' for survival, the picture it elicits is misleading. Genes have no preference whether or not they are reproduced: there is no agency or self-reflective will to determine what happens to that gene. As Richard Dawkins (1996, 155) said, 'DNA neither cares nor knows. DNA just is.' Nevertheless, even Dawkins himself has perpetuated particular metaphors now associated with genes, most notably associated with his book 'The Selfish Gene'. Consequently, Dawkins appears to be more guarded against misleading metaphors and attempts to be aware where particular metaphors fail. For instance, when he uses the metaphor of a river to describe the process of evolution, he warns his readers not to conjure up a particular tempting picture that such a metaphor elicits:

Now here is an important respect in which we have to be cautious about the river metaphor. When we think of the divide leading to all the mammals – as opposed to, say, the stream leading to the grey squirrel – it is tempting to imagine something on a grand, Mississippi/Missouri scale. The mammal branch is, after all, destined to branch and branch and branch again, until it produces all the mammals – from pigmy shrew to elephant, from moles underground to monkeys atop the canopy. The mammal branch of the river is destined to feed so many thousands of important trunk waterways, how could it be other than a massive, rolling torrent? But this image is deeply wrong. (Dawkins 1996, 10)

Dawkins also refers to the distinction between the commonly used metaphors of recipe and blueprint when describing genetic reproduction. He believes that the blueprint metaphor is outdated and plainly misleading. A blueprint, he maintains, is something that is reversible; that can be constructed from examining the finished product. If life evolved from blueprint embryology, he argues, then it would support the Lamarckian theories of evolution. Dawkins (2003, 105) argues that the metaphor of a recipe is a more accurate representation; that genetics is more akin to a chef attempting to reconstruct a rival's soufflé from its taste than an engineer producing the blueprint from a car. As he says, 'You can't isolate a particular blob of soufflé and seek one word of the recipe that "determines" that blob.' The same is true of genetics.

In another example, Nordgren (2003) points out that the usual use of the term 'responsible' implies a moral responsibility which necessarily involves a degree of freedom in action, that is, that a will could have determined another course of action, which in some way requires a degree of foresight. In Nordgren's analysis of a popular scientific publication, he finds that the authors use the term 'responsible' in a causal way. Nordgren (2003, 67) states: 'when they talk about the causal responsibility of genes almost everything that is associated with "responsibility" in its etymological senses is dispensed with. Genes are not called to appear in courts, neither are they in financial debt.'

He provides similar metaphorical terms that are activities of agents that are used in discussions on genetics, such as 'responding', 'controlling', 'having power', and 'shaping'.

Granting the gene with substantially more responsibility than it can actually 'carry' through ascribing particular metaphors (primarily in using metaphors concerned with intentionality and action) may unwittingly create a conception of the gene that is neither useful in scientific or technological development, nor helpful in attempts to understand the human condition. Genes have been attributed to every aspect of human behaviour and fate and so we are led to believe that genes determine our likelihood of cancer, heart disease, diabetes and stroke; whether we are prone to becoming an alcoholic, burglar or genius; whether we will be tall, muscular, blond or homosexual. In all this, we are told that our genes 'decide'; in that they can be isolated and removed from the host body in which they 'inhabit'. Arguably, the choice of particular metaphors reinforces an ideological position or worldview that serves the interests and purposes of a particular group.

This analysis of different types of scientific writing supports Lakoff and Johnson's claim that metaphor is fundamental to our thought and not merely a rhetorical effect. Such evidence suggests that metaphors are vital in providing us with any understanding of science, including genetics, when the raw data from scientific experiments comprise numbers and statistical analysis. Metaphor allows us to construct a picture of a world from these 'raw' data.

Given the previous argument, it seems appropriate to approach the use of metaphor with caution, for the pictures created are merely that, and not reality in itself. Simply by being aware of the mesmerizing pictures that language can elicit enables us to recognize our vulnerable position even if we are unable to draw ourselves away. Wittgenstein (1969, 28) writes: 'it is, in most cases, impossible to show an exact point where an analogy begins to mislead us'. It is not that the use of such linguistic devices should, or even could, be avoided but rather that we must continuously guard ourselves from their mesmerizing power.

A further illustration of these claims can be given by the language used in the media's reporting of genetic technology in sport. These examples come from a variety of broadsheet, tabloid, magazine and Web sources; the majority from British media but occasionally sources from other media outlets.

What can be shown is that the overall treatment of the issue of genetic technology in sport by the mass media has tended towards the depiction of Frankensteinian-type monsters; a fear that 'normal' humans will turn into 'deformed' (with negative connotations) creatures; and by 'playing God' (again with a negative subtext) we will create an Armageddon which will see a battle between

ourselves and the opposing will of autonomous genes. Arguably, these pictures are produced from a literalization of the kinds of metaphors that are commonly associated with genetics that have already been discussed.

Many of the metaphors that can be seen in the media are those that are embraced elsewhere in popular and academic literature. In particular, the metaphors of *body as machine* or *human as computer* have gained in magnitude alongside the technological developments over the last half century.

In his analysis of the ethics of genetic technology in sport, Miah (2002, 199–200) notes that this topic has been accompanied by a media full of speculation and sensationalization. He argues that the pictures that the tabloid media in particular present are fanciful and out of synchronization with actual scientific application. Miah suggests that had these reports (and arguably the pictures that are created) been more cautious, the ethical debate may well be different to the general swathe of negativity and fear associated with this technology. The types of pictures created through the use of particular language by the media are exemplified with the athlete depicted on the front cover of Miah's (2004) book *Genetically Modified Athletes* which depicts a sprinting athlete carrying a relay baton. Though obviously human in its overall form, there is something disconcerting about this athlete. Its torso is longer and thinner, its head smaller and its face is rather catlike: it is human but at the same time not quite human. This image appears to be consistent with the general portrayal of this issue within the media. However, whereas Miah has argued that it is the media lust for sensationalization that has created such images, it maybe a less intentional result that is brought about by being misled and confused by our language and the way in which metaphor encourages us to see things in a particular way.

Indeed, Miah himself aims to influence the political decisions that surround the development of genetic technology in sport and attempts to argue that the language (arguably the metaphors) used in the doping debate should not be directly transferred to that on genetic technology. He is critical of the way in which there has been an onerous emphasis on drugs in sport which has driven the subsequent debate on genetic technology. For Miah (2002, 92), attaching such weight has skewed the perspective about what real harms are involved in performance enhancement and has prevented a holistic treatment and understanding of the broader issue of what is valuable in sport. Effectively, using the metaphor of drug in the discussion of genetic technology has negatively influenced this ethical debate. The connotations associated with drugs in sport typically are those that have produced harmful effects, such as steroids and EPO, and not common daily-used drugs such as aspirin, caffeine or alcohol. Anti-drug campaigners will point to the tragic cases of Florence

Griffith Joyner, Tour de France cyclists such as Tommy Simpson, and the Eastern bloc athletes in the 1970s and 1980s, and argue that even if the drugs do not lead directly to an athlete's death they will have some negative effect on health. When the metaphor of drug is added to metaphors used to describe genetic technology, such as 'the book of life' or 'the holy grail' – whereby genes are essentially a person's very being – a picture is painted whereby genetic technology creates much more fearsome effects than those ever produced by the use of steroids, and this is indicated in the analysis of media reports given below.

My analysis of media articles suggested that the language used can be separated into three areas: *threats to individual identity* points towards the way in which genetic technology affects the nature of the self; the *creation of gods and monsters* refers to fears about the reduced power and dominance of the human race through the rise of a threatening species; whilst the *emergence of fearful scenarios* highlights the long-term, disastrous consequences of creating so-called monsters on the world.

The first area – threats to individual identity – literalizes the metaphor that genes have agency. This creates a dualistic conception of the self; in that there is the 'I' and there are also our genes. This dualistic picture can be exemplified in a newspaper article from the Guardian which includes the lines: 'Who's calling the shots, you or your new gene? What if in its enthusiasm, your new gene overdoes it and gives you too much of a good thing? Be careful of what you wish for'.¹

Here, there seems to be a conflict of will, which sustains a dualistic perspective, in that both 'you' and 'your' genes are fighting over what happens to 'your' body. It is a warning as to what may happen if the gene wins this battle with an implication of fearful consequences (which is reinforced by the adoption of first- and second-person form of language).

Such a dualistic picture is also indicated by language that suggests humans will be able to pick and choose their genes as if shopping for clothing, cosmetics or computers. The metaphor of *human as computer* appears to be increasingly prevalent with the use of terms such as 'upgrade', 'portability', 'made-to-order', 'component' and 're-programme'. Equally, phrases such as '[A]thletes will begin tinkering with their own DNA' implies that the thing doing the 'tinkering' is different from the thing that is being 'tinkered' with.

There are additional concerns that genetic technology produces problems with the concepts of being human, highlighted by the phrase 'what happens if human beings are made from nonhuman

¹ Swift, E. M., and D. Yaeger. 2001. Man or mouse: The genetic generation of world beaters. *The Guardian*, 2 September, p44.

parts? Is a baby made from cloned DNA, gestated in a bubble and connected to a cellular phone still human?' and 'it [will] no longer obvious what it means to call something or someone "normal" or a "person"' and 'GM asks us to question what it means to be human'. Such examples illustrate the misunderstandings and confusions surrounding the issue of cloning, genetic manipulation and identity.

The second theme: creating Gods and monsters, is primarily concerned with the appearance of genetically modified creatures. Many phrases indicate a highly toned and muscular individual as exemplified in the speculation that: 'Weightlifters' arms and sprinters' thighs bulge as never before', and 'sport will be dominated by ultra-fast, super-strong, muscle-bound' athletes. There are reports that 'genetic scientists are now creating mice with indestructible muscles' and will go on to create '12-foot-tall basketball players' or an '8ft shot putter who could throw the shot 100m into the crowd', 'Swimmers with lungs like bellows or feet like flippers' and 'lock forwards with the power of traction engines'.

Many of the terms used in the media are derivations of the idea of a super-human that has powers and abilities beyond that of a human. On a significant number of occasions the muscle-bound cartoon character 'He-Man' is mentioned. The former State Governor of California, actor and body-builder Arnold Schwarzenegger, is another common reference in descriptions of genetic technology that increases muscle mass in mice. The reference to Schwarzenegger is particularly interesting due to the fact he was both a renowned body-builder, who took steroids, and also played the part of the Terminator in the dystopian science fiction films. The use of the term 'Schwarzenegger' plays upon both the fears and rhetoric around the use of drugs such as steroids, but also the creation of a monstrous, untameable machine.

This is also highlighted in the frequent use of the phrases; 'Frankenstein athletes', 'athletes who are freaks of nature', 'tomorrow's freak performers' and 'an unnatural creature[s] being formed in the laboratory'. It is a 'Frankenstein world where genetics meets athletics', which is a transformation of 'the human body as an invincible machine'. These creatures will be 'professional robo-athletes' or 'a generation of world beaters who are hardly human at all'.

The frequent allusion to Frankenstein's creation – a being tormented by his own existence who in despair turns on his maker – seeks to serve as a warning that our desire to produce bigger, faster, stronger, and ultimately better athletes will result in athletes who are ostracized from a society which is fearful of them. Moreover, as Frankenstein himself is often depicted in popular conceptions of the fictional story as an eccentric and renegade scientist, the scientists who carry out genetic

experimentation today are represented similarly. Such scientists are referred to as, the 'Scourge of sport' or 'renegade geneticist[s]'.

The third theme is given by the scenarios that are painted from using genetic technology. The scenarios that are reported in the media are the manifestations of the perceived fears and threats. They describe the kinds of world in which we will find ourselves if we are not careful with the application of this technology. It creates, to quote, 'a chilling picture' and 'brave new world'. Other articles refer to it as 'doping from hell', 'the ultimate sporting nightmare', 'a disaster in human and social terms', 'sporting Armageddon' and 'sport's doomsday scenario'. Several others describe it as opening 'Pandora's box'.

As illustrated, the picture presented in the media of genetic technology in sport is a wholly negative one. During my analysis, there may have been a handful of articles that presented a more balanced and less emotive description but there were no positive depictions of the part that genetic technology might play in sport; apart from a few articles that in an attempt to provide counter-argument, gave space to the thoughts of the transhumanist advocate, Professor Andy Miah.

What can we say about the negative effects of genetic technology? Certainly not the rise of monsters, machines or a likely Armageddon. Genetic technology is potentially harmful to any individual that uses it as it is currently understood. Individuals may well be more likely to suffer strokes, blood clots, injury and cancer: but these are illnesses and diseases that already occur. The pictures painted in the media, and the misleading metaphors they stem from, present a much more worrying and grotesque view. This arguably plays in to the hands of sports governing bodies and authorities such as the World Anti-Doping Agency. It suits them to perpetuate the myth of the 'natural' athlete despite the fact, as we know, elite sport is hugely commercial and relies upon innovations in technology in a whole range of areas. WADA is content for popular media to hark back to the mythical age of the talented 'God-given' amateur who just happens to be good at sport, whilst knowing that sporting excellence today is dependent on science and technology.

The World Anti-Doping Agency is a body that was set up in 1999 but has seen enormous growth in its scope and finances. Its financial statement of 2012 stated assets worth more than 35million dollars. Notwithstanding Andy Miah's criticism that genetic technology should not be categorised as doping, it does seem that WADA are getting into making policy decisions about technology that is outside its remit, as can be seen with its judgements on prosthetic limbs, hypoxic chambers and the use of rare gases; so called 'technological doping'.

The pictures that are presented in the media regarding the application of genetic technology to sport suit authorities such as WADA as it provides them with added legitimacy for making decisions in this area. If WADA are able to paint themselves as the 'good guys', ensuring sport is 'clean' and that they are able to protect it, their athletes, and the public from the fearful scenarios painted in the media, they provide themselves with a greater rationale for existence. That is not to say that governing bodies do not have a duty for the welfare of their athletes but my concern is that WADA, in particular, is yielding increasing power over sport, and this power stems in part from false premises.

What I suspect we will see in future, is the development of genetic technology to areas such as the elimination of illness and disease. This, as with all medical therapies, will be strictly regulated but eventually methods will be refined and risks will be reduced and applied with greater frequency to a larger population. There may be so called 'renegade' scientists who attempt to use early technology in sporting applications and there may be negative effects similar to those seen in doping. But it won't produce the threats and scenarios depicted in the media. The metaphors on which our current pictures about genetic technology are based, are ones that stem from a lack of knowledge and understanding about genetics. Different metaphors would produce different pictures, and perhaps pictures that would be more encouraging about the use of this technology and its application to sport. As wider understanding develops and fears fail to materialise, I suggest that different metaphors will be employed. But until then, it is important to see the effects that using our current metaphors about genetics have on our perception of the world.