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Sport and the artifice of nature and technology: Bio-technological entities at the 2020 Tokyo Olympic and Paralympic Games

William W. Kelly
Yale University

Abstract

This essay turns to an anthropology of science and technology to propose that elite athletes, such as those who will compete in 2020 at the Tokyo Olympic and Paralympic Games must be conceptualized as bio-technological entities. For well over a century, modern sports, its participants, spectators, organizers, and commentators, have tried strenuously but unsuccessfully to define and defend strict categorical differences among the athletes. These debates have ontological, governance, engineering, and ethical dimensions. Drawing on the controversies over performance disability and sex assignment, I show that a distinction of the human and non-human, the natural and the technological, is unsustainable in assessing sports and that the elite athlete is always necessarily constructed by human qualities and technological elements.

Keywords: Sport; disability; technology; Japan; 2020 Olympic Games; sex

The 2020 Summer Olympic Games will open in Tokyo on July 24 and conclude three weeks later on August 9 of that year. Immediately following, on August 25, the 2020 Summer Paralympic Games will open, using many of the same venues. The Paralympics are generally treated as a condescending afterthought to the Olympic games themselves, but in recent decades, the International Olympic Committee (IOC) has been bringing the Paralympics into an ever-closer embrace. This is not only a matter of institutional sponsorship but it is also raising some basic ontological and policy questions about the meanings (and meaningfulness) of being abled and being disabled in sports performance. This in turn raises provocative issues about the permeable lines between the natural (the human body) and the technological (that which might assist the body performing sports). That is my topic for this essay, which takes the perspective of the anthropologist.

The Paralympics began as a small competition organized by an English doctor in 1948 for wounded British veterans of World War II. The first official Paralympic Games, no longer open solely to war veterans, was held in Rome in 1960, attracting 400 athletes from 23 countries, competing in a range of sports. Since 1960, the Paralympic Games have taken place in the same year as the Olympic Games. They were initially open only to athletes in wheelchairs; at the 1976 Summer Games, athletes with different disabilities were included for the first time. Paralympics athletes are categorized both by event and by type of disability, including impaired muscle power (e.g. paraplegia and quadriplegia, muscular dystrophy, spina bifida), impaired passive range of movement, limb deficiency, leg length difference, short stature, hypertonia, ataxia, athetosis, vision impairment and intellectual impairment. Interestingly, some athletes without a disability also compete at the Paralympics; the sighted guides for athletes with a visual impairment are such a close and essential part of the competition that the athlete with visual impairment and

the guide are considered a team, and both athletes are medal candidates!

Since 1988, Winter and Summer Paralympic Games have been held almost immediately following the respective Olympic Games. All Paralympic Games are governed by the International Paralympic Committee (IPC), which now coordinates closely with the IOC. Nonetheless, the Paralympic Games continue to be largely overlooked by spectators and world media alike and seriously underfunded by the host city, which is generally over budget for the Olympic Games themselves. The Rio 2016 Paralympic Games, for instance, suffered a serious shortfall of promised travel subsidies, scheduled event venues, logistical support, and income-generating media coverage.

However, it is entirely possible that the 2020 Tokyo Paralympics will gain a significantly higher profile than previous Paralympics, at least within Japan itself. This has less to do with the sporting event itself and much more to do with the drive by activists and government authorities as well to make Tokyo more accessible. Tokyo has a wide reputation as one of the world's most handicap-inaccessible global cities – from transportation to building access to the narrow roads, obstructing utility poles, and a general public indifference to the needs of these populations. These controversies are forcing (enabling) ever more public debates about public responsibility for accessibility and the nature of the abled and disabled body. Even the new Tokyo Metropolitan Governor Koike Yuriko has been forceful about using the upcoming 2020 Games to push for a re-engineering of Tokyo's infrastructure towards accessibility.

That is my entry point here: how sports, which seemingly are so centrally about superiority and clarity –the strongest, fastest bodies engaged in clear-cut struggles to win or lose– actually raise pointed questions about the nature of such distinctions. There is much more at stake at Tokyo 2020 than the pursuit of gold medals.

Let us begin by reflecting on four images that depict realms of competitive elite sports. In Figure 1, an equestrian rider at the 2016 Rio Olympics guides his horse over a jump in the dressage event. In Figure 2, Olympic skier Ove Karlsen curves around a sharp turn on the 2014 Olympic slalom course. In Figure 3, Daniel Lowe competes in the air rifle event at the Rio Olympics, and in Figure 4, the Japanese single-leg amputee and Paralympic champion Sato Keita competes in a 100 meter-sprint with his racing prosthesis.

Taken together, these images raise a common question: in such elite sports, where does the “natural” performing and competing body end and where does the equipment that enables this performance/competition begin? Or in other words, who is the athlete in these competitions? In an equestrian event, for instance, is it the horse or is it the rider or is it even the cyborgian bonded pair? In slalom skiing, should we consider the skis and poles to be a skier’s equipment or an extension of his/her body limbs? Does ski “equipment” really begin at the soles of the feet, or, with feet encased in knee-high boots, body wrapped in aerodynamic sheathing, hands grasping fiber poles, lungs trained with hours of oxygen tents, is an elite skier really the interpenetration of materials technology and human body?

In shooting events, does “equipment” really begin at the tips of the fingers and the outer filament of the eye? Is it not the assemblage of body and rifle that dispatches the bullet towards the target? And in Paralympic track events, does the leg end at the stub and begin with the prosthesis? Or is Sato really running with rather than on his “artificial” leg?

In their “Call for Papers” that inspired the 2015 JAWS meetings at Boğaziçi University, Dr. Cornelia Reiher and Dr. Cosima Wagner, the conference organizers, posed two very significant questions as a rubric for our meetings:

“1. How are (concepts of) technology and nature constructed, negotiated and translated into practices, and how is the



Fig.1: Equestrian horse and rider at 2016 Olympics Games (All images are licensed for publication under Creative Commons Attribution 3.0)



Fig.2: Olympic skier Ove Karlsen



Fig.3: Daniel Lowe at air rifle event, 2016 Olympic Games



Fig.4: Sato Keita (on left) in 100-meter dash.

relationship between the two imagined, discussed and challenged in Japan?

“2. What can anthropological research on nature and technology contribute to our understanding of Japan?” (Reiher and Wagner 2015:1)

Sport is one of the very largest sectors of the world economy, it produces the biggest mega-events on the globe, and it plays an oversized and often inflammatory role in shaping nationalist fervor, collective identities, gender ideologies, and more. Thus it is very curious that sport is so underutilized as a field of social analysis. This is true for our exploration of the shifting, permeable lines between the natural and the technological that were highlighted at the 2015 JAWS conference. In this essay, I want to suggest several ways in which analysis of sports can help us make headway with these questions. In particular, I propose that anthropology, drawing on insights from science and technology studies (STS), can contribute to sport studies in formulating the elite athlete as a “bio-technological entity.” The sporting body is inseparable from its genetic endowments and enhancements, its endocrinology characteristics and supplements, its surgical interventions, and its mechanical supports. Conceiving of it as a bio-technological entity acknowledges that we can never clearly distinguish between the “naturally” human and the “technologically” enhanced, and we must find grounds for equitable sports performances elsewhere.

Sport as quintessentially modern and subversively anti-modern

Modern sports, we must appreciate at the outset, are inherently paradoxical. The ludic sporting impulse may be near-universal across human experience but the highly organized, rule-governed spectator and mass participation sports characteristic of the 20th century had their origins in the mid- to late-19th century (soccer, baseball, rowing, etc.) in a few Western countries, notably in Great

Britain and the United States. What set these sports apart and marked them as modern is that they came to express a fundamental quality of the modern condition – the imperative to define and defend firm boundaries of clear categorical distinctions.

What do I mean by this? Between Spencer and Marx and Foucault and Bourdieu, with Durkheim, Weber, Parsons, Habermas, and many others in between, there have been multiple grand narratives of modernity – what it is and how it operates. But across all of them, I would argue, is a common insight that fundamental to the modern social order is the drawing of distinctions, often absolute binaries, as:

- between reason and faith
- between mind and body
- between polity and economy
- between public and private
- between work and leisure
- between male and female
- between nature and culture

Such binaries underpin a modern societal order of autonomous individuals and independently sovereign nation-states, and they are the basic constituents of modern social theory. Of course, such distinctions have deep historical roots in Western philosophical and political thought, but the ways in which they have been aligned with one another and made so central to theorizing is a distinctly modern phenomenon.

And where do sports come in? Sports have been central to developing, demonstrating, and enforcing all of these distinctions that underpin modernity by drawing and defending absolute lines between work and play, between winning and losing, between amateur and professional, between male and female, between rules and cheating, between our team and your team, between the able and the disabled, and, yes, between the

natural and artificial.

However, paradoxically and simultaneously, sport is resolutely anti-modern. Sport is one of those realms of life where we have constantly exceeded and elided and questioned and transgressed all of the distinctions that we hold to be so central to being modern. None of these distinctions has been settled or stable, and sport for 150 years has instead been a field of debate and contention about what these are and should be. Over and over, they have been exposed as politically motivated and socially fragile distinctions. It is in this sense that modern sport is fundamentally auto-subversive.

Because sports themselves are contests that determine unambiguous winners and losers, because they require clear rules, and because they are so public, so ubiquitous, and so attractive to the pursuit to profits and pleasure, they are especially diagnostic in exploring the nature of the modern condition, including the elusive –and illusory– efforts to protect the natural from the “unnatural,” the technological. Is Sato Keita, the Japanese Paralympic medalist, disabled? Well, having lost a leg to disease, he certainly has a physical impairment relative to other elite bipedal runners. But is he really disabled if he can extend his shorter appendage with a prosthetic that actually allows him to compete at a level that begins to equal that of “abled” elite runners, whose own technological enhancements may include diet supplements, specially commissioned track shoes, oxygen-tent training, and surgical repairs of torn tendons and joints? Do not these latter enhancements equally question a confident distinction between the naturally human athletic body and the technologies applied to it?

“Fem tests” and the shaky line between male and female

Let us consider another diagnostic controversy that is certain to be prominent in the 2020 Games, that of sex determination.

Modern sports have always been sex divided; athletes, authorities, and audiences have insisted on a firm separation of male sports and female sports, with very few exceptions (equestrian sport is the rare instance of this). Because women were denied any significant opportunity to participate in major sports at elite levels in the early decades, this raised few complications. However, as the Olympics and other international venues began to open to female participation in the 1920s and beyond, sport authorities began to police the divide between the sexes. Although their intention was clear, the language in the sports world is confused –what is often still called “gender testing” is actually sex determination– and, more significantly, in seventy-five years, sports organizations and the scientists they enlist have not been able to develop any reliable method for determining sex unambiguously (Caudwell 2010). In the 1950s and 1960s, elite women athletes were subjected to demeaning public physical inspections by panels of doctors and officials and barred when they did not “appear” to have female genitalia. Subsequently, “gender verification” (or “fem test”) moved to the genetic level, with a Barr body test used in the 1970s and 1980s, which was replaced by a polymerase chain reaction (PCR) test in the 1990s (Henne 2014). Most recently, global sports organizations like the International Amateur Athletic Federation (IAAF) have based their rulings on testosterone level measurements; a competitor is ruled female only if “her” testosterone level does not exceed 10-nanomoles-per-liter threshold (Pieper 2016). This continues to produce controversial decisions that have challenged Olympic-level runners such as Castor Semenya from South Africa and Dutee Chand from India (Padawer 2016). In both cases, the athletes were told that they would only be certified if they underwent a series of hormone-suppressing drugs or have surgery to remove testes and reduce and limit their testosterone levels. Complicated litigation and embarrassing publicity forced the IAAF to modify its demands,

and the whole matter of testosterone levels, their measurements, and their regulation remains in the courts and under scientific debate (Padawer 2016). It will surely continue to remain a high profile issue through the 2020 Tokyo Games, and it is possible that the global focus of this multi-sport mega-event may provide the venue to finally resolve this longstanding controversy of sex-boundary marking.

Of course, the issue here has never been technology –the limits of testing and medical intervention– but the all-too-human and fallacious drive to impose an arbitrary binary (male/female, so central of modern social theory) on a biological continuum and a multivariate genetic and endrocrinological matrix. Sport once again, as with notions of bodily disability, has both constructed an untenable divide and then created a highly public platform for demonstrating its own fragility!

Four dimensions of contention: Ontology, governance, engineering, and ethics

Moreover, we must also realize that these and many other foundational qualities of sport are contested in at least four dimensions: ontologically, as subjects of governance, as matters of engineering, and as ethical issues. The first of these is the level of being. The cases of Semenya and Chand and many others force us to confront the question, ontologically, of what is a female in the sporting world? Is there a human sex binary, or is it a sex spectrum, or even multiple intersecting vectors of sex-coded features? Who are these athletes? Within disability studies, there are parallel fundamental concerns about the nature of disability; scholars in disability studies have persuasively argued that we inadequately appreciate the distinction between disability as a social construction and impairment as a medical problem (i.e., physical differences from bodily norm). Many of them argue that Paralympic and other elite sports competitions should better be

formulated as sport for the impaired rather than the disabled.

But these are not just issues of philosophical conceptions and theoretical debate. When disability and sex as supposed attributes of humans enter the sporting world, they are ultimately subjected to jurisdiction, judgment, and jurisprudence. They have been taken up within the governance structures of global sport. Chand's case, for example, was brought before the Court for Arbitration in Sport, with the IAAF and its lawyers as defendants, and Chand's lawyers as plaintiffs. The Court has also heard cases relating to prosthetics and other technological equipment. Doping is now monitored by the World Anti-Doping Agency (WADA), which is not only contracted by national and global sport federations to conduct extensive testing but also issues "biological passports" to athletes that contain extensive genetic profiles and testing records.

What is most remarkable about these multiple, overlapping structures of sports governance is their autonomy from the international order of nation-states. It is profoundly underappreciated that sports have long had the widest and densest supranational governance grid of any sector of life, including the political and the economic. It is a parallel world of multiple levels, powerful authority claims, unaccountable to anything but itself – sports organizations abrogate to themselves the power to decide athlete citizenship, event host venues, broadcast rights, team sponsorship, sportswear copyright, drugging and cheating claims, and most other issues elemental to sports. The IOC, FIFA, IAAF, and other sports organizations have wider global reach and greater executive, legislative, and judicial powers than any other transnational or international organizations in politics or the economy (exceeding, for instance, the United Nations, UNICEF, the World Court, and GATT).

Beyond governance is a third manifestation of the natural/technological divide in sports. The Semenya and Chand sex-determination cases, which produced IAAF rulings to require

pharmacological and/or surgical interventions to become sporting females, remind us that engineering the body extends from materials science to bioengineering, genetic manipulation and a host of other techniques and technologies. Engineering the human/extra-human divide is used in sports both to enhance competitive advantage (e.g., through new swimsuit fabrics, tennis racket strings, and bicycle frames) but also to reduce competitive advantage – at least to suppress those advantages (like testosterone and running prosthetics) that are deemed unfair by sports governing bodies. To further complicate its role in sports, engineering the body is equally vital in yet a third objective, that of body repair. Knee and elbow surgeries, organ transplants, surgeries for artificial implants, and many more are rehabilitative by intention – but what is the line between returning an athlete to a condition where she can resume her previous routines at her previous levels or adding a degree of strength or endurance that actually elevates that performance?

Engineering, thus, opens up into proliferating ethical debates about fairness that have characterized modern sports since their 19th-century origins. This is the fourth dimension, or idiom, by which the human/technological divide is debated in the sports world. Amateur or professional, evading the rules or breaking the rules, a competition of nations or of individual athletes – these and many other fractious matters turn ultimately on ethical determinations of fairness. Sport is intrinsically competitive, and thus its fundamental ethical concern is equality of opportunity, not equality of result. Everyone to the starting line, a level playing field, fair play – these are the mantras of sports.

How does the International Paralympic Committee create a “fair” sport event with athletes of multiple, incommensurate impairments (limbs, sight, intellect, etc.)? Does an “elevated” testosterone level (over an arbitrary limit, it should be added) give Dutee Chand an “unfair” advantage (note she was nonetheless

not allowed to compete in men's track!). Enhancement is deemed cheating, while regulation is sanctioned. The line may be decided through organs of governance; it may be manipulated through engineering, and it may provoke ontological ponderings, but the decisive standards are ethical. Is it fair – as a sporting event?

In addition to debates about impaired athletes and athlete sex determination, doping will undoubtedly be a major controversy in Tokyo in 2020. The World Anti-Doping Agency's Code of Conduct begins with the following preamble:

Anti-doping programs seek to preserve what is intrinsically valuable about sport. The intrinsic value is often referred to as 'the spirit of sport'; it is the essence of Olympism; it is how we play true. The spirit of sport is the celebration of the human spirit, body and mind, and 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. Doping is fundamentally contrary to the spirit of sport. WADA 2003:7-8)

This is a longstanding debate. There are always differences among athletes, and the ethical debates often turn on the distinction between which are the *relevant* differences that must be controlled to insure an equal starting line and which are those deemed *irrelevant* to such conditions.

The anthropological take: The athlete as “biotechnological entity”

So what might be an anthropologist's contribution to all of this turmoil in the world of sport and its anxiety over the lines between the human athlete and the surrounding and supporting and sometimes subverting technology? Our first reaction might well be to assert that all such distinctions are so arbitrary and so contested and so continuously and easily transgressed that it

is futile and illusory to maintain them – as we anthropologists have known all along!

We must be careful about adopting such a smug attitude because it has created predicaments for us in the past. For instance, American anthropologists, in particular, have been hobbled in our contributions to national race politics for over a hundred years (Smedley and Smedley 2012). It has been a landmark accomplishment of anthropology since Franz Boas to critically attack all constructs of race, in physiological and genetic forms, by politicians and other scientists alike. Despite that, indeed, some would argue because we have so effectively deconstructed every effort to establish a scientific foundation for race, we have been much less effective in explaining the deeply ingrained racism that still characterizes our society. Racism remains virulently present in American thought and practice even if we scholars show convincingly that race itself as a category of distinction is unsustainable.

Therefore, to contribute to critical sport studies, we anthropologists need to push our conceptualizations of the body in competition in a more constructive direction. It is not enough to parse and decry the false distinctions of the natural and the artificial, the human and the technological, and I would suggest that the most fruitful moves beyond this are to be found in the interdisciplinary field of Science and Technology Studies, to which anthropologists, including Japan anthropologists, have been central contributors.

Let me proceed here by analogy. Consider, for example, the massive concrete seawalls that were constructed in recent decades to protect ports along the Tohoku coast in recent decades (Fig. 5). Some of them were among the largest such maritime structures in the world, and yet nonetheless they proved tragically ineffective in the tsunami that devastated the coast on March 11, 2011.

But what precisely was ineffective? Photographs of the



Fig. 5; A seawall in Tohoku, destroyed by the tsunami of March 11, 2011.

breached and broken seawalls in the aftermath of the tsunami visualized them as material objects produced by advanced technology and the hubris of human expertise. Science and Technology Studies contradicts this commonplace assumption as a visual trick. It is the fundamental insight of STS tells us that we may be looking at a material object, the seawall, but what we are really seeing a “sociotechnical system” (Pfaffenberger 1992). The seawall in Figure 5 is not a *product* of technology to be opposed to local human knowledge and social ties. That Tohoku seawall is a “sociotechnical system” in the sense that Bryan Pfaffenberger and others have formulated. It is an inextricable technological activity system, rooted in the linkage of techniques and material culture to the social coordination of labor and the provision of capital (Pfaffenberger *ibid.*). It is not an object but an objectification –an instantiation, really– of the application of human labor, capital, and knowledge to materials at a particular

spatial-historical juncture.

Similarly, at the level of individual agency, I would suggest that we might more productively formulate the elite athletes who train, perform and compete in the modern sports system as “biotechnical entities,” assemblages of nature and technology in a wide range of forms that vary across the spectrum of individual sports. The skier and the equestrian and the runner and the rifle range athlete have widely different talents and expertise, but as athletes in competition, it becomes analytically unhelpful to focus on dubious parsing of the natural and the technological. What follows from this is that the necessary debates and decisions about the ontology, governance, engineering, and ethics of sports cannot be grounded in a distinction of the primordial human and subsequent “technological” supplements and implements.

Modern sports competition depends for its pleasure and profit on a determination and a management of relevant equalities and irrelevant inequalities, and my point here is that modernist distinctions of the human and the technological have been rendered spurious and irrelevant. Equality of opportunity remains an absolutely essential condition of sporting competition, but the lesson of an anthropology of science and technology is that it can never be founded on the false binaries of physical ability/impairment or human sexual difference.

The 2020 Tokyo Games and the coming merger of Olympics and Paralympics?

A fuller pursuit of what such relevant equalities is beyond this essay, but I want to conclude by bringing this back to the upcoming 2020 Tokyo Games and the ongoing blurring of the Olympics of “able-bodied” athletes and the Paralympics of “disabled” athletes. Japan has actually been more prominent in Olympic/Paralympic Games history than most nations. The 1964 Games in Tokyo were the second to host them in the same

location and the support by the Tokyo Organizing Committee set the IOC on a path to embrace, include, and (some critics argue) coopt the Paralympic movement. The effects on the Paralympics as a governance structure, on its athletes, and on our notions of “disability” and elite sport have been profoundly disturbing to our modernist presumptions of 20th century sport. As I noted at the outset, for Tokyo 2020, the closer embrace of Olympics and Paralympics is being pushed not only by the IOC but even more vigorously at the national and metropolitan levels in Japan by politicians, sports officials, education advocates, and activists as a means for promoting barrier-free metropolitan infrastructure throughout the city. After 2020, it is not impossible to imagine a time when they will be merged into a single Games.

However likely that possibility, one of the advantages of the multi-sport Olympic Games, especially that they are now paired ever more closely with the Paralympics, is that they put on display and force us to contemplate a much fuller range of possible (and actual) intersections of the natural and the technological. Ontologically, in governance, in engineering, and in ethics, we are seeing a merger of a distinction that not just the sporting world but modern societies in general tried hard to establish and maintain for much of the previous century but which is now in the present century yielding to other ways by which equality and excellence might be better formulated.

In particular, the juxtaposition of the two Games will expose the porousness of two boundaries: between the mechanization of the physical body and the animation of prostheses, equipment, and other extensions and between the impaired athlete and the enhanced athlete as biotechnical entities. The seemingly body impaired may be enhanced through bio- and mechanical engineering even as the body enhanced is impaired by the demands of elite training and competition.

Who is the just and the unjust athlete and what is fair and unfair competition remain foundational issues in constructing modern

sports. But what the Tokyo Games will dramatize with heightened urgency is that these questions can no longer be determined by a false binary of the natural and the technological.

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