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ORIGINAL ARTICLE

Gene-talk and sport-talk: A view from the radical middle ground

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Abstract
In this paper, we explore and reflect critically on what elite sport may expect or fear from genetic technologies. In particular, we explore the language in which we (where "we" denotes scientists, sports scientists, the media, sports coaches, academics) tend to speak about genetics, elite sport, and the human body – we call this language "gene-talk" – which imagines the world of elite sport as one in which genes were always dominant in athletic performance. The dominant question here seems to be whether what is thought to be possible ought to be, and can be realized. We unpack the question by asking whether the practices needed for genetics to intervene so powerfully in elite sport exist in the straightforward and uncomplicated manner that the "gene-talk" literature seems to suggest. We argue that there is a lack of relevant studies to support and analyse the notion of sports performance as an immensely rich and complex practice. We conclude that elite sport may be more complex and heterogeneous than "gene-talk" has imagined to date.

Introduction

In recent years, discussions about the use of genetic technologies to enhance performance in sport have been gathering momentum. Arguments in favour of performance-enhancing interventions include somatic genetic modification, germ-line genetic modification, and the genetic selection of individuals for funded sports programmes (Miah, 2004; Munthe, 2000; Sweeney, 2004; Tamburrini, 2002; Tamburrini & Tännsjö, 2005). Arguments against such interventions are based on reasons of safety, moral purity, and athletic tradition (Friedmann & Koss, 2001; Loland, 2005; Munthe, 2000). In this paper, we explore and reflect critically on what elite sport[1] may expect or fear from genetic technologies. In particular, we explore the language in which we (where "we" denotes scientists, sports scientists, the media, sports coaches, academics) tend to speak about genetics, elite sport, and the human body – we will call this language "gene-talk"-which imagines the world of elite sport as one in which genes were always dominant in athletic performance. Until recently, this genetically organized world was always beyond the powers of intervention or correction. But today the situation is changing. Developments in genetic knowledge will have a powerful impact on elite sport – or so we are told (Adam, 2001; Aschwanden, 2000; Azzazy, Mansour, & Christenson, 2005; Sweeney, 2004). The dominant question here seems to be whether what is thought to be possible ought to be, and can be realized.

In this paper we unpack the question. We ask what it would take to realize what is thought and ought to be possible. In other words, we ask whether the practices needed for genetics to intervene so powerfully in elite sport exist in the straightforward and uncomplicated manner that the "gene-talk" literature (Dick, 1997; Friedmann & Koss, 2001; Huard, Li, Peng, & Fu, 2003; Montgomery *et al.*, 1998; Rankinen *et al.*, 2001; Steinacker & Wolfarth, 2002; Wilson, 1998; Wolfarth, 2002; Woodridge, 1998) seems to suggest. We think that this unpacking

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[1] The reasons for our focus on elite sport only are two-fold. First, high-profile elite sportspeople enjoy such extensive coverage in the media that their influence in society generally has become the topic of both popular and academic debate. A second, and related point, is that much of what goes on in elite sports eventually filters "down" into amateur sports (e.g. drug taking; new techniques such as the double-handed drive volley in tennis; fashion such as lycra running shorts in athletics) rather than "up" into elite sport.
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reveals new questions about genetics and elite sport. For instance, what kinds of "genetization" of sports practices are needed for genetic interventions to be effective? Is it worth the effort to genetize sports practices in this way? We also think that the research needed to fill the lacuna between "gene-talk" and "sport-talk" will provide insights into what the processes of "preparatory genetization" of sport look like. The process in which the term "talent" tends to become synonymous with "genetic make-up" is an example of such a process. We have borrowed the term "gene-talk" from Evelyn Fox Keller (2000, p. 10 and pp. 133–148). For Fox Keller, the primacy of genes as an explanation for the structure and function of biology has gradually disappeared. The human genome project has not turned out to be the end of a century-long search, but rather the start of an infinitely complex new era in which the major issue is to find out how genes relate to the richness and complexities of biological life. Notwithstanding the modesty with which genetics sometimes presents itself these days, however, the language of genetic causality and primacy – "gene-talk" – is still very alive, and shapes our (vision of the) world. "Words enable us", Fox Keller writes (2000, p. 138). She calls for the development of a subtle and well-informed study and language of broad "biological" practices in which the richness and complexity of genes in our biology can be understood. Our paper can be read as an attempt to initiate that language and study for the sphere of elite sport and human movement.

First, we will sketch out, albeit somewhat a caricature, the world that is assumed in "gene-talk". Then we will elaborate on the idea that performance in elite sport is much more complex than can be grasped in the logic of genetics. We argue that there is a lack of relevant studies to support and analyse the notion of sports performance as an immensely rich and complex practice. We conclude that elite sport may be more complex and heterogeneous than "gene-talk" has imagined to date.

"Gene-talk"

"Gene-talk" entails a triple logic. Its *first* element is genetic reductionism, albeit a moderate one. It assumes that athletic performance is primarily and largely due to the athlete's personal genetic make-up. While it does not deny that performance consists of other elements too, such as training, coaching, funding, facilities, the environment, and so on, "gene-talk'" suggests that these other elements are essentially different – environmental rather than natural – from genes. Genes are taken to be natural and given, and it is therefore a matter of either

having or not having the proper ones for performance. One cannot "learn" genes in the way that one can learn to embody skills, nor can one "put on" genes in the way that one can put on specific clothes. Thus, in "gene-talk" genes come first and are fundamental to who we are and what we are capable of. To put it more radically: it is impossible to compensate for a lack of proper genes, but a lack of proper social, material, and environmental technologies can be compensated for in a performance.

To some extent, genes are now what used to be called "talent". The two terms have become synonymous. But talent is different: it is to do with the surprising ability of athletes to come back from a losing position, or with finishing the marathon on a "bad" day. Talent is not only to be found in the body's make-up; it is also the ability to use the wind or the sun, or a "bad" bounce, to one's advantage. Talent is not always fixed and determined: it also develops in relevant circumstances. Talent is synonymous with "being gifted" rather than merely with genetic make-up. Indeed, we still hear athletes and others call out in surprise and admiration that "this girl is so talented!", where talent connotes not unambiguously with "this girl has such good genes!" Talent can even be related to skills that do not seem to have a genetic marker: motivation, passion, the will to win, the ability to lose, and so on. In present practices these skills are indispensable, but they are not obviously or only genetic. That the two terms – "genetic make-up" and "talent" – are often taken to be synonymous is an indication that the rich and heterogeneous notions and practices of talent are being genetized. This powerful image of what constitutes performance – first come the irreplaceable genes, then replaceable technologies – makes the application of genetic technologies for enhancing the human body relatively easy, rhetorically speaking: these words enable us (Fox Keller, 2000, p. 138). For it is only a small step from an image of genes as essential and foundational to performance, to the vision that their manipulation will hugely enhance performance. Whether such interventions fit the practices of elite sport rather than the laboratory practices in which they are invented is not often an issue, or so it seems. Intervening in the process of talent selection, before or after birth, or in the DNA of an ambitious child who lacks just a little something, perhaps speed or stamina? "We can do it (so goes the mantra), if not now then certainly within a year or five" (for "gene-talk" is often "future-talk") (Azzazy *et al.*, 2005; Huard *et al.*, 2003; Montgomery *et al.*, 1998; Rankinen *et al.*, 2001; Steinacker & Wolfarth, 2002; Wolfarth, 2002). And, of course, we need to discuss the consequences and the "oughts" of such interventions. But we tend to forget to articulate that interventions are only

possible – if at all – when they are preceded by great changes in the preparation, training, monitoring, and evaluation of pre-race or pre-match athletes. Preparing for potential genetic interventions "translates" practices towards a readiness to be affected by such interventions, and such translations may be both discursive and material. "Gene-talk" partakes in this preparatory process: it "enables us", and at the same time it tends to look away from the enabling effects of what it proposes. Genetic interventions need a prepared world, and it is far from evident to us that that world exists throughout – and that we want to make it so[2].

The *second* element of "gene-talk" reinforces the first. It assumes that contemporary elite sport is little more than a genetic lottery. On this account, the manipulation of genetic material for the sake of athletic performance is merely the last step (perhaps) in a centuries long process of the quantification, standardization, and technologization of environments, rules, measurements, materials, and … hu-human bodies. The process shows that scientific knowledge and technologies of all kinds and in all places gradually eliminate whatever is unruly – and therefore human – in high-performance sport to create the greatest possible equality for and in athletes to perform. On this view, genetic modifications and interventions (e.g. somatic, germ-line) (Munthe, 2000; Pérusse *et al*., 2003; Tamburrini, 2002; Tamburrini & Tännsjö, 2005) are simply at the most recent end of the measuring, standardizing, and controlling continuum that began, arguably, with the stop watch in the eighteenth century (Eichberg, 1982) and moved through to the use of performance-enhancing drugs in the twentieth century, incorporating many other measuring, standardizing, and controlling technological innovations along the way. Within this mode, it is a peculiar anachronism, at least at first glance, that almost all elements of elite sports practice are quantified, controlled, and thus predictable, except human genes. And so we are now at the fascinating point at which the last relevant inequality between athletes is their genetic make-up – and we are about to be able to eliminate that "unfairness"! (Tamburrini, 2002).

Philosophers like Hoberman (1996) and Rintala (1995) deplore this state of affairs, arguing that technology has already gone too far in destroying whatever is human in elite sport. They do not want the unfairness of "the genetic lottery" to be resolved through genetic manipulation that leads to equaliza-

tion, for that would dehumanize elite sport even more. For them, an option might be to develop, as Loland (2002) suggests, modalities of sport that are less directed at higher, stronger, faster, and less infiltrated by commerce. For posthumanists[3] (Butryn, 2002) who argue that humanity is immanently technological (and that the human body is always already a hybrid of man and machine), the humanistic idea that technology would be antithetical to humanity is senseless. Yet they have trouble explaining themselves when it comes to the question of whether or not to eliminate the "unfair" genetic inequality between athletes through a further technologization of the human body: when and why would the involvement of bodies with technologies reach its limits? When would the human element in the hybrid cease to exist? For posthumanists, the only option is to hail the ongoing cyborgification of the human body: there is no "human" boundary that cannot be crossed. More importantly, however, is that both humanists and posthumanists assume that the "facts" are "true": that elite sport is about to become merely a genetic lottery in which genes themselves are the only unruly and unmodified elements left.

This second element of "gene-talk" also carries a powerful rhetoric because here, too, the assumption that sport is (almost) a genetic lottery makes the justification of the application of genetic knowledge and technology less problematic. We think, again, that understanding sports practices in terms of a genetic lottery makes the "application" of genetic knowledge and technologies too much of an "ought" question alone: now that elite sport has definitely turned into a genetic lottery, and now that we have or are about to have the knowledge/technology to eliminate relevant genetic inequalities between athletes, ought we or ought we not proceed? Would that be ethically responsible? And again, we suggest that the "facts" assumed by these imperatives are ambiguous and hard to find. Thinking of elite sport in terms of a genetic lottery points to yet another genetization of the language of sport. And although there is a lack of studies that actively "translate" actual sports practices into "data" on this issue, we conjecture that even the most extremely standardized and quantified sport (the 100-m run is an archetypical example which we address at the end of this paper) involves much more than merely the genetic make-up of the runners.

Most debates on how or whether to proceed with genetics in sport tend to follow from this logic. The

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[2] For the classical notion that laboratory knowledge is not applicable just like that in the "outside world", but needs to be translated and matched, see Latour and Woolgar (1987) and Latour (1988).

[3] The view that we are "post" or "trans" human if we have transgressed the boundaries between animals, humans, and machines with, for example, an electronic pacemaker, an artificial limb or an implanted corneal lense.

"facts" from the genetic laboratories feed into the ethical debates on genetics and elite sport through a linear extrapolation of these facts to the world of elite sport. The assumption is that what works in the laboratory will also work outside it. And so debates focus on what would, could, might or ought to be the physical, legal, economic, ethical, humanistic, political, health, and social implications of the deliberate modification of genes with(in) the body. And whether we want such interventions, or forbid them, and if so, how? And if we would allow them, would sport still be interesting and economically viable? Would genetically enhanced athletes be entertaining? Would they be good role models for our children? Wouldn't health risks be involved? Do we want to live in a world like that? Is it still possible to alter developments? And who is in charge? Do athletes have a say in all that happens to their bodies?

These are no doubt important questions. But they pass over an equally important point: the normative questions assume that the language of sport is the language of genes, and that elite sport as it is currently played out, matches genetics to such an extent that the question is not whether interventions are feasible, but whether they ought to be undertaken. We think that these assumptions have, as yet, too weak an empirical basis, and in fact we doubt that at this point an empirical basis is easy to find. Thus far, we lack the scientific research that illustrates and theorizes how the practices of elite sports develop, so that we can see whether, how, and where these practices are, or are becoming, unambiguously genetic so that a transition to deliberate genetic manufacturing is indeed a possibility. In many cases, we think the assumption that we can actually do what we think we ought to, is rarely based on appropriate knowledge of how and the extent to which "genes" do actually function in elite sports practices.

This brings us to the *third* element of "gene-talk". "Gene-talk" suggests that what is possible in genetic laboratories is easily applicable in the outside world because the world is already, and has always been, genetically organized. This particular view of the world as already genetic is far from being theoretically neutral. It renders invisible the idea that genetic interventions need tranformations to work. For "gene-talk", the world (of elite sport) has always been genetic whether it is conceptualized as such or not. We now come to understand this order and are able to manufacture it as we think proper. That language, we think, with Fox Keller (2000), actively presents to us a particular version of the world. It suggests factuality but with that it simultaneously shows, hides, and brings with it normative interventions in how we think about things and what we think is possible or impossible. As policy makers, philosophers, geneticists, athletes, and so on, we need to become alert to the translations of sport language into genetic language – from blood, sweat, and tears to haematological fluid, apocrine secretions, and skin exudations.

A good example of this is the issue of patient compliance to medication for diabetes: for diabetes medication to work in a patient's body, the patient needs to reorganize her life; she needs a diet; she needs to measure her blood sugar levels at particular intervals; and she needs to lead a "regular" life. Only if she makes her body resemble the laboratory-body will the medication work (Mol, 2002; Pasveer & Heesterbeek, 2001; Willems, 1995). Her body must be made into a "working object" for the medication (Daston & Galison, 1992). We do not know whether or how the many practices and modalities of elite sport are doing this work of bevoming "compliant" to genetic technologies and knowledge. We lack studies that show us the modalities of elite sports and the knowledge of whether and how they genetize.

Others (Benschop, Horstman, & Vos, 2003; de Vries, Horstman, & Haveman, 1997; Huijer & Horstman, 2004) have examined such changes brought about in everyday life in their studies on genetics and preventive medicine. As soon as genetic technologies touch upon people's lives, it is immediately obvious that these lives were not previously lived "genetically". Genetic propositions profoundly change a person's past, present, and future liaisons, and even when people decide not to go along and have a genetic "check-up", they now explicitly embody genes and genetic aberrations. In other words, whether it concerns preventive, selective, therapeutic or enhancement technologies, they all need a (social) body that is primarily genetically organized. As "gene-talk" *assumes* that bodies function that way, the work of genetization is effectively rendered invisible.

Genetics, we argue, is thus not only about the effects of actual genetic interventions, but also about the quiet changes of normal life into a genetically regulated life. Such transformations, we think, are far from innocent. Yet again, we know very little about what occurs in sports practices in this respect (Butryn, 2003; Butryn & Masucci, 2003). But the "gene-talk" proposal that we should think our bodies are already (and have always been) genetically organized has proven to be quite powerful to date. It has rendered invisible the disappointing results of the genetic project, and hidden how endlessly more complex it is to determine the work of genes in the development of athletic abilities, or diseases. We think it is extremely important to become sensitive to the preparatory work that must be done for genetic interventions to function, and to start asking

whether we "ought" while that work is being done and not after it is completed.

"Sport-talk"

In the remainder of this paper, we argue that "gene-talk" is as yet unfit fully to grasp what happens in elite sports practices, and that it is important to enrich or re-order "gene-talk" with what we will call "sport-talk". For we have reasons to believe that today's elite sport does not seamlessly fit the genetic interventions we fear or hope for. We also think that "gene-talk", in particular because of the way it is presented as being already genetically programmed, carries with it the risk of becoming a self-fulfilling prophecy. We suggest that it is of utmost importance to start filling in the intellectual wastelands between "gene-talk" and the actual and everyday practices of elite sport with social-scientifically, ethnographically, and philosophically inspired studies. We will suggest what might appear, potentially, on these wastelands.

"Gene-talk" is quite general in character: the importance of genes, or so it seems, is not sport-specific. However, there are many reasons to believe that the contribution of "given" qualities in performance is sport-specific rather than general. In team sports, talents are "done" differently than in individual sports, endurance sports will differ from explosive sports, and record-sports may use talents, or genes, in ways that differ from their employment in qualitative sports (Loland, 2002). It can even be imagined that within these modalities, the articulation of talent differs profoundly. Moreover, training hard requires other elements and talents such as being able to stand the stress of competition or to find the motivation to go on after a bad performance. A final play-off will differ from a giant killing game and from a grudge match. In other words, the qualities needed to perform tend to be different, sport by sport and within each sport.

A brief look at long-track ice speedskating shows that the (genetically) ideal body is reinvented time and again. One of the skaters'[4] so-called X-shaped legs gradually changed from an unusual anatomical anomaly that was to be compensated for (interview 7 July 2003) into a pair of legs that are spectacularly efficient. Moreover, not one single body image but a wealth of differences seems to be constitutive for what the sport contains at this point. The speedskater who is capable of a sudden acceleration halfway through the 10-km race has a huge advantage over those who cannot do that. Furthermore, because of a combination of other complex reasons (e.g. ice, material, generational accommodation to klapskates[5], new knowledge about training and nutrition, inclusion of the importance of the team in this individual sport), speedskaters go faster than ever before. In other words, what is needed to perform differs from sport to sport, differs in the kind of performance within the sport, and differs through time. To claim that it is always genes that ultimately cause and therefore explain the relevant differences between athletes or teams limits any conceptual insight into the complexity of what constitutes performance, and is unable to account for the process-centred character of performance. It is, we think, of utmost importance to study and describe how elite sport, in all its modalities, acquires performance-enhancing elements if only to be able to determine what we are about to manipulate, and what kind of effects they will have on performance.

"Gene-talk" also seems to suggest that it would be an option to isolate and "treat" genes separate from all the elements that contribute to a performance. If performance is merely or mainly a matter of genes, such interventions would have a marked effect on performance. Again, we have our doubts. It might be possible to do this in a laboratory contect and then speculate about the precise location and quality of relevant genes to performance. But we think that precisely when it counts – when performance is *situated* in the actual practice of training or competition – this body does not exist, and the isolation of its relevant genes is a theoretical and practical fiction. We think that *doing* sport (training twice a day, eating a modified diet, travelling 200 days a year, the excitement and the passion of competition, the confrontation with unexpected events or vociferous vocal support for an opponent, unforeseen climatic changes, and so on) resists any precise and durable isolation of genetic from other elements. Performance, we conjecture, is not constituted by the sum of its parts, but results out of the *quality of the blend of the elements that constitute it*. Even if it would be possible to render explicit all these elements and categorize them as genetic/natural or achieved, it would still be hard and senseless to isolate them, treat them, and then "hand them back" to the body – as if performance would then radically and visibly improve. Rather, we think it is important

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[4] Data come from ethnographic fieldwork performed by one of us (Bernike Pasveer) among Dutch professional speedskaters in 2003.

[5] With klapskates, the skate disconnects from a skater's boot. A hinge beneath the ball of the foot between the shoe and the blade allows the foot to rotate while the blade remains gliding on the ice. This way, the skater stays in contact with the ice longer than with traditional skates. It allows plantar flexion of the foot at the end of the push-off (van Hilvoorde, Vos and De Wert, in press). It is held that those who learned to skate on klapskates have embodied the technique in a more natural manner than those who started to skate on them midway through their career (fieldnotes of Bernike Pasveer).

to know what these mixtures look like in context, and to determine whether practices exist or are in the making in which genes are the most important constituent of performance. Practices, that is, in which elite sport has indeed turned into a mere genetic lottery or is about to do so.

"Gene-talk" is effective in that it has succeeded, to some extent, in suggesting the reality of genetic practices. Our suggestion is that we do not know whether "gene-talk" claims are true. Put more bluntly, we do not think the reality of elite sport is as genetic, at least not yet, as it is claimed to be but the point is, of course, that we claim that this is a problem in itself: we want references about the "middle-ground" but we don't have that many middle-ground studies (Montgomery *et al.*, 1998; Rankinen *et al.*, 2001). To reinforce this point, we take the example of the 100 m sprint and compare it with a game of tennis. It would seem that the 100-m athletics race is potentially one of the more genetically controllable, manageable and therefore achievable sports[6]. The argument goes that there are only a few genetic variables that need to be engineered in a 100-m athlete because the 100-m race is one of the least complex sports to perform. It is an individual sport; it usually lasts just over 10 s; the only tactic is to run as fast as possible in a straight line, and it is usually summed up as being just about speed and strength. The 100-m race is the standard "genetic lottery" example. By contrast, a sport like tennis is more complex because it can be an individual or a team game (singles, doubles, mixed doubles) and therefore is more dynamic; a match can last for as little as about 20 minutes to as much as about 6 hours. There are, then, many more opportunities for game- or non-game-related actions to happen in the longer timescale; the nature of the game, its rules (e.g. scoring system), and ethos (e.g. etiquette) require the development of a wide range of techniques and tactics; the extent to which techniques and tactics are used and when they are used can vary enormously from game to game; and it may be summed up, albeit not easily, as being a game of skill, strategy, tactics, explosive speed, power, stamina, hand–eye coordination, and balance.

Yet it is far from evident that these two scenarios are as straightforward as they seem. The 100-m race might be far more complex than what it seems to be. Perhaps the 100 m is as technically complex as tennis. There could be just as many technical skills to acquire to be a good 100-m runner as there are for playing tennis. It might be that they are simply less visible than in tennis. Perhaps the 100-m race lasts much longer than 10 seconds. After all, it is widely acknowledged by the athletes themselves, their coaches, and race commentators that what goes on in the pre-race build-up (on the warm-up track and on the race track just before the race itself) could play a large part in determining the outcome of the race. It is during this time that athletes can "psyche out" their opponents or dictate the mood or atmosphere of the race. It might be that the 100-m race really lasts about 1 hour and 10 seconds. The point is that we do not really know because we do not yet have enough knowledge about the role and place of genetics in particular sporting practices (e.g. training practices, techniques, tactics, the competitive context, and so on). We think it is important to study these practices and to observe and take seriously the richness of the language of sport. It is possible that we need to conclude that "talent" is not yet synonymous with "genetic make-up", and that terms like "having good hands" or "having a good day" carry more weight than merely a symbolic content.

We need, then, to tap into the "ordinary" understandings of sport. By this we mean, first and foremost, the voices of the athletes themselves. There has been little research done on athletes' perceptions and experiences of technology, although Butryn's (2003) narrative analysis of a group of track and field athletes is an exception. We need to explore the extent to which athletes express and describe their lives in terms of the language of genetics and/or talent, and the implications of that for athletes, sport, and society. Elite sport, we think, is still an irreducibly rich world; a world that ethnographically inspired studies could develop or design a language for that potential irreducibility, a language that could enrich the debates about the dangers and promises of genetics for elite sport. "Gene-talk" proposes something similar to us: a vocabulary in which the work of working towards performance can be described so that we think of our present lives in terms of genetically defined opportunities and risks. The danger here is that "gene-talk" becomes the only reality we can imagine. And that language, we think, is a poor interpretation of elite sports. For it is a one-dimensional or "thin" interpretation of sport performance as merely a scientific enterprise. Sport performance is much more than this, it is about passions and the emotions: guts, fight, heart, and spirit. And thus it demands a much "thicker"

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[6] Meier (1985), for example, suggests there are some sports – in particular the 100 m – where athletes are able to neutralize or negate deliberately, distracting or restrictive human characteristics or qualities. Loland (2001, p. 130) claims that since "record sports" are highly specialized – in particular the 100 m – they are the kinds of sports where "the potential for improvement is reduced to one or a few basic human qualities".

vocabulary to fully describe and account for its complex and heterogeneous nature.

The middle

And so it seems that debates on genes in sport are of extremes, of advantages, and disadvantages that are all based on projections of the genetic essence of elite sport. The question that arises is, given the fact that elite sport is a matter of genes anyway, ought we or ought we not grab the chance and manipulate these genes for better performance and for more effective trajectories of our genetically predisposed children. We propose to shift the debate to another ground somewhere in between these extremes to a radical middle position, the almost empty terrain in between genetics and elite sports practices. It could be that the terrain is populated already with studies on genetics and preventive care, but when it comes to sport and performance, it is quite empty. Ironically, then, this middle ground would be the most radical place to be. Not because it is empty, but because it consists, potentially, of more than genes and because, potentially, it will afford a language that can enrich "gene-talk", or can at least compete with it. Instead of downplaying passion, joy, the complexities of training, having "good legs" or a "bad day", and the richness of relations that constitute performance, "sport-talk" would theorize these elements to determine where they, too, figure in the constitution of somebody's situated competencies. This language might do justice to elite sport in ways that "gene-talk" cannot. Moreover, it may counter the genetic colonization of our language and the things that connect to it.

Conclusion

We end this paper, then, with an unexpected "ought". We ought to use and produce knowledge of how performances are done in the heterogeneous world of elite sport; of where and how genes matter; and of which mixtures of elements matter when it comes to explaining the extreme performances of athletes' bodies. We do not think we have to invent this language from scratch. For many people are experts about elite sport. What is lacking, however, is a social-scientific translation of all the expertise of athletes and their co-workers. We need anthropologists of sport, who would describe what occurs in practice and who would analyse the ways in which the complexities of everyday life are constitutive of performance. We need philosophers of sport to develop an understanding and appreciation of the underpinning philosophical and epistemological issues. And we need appreciations of the

languages – words, body-talk – in which elite sports' experts communicate what moves them, quite literally, because language increases our vision and is enabling.

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