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CULTURA E SOCIETÀ

DOSSIER

Non nei nostri geni.
Usi e abusi della genetica

Racism after the End of the Race:
A Brief Epistemological Viewpoint
on Genomic Studies and Racism

Teorie razziste e studi antropologici
all'Università di Torino:
storie e memorie di un patrimonio
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Il grado zero del razzismo

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Foto di copertina
Peter Mukhaye,
Veiled to Fit In, BLM series 2020.
Courtesy of AKKA Project and the artist.

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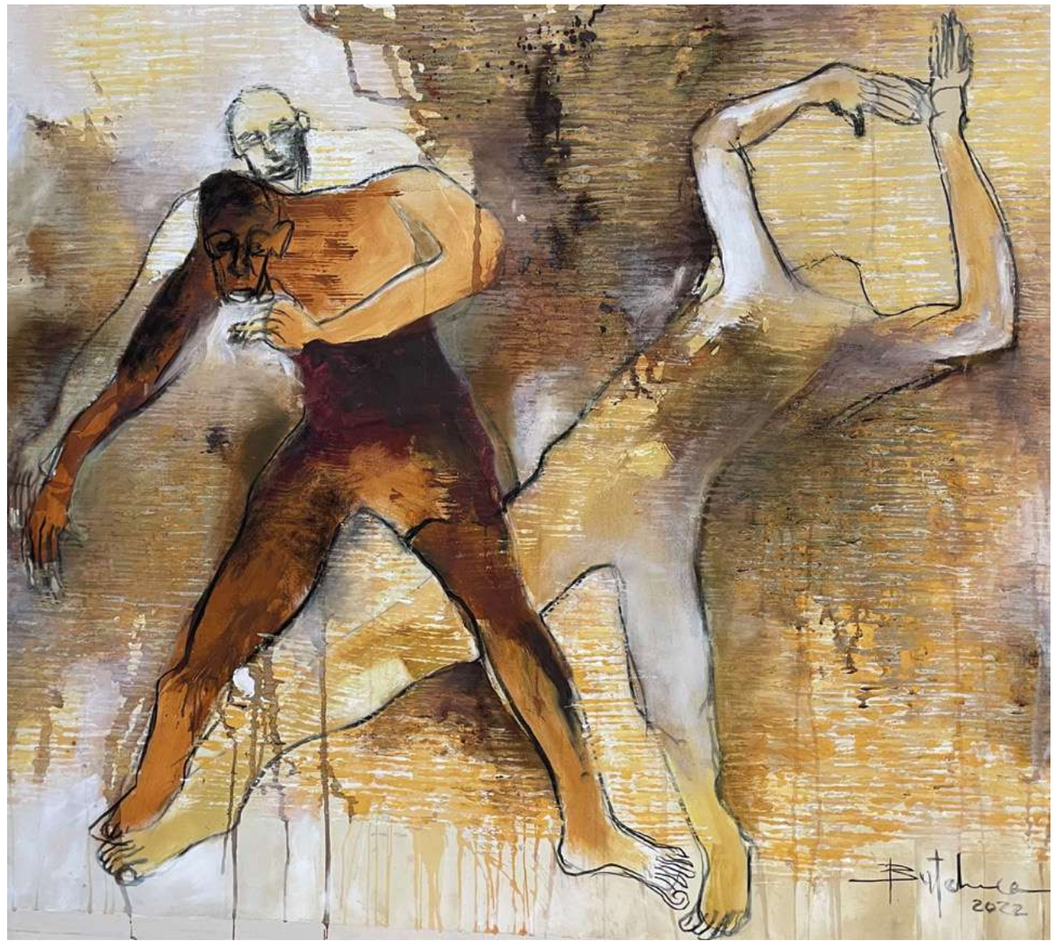

Butcheca, *The Same Movement Behind a Dance*, 2022, oil, acrylic and charcoal on canvas, 160x140 cm. Courtesy of AKKA Project and the artist.
This artwork was featured in the "African Identities" Group Exhibition, AKKA Project, Venice 18 July – 29 August 2022.

Eventi

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Racism After the End of the Race: A Brief Epistemological Viewpoint on Genomic Studies and Racism

Although genomics and genetics have unhinged the classification of the human species into races, racism still exists. This essay looks at some scenarios of persisting racism and argues for the importance of approaching them from an epistemogical perspective.

by Federico Boem

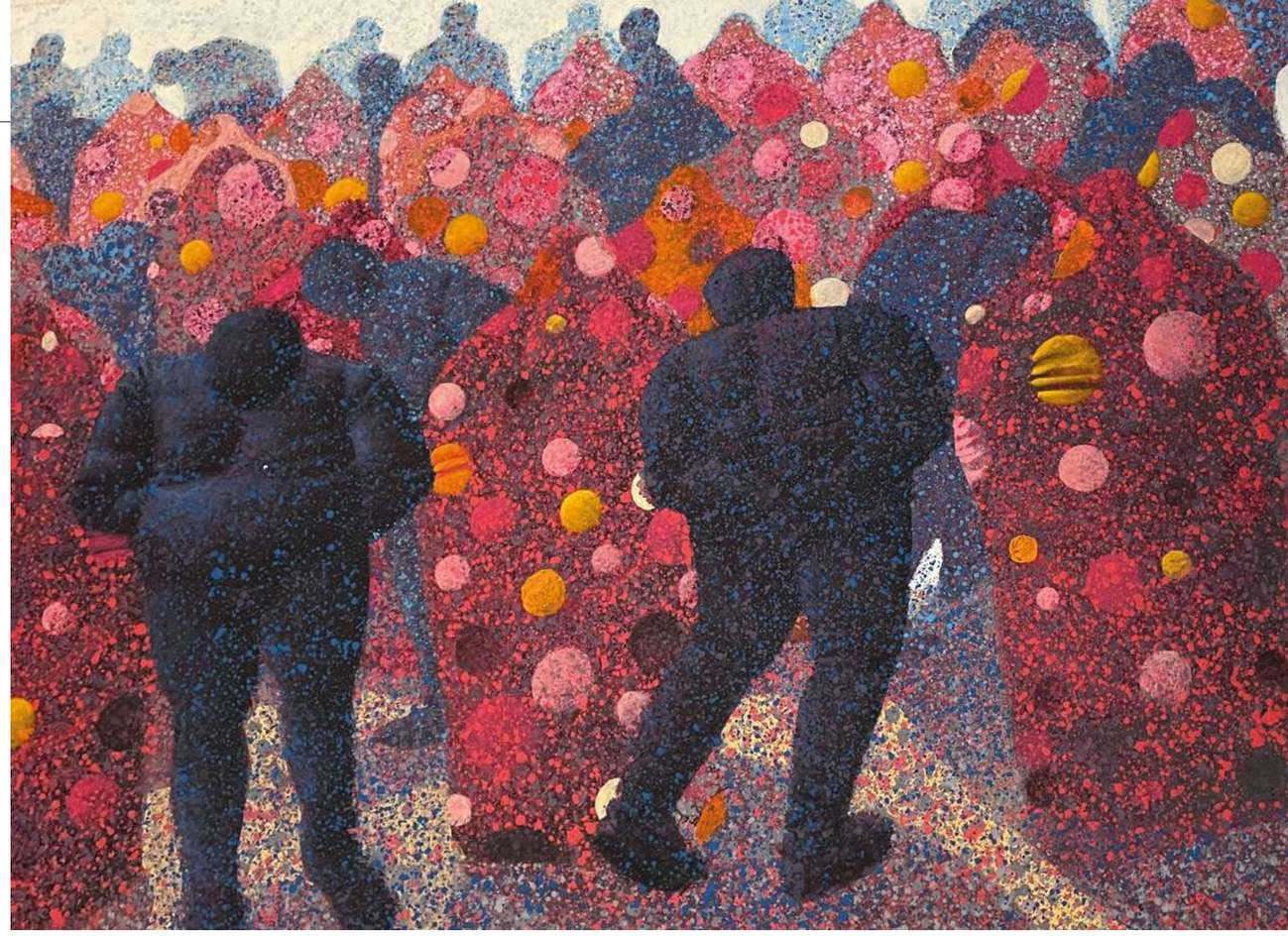
In recent years, genomics (along with the other "omics") has had (and is having) a profound impact on the way of doing science. Furthermore, these approaches, characterised by large volumes of data that can be analysed thanks to the computing power of computers, have offered hope and possibilities for answering essential questions concerning the human species (see, for instance, Wohns et al., 2022; Almarri et al., 2020). These approaches and their results have produced scientific and epistemological discussions on the modes and meaning of doing science (Manzoni et al., 2018; Leonelli 2019). But there is no doubt that, for this reason, the knowledge thus obtained has changed many scientific practices and opened new horizons.
In the case of human genomics, it was also a question, more or less explicitly, of trying to establish on a more solid scientific basis why our species exhibits specific characteristics.
Indeed, even before next-generation sequences, the advent of genome research has helped shed light on crucial aspects not just for scientific investigation, but also for some fundamental questions of broader interest about the origin of our species, its characteristics, and its evolutionary history. As a matter of fact, the scientific community, already at the time of the *Human Genome Project* (HGP)[1] and the *Human Genome Diversity Project* (HGDP) in the 1990s, hoped not only to expand the knowledge of the mechanisms and reasons inherent in the development of certain pathological conditions (cancer above all), but also to make certain types of data available, given the possibility of a more detailed understanding of "human specificity," including the origins and geo-distribution dynamics of our species (Nurk et al., 2022; Cavalli-Sforza 2005).
It is commonly believed that the progress of those studies helped to show the scientific inconsistency of the concept of race. This is undoubtedly true. However, despite this, and with a particular paradox, this deconstruction of the concept of race has not been followed by the dissolution of racism nor the use of the term "race" in specific contexts (including scientific ones).
How is it so? Here, I highlight some aspects of this problem and propose a role for philosophy (of science, but not only) in this type of debate.

Genomics and human origins

As a matter of fact, the idea behind the study of genomes, thus passing from genes to their whole architecture and interrelations (i.e. the genomes), reveals a clear epistemological choice regarding the need to analyse particular complex objects as responsible for certain phenomena in their totality. This research perspective obviously also involved a choice of method. As a matter of practice, to study genomes, rather than just single genes, it was necessary to have specific tools that guaranteed an "overview." This line of inquiry should also be seen in relation to research concerning other living beings. In 2021, more than 3000 species, afferent to 24 different phyla, had their genome sequenced (Hotaling et al., 2021).
On a more theoretical and epistemological level, this project has been left with an underlying tension between the particular and the general. In other words, on the one hand, there was the need to provide a mapping of human specificity as such, i.e. what constitutes a human being *as* a human being. On the other, it was important not to forget how single individuals and different human populations present differences whose investigation was equally crucial. More explicitly, if the HGP set out to create a "universal" model, i.e. "the" human genome map, the HGDP had the ambition to analyse the differences in human genomes, to study their properties and peculiarities, i.e. the specific aim was to understand genomic diversity within human populations (Elgabsi 2022).
Despite methodological differences that cannot be thoroughly discussed here, it is fair to claim that the completion of these projects has led scientists to think that it would have been feasible to analyse and understand human origins through the perspective of "omics."
In the hopes of the researchers, this would not only produce a better understanding of human evolution as such (at the species level), it would also provide a better classification of human varieties than the antiquated and scientifically unsustainable one based on the concept of race.
Unfortunately, this was not the case. Not only because of some questions about methodological biases that some scholars actually described as "racist" (whether unwittingly or not) (Elgabsi 2022; Yudell et al., 2016), but also because the deconstruction of the traditional concept of race did not have as a direct consequence the diminution or downsizing of racist ideologies or arguments. This provides the cue to understand how a problem steeped in scientific knowledge (more or less well-founded) also presents values (i.e., value-ladenness) and a conceptual dimension (i.e. theory-ladenness) that cannot be solved by techno-scientific progress alone. Indeed, sometimes only looking at science without addressing the other aspects of an issue risks making the matter worse by hinging in different ways.

The notion of race and beyond

The concept of race, in the most modern sense of the term, emerged in the late 18th and early 19th centuries. For example, the famous German scientist Johann Friedrich Blumenbach (a central figure in the establishment of this line of inquiry or "scientific racism") initially claimed that the human species, as such, comes in different forms, which have been called "races." However, at first Blumenbach's (and not only Blumenbach's) conception was *monogenic*: i.e. the human races are variants of the same species (the human being) and their differences are attributable to different environmental stimuli. Subsequently, however, anthropology, above all, moved towards so-called *polygenic* positions. These theories also presented internal differences. Simplifying, it can be said that all of them questioned the common origin of human variants and, influenced also by Romantic ideas, anchored those differences to the "purity" of the lineages, which in turn exhibited different characteristics, making some races more noble or virtuous than other "inferior" ones. Later on, although Darwin's theories suggested the



Michael Musyoka, *The 11th Hour of Bachelorhood 1*, 2022, acrylic on canvas, 140x200 cm. Courtesy of AKKA Project and the artist.
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common origin of all human beings, the emergence of Darwinism paradoxically also brought new energy to those perspectives that stipulated unbridgeable differences between human variants. In particular, both natural and (especially) sexual selection were adopted (far beyond Darwin's intentions) as mechanisms to justify racial differences and thus reinvigorate the ideas that specific lineages were better than others (James and Burgos 2022).

It is fair to say that the genomic perspective (resulting from HGP and similar studies) has, in fact, unhinged the classification into races. If analyses of this type have nevertheless shown that genetic variations are associated with geographical distributions in human populations, they are not representative of such profound divergences (Yudell et al., 2016). In other words, if there are variants within the human species, the concept of race is not adequate to intercept these specificities. On the contrary, it indeed produces a distorting effect. Actually, it has been shown that there can easily be the case of more genetic diversity between two Europeans, than between one of them and someone from Asia (see, for instance, Barbujani et al., 2013). To sum up, briefly, race is not a scientific notion.

Indeed, it is undeniable to claim that in current biology, the notion of race is misleading since it does not serve as a genuine proxy for differences within our species. And yet it is used (sometimes) in political and legal contexts (e.g. immigration policies).

This is also due to the fact that some important theoretical distinctions are often forgotten. If, as has been said, race as a scientific category (in a sense, we can call "ontological") is to be rejected, it is not sure that the practices that lead an individual to identify with a particular human group are to be totally dismissed. This is a crucial point that shows a crucial epistemological aspect. Admitting that specific categorisations play a vital heuristic role (with predictive and diagnostic repercussions in the medical field) does not mean re-admitting the concept of race as a "natural kind." Indeed, some scholars (see, for instance, Kaplan 2010, Lorusso and Bacchini 2015, 2021; Spencer 2018) have pointed out that, especially (but not only) in the field of epidemiology, specific categorisations still play a decisive role. Obviously, I believe that it should be emphasised that in these cases, the notion of the racial category is to be understood more as a constructive process of determining a belonging (which involves numerous extra-biological and, above all, extra-genetic factors). In fact, different human groups have specific social and cultural practices, and they have historically connected themselves in different ways to diverse environmental contexts. It is, therefore, crucial not to neglect these aspects and to remember that the different aspects that contribute to the way in which individuals recognise themselves in a particular human group (which they can possibly still call "race") can play a meaningful role in understanding the specificities of these individuals, especially about their health. For instance, these self-attributed "racial characterisations" can also serve as a proxy for socioeconomic status. These data can offer a precious "window" to understand so-called multifactorial diseases. The theoretical-practical tension in these research fields is far from being resolved. In particular, Lorusso and Facchini (2021) argue that, although races do not exist, the forced elimination of the concept of race (without specifying what is meant by it) could not only harm research (depriving it of crucial heuristic resources), but also not solving the problem of racist attitudes, as I argue in the next section on medicine.

Nevertheless, and in spite of these relevant discussions, even though races do not biologically exist and they should be intended, at best, as a social construct, the fact that they are still superficially and uncritically adopted in other situations generates tension, especially in the public sphere, which may also reinvigorate racist behaviours (Cerdeña, Grubbs, and Non 2022; Yudell et al., 2016; Carter 2007).

Indeed, within the public perception, considering the pragmatic use of this notion, it is still unfortunately common to classify people into distinct races. We have to admit that the notion of race persists, and genetic data are often used to confirm biases or justify specific political goals (Cerdeña, Grubbs, and Non, 2022; Yudell et al., 2016; Barbujani et al., 2013). Moreover, as a matter of fact, scientific advancement and technological development are not immune from the possibility of distortion. In reality, more and more potential discrimination, from the labour market to university access, from the welfare state to healthcare, is engulfed by an often distorted interpretation of genetic data. Unfortunately, very often, this information is conveyed or incorporated through technological procedures (such as algorithms), which, perceived as neutral, objective, and faithfully instantiating the "genetic facts", are therefore considered a legitimate and reliable source for such categorisations (see for instance Obermeyer *et al.* 2019).

Lizette Chirrime, *The African dream*, detail, 2021. Courtesy of AKKA Project and the artist. This artwork was featured in the "African Identities" Group Exhibition, AKKA Project, Venice 18 July – 29 August 2022.

In biology, the notion of race is misleading since it does not serve as a genuine proxy for differences within our species.

A racist science/medicine?

Science is not immune to bias and prejudices that can affect how data are understood and interpreted. In this sense, we must heed the appeals and requests to ban certain notions (such as that of race) from theorising and scientific practice (Brothers, Bennett, and Cho 2021; Yudell et al., 2016; Barbujani et al., 2013). And yet the reference to race, even in purely scientific contexts, has not ceased. Indeed, in certain situations, despite the progress of "omics", the use of the notion of "race" has even increased (Yudell et al., 2016). Regardless of the proposal of some scholars and researchers to use the terms "ancestry" or "ethnicity" in the place of "race," some recent studies still seem to suggest that the latter notion can provide a non-renounceable level of classification of human variants (see for instance Banda *et al.* 2015). Furthermore, the practice of adopting different terms in the absence of precise and robust conceptual specifications does not guarantee that even these notions will work better toward the issue at stake. In fact, even if the notion of ancestry indeed suggests greater relevance to evolutionary trajectories rather than a criterion of belonging to this or that human group, this does not prevent the reconstruction and re-proposing based on such ancestries, racist or racist-like arguments.

Biomedicine gives some examples. Quite recently, some studies suggest that, in clinical practice, sometimes the notion of race still plays a role as a classification system (or even just as a grouping system for practical reasons) of the varying forms of human beings from the point of view of their clinical relevance, social epidemiology and, as already discussed, medical genetics (Burchard *et al.* 2003; Cerdeña, Grubbs, and Non, 2022; Hindorff *et al.* 2018; Lorusso and Bacchini 2015; Risch et al., 2002; Spencer 2018). In other words, where genetic variability could provide indications about the susceptibility (to specific diseases) or otherwise of this or that therapeutic intervention, in some cases, the notion of race still seems to be applied, in practice, to account for these distinctions. This is despite of its biological groundlessness. Another distinction appears crucial here, which again shows the crucial nature of the epistemological reading (which, unfortunately, is too often absent in the training and educational path of health personnel and researchers in the biomedical field) in dealing with these issues. The distinction concerns outlining the difference between the use of the concept of race to indicate a possible predisposition to certain diseases (i.e. "ontologically" biological) and the use of race to indicate a specific therapeutic, even preventive treatment (e.g. biological heuristics, see section 2). An interesting and still controversial example is the one concerning the first approval (by the FDA) of a drug called BiDil specifically for African Americans (see Brody and Hunt 2006).

In this framework (also to better highlight the perils of poor conceptual attention), it may be vital to mention those pathologies which, statistically or historically, have an overrepresentation in certain groups and are labelled as a specific expression of those groups. A famous case is represented by thalassemia (a blood disease characterised by a reduced production of haemoglobin), which is often associated with Mediterranean populations and thus characterised as such (Yudell et al., 2016). By that, I mean that thalassemia has been, therefore, also used to characterise Mediterranean populations as "inherently" (again a relic of an essentialist view on biological features) affected by certain conditions, potentially discriminating against these populations, or postulating their genetic "inferiority" (Yudell et al., 2016). However, this example has nothing to do with race, but with the geographic origin of an individual. Indeed, as already discussed in the previous section, the notion of race intended as a social construct can serve as a proxy for genetic variants which are causally relevant to susceptibility to certain diseases. But in the case of thalassemia, the situation is different. Here the "Mediterranean" label serves to point to the geographic origin of an individual. This will help to determine the probability of possessing a variant for diseases that are associated with specific environmental conditions. Therefore, these features are usually shared by populations of different ancestry but living in similar environments.

Another case, connected to the previous one, is constituted by the specialisation of pharmacological research within personalised medicine. Some wonder if the ways of studying peculiar pathologies and the drugs to fight them risk contributing, even unwittingly, to a kind of racial (if not racist) medicine. Simplifying, if it is undisputed that all human beings belong to the same species, it is equally fair to recognise that each individual has specific particularities (roughly, this is what evolution tells us). Sometimes, some of these features might also be shared with other human beings, thus forming sub-divisions with respect to the entire human population. Although these partitions do not have much in common with the old notion of race (in other words, they do not form groupings that can be directly associated with the divisions postulated by the "races"), their characterisation and their use with little caution could still generate forms of discrimination or racism, even if not based on traditional concepts. For example, if specific genetic variants widespread in certain geographic regions were essentially associated with specific populations or certain groups of individuals, there is a risk that such information could be used against these people. In other words, even without explicitly speaking of races, genomic diversity and the partitions it generates can provide new life to racism. In this sense, some entities (from companies to public administration) may refuse to employ people with a particular genetic profile or ancestry.

In short, the use of genetic and genomic data does not in itself solve the problem of racial discrimination. Instead, it

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could even worsen it. In fact, this shows how a scientific or technological solution cannot be the answer, as such, to a problem that is also conceptual, historical and socio-political. Moreover, as already mentioned, even the use of new terms, such as "ancestry", thought to be more neutral or neutral, does not represent a satisfactory solution.

Unfortunately, the question does not end there. There are other aspects of genomic research that present critical elements. One relevant example is constituted by the so-called Genome-Wide Association Studies (GWASs). GWASs are genomic tools that are now widely used and considered extremely valuable in biomedical research. As reported on the web page of the National Human Genome Research Institute (NIH), a GWAS is «a research approach used to identify genomic variants that are statistically associated with a risk for a disease or a particular trait. The method involves surveying the genomes of many people and looking for genomic variants that occur more frequently in those with a specific disease or trait compared to those without the disease or trait. Once such genomic variants are identified, they are typically used to search for nearby variants that contribute directly to the disease or trait» (NIH, undated)

As recently reported, in 2009, 96% of participants in studies of this type were of European origin. Recently the proportion of studies on people from Asia has increased by an estimated 20%, but is still insufficient to correct the problem. Furthermore, people with other geographical backgrounds, such as those from South America or Africa, are still hugely unrepresented (Popejoy and Fullerton 2016). The need to increase these proportions is obviously a methodological and epistemic issue (just consider how crucial the representation of such diversity is in terms of accuracy and representation), but it also has enormous ethical relevance. Indeed, such distortion risks making medicine increasingly oriented towards understanding and treating specific problems of certain human populations ("coincidentally" the most privileged and wealthy ones), visibly neglecting others. Therefore, the destiny of personalised medicine could be of being medicine for those who can afford it, both economically and genetically. It is then evident that, beyond the theoretical appeals, precise institutional efforts are warrated to obtain these data and transform the practices and the sources of these studies, which consequently also involve specific economic choices. This is another aspect that points to the phenomenon's complexity and to the fact that the solution cannot come exclusively from a disciplinary context that operates totally separate from the others.

Even without explicitly speaking of races, genomic diversity and the partitions it generates can provide new life to racism.

Conclusion or a brief defence of the role of epistemology on scientific data and racism

Recent advances in genomics (and other "omics") constitute an essential milestone in the development of scientific research. The results obtained made it possible to reveal and certify some "incredible" aspects (especially from the point of view of public perception) of the human species (and not only of the human one). Thanks to these studies, we have a better understanding of our evolutionary path, the differences between two members of the human species, and the relevance/meaning of these differences. Indeed, such differences are significant to recognise, yet they exhibit a distinct relevance from that assumed only a century and a half ago. We also understood much better what unites us instead, that all human beings belong precisely to the same species and that this or that peculiarity is not only wholly justifiable from an evolutionary point of view but is also necessary and vital: "being diverse is an essential condition to be alive" (Buiatti 2004). Furthermore, these results have undoubtedly helped to show that the concept of race has no scientific basis.

However, this does not entail, as a direct consequence, a downsizing of racism as a phenomenon. First, in part, this is due to the fact that the notion of race as a social construct is still used in many contexts, from the political sphere to socio-economic studies, to issues concerning the question of identity. Secondly, even the sciences and medicine, in some cases, continue to adopt those notions, although they are outdated and in spite of the efforts of many scholars to eliminate them. Finally, there are more subtle issues but perhaps potentially even more relevant, precisely because they are more difficult to notice. And that is the fact that biases and methodological approaches marked by a vision that we could call "racist," or at least privileging particular "ancestries" over others, end up informing the results of scientific research, which are, in turn, considered valid for all human beings. Such generalisations, which would be very important in knowledge acquisition, run the risk of becoming binding despite their profound partiality. This is obviously an ethical problem. As such a situation can increase inequality and unfairness and have profound discriminatory effects (beyond the possible good intentions of some). However, it also constitutes an actual epistemological problem because it leads us to reflect on the methods and ways scientific knowledge is constructed and established. Moreover, it may also push us to consider the very nature of what we call scientific knowledge with greater attention.

In this sense, philosophy (of science but not only) could have a crucial role in at least three aspects (but in fact, this does not exclude that there may be others). First of all, classically, a greater epistemological awareness should be able to help scientific research in the evaluation of its methods, processes and results. Secondly, such a philosophy could also help convey this information in a critical, yet usable way for the general public. This would also be extremely important considering the relevance that certain studies have and the centrality of the origins of man for those aspects of human life that go beyond scientific research (e.g. politics, among others). Finally, a philosophically more analytical look could help to understand certain forms of naive reductionism, which, in representing or perceiving a problem only from a particular perspective, imagine its solution as a pure problem of updating knowledge.

The problem of race has deep roots in the biological sciences, and it would be impossible to deal with it apart from

Lizette Chirrime, *The Challenge of Today's Single Mother*, 2021. Courtesy of AKKA Project and the artist. This artwork was featured in the "African Identities" Group Exhibition, AKKA Project, Venice 18 July – 29 August 2022.

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them. Indeed, as has been said, the biological sciences (genetics and genomics, among all) show how it is scientifically unsustainable. Yet the problem of race is not just a problem of bad science or science being distorted. It is a question that involves, among other things, culture, history, politics, and the psychological component of our species. Philosophy could therefore help us to put these perspectives together without reducing one aspect to another. In my view, this shows how ethics and epistemology form a continuum with scientific knowledge. In fact, science is never neutral. A better understanding of these aspects can potentially avoid or prevent unwanted outcomes. Maybe, it allows for more reliable and more robust scientific research.

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NOTE

1 - https://www.genome.gov/human-genome-project

ABSTRACT | **ENG**

Developments in genetics have laid the foundations for a more accurate understanding of human specificities. Those discoveries have definitively sanctioned the end of the concept of "race," showing that it is not a scientific category but, at most, a social and cultural construct. However, these advances have not only failed to defeat racist rhetoric but, in some cases, run the risk, paradoxically, of reinforcing it. In this essay, we look at some of these scenarios.

Keywords: Racism, race, genomics, personalized medicine, epistemology

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Il razzismo dopo la fine della razza: breve punto di vista epistemologico su genomica e razzismo

Gli sviluppi della ricerca biologica negli ultimi venti anni, soprattutto nel campo della genetica e della genomica, hanno mostrato come la nozione di razza sia scientificamente insostenibile. L'elaborazione scientifica attuale non solo mostra come questa nozione sia antiquata, inaffidabile e non supportata dalle scoperte moderne, ma rivela anche, particolarmente, come il concetto di razza sia fuorviante poiché divide e raggruppa gli esseri umani in modi che hanno contribuito (e ancora purtroppo contribuiscono) all'emergere di comportamenti discriminatori e ingiusti. Alla luce di questi aspetti, e della perdita di scientificità del concetto di razza, molti studiosi in vari campi avevano ipotizzato un ridimensionamento, se non la scomparsa, delle argomentazioni razziste. Tuttavia, per quanto possa sembrare paradossale, i risultati della ricerca non solo non sono sufficienti a minare il razzismo ma non riconoscono che, se è certo che la concezione razziale, di stampo tardo ottocentesco e novecentesco, rimane biologicamente insostenibile, la razza, intesa come costrutto sociale gioca, ancora un ruolo importante in molti settori, quali la demografia, l'epidemiologia sociale e la ricerca biomedica e clinica.

Questo perché molti individui utilizzano alcune nozioni di razza per identificare se stessi ed i gruppi sociali, culturali e politici cui appartengono. Una scarsa riflessione su questi temi dunque, potrebbe, in contesti specifici, addirittura alimentare nuove forme di razzismo, nonostante la fine al concetto "scientifico" di razza.

In questo breve e parziale saggio, mi propongo di ripercorrere alcuni punti di questa tensione sia teorica che pratica all'interno delle discipline che hanno a che fare con il concetto di razza. A tale proposito mi soffermo quindi su alcuni esempi per chiarire questi aspetti. Infine, cerco di spiegare come la questione razzista non possa essere separata dalla ricerca scientifica.

Nella parte finale compio alcune riflessioni circa possibili soluzioni. Un superamento delle tensioni attuali dovrebbe, probabilmente, comportare l'abbracciare una prospettiva più ampia e integrata, in cui anche la filosofia, soprattutto quella della scienza, potrebbe avere un ruolo essenziale.

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